Planning Proposal (revised)

Rezoning for industrial purposes

Willowbank Road, East Albury

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APPENDICES

INTRODUCTION

This is a revised Planning Proposal relating to land in Willowbank Road, East Albury (see Figure 1) described as parts of Lot 156 DP 753326, Lot 2 DP 999814 and Lot 37 DP 1007315 ("the subject land"). The purpose of the Planning Proposal is to rezone the subject land for general and light industrial purposes.

The Planning Proposal was revised following public exhibition and referral of the original proposal. In response to some of the public submissions relating to perceptions of amenity impacts, the eastern boundary of the proposed rezoning has been contracted westwards (see Figure 2) and the more restrictive IN2 Light Industrial zone applied east of Schubach Street (see Figure 6). The benefits to residents east of the subject land from this change include:

- an increase in distance of approximately 85 metres between existing residential development and any form of future industrial development;
- an increase in distance of approximately 190 metres between existing residential development and the type of future industrial development permitted in the IN1 General Industrial zone;
- excluding dwellings that are in the ownership of the proponent, the nearest unrelated residence to the east will now be 170 metres;
- only light industry that does 'not interfere with the amenity of the neighbourhood' being permissible east of Schubach Street;
- 'Industries' other than 'Light Industries' being prohibited east of Schubach Street (i.e. in the IN2 zone);
- developments such as 'crematoria', 'electricity generating works', 'restricted premises', 'storage premises' and 'waste or resource management facilities' being prohibited east of Schubach Street (i.e. in the IN2 zone);
- retention of trees surrounding the existing dwelling at the eastern end of the subject land that will now be retained in the RU2 Rural Landscape zone;
- a buffer of RU2 zoned land being provided between the public open space adjoining the eastern end of the subject land and the proposed IN2 zone; and
- less likelihood of heavy vehicles using Doctors Point Road (given the IN2 zoning).

In summary, the modification provides a greater buffer between future activities on the subject land and residents to the east. This report addresses the modified proposal and also updates the Planning Proposal to address current requirements.

The Planning Proposal has been prepared in accordance with the Department of Planning's *A guide to preparing Planning Proposals* ("the Guide") and other information requested as part of the Gateway determination.

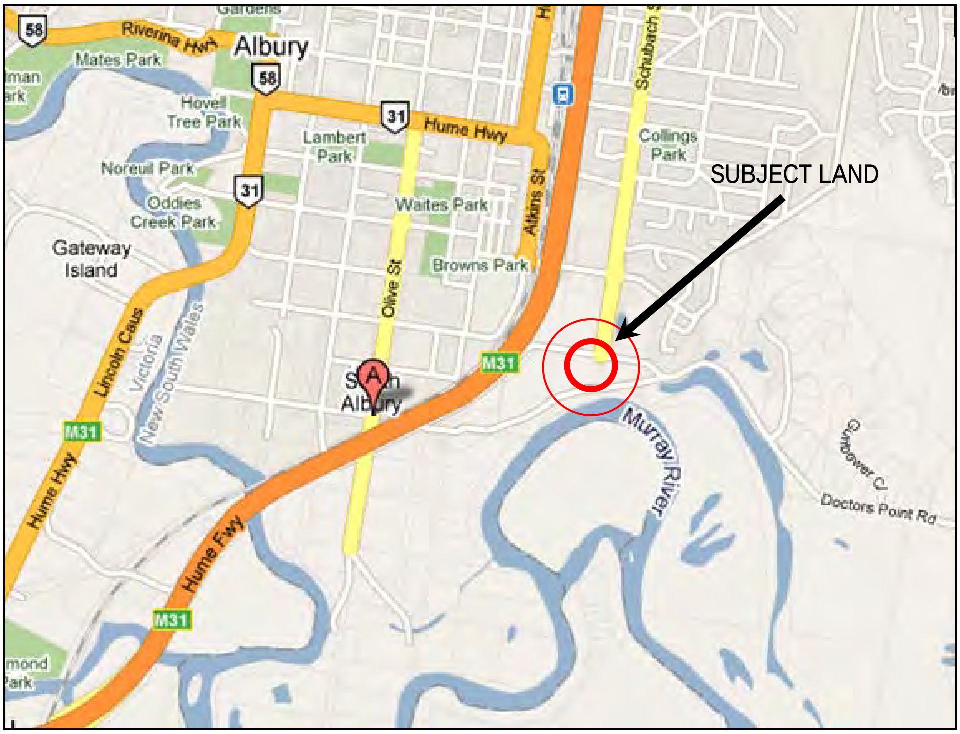


Figure 1 – Location of subject land within the context of Albury (Source: Google Maps)

Figure 2 –Extent of land sought to be rezoned (Source: nearmap)

Background

The subject land was purchased by the Riccardi family in the mid-1960's when it was zoned Non Urban A (Rural). It was subsequently 'up zoned' to Industrial (General) by Interim Development Order No.16 on 7 December 1973 and then 'back zoned' by Council in 1995 to an environment protection zone without the landowners consent or knowledge. In 2005 a portion of the subject land in the north-western corner was acquired from the landowners by the RTA for the purposes of the new freeway. Details of the zoning history of the subject land since 1973 are as follows.

Albury Local Environmental Plan No. 8 was gazetted in mid-1982 and applied the following zones to the subject land (see Figure 3):

- Industrial 4(a) to the majority of the land being that north of the licensed flood levee
- Reservation Local Open Space 9(c) to river frontage strip
- Reservations Proposed Arterial Roads Zone 9(a) to north-western corner (this is the section later acquired by the RTA)
- the portion south of the levee bank was within a separate LEP being the **Albury and Hume Designated Area Local Environmental Plan No.1** administered by the Albury Wodonga Development Corporation (AWDC).

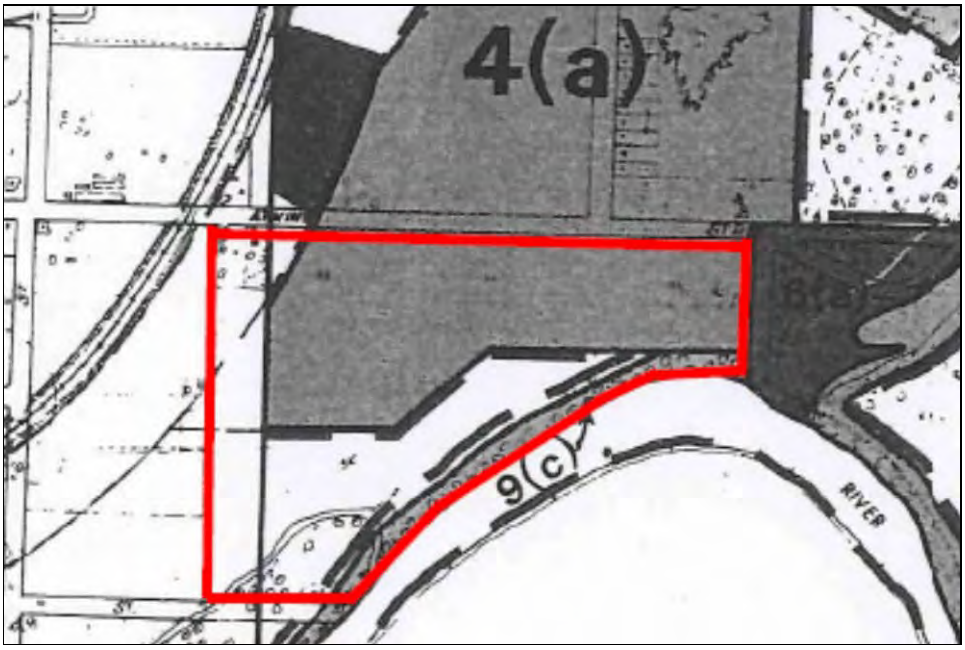


Figure 3 – Extract from LEP 8 zoning map showing the 4(a) industrial zoning that existed over most of the Riccardi property (outlined in red) for 23 years between 1973 and 1996.

Albury Local Environmental Plan 1995 was gazetted on 4th April 1996. Under this LEP, the following zones were applied:

- Environment Protection to the majority of the land
- Open Space to the river frontage strip
- Reservation (Proposed Arterial Road) to the north-western corner , which was later acquired by the RTA

The application of the Environment Protection zoning to the subject land north of the flood levee was undertaken without the knowledge of the landowner. In fact it was not until the then NSW Roads and Traffic Authority (RTA) had commenced its acquisition process for the internal by-pass route of Albury that the landowner became aware that the zoning of his land had been changed.

The land owner approached Council via his solicitor on 13 June 2006 to establish the circumstances surrounding the change. At that time and again in a request as part of this Planning Proposal, Council has been unable to locate any documentation that assessed the land and recommended it for ‘back zoning’ to Environment Protection.

Albury Local Environmental Plan 2000 was gazetted on 28th July 2000. This LEP was largely a review of the 1996 instrument and did not implement any major changes across the city. Under this LEP, the following zones were applied (see Figure 4):

- Environment Protection to the majority of the land
- Open Space to the river frontage strip
- National Highway to the north-western corner (this is the section acquired by the RTA)

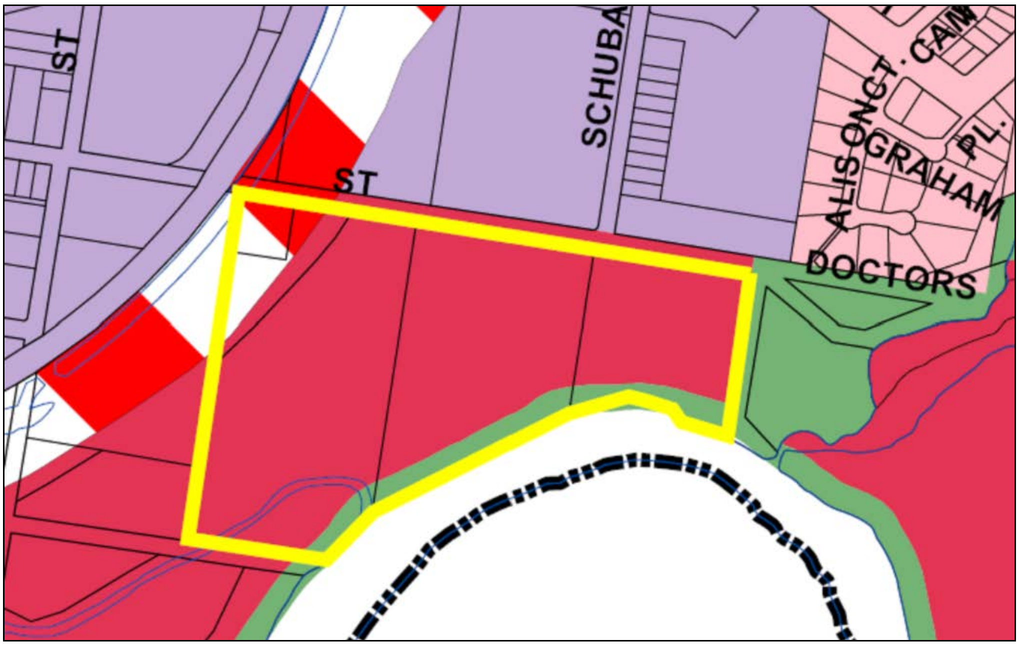


Figure 4 – Extract from Albury LEP 2000 zoning map showing the Environment Protection zoning (in red) that existed over the Riccardi property between 1996 and 2010.

Albury Local Environmental Plan 2010 was gazetted on 13th August 2010 and applied the following zones (see Figure 5):

- RU2 Rural Landscape to the majority of the land
- RE1 Public Recreation to the river frontage strip

During the exhibition of the draft Albury LEP 2010, a submission was made on behalf of the landowner outlining the above zoning history and requesting that the industrial zoning be reinstated as part of the new LEP. This submission was considered by Council but they declined to rezone the site as part of the new LEP, stating that the RU2 zone was a reasonable change to the existing zone, having regard to the horticultural use of the site. Council however did resolve that:

Further discussions be initiated with the land owner to facilitate the preparation of necessary investigations and supporting documentation that will allow Albury City to reconsider zoning for the subject land which would be subject to a separate consideration and reporting process.

These discussions were subsequently undertaken and the Planning Proposal prepared for Council's consideration.

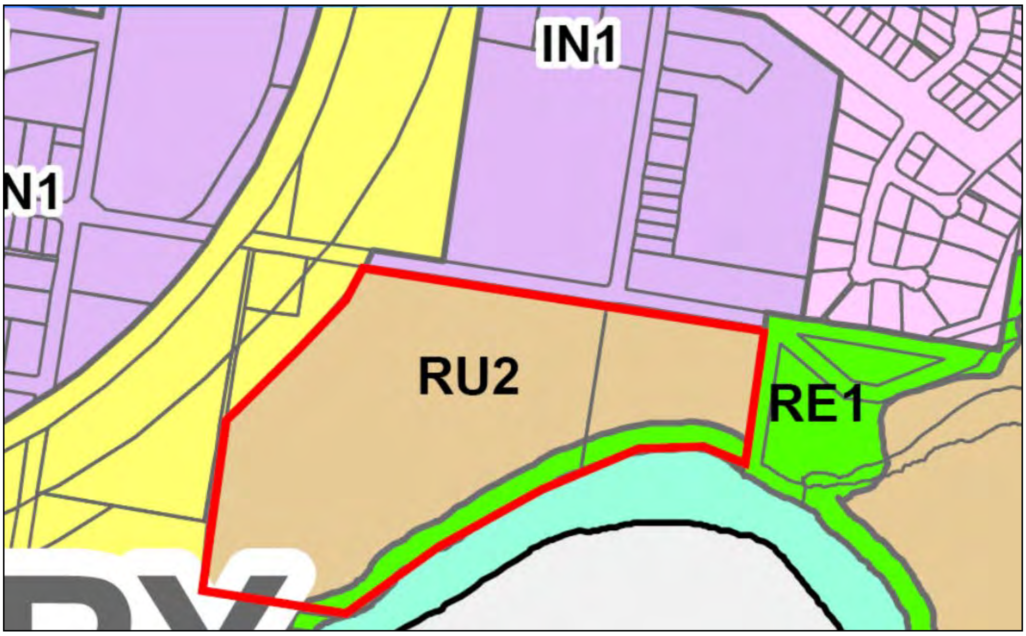


Figure 5 – Extract from Albury LEP 2010 zoning map showing the Rural Landscape zoning (RU2) that has existed over most of the Riccardi property since 2010.

PART 1. INTENDED OUTCOMES

The intended outcome of this Planning Proposal is to facilitate the development of the subject land for industrial purposes whilst minimising environmental impacts, including the amenity of nearest residents. The extent of the proposed zones is shown in Figure 6. An indication as to how the land might be developed in terms of subdivision is included at Appendix 'C'.

Figure 6 – Proposed rezoning (Source: nearmap).

PART 2. EXPLANATION OF THE PROVISIONS

The Planning Proposal advocates for the subject land to be rezoned part IN1 General Industrial and part IN2 Light Industrial. Both these zones are currently in use in Albury LEP 2010 at various locations across Albury.

The objectives of the IN1 zone are:

- To provide a wide range of industrial and warehouse land uses.
- To encourage employment opportunities.
- To minimise any adverse effect of industry on other land uses.
- To support and protect industrial land for industrial uses.
- To provide for industrial uses in close proximity to transport infrastructure.

The objectives of the IN2 zone are:

- To provide a wide range of light industrial, warehouse and related land uses.
- To encourage employment opportunities and to support the viability of centres.
- To minimise any adverse effect of industry on other land uses.
- To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.
- To support and protect industrial land for industrial uses

Whilst there is little difference in the objectives of the two zones, there is a significant difference between the types of permissible industrial activities. All types of industry (general, heavy and light) are permissible with consent in the IN1 zone whereas only light industry is permissible in the IN2 zone. '*Light industry*' is defined in the dictionary of Albury LEP 2010 as:

> *a building or place used to carry out an industrial activity that does not interfere with the amenity of the neighbourhood by reason of noise, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit or oil, or otherwise, and includes any of the following:*
>
> *(a) high technology industry,*
>
> *(b) home industry.*

The application of the IN2 zone at the eastern end of the subject land in the modified Planning Proposal is intended to ensure that only industries having no impact on amenity can be considered east of the Schubach Street intersection (see Figure 6). In conjunction with the contraction of the area proposed for rezoning from the eastern end of the subject land (see Figure 2), the residential areas to the east will be provided with an additional buffer to future industrial development on the proposed IN1 zoned land.

The proposed zoning allows for the development of the site in accordance with the future development aspirations of the owner who was also the owner when it was previously zoned industrial. The land is suited to a wide range of industrial uses that will create employment opportunities in proximity to the city centre and transport infrastructure including the East Street/Bridge Street full interchange with the Hume Highway.

The rezoning would be given effect via an amendment to the relevant zoning map in the Albury LEP 2010 and specifically:

- Amendment of Map No LZN 005 to zone the subject land as part IN1 General Industrial and part IN2 Light Industrial.
- Amendment of Map No LSZ 005 to remove the minimum allotment size currently applicable to the subject land (as is the practice for industrial zoned land).

It is noted that no changes are required to Map No LRA 005 (the Land Reservation Acquisition Map) as no changes are proposed to the RE1 Public Recreation Zone.

PART 3. JUSTIFICATION

This section of the Planning Proposal sets out the justification for the intended outcomes and provisions, and the process for their implementation. The questions to which responses have been provided are taken from the Guide.

3.1 Need for the Planning Proposal

- **Is the Planning Proposal a result of any strategic study or report?**

The Planning Proposal is not the result of any strategic study or report.

It is also noted that the 'back zoning' of the site in 1996 to Environmental Protection was also apparently not subject to any detailed strategic investigation or environmental study.

- **Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?**

Given the current zoning of this flood protected urban land under Albury LEP 2010, it is not possible to achieve the objective of urban development on the site under the current planning regime.

As noted earlier, Council declined to support the rezoning the site as part of the preparation of the Albury LEP 2010 in the absence of further detailed information being provided to substantiate, but resolved to support further investigation of the land as part of consideration for a separate LEP amendment.

Consequently a Planning Proposal is necessary to achieve the intended outcome.

3.2 Relationship to strategic planning framework

- **Is the Planning Proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy (including exhibited draft strategies)?**

There is no adopted regional strategy applicable to the Planning Proposal.

However a draft *Riverina-Murray Regional Plan* (RMRP) has been prepared by the NSW Department of Planning and Environment (DPE) and released in April 2016. The draft RMRP has also been exhibited and is therefore a relevant matter to be considered in this Planning Proposal. It is noted that the RMRP is yet to be finalised.

Table 1 considers the Planning Proposal against the main strategic directions expressed in the draft RMRP.

Table 1 - Consistency with draft *Riverina-Murray Regional Plan*

Directions	**Response**
1.1 Grow the economic potential of the agribusiness sector.	The rezoning of the land will create the opportunity for new businesses to establish in Albury, including those related to agriculture.
1.2 Manage productive agricultural lands in a sustainable way.	The subject land was previously used for intensive agriculture but this is no longer viable and that activity has ceased. The area of land is too small for extensive agriculture on a commercial scale. The best use of the land is now for urban purposes.
1.3 Manage and use the region's natural resources sustainably.	There are no natural resources on the subject land.

Directions	**Response**
2.1 Enhance the region's freight networks through coordinated investment.	The Planning Proposal seeks to establish additional industrial land adjacent to a major national transport and freight route. The provision of industrial land in this location further diversifies the options available to industrial development, i.e. Airport related lands at East Albury and transport related activities in close proximity of the Hume Highway.
2.2 Improve inter-regional transport services.	The location of the land close to the Hume Highway will improve transport movements to other regions (including metropolitan areas) to the north and south.
2.3 Coordinate infrastructure delivery to facilitate economic opportunities.	It has been established that the subject land can be provided with all urban infrastructure necessary for employment generating development (see Appendices 'E' and 'G').
3.1 Grow the regional cities of Albury, Wagga Wagga and Griffith.	It is considered that the addition of new industrial lands accessible to the Hume Highway will further enhance Albury's role as the major centre in the Riverina-Murray region. This is consistent with the draft RMRP that states "*population growth across the region will not be evenly distributed, with the regional cities of Albury and Wagga Wagga projected to experience the highest rate of growth. Investment in major services, facilities and industrial activity will drive growth in the regional cities, distributing benefits across the region*" (page 49). Action 3.1.2 of the RMRP is to "*implement an industrial land monitoring program to maintain a supply of well-located and serviced industrial land.*" Council's annual Albury Development Monitor satisfies this action. The Albury Development Monitor demonstrates that there is demand for industrial land in the city and the proposal is a response to that demand. This is consistent with this Direction of the RMRP. A discussion on the demand and supply of industrial land is undertaken later in the report. In addition, this Action encourages Council's to apply the *Draft Principles for Industrial Land Identification* to assist in managing the demand and supply of industrial land, and avoid potential land use conflicts for "*regionally significant industrial land*". Consideration of these principles is undertaken in Table 2 below.
3.2 Enhance the liveability and economic prosperity of the region's towns and villages.	The rezoning will have no impact on the regions "*towns and villages*" other than perhaps increasing the demand for housing in these locations within commuting distance through new employment on the subject land. The proximity of the land to the Hume Highway enhances this prospect through increased accessibility.
3.3 Enhance the economic self-determination of Aboriginal communities.	The rezoning will have no effect on Aboriginal communities.
3.4 Provide a continuous supply of appropriate housing to suit the different lifestyles and needs of the region's population.	Not relevant as the proposal does not relate to residential development. The provision of additional industrial and employment generating land is considered to have potential to increase the population of Albury and in turn, encourage new residential development.

Directions	**Response**
3.5 Enhance connections and planning between cross-border communities to improve service quality and infrastructure delivery.	The subject land is located less than 10 minutes from Wodonga via the Hume Highway. This proximity will be attractive to business activities that operate across Albury-Wodonga.
4.1 Protect the nationally significant Murray River.	It is acknowledged that the proposal has the potential to impact upon the riverine environment through future industrial development and activities on land located in proximity of the Murray River. The part of the land to be developed involves only that north of the existing licensed flood levee, which is already highly modified from its original natural state. The land to be rezoned is a minimum of 70 metres from the Murray River and separated by a licensed levee bank that not only protects the land from flooding but acts as a bund to contain any polluted material within the site. Future development of the land for both subdivision and individual development of allotments will be subject to assessment by Council under Section 79C of the EP&A Act. This includes the planning principles of MREP2 that in effect would prevent any development considered to have a detrimental impact on the Murray River. The Planning Proposal is therefore considered to satisfy this strategic direction.
4.2 Protect the region's environmental assets and biodiversity values.	The land proposed for rezoning is of low environmental value because it has been cleared of native vegetation and has a long history of being used for agriculture. Consequently it is not considered to be an 'environmental asset'. In preparing the ALEP 2010 Council identified lands of environmental significance within the municipality and applied the E3 Environmental Management zone. It is noted that the current RU2 zone is a rural and not environmental zone. The land has been zoned and envisaged by previous environmental planning instruments as suitable for industrial development. The construction of the Hume Highway and East Street full interchange has reinforced the suitability of the land for what is proposed. As such, it is considered to be an appropriate location for provision of new industrial land.
4.3 Increase the region's resilience to natural hazards.	The rezoning does not increase the risk of exposure to natural hazards. The subject land protected from flooding by a levee bank constructed and licensed for this purpose. This levee will be unaffected by the proposal. The land is not mapped as a bushfire risk and the rezoning will not alter this.

Table 2 – Consideration of draft principles for industrial land identification in the *Riverina-Murray Regional Plan*

Principle	**Response**
1. New industrial land should meet the long term needs of industry growth for the region.	Within the vicinity of the subject land, the *2015/16 Albury Development Monitor* (ADM) records just three vacant lots in the Schubach Street precinct and 10 on the opposite side of the freeway in South Albury. Based on most vacant industrial lots being located north of the Riverina Highway, the creation of additional industrial land in the southern part of East Albury is considered to be contributing to meeting the overall need for future industrial growth in Albury-Wodonga.
2. Industrial land should be protected and separated from sensitive and incompatible land uses.	Excluding dwellings that are in the ownership of the proponent, the nearest unrelated residence to the east is 170 metres away. In addition, the use of the IN2 zone at the eastern end of the subject land will further protect residences from industrial uses that have potential to affect residential amenity.
3. Isolated, unused or underused pockets of industrial land should be consolidated to create opportunities over the long term.	Zoning the subject land for industrial purposes will consolidate it with existing industrial land adjoining to the north.
4. Regionally significant industrial lands should be retained and supported to meet the changing needs of industry.	The land is not regionally significant (in the same context as the Albury Industrial Hub or Logic Industrial Estate near Wodonga).
5. At a regional-scale, industrial land supply should provide capacity to enable the development of specialised industry clusters.	The combination of the proposed IN1 and IN2 zones will provide for a broad range of industrial and industrial related activities. The land is not identified as having any unique characteristics that are conducive to a "*specialised industry cluster*".
6. Plan for and maximise the use of infrastructure to encourage sustainable development of industrial land, including access to markets and workers, and connectivity to the existing freight network.	The Servicing Strategy at Appendix 'G' demonstrates that the subject land can be provided with all urban infrastructure. The land is also in close proximity of a full interchange on the Hume Highway providing access for employees and traffic associated with future industrial activity.
7. Co-location should be encouraged, where appropriate, to maximise opportunities for co-efficiency and decreased supply chain costs.	This is a matter for future development rather than zoning.

Is the Planning Proposal consistent with the local Council's community strategic plan or other local strategic plan?

The ***Albury Wodonga Region Planning Strategy*** (AWRPS) in 1991 identified the subject land as "*existing service/industrial*" (see Figure 7) representing part of the East Albury industrial area. Whilst this document has been superseded by various subsequent plans at a local level, it does demonstrate that the 1995 LEP contradicted what was the only strategic land use plan in place at the time for Albury, by applying the Environment Protection zone to the subject land.

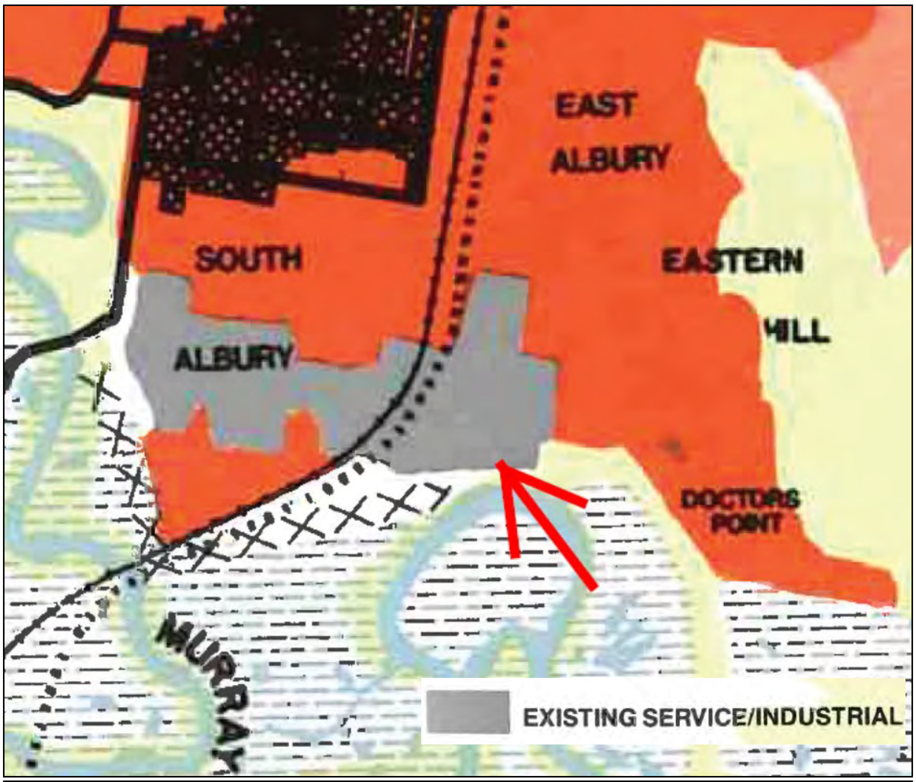


Figure 7 – Extract from the Albury-Wodonga Framework Plan with location of subject land indicated (Source: Albury-Wodonga Regional Planning Strategy 1991)

Council's community strategic plan is titled ***Albury 2030***. It was first prepared in 2005 and reviewed in 2010. It will be reviewed again following local government elections in 2016. As stated in the document, *Albury 2030* is "*is the highest level planning document for Albury*." An assessment of the Planning Proposal against the four themes in the community plan is undertaken in Table 3.

Table 3 - Consistency with *Albury 2030*.

Relevant aims of Albury 2030	**Response**
Theme No. 1 – A Growing Economy ▪ *Grow the city and its population to provide confidence to local business expansion and growth.* ▪ *Provide integrated transport routes to meet the needs of the expanding city.* ▪ *Provide for connections with key transport routes;* ▪ *Enhance promote and maintain the built environment to serve the needs of the city.* ▪ *Become a leader in health and education services.* ▪ *Support Albury's population and employment growth.*	The Planning Proposal is generally consistent with the broad objectives and aims of this theme of *Albury 2030* as it supports economic growth of the city by providing additional employment generating land for future investment. More specifically, the proposal is consistent with the following strategic actions. **1.3.2 Support Albury's population growth**. The proposal will provide new employment generating lands, which will have a flow on effect upon population growth. **1.5.1 Promote Albury as an inland city that is attractive to visit live and invest in**. The proposal will provide additional industrial land and create opportunity for business investment within the industrial and commercial sectors of Albury's economy.

Relevant aims of Albury 2030	**Response**
▪ *Support and promote business opportunities across all sectors of the economy.* ▪ *Promote Albury as a 'hub' for regional investment.* *Encourage new manufacturing and commercial businesses to Albury with a focus on 'green industry'.*	**1.5.4 Economic Development Strategy Priorities.** The proposal will provide additional industrial and employment generating land which offers potential for greater investment in the industrial and commercial activities of Albury. The location of the land adjacent to existing industrial land and ease of access to interstate freight corridors makes the site particularly attractive for future industrial growth.
Theme No. 2 – An Enhanced Natural Environment ▪ *Improve the health of the Murray River.* ▪ *Become a leader in water and waste-water management and protecting local plants and animals.* ▪ *Manage access to sensitive areas to protect and promote the natural assets of Albury.* ▪ *Raise community awareness of relevant climate change issues.* ▪ *Promote energy efficient building design and operation.* ▪ *Implement strategies to minimise waste generation.*	The Planning Proposal is generally consistent with the broad objectives and aims of this theme of *Albury 2030* as it recognises and responds to the natural context of the site, and seeks to provide an initial framework (through land use zoning) that will protect the sensitive riverine environment. More specifically, the proposal is consistent with the following strategic actions. **2.1.1 Enhance, protect and promote natural assets.** The proposal recognises the location of the adjacent Murray River environs, and seeks to zone only that land which is flood free (i.e. within the South Albury Levee in this part of East Albury). The contraction of the initial proposed zone boundary at the eastern end of the subject land will also result in the retention of a number of established trees. **2.1.3 Resource efficient building design and refurbishment**. Future detailed design work of both the subdivision infrastructure and subsequent building design will be encouraged to meet best practice design standards through compliance with relevant matters within the ALEP 2010 and ADCP 2010. The Servicing Strategy prepared as part of the Planning Proposal (see Appendix 'G') demonstrates that the subject land can be serviced by existing infrastructure. **2.1.4 Regional waste minimisation strategies**. Future development of the land has adequate opportunity to minimise and reuse, where possible, waste generated by future activities. Compliance with Council's relevant controls will ensure an appropriate level of waste minimisation can be achieved.
Theme No. 3 – A Caring Community ▪ *Become a cultural and creative city that embraces and celebrates diversity.* ▪ *Provide quality health care, aged care services, encourage health lifestyles and provide community services.* ▪ *Become a city which values lifelong learning and knowledge.* ▪ *Provide quality education.* ▪ *Support skills and development and provide incentives for employers.* ▪ *Promote multi use of*	The Planning Proposal is generally consistent with the broad objectives and aims of this theme of *Albury 2030* as future development of this land will have an indirect impact upon the population growth as well as ongoing use and investment in community facilities and services. There are no specific strategic actions relevant to this Planning Proposal.

Relevant aims of Albury 2030	**Response**
facilities and services. ▪ *Facilitate a safe and caring community.*	
Theme No. 4 – A Leading Community ▪ *Promote strong government and regional networks* ▪ *Empower the community to contribute to the future direction of the city and providing inclusive decision making processes* ▪ *Develop strategies to allow young people to contribute to the city's future* ▪ *Council consult with the community on all major changes that will affect them.*	The Planning Proposal is generally consistent with the broad objectives and aims of this theme of *Albury 2030* as future development of this land in terms of rezoning and subsequent detailed development will be subject to notification and consultation. More specifically, the proposal is consistent with the following strategic actions. **4.1 A central communication resource, 4.1.1 Community engagement strategies** and **4.1.2 Evaluate ongoing effectiveness of community strategy.** The proposal, by way of this Planning Proposal and subsequent exhibition processes, will provide adequate communication to the surrounding community of changes affecting this area of Albury.

The current ***Albury Land Use Strategy*** (ALUS) was prepared by Council in 2007 as a strategic planning document providing guidance for the subsequent Albury LEP 2010 and Albury DCP 2010. The ALUS acknowledges the strategic work undertaken in the AWRPS (see above). The ALUS focussed on the larger development fronts of Albury in terms of future land use and took the 'existing conditions' approach to land use designations for areas closer to central Albury. For this reason the subject land is depicted as "*agriculture*" on the Albury Land Use Strategy Plan as that is what it was being used for at the time.

The ***Murray River Experience*** (MRE) is a strategic plan for various parcels of open space in Albury having an interface with the Murray River. The MRE was undertaken by Council in 2006 and stated as "*a challenging investigation of opportunities for AlburyCity's open space areas (existing and future) which converge on the Murray River and the foreshores of Lake Hume*". The objectives of the MRE were to:

- strengthen the relationship between the community and the Murray River;
- provide greater access to the Murray River;
- provide quality amenities in all open spaces;
- promote and develop a diversity of experiences; and
- significantly improve the health and well-being of the Murray River.

Within the context of the Planning Proposal, the MRE proposes the embellishment of a small park adjoining the subject land on the eastern side. This is public land and not part of the Planning Proposal. The retraction of the eastern boundary of the proposed rezoning would provide a buffer to the park and remove the risk of any land use conflicts at the interface of the park and the subject land.

The MRE also identifies the potential for walking and cycling tracks along the bank of the Murray River that ultimately would link the Wonga Wetlands in the west to Hume Weir in the east. This path would be located to the south of the subject land and consequently unaffected by the Planning Proposal.

- **Is the Planning Proposal consistent with applicable State Environmental Planning Policies?**

  There are a number of State Environmental Planning Policies (SEPPs) relevant to the Planning Proposal. An assessment of the Planning Proposal against the requirements of these SEPPs is undertaken in Appendix 'A'.

  In summary, the assessment demonstrates that the Planning Proposal satisfies the requirements of the relevant SEPP.

- **Is the Planning Proposal consistent with applicable Ministerial Directions (S.117 Directions)?**

  Section 117 of the EP&A Act allows the Minister for Planning to give directions to Councils regarding the principles, aims, objectives or policies to be achieved or given effect to in the preparation of draft LEPs. A Planning Proposal needs to be consistent with the requirements of the direction but can be inconsistent if justified using the criteria stipulated such as a Local Environmental Study or the proposal is of "*minor significance*". An assessment of the Planning Proposal against the requirements of relevant directions is undertaken in Appendix 'B'.

  In summary, the assessment demonstrates that the Planning Proposal either satisfies the requirements of the direction or the non-compliance is justified using the provisions provided.

3.3 Environmental, social & economic impact

- **Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?**

  The proposal will not result in any disturbance of habitat areas or natural features of the area because it relates to the rezoning of land that has already been significantly modified from its natural environment through agricultural use (including horticulture). The contraction of the initial proposed zone boundary at the eastern end of the subject land will also result in the retention of a number of established trees.

  It is also noted that the Planning Proposal does not relate to the floodplain located south of the levee or along the Murray River.

  The potential environmental impacts have been discussed elsewhere within this report including consideration of REP 2.

- **Are there any other likely environmental effects as a result of the Planning Proposal and how are they proposed to be managed?**

  There are few environmental effects anticipated as a result of the Planning Proposal.

  Flooding

  The site is protected from flooding by the existing licensed South Albury Levee and any future buildings will be subject to minimum floor height requirements. Consideration of flooding is made under Ministers Direction 4.3 at Appendix 'B'.

  Groundwater

  A preliminary Groundwater Level Assessment (see Appendix 'D') has been undertaken on the subject site. The assessment identifies two locations where ground water was observed – an irrigation bore and an irrigation dam. The preliminary assessment estimates that the current groundwater level on site is 151.50m AHD but given the proximity to the Murray River, it is anticipated that levels would periodically fluctuate in response to the height of the river.

  Whilst the assessment anticipates that excavations on the site may intersect with groundwater levels, it is outlined that the impacts "*would be of a temporary nature and can be mitigated through the development of an appropriate de-watering* *methodology and a site construction environmental management plan which considered water quality impacts*."

The assessment concludes that no long term negative impacts to groundwater levels are anticipated from development at the site.

Potential land contamination

The subject land has a history of being used for horticultural purposes. Whilst this activity has recently ceased, there remains the potential for land contamination based on historic farming practices associated with horticulture. Consequently and in response to SEPP55 a preliminary environmental site assessment has been undertaken on the subject land. The result of this assessment is recorded in the response to the requirements of SEPP55 in Appendix 'F' and concludes that "b*ased on the site soil and groundwater quality results, contamination associated with previous site activities that might pose an unacceptable risk to identified potential receptors related to commercial/industrial land use is not evident and the findings of this assessment do not preclude use of the site for commercial/industrial purposes*."

Traffic

A Traffic Impact Assessment (TIA) has been undertaken for the subject land (see Appendix 'E') based on anticipated future traffic conditions, including development of the subject land. The TIA reviews, supplements and in part replaces an earlier version that was exhibited with the original Planning Proposal and addresses additional issues, particularly in relation to future land use activities and operating hours, intersection treatment at Schubach Street/Willowbank Road, consideration of impacts on the wider road network (East Street/Schubach Street roundabout and East Street/Hume Highway interchange) and forecast traffic volumes noting the date of original report.

The revised TIA concludes that based on SIDRA traffic modelling, the vehicle movements anticipated at the intersection of Schubach Street and Willowbank Road in the future could be accommodated by a channelised and upgraded 'T'-junction intersection. The TIA also acknowledges that this intersection would be further enhanced in terms of safety with the provision of a roundabout. The proponent of the Planning Proposal is prepared to provide a roundabout of appropriate design for turning heavy vehicles.

Aboriginal cultural heritage

Whilst there are no known archaeological items on or around the subject land (see Appendix 'I'), it is still appropriate to consider the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* prepared by the former NSW Department of Environment, Climate Change and Water in 2010. Consideration of the due diligence process is undertaken in Table 4 below.

Table 4: – Due diligence code of practice

Due diligence process	**Response**
Step 1. Will the activity disturb the ground surface?	Not from the Planning Proposal itself, but the subsequent development of the land will result in ground disturbance through construction.
Step 2a. Search the AHIMS database and use any other sources of information of which you are already aware.	There are no recorded archaeological sites on the AHIMS database (see Appendix 'I') or on the Heritage Map in the ALEP within or near the subject land.

Due diligence process	**Response**
Step 2b. Activities in areas where landscape features indicate the presence of Aboriginal objects.	The current landscape of the subject land is that of farmland (i.e. extensively disturbed rural land). Whilst the subject land is in proximity of the Murray River in its highly modified state there are no current "*landscape features*" that would indicate the presence of Aboriginal objects.
Step 3. Can you avoid harm to the object or disturbance of the landscape feature?	Not applicable as the proposal is not "*on land that is not disturbed land or contains known Aboriginal objects*".
Step 4: Desktop assessment and visual inspection.	Not applicable as the proposal is not "*on land that is not disturbed land or contains known Aboriginal objects*".
Step 5. Further investigations and impact. assessment	Not required.

This preliminary assessment is adequate for the purposes of the Planning Proposal. As is standard practice, any approval for the future development of the land would be conditional upon the cessation of works in the event any objects are unearthed.

Noise

An accurate assessment of noise impacts resulting from the future development of the subject land for industrial purposes is not possible without knowing the type of development. It is noted that the modified Planning Proposal has contracted the eastern extent of the proposing zoning and applied the more restrictive IN2 zone to that part of the subject land east of Schubach Street. This will reduce the risk of any noise impacts on residences east of the subject land. It is also noted that Council will be required to consider the noise impacts of any future development on the subject land and through the development application process will need to be satisfied that any development won't have a detrimental impact on the amenity of nearby residents.

Vegetation

The subject land is extensively cleared of vegetation courtesy of its previous use for horticulture. Of the vegetation remaining, the most significant is at the eastern end within the curtilage of a small dwelling. Most of this vegetation consists of exotic species that offer a landscape benefit but not habitat for native fauna. Consideration of this vegetation is no longer required in terms of the Planning Proposal because the eastern extent of the proposed zone has now been contracted so as to not include this area of the subject land.

➢ **How has the Planning Proposal adequately addressed any social and economic effects?**

The Planning Proposal relates to the provision of well located, serviced urban land for industrial uses. This is the largest employment sector in the region and the Planning Proposal represents an opportunity to create additional employment generating development. It is also noted that there are few vacant industrial sites available in East Albury and that this site, being located so close to transport networks and the commercial centre of Albury, represents an ideal opportunity to provide industrial land in close proximity to the urban area and its population.

At present, industrial land is predominantly contained within several estate environs, being Airport Industrial Estate (East Albury), Airside North (Thurgoona/East Albury) and Nexus (Ettamogah). The subject land will offer additional choice of industrial land location in Albury. This choice is considered to be a significant factor in ensuring opportunities for diversification of industrial activities and providing opportunities for attracting new industrial activities to Albury. The proximity and visibility of the subject land from the Hume Highway also provides a clear point of difference to other industrial land and allows Albury to offer choice in locations for industrial development.

The *2015/16 Albury Development Monitor* (ADM) indicates that there has been an average demand for around six vacant industrial per annum since 2010/11 with a peak of nine lots developed in 2015/16. The ADM records 100 vacant industrial lots across all of Albury as at 30 June 2016 of which 87 are located north of the Riverina Highway. Within the vicinity of the subject land, the ADM records just three vacant lots in the Schubach Street precinct and 10 on the opposite side of the freeway in South Albury. Based on the location of vacant industrial lots, the creation of additional industrial land in the southern part of East Albury is not considered to be creating an over-supply.

In summary, the Planning Proposal is considered to have a net positive social and economic effect on Albury as a whole through investment and employment creation.

3.4 State & Commonwealth interests

- **Is there adequate public infrastructure for the Planning Proposal?**

To determine the feasibility of providing the land with urban infrastructure, a Servicing Strategy based on an indicative subdivision layout was prepared for the basis of assessment (see Appendix 'G'). This strategy demonstrates that the subject land can be serviced with reticulated potable water, stormwater drainage, electricity, gas and telecommunications. In regards to reticulated sewerage, the existing infrastructure at Schubach Street is nearing capacity, and the future development of the land is likely to require upgrading and/or augmentation.

The Traffic Impact Assessment (TIA) undertaken for the modified Planning Proposal (see Appendix 'E') also concludes that the development of the subject land along the lines proposed by the indicative subdivision plan is feasible from a road and traffic perspective. Whilst the TIA notes that a 'T' junction at the Willowbank/Schubach/Doctors Point intersection could technically accommodate the traffic predicted from future development, a roundabout would provide for enhanced safety and traffic flows.

Servicing requirements may change depending on the type of development proposed for the land and require an upgrading of one or more elements of infrastructure. Some types of development may not be suited to the location because it is not possible to provide the necessary infrastructure to the required standard. These considerations would be made when a development application is lodged with Council. The provision of all infrastructure associated with the development of the land is at the developer's expense.

The exact timeframe of development is not known at this stage, and is subject to a variety of external influences by planning authorities and other agencies. Despite this, it is expected that a development application for subdivision of the land would be made within 12 months of the gazettal of the Planning Proposal. Upon which, it is anticipated that it would be at least 12-18 months before any subsequent construction work for new industrial properties would commence (allowing for construction works for the subdivision, registration of titles, sale of individual lots etc.).

Notwithstanding the above, it is considered that given the location of the land adjacent to existing urban development and the flat topography, that infrastructure can be efficiently provided to the land, subject to detailed consideration at subsequent detailed design and development stages of the land.

- **What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?**

The ***Department of Primary Industries (Agriculture)*** does not object to the proposal and commented as follows:

- The subject land is not "*significant agricultural land*".

- Other rural areas are better suited for agricultural uses.
- The proposal meets the objectives of the IN1 zone.
- The proposed zoning would still allow for agricultural related industry.

The ***Department of Primary Industries (Fisheries)*** commented as follows:

- The proximity of the subject land to the Murray River and Normans Lagoon has the potential to "*significantly impact upon fish and fish habitat*".
- A buffer distance of 100m is required to the river and lagoon.
- Riparian vegetation should be protected.
- Buffer zones should be protected and rehabilitated where necessary.

Murray Local Land Services commented as follows:

- Native vegetation is unaffected by the proposal.
- There is no impact on any E3 Environmental Management zone.
- Need to consider flooding.

The ***NSW Office of Environment and Heritage*** commented as follows:

- No concerns with biodiversity and threatened species.
- The land is protected from flooding from the river by a levee but consideration needs to be given to flooding from stormwater run-off.
- An easement should be applied over the levee bank to provide access for proposed works and ongoing maintenance.
- The land is in close proximity (250m) of known Aboriginal cultural heritage sites.
- There is potential for Aboriginal sites to be discovered if ground disturbance associated with the change in land use from horticulture to industrial is undertaken.
- The *Due Diligence Code of Practice for the Protection of Aboriginal Objects* should be applied to the proposal at the time of development.

The ***NSW Roads and Maritime Services*** does not object to the proposal subject to the following matters being taken into consideration:

- The proposed zoning is consistent with that for land to the north.
- Access to the Hume Highway is from East Street and no other accesses will be permitted.
- A 5m wide landscape buffer and possibly non see-through 2m high fencing should be established along the western boundary.

Whilst not a State or Commonwealth authority, the ***City of Wodonga*** is a public authority and were referred the original Planning Proposal by Council. Their submission recognises the advantages of the subject land for future industrial use and consequently supports the proposal.

In summary there is general acceptance of the Planning Proposal by State or Commonwealth authorities and in response to specific issues, the following response is made:

- The 100m buffer requested by DPI Fisheries is achieved for Normans Lagoon with the contraction of the proposed rezoning boundary on the eastern side. Whilst the buffer to the Murray River is only 70m, it is considered the flood levee actually acts as a large bund around the subject land that would prevent any detrimental impacts on fish habitat.

- No riparian vegetation needs to be removed to facilitate future development on the subject land.
- The land is protected from flooding by a licensed flood levee. Within the subject land the issue of flooding will be addressed via minimum floor heights specified by Council at the time of development.
- The further investigation of Aboriginal cultural heritage within the subject land is not necessary following the results of the 'due diligence' assessment.
- Treatment of the interface between the land and the Hume Highway is an issue relating to the development of the land and will be addressed as part of any development application.

PART 4. MAPS

Maps to assist in the interpretation of the Planning Proposal are included in the appropriate place throughout the report.

PART 5. COMMUNITY CONSULTATION

The Planning Proposal has already been subjected to a public exhibition and agency consultation as part of the Gateway process. The Gateway determination specified the community consultation that must be undertaken on the Planning Proposal. This modified Planning Proposal has responded to the issues raised by the community and agencies (see Section 3.4 above) and as a consequence, it is expected that a second round of notification and public exhibition will be undertaken.

This Planning Proposal is considered to be a major proposal given it will result in a rezoning for industrial purposes. As such, the proposal will be exhibited for a period of 28 days in accordance with the requirements of section 57 of the *Environmental Planning & Assessment Act 1979* and the NSW Department of Planning's: *A guide to preparing local environmental plans* (August 2016).

At a minimum, the future consultation process is expected to be in accordance with the consultation requirements set out in the Guide, being:

- written notification will be provided to adjoining and surrounding landowners who may be directly or indirectly impacted by the proposed development (including any persons who made a submission to the original proposal), with a minimum notification period of 28 days;
- consultation with relevant Government Departments and Agencies, service providers and other key stakeholders, as determined in the gateway determination;
- public notices to be provided in local media, including in a local newspaper and on Councils' website;
- static displays of the Planning Proposal and supporting material in Council public buildings, including (at a minimum) the Albury City Administration Building and the Albury Library Museum;
- electronically available via Albury City's website including provision for electronic submissions; and
- electronic copies of all documentation being made available to the community free of charge.

At the conclusion of this second notification and public exhibition period Council staff will consider submissions made with respect to the Planning Proposal and prepare a report to Council.

The zoning of the subject land was the subject of a detailed submission to the exhibited draft Albury LEP 2010 and that submission was considered by Council in a public meeting prior to the finalisation of the LEP. Consequently, the issues relating to the zoning of the subject land and the desired development in the future have been in the public arena for some time.

PART 6. PROJECT TIMELINE

The project timeline for the Planning Proposal is outlined in Table 5. There are many factors that can influence compliance with the timeframe including the cycle of Council meetings and unresolved issues between parties. Consequently the timeframe should be regarded as indicative only.

It is noted that this is a modified Planning Proposal that has already been granted a Gateway determination and been subjected to agency consultation and public exhibition.

Table 5: – Project timeline

Milestone	**Date/timeframe**
Anticipated commencement date (date of Gateway determination)	Revised Gateway January 2017
Anticipated timeframe for the completion of required studies	Not applicable
Timeframe for government agency consultation (pre and post exhibition as required by Gateway determination)	February-March 2017
Commencement and completion dates for public exhibition period	February-March 2017
Dates for public hearing (if required)	March-April 2017
Timeframe for consideration of submissions	April 2017
Timeframe for the consideration of a proposal post exhibition	April-May 2017
Anticipated date RPA will make the plan (if delegated)	June 2017
Anticipated date RPA will forward to the department for notification (if delegated).	June 2017

CONCLUSION

The primary instigation for the Planning Proposal is the landowners desire to realise the development potential of the subject land. A secondary motivation is to reinstate the industrial zoning that previously applied to the subject land. It is acknowledged however that this is not grounds alone to justify the current Planning Proposal and it must also satisfy the planning requirements to rezone land.

The proposal has been revised in light of concerns expressed by nearby residents resulting in a contraction of the proposed zoning from the east and application of the IN2 zone at the eastern end. The IN2 zone restricts the type of industrial development that can be undertaken and only allow for activities that do not interfere with the amenity of the neighbourhood. It now provides a more balanced outcome with regard to future development of the subject land for industrial purposes whilst protecting the residential and environmental values of the area.

The subject site is well situated for urban development, being situated between the licensed flood levee and the existing industrial development on adjacent lands. The area has a mixed land use character, but in this part of East Albury, the character is predominantly industrial. The Main Southern Railway and Hume Highway are located immediately west of the site, and access to this national transport network is located within a kilometre of the subject land. The various investigations undertaken in preparing the Planning Proposal confirm that the land is suitable for the proposed purpose.

In conclusion, the proposal satisfies the requirements of the Guide and should now proceed to a conclusion.

Appendix ‘A’

State Environmental Planning Policies

Consistency of the Planning Proposal with relevant State Environmental Planning Policies

	Title	Applicable to Planning Proposal	Consistency
1	Development Standards	No, does not apply to land in the Albury LGA since gazettal of ALEP 2010	
14	Coastal Wetlands	No, does not apply to the Albury LGA	
19	Bushland in Urban Areas	No, does not apply to the Albury LGA	
21	Caravan Parks	Not applicable to this proposal.	
26	Littoral Rainforests	No, does not apply to the Albury LGA	
30	Intensive Agriculture	Not applicable to this proposal.	
33	Hazardous & Offensive Development	Yes, as the proposed rezoning involves a change to general industrial land.	*State Environmental Planning Policy No. 33* (SEPP 33) sets out definitions of and requirements for potentially hazardous or offensive development. The SEPP presents a systematic approach to planning and assessing proposals for potentially hazardous and offensive development for the purpose of industry or storage. Given the proposed rezoning will provide for additional industrial zoned land, SEPP 33 must be considered. Clause 3 of the SEPP includes the following definitions of potentially hazardous and offensive development: ***Potentially hazardous industry*** means a development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality: (a) to human health, life or property, or (b) to the biophysical environment, and includes a hazardous industry and a hazardous storage establishment. ***Potentially offensive industry*** means a development for the purposes of an industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely

Title	Applicable to Planning Proposal	Consistency
		future development on other land, would emit a polluting discharge (including for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land, and includes an offensive industry and an offensive storage establishment. Clause 4 of the SEPP refers to hazardous and offensive development[1] and states: ***Hazardous industry*** means a development for the purposes of an industry which, when the development is in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the development from existing or likely future development on other land in the locality), would pose a significant risk in relation to the locality: (a) to human health, life or property, or (b) to the biophysical environment. ***Hazardous storage establishment*** means any establishment where goods, materials or products are stored which, when in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the establishment from existing or likely future development on the other land in the locality), would pose a significant risk in relation to the locality: (a) to human health, life or property, or (b) to the biophysical environment. ***Offensive industry*** means a development for the purposes of an industry which, when the development is in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the development from existing or likely future development on other land in the locality), would emit a polluting discharge (including, for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land in the locality. ***Offensive storage establishment*** means any establishment where goods, materials or products are stored which, when in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the establishment from existing or likely future development on other land in the locality), would emit a polluting discharge (including, for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land in the locality.

[1] It is noted at clause 7 of the SEPP that in an environmental planning instrument (whether made before, on, or after the date on which SEPP 33 takes effect) a reference to an offensive or hazardous industry, an offensive industry or a hazardous industry, however defined in that instrument, is to be taken to be a reference to development for the purposes of an industry (as defined in that instrument) that is a hazardous industry or an offensive industry within the meaning of clause 4 of SEPP 33:

Title	Applicable to Planning Proposal	Consistency
		The future development of the land is unknown at this stage, however the zone provisions of the IN1 zone allow for future potentially hazardous or offensive development to occur on the land. Notwithstanding this, any future development of the land will be subject to detailed planning consideration by Council officers. Part 2 of SEPP 33 refers to hazardous or offensive development. Clause 8 of the SEPP states: In determining whether a development is: (a) a hazardous storage establishment, hazardous industry or other potentially hazardous industry, or (b) an offensive storage establishment, offensive industry or other potentially offensive industry, consideration must be given to current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development. Part 3 of SEPP 33 sets out the matters for consideration by consent authorities for potentially hazardous or offensive development, and states the following: In determining an application to carry out development to which this Part applies, the consent authority must consider (in addition to any other matters specified in the Act or in an environmental planning instrument applying to the development): (a) current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development, and (b) whether any public authority should be consulted concerning any environmental and land use safety requirements with which the development should comply, and (c) in the case of development for the purpose of a potentially hazardous industry—a preliminary hazard analysis prepared by or on behalf of the applicant, and (d) any feasible alternatives to the carrying out of the development and the reasons for choosing the development the subject of the application (including any feasible alternatives for the location of the development and the reasons for choosing the location the subject of the application), and (e) any likely future use of the land surrounding the development. The potential impact of industrial development on residences to the east has been reduced by modifications to the Planning Proposal. The contraction of the proposed zone boundary from the eastern end and application of the more restrictive IN2 zone to that part east of Schubach Street provides a for a greater separation between residences and future industrial development. The future specific activities for the land are unknown, and will be considered as part of future detailed development applications by Council. Without specific details of the future activities, assessment against the range of hazard identification and mitigation guidelines cannot be accurately prepared. Notwithstanding this, the case for the suitability of this land for industrial development generally can be

	Title	Applicable to Planning Proposal	Consistency
			made, and is provided throughout this Planning Proposal. The land is located directly adjacent to existing industrial land, which has developed over time into a commercial and industrial precinct, which functions appropriately within its urban context. It is noted that the existing industrial area shares a common interface with an existing residential zone. The proposed area to be rezoned is set back a greater distance from the existing residential land, and does not share any common interfaces with either existing or potential residential land. The location of the proposed zoning some distance from the nearest residential zone means that there will be a considerable buffer distance to future industrial development. In addition Council has the opportunity to impose a variety of mitigation measures through the development application process such as screening, hours of operation, capacity limits and the like. The sensitive environmental location of the Murray River environs surrounding the property is also noted for the purposes of this Planning Proposal. The operation of future industrial lands will be required to ensure that any waste or drainage from the site is directed to reticulated services and away from the river environs.
36	Manufactured Home Estate	Not applicable to this proposal.	
44	Koala Habitat Protection	Not applicable (only applies to that part of the Albury LGA that was located within the former Hume Shire LGA)	
47	Moore Park Showground	No, does not apply to the Albury LGA	
50	Canal Estate Development	Not applicable to this proposal.	
52	Farm Dams and Other Works in Land and Water Management Plan Areas	No, does not apply to the Albury LGA	

	Title	Applicable to Planning Proposal	Consistency
55	Remediation of Land	Yes, as the Planning Proposal will affect land that may be contaminated	SEPP 55 contains the matters that must be considered when assessing rezoning or development of a potentially contaminated site. Clause 6 of the SEPP requires that Council is: not to include in a particular zone (within the meaning of the instrument) any land specified in subclause (4) if the inclusion of the land in that zone would permit a change of use of the land, unless: (a) the planning authority has considered whether the land is contaminated, and (b) if the land is contaminated, the planning authority is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for all the purposes for which land in the zone concerned is permitted to be used, and (c) if the land requires remediation to be made suitable for any purpose for which land in that zone is permitted to be used, the planning authority is satisfied that the land will be so remediated before the land is used for that purpose. Subclause (4) identifies that the above provisions apply to land on which development for a purpose referred to in Table 1 to the contaminated land planning guidelines is being, or is known to have been, carried out. Agricultural/horticultural uses are identified in Table 1 to the guidelines as being potentially contaminating uses. The site was previously used for horticultural purposes, which requires Council to have regard to this SEPP in any rezoning proposal. It should be noted however the proposed IN1 and IN2 zones do not permit the types of sensitive land uses identified in the SEPP such as residential, educational, recreational or child care purposes, or for the purposes of a hospital. In accordance with the Gateway Determination, a Preliminary Environmental Site Assessment (ESA) was undertaken on the site. This report is included at Appendix 'F'. The report concludes as follows: *Based on the site soil and groundwater quality results, contamination associated with previous site activities that might pose an unacceptable risk to identified potential receptors related to commercial/industrial land use is not evident and the findings of this assessment do not preclude use of the site for commercial/industrial purposes.* The findings of the ESA demonstrate that the land is suitable for the type of development envisaged by the proposed zoning and therefore the requirements of this direction are satisfied.
56	Sydney Harbour Foreshores & Tributaries	No, does not apply to the Albury LGA	
62	Sustainable Aquaculture	Not applicable to this proposal.	

	Title	Applicable to Planning Proposal	Consistency
64	Advertising & Signage	Not applicable to this proposal.	
65	Design Quality of Residential Flat Development	Not applicable to this proposal.	
70	Affordable Housing (Revised Schemes)	No, does not apply to the Albury LGA	
71	Coastal Protection	No, does not apply to the Albury LGA	
	Affordable Rental Housing 2009	Not applicable to this proposal.	
	Building Sustainability Index: (BASIX) 2004	Not applicable to this proposal.	
	Exempt & Complying Development Codes 2008	Yes, as some minor industrial development qualifies for the Code.	This Code will allow some minor and ancillary forms of development without the need for development consent.
	Housing for Seniors & People with a Disability 2004	Not applicable to this proposal.	
	Infrastructure 2007	Yes, as the proposal may require a referral to the Roads and Maritime Services.	*State Environmental Planning Policy (Infrastructure) 2007* facilitates the effective delivery of infrastructure across the State. The aims of the SEPP are: (a) improving regulatory certainty and efficiency through a consistent planning regime for infrastructure and the provision of services, and (b) providing greater flexibility in the location of infrastructure and service facilities, and (c) allowing for the efficient development, redevelopment or disposal of surplus government owned land, and (d) identifying the environmental assessment category into which different types of infrastructure and services development fall (including identifying certain development of minimal environmental impact as exempt development), and (e) identifying matters to be considered in the assessment of development adjacent to particular types of

Title	Applicable to Planning Proposal	Consistency
		infrastructure development, and (f) providing for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing. The Planning Proposal is considered to be consistent with these broad objectives, particularly in that future development will make efficient use of existing infrastructure and also provide further improvements to the surrounding services (see Appendix 'G'). The subject land is located adjacent to the Hume Highway corridor, and is also within close proximity to a classified road (East Street). It is noted that the subject land addresses the Hume Highway corridor along its western boundary, however is buffered to the roadway by Willowbank Road, with no future access to be made to the freeway corridor. All access to the land and future lots will be achieved from Willowbank Road, which is classified as a minor road. Clause 104 of the SEPP refers to traffic generating development and states: (1) This clause applies to development specified in Column 1 of the Table to Schedule 3 that involves: (a) new premises of the relevant size or capacity, or (b) an enlargement or extension of existing premises, being an alteration or addition of the relevant size or capacity. (2) In this clause, "relevant size or capacity" means: (a) in relation to development on a site that has direct vehicular or pedestrian access to any road-the size or capacity specified opposite that development in Column 2 of the Table to Schedule 3, or (b) in relation to development on a site that has direct vehicular or pedestrian access to a classified road or to a road that connects to a classified road where the access (measured along the alignment of the connecting road) is within 90m of the connection-the size or capacity specified opposite that development in Column 3 of the Table to Schedule 3. The table at schedule 3 of the SEPP sets out those developments which must be referred to the RMS for consideration. A number of development types likely to be undertaken within the subject land are listed in the table at Schedule 3 of the SEPP, which may trigger a referral to the RMS, such as 'industry' and 'subdivision of land'. The particular details of future development within the subject are not yet known, and will be subject to future detailed design and development interest. It is noted the Planning Proposal will also be referred to the RMS as part of agency consultation.
Integration and Repeals 2016	Not applicable to this proposal.	
Kosciuszko National Park Alpine Resorts 2007	No, does not apply to the Albury LGA	

Title	Applicable to Planning Proposal	Consistency
Kurnell Peninsula1989	No, does not apply to the Albury LGA	
Major Development 2005	Not applicable to this proposal	
Mining, Petroleum Production & Extractive Industries) 2007	Not applicable to this proposal.	
Miscellaneous Consent Provisions 2007	Not applicable to this proposal.	
Penrith Lakes Scheme 1989	No, does not apply to the Albury LGA	
Rural Lands 2008	Yes, as the proposal involves a change in zoning from an existing rural zone.	*State Environmental Planning Policy (Rural Lands) 2008* (SEPP Rural Lands) applies to all rural lands across the state. The subject land is presently zoned RU2 Rural Landscape and is proposed to be rezoned to part IN1 General Industrial and part IN2 Light Industrial. As such, the Planning Proposal involves existing rural lands and the general provisions of the SEPP Rural Lands are relevant. Clause 7 of the SEPP sets out the general rural planning principles: (a) the promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas, (b) recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State, (c) recognition of the significance of rural land uses to the State and rural communities, including the social and economic benefits of rural land use and development, (d) in planning for rural lands, to balance the social, economic and environmental interests of the community, (e) the identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land, (f) the provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities, (g) the consideration of impacts on services and infrastructure and appropriate location when providing for rural housing, (h) ensuring consistency with any applicable regional strategy of the Department of Planning or any applicable local strategy endorsed by the Director-General.

Title	Applicable to Planning Proposal	Consistency
		An assessment of the Planning Proposal against these principles concludes the following: ▪ This land is presently utilised for low intensity agricultural activities, however is constrained from future growth and diversification by its urban location and adjacent sensitive river environs. As such, it is expected to be difficult for the land to continue to develop and compete with larger activities elsewhere in generally unconstrained rural locations. ▪ The current use of the majority of the land for agricultural purposes is recognised, however given the urban context of the immediately surrounding land, it is not considered to represent significant agricultural land. The land is highly constrained for agricultural operations (particularly those that are intensive with potential off-site impacts) and cannot be expanded in this location. It is noted that the previous use of the land for horticulture was ceased due to it becoming commercially unviable. ▪ The need for the landowners to diversify their agricultural production is representative of the changing nature of rural industries. The land presently offers limited opportunity to expand and diversify the current agricultural activities (grazing) and the urbanised surrounding location represents a more appropriate and logical long term use of the land. ▪ The significance of this land is considered to be more closely related to the Murray River environs than the agricultural or natural conditions of the land itself. The future zoning and development of the land is intended to recognise the significance of the Murray River environs by allowing a significant buffer to the river area. ▪ The proposal represents transition of existing rural land into a more logical future urban zoning. As discussed elsewhere, the ability for future growth and diversification of agricultural production in this location is limited, however there is demand for additional urban growth and expansion of the existing commercial/industrial area developed north of the land. ▪ The sensitivity of the river environs is noted, and the future zoning of the land is provided to ensure adequate protection and ongoing opportunities for improvement of the river conditions. The proposed industrial zoning will be applied up to the existing levee bank, with the land between the levee bank and the river being retained as ‘foreshore protection area’, with no development to be undertaken. Further, future detailed design of new development within the expanded industrial zone will be carefully designed to ensure no additional impacts upon the river environs. ▪ While it is recognised that the land is located adjacent to sensitive riverine environment, the design response is considered to ensure an appropriate framework for future protection of this sensitive environmental location. The more specific details of the location of the new zones, buffers and future design approach are discussed elsewhere throughout this Planning Proposal. ▪ This proposal provides alternative opportunities for the land which will benefit the economic growth and development of Albury City generally. The ongoing agricultural capacity of the LGA, in core rural areas

Title	Applicable to Planning Proposal	Consistency
		outside of the urban area, will continue and be unaffected by this proposal.
State & Regional Development 2011	Not applicable to this proposal.	
State Significant Precinct 2005	Not applicable to this proposal.	
Sydney Drinking Water Catchment 2011	No, does not apply to the Albury LGA	
Sydney Region Growth Centre 2006	No, does not apply to the Albury LGA	
Three Ports 2013	No, does not apply to the Albury LGA	
Urban Renewal 2010	Not applicable to this proposal.	
Western Sydney Employment Area 2009	No, does not apply to the Albury LGA	
Western Sydney Parklands 2009	No, does not apply to the Albury LGA	
Murray Regional Environmental Plan No. 2 - Riverine Land (MREP2)	Yes, as the land is within the area to which MREP2 applies.	The aims of MREP2 are to conserve and enhance the riverine environment of the River Murray for all users. This environment includes all waterways, river beds and banks, associated tributaries, wetlands and water bodies. MREP2 requires (at clause 4) Council to consider the objectives and planning principles expressed in it when preparing an LEP. The specific principles in MREP2 applicable to the Planning Proposal include access, flooding, landscape, and river related uses. MREP2 specifically includes the following matters to be taken into account in regard to those specific principles, which are relevant to the proposal: ▪ The waterway and much of the foreshore of the River Murray is a public resource. Alienation or obstruction of this resource by or for private purposes should not be supported. ▪ Development along the main channel of the River Murray should be for public purposes.

Title	Applicable to Planning Proposal	Consistency
		▪ Where land is subject to inundation by floodwater: a) the benefits to riverine ecosystems of periodic flooding, b) the hazard risks involved in developing that land, c) the redistributive effect of the proposed development on floodwater, d) the availability of other suitable land in the locality not liable to flooding, e) the availability of flood free access for essential facilities and services, f) the pollution threat represented by any development in the event of a flood, g) the cumulative effect of the proposed development on the behaviour of floodwater, and h) the cost of providing emergency services and replacing infrastructure in the event of a flood. ▪ Flood mitigation works constructed to protect new urban development should be designed and maintained to meet the technical specifications of the (current equivalent of) the Department of Water Resources. ▪ Development should seek to avoid land degradation processes such as erosion, native vegetation decline, pollution of ground or surface water, groundwater accession, salination and soil acidity, and adverse effects on the quality of terrestrial and aquatic habitats. ▪ Measures should be taken to protect and enhance the riverine landscape by maintaining native vegetation along the riverbank and adjacent land, rehabilitating degraded sites and stabilising and revegetating riverbanks with appropriate species. ▪ Only development which has a demonstrated, essential relationship with the river Murray should be located in or on land adjacent to the River Murray. Other development should be set well back from the bank of the River Murray. ▪ Development which would intensify the use of riverside land should provide public access to the foreshore. An assessment of the Planning Proposal against these principles reveals the following: ▪ The subject land is located within the identified 'flood referral area' of the Albury DCP 2010, however, the site is bisected by a flood levee (constructed to a height of 155 metres AHD), which protects the northern part of the site up to the FPL for this site. The Planning Proposal relates only to the protected land north of the levee. ▪ The site has existing ground levels ranging from 153 metres AHD on the north western corner (a dam) to 154.5 metres AHD at the point where the land abuts the levee. The levee has a height of 155 metres AHD at its crest. Consequently, filling of the site to ensure that any future buildings have a floor level 500 millimetres clear of floodwaters will be required, but only in the vicinity of the buildings i.e. outdoor areas for storage, car parking and the like do not need to be above the flood level. It is therefore not necessary to raise the level of the whole of the northern portion of the site above the

Title	Applicable to Planning Proposal	Consistency
		FPL. ▪ The land has similar levels and characteristics to other land in the vicinity which has been developed for industrial purposes and which has not had a detrimental impact upon the riverine environment. ▪ A suitable visual and physical buffer between industrial development and the river is provided by the land to the south of the levee which will not be developed. ▪ The flood prone area to the south of the levee is not included in the Planning Proposal and will retain its current RU2 Rural Landscape and RE1 Public Recreation zoning. ▪ The strip of land located along the river frontage, which is identified for future acquisition by Council, will not be impacted by the proposal. ▪ The modified proposal now retains some native trees at the eastern end within the RU2 zone. In conclusion, the Planning Proposal can satisfy the relevant planning principles expressed in MREP2.

Appendix ‘B’

Section 117 Directions

Consistency of Planning Proposal with directions issued by the Minister for Planning

No.	Direction Title	Applicable	Consistency
1.	**Employment and Resources**		
1.1	Business & Industrial Zones	Yes, as the proposal is to rezone land industrial.	The objectives of this direction are to encourage employment growth in suitable locations, protect employment land in business and industrial zones, and support the viability of identified strategic centres. The proposal is consistent with this direction because it: a) gives effect to the objectives by creating additional industrial land; b) does not reduce the areas and effect the locations of existing business and industrial zones; c) does not reduce the total potential floor space area for employment uses and related public services in business zones; d) does not reduce the total potential floor space area for industrial uses in industrial zones; and e) is consistent with the draft *Riverina Murray Regional Plan* (see Table 1 in Section 3.2 of the Planning Proposal).

No.	Direction Title	Applicable	Consistency
1.2	Rural Zones	Yes, as the proposal affects land within an existing rural zone.	The objective of this direction is to protect the agricultural production value of rural land. The direction prevents the rezoning of land in a rural zone to an industrial zone and the proposal is therefore inconsistent. Planning proposals may be inconsistent with this direction if they are: (a) justified by a strategy which: (i) gives consideration to the objective of this direction, and (ii) identifies the land which is the subject of the Planning Proposal (if the Planning Proposal relates to a particular site or sites), and (iii) is approved by the Director-General of the Department of Planning, or (b) justified by a study (prepared in support of the Planning Proposal) which gives consideration to the objective of this direction, or (c) in accordance with the relevant Regional Strategy or Sub-Regional Strategy prepared by the Department of Planning which gives consideration to the objective of this direction, or (d) of minor significance. In this instance, the proposal has been demonstrated to be consistent with the draft *Riverina Murray Regional Plan* (see Table 1 in Section 3.2 of the Planning Proposal) and consequently the inconsistency with the direction is justified.
1.3	Mining, Petroleum Production & Extractive Industries	Not applicable	Not applicable
1.4	Oyster Aquaculture	Not applicable	Not applicable
1.5	Rural Lands	Yes, as the proposal affects land within an existing rural zone.	The objectives of this direction are to protect the agricultural production value of rural land and to facilitate the orderly and economic development of rural lands for rural and related purposes. The proposal is consistent with this direction because it is consistent with the Rural Planning Principles expressed in the *SEPP (Rural Lands) 2008* (see Appendix ‘A’ of the Planning Proposal).

No.	Direction Title	Applicable	Consistency
2.	**Environment and Heritage**		
2.1	Environmental Protection Zones	Yes, because it applies to all Planning Proposals.	This direction requires a draft LEP (stemming from a Planning Proposal) to facilitate the protection and conservation of environmentally sensitive areas. The proposal is not inconsistent with this direction because it does not involve land that is environmentally sensitive. Consequently any draft LEP applied to the subject land does not need to include any provisions specifically relating to environment protection. The proposal does not reduce any environmental protection provisions currently within the Albury LEP 2010.
2.2	Coastal Protection	No (does not apply to land in the Albury LGA)	Not applicable
2.3	Heritage Conservation	Yes, because it applies to all Planning Proposals.	This direction requires a draft LEP (stemming from a Planning Proposal) to contain provisions that facilitate the conservation of heritage items. The proposal does not affect or alter any heritage items or heritage conservation areas or relevant controls contained in clause 5.10 of ALEP 2010. Consequently the proposal is not inconsistent with this direction.
2.4	Recreation Vehicle Areas	Not applicable	Not applicable
3. Housing Infrastructure and Urban Development			
3.1	Residential Zones	Not applicable	Not applicable
3.2	Caravan Parks & Manufactured Home Estates	Not applicable	Not applicable
3.3	Home Occupations	Not applicable	Not applicable

No.	Direction Title	Applicable	Consistency
3.4	Integrating Land Use & Transport	Yes, as the proposal creates a zone relating to urban land.	The direction requires that: (1) A Planning Proposal must locate zones for urban purposes and include provisions that give effect to and are consistent with the aims, objectives and principles of: (a) Improving Transport Choice – Guidelines for planning and development (DUAP 2001), and (b) The Right Place for Business and Services – Planning Policy (DUAP 2001). An assessment of the proposal against these two documents is undertaken as an attachment at Appendix 'H'. In summary, the location of the site within a kilometre of a full interchange with the Hume Highway, and in close proximity to walking and cycling trails along the freeway corridor, assists in reducing travel distances by employees, suppliers and distributors. The area is also serviced by local private buses, which have a route from central Albury through East Albury and along East Street, less than a kilometre to the north of the site. This service provides connections to the Albury CBD and from there to Lavington, Thurgoona and Wodonga. Albury Railway Station is approximately 1.5 kilometres to the north west of the site, providing access to transport of goods via the Great Southern Railway. The Albury Airport is located approximately 5 kilometres to the east of the subject site. Consequently, the location of the site is consistent with the objectives and principles of the Guidelines and Policy identified in this direction. A Traffic Impact Assessment Report (see Appendix 'E') has been prepared for the Planning Proposal that concludes the proposed development of the land would not reduce the level of service of the surrounding road network and would be capable of being serviced by existing and proposed roads.
3.5	Development Near Licensed Aerodromes	Not applicable	Not applicable
3.6	Shooting Ranges	Not applicable	Not applicable
4.	**Hazard and Risk**		
4.1	Acid Sulphate Soils	No (does not apply to land in the Albury LGA)	Not applicable
4.2	Mine Subsidence & Unstable Land	No (does not apply to land in the Albury LGA)	Not applicable

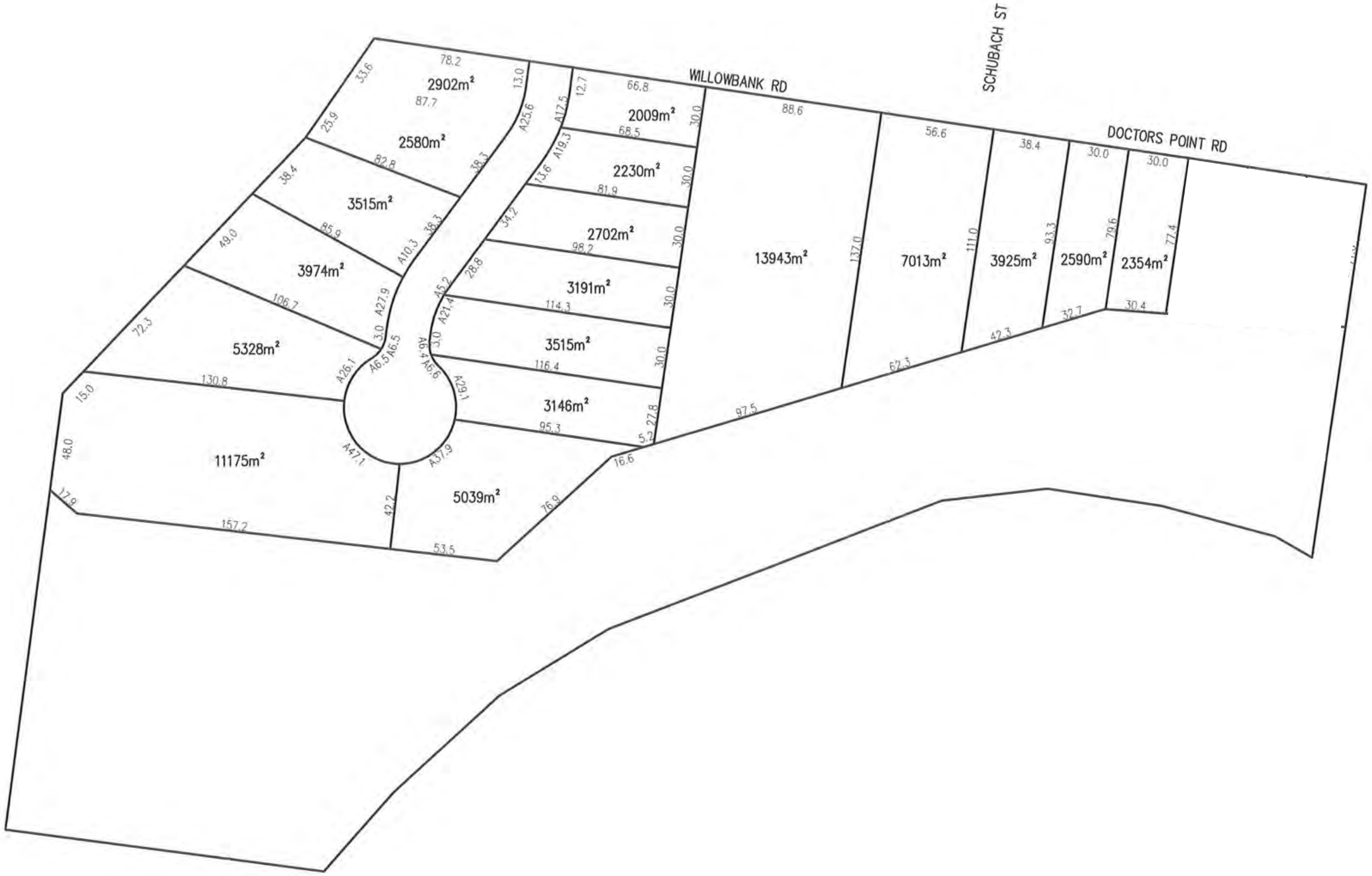
No.	Direction Title	Applicable	Consistency
4.3	Flood Prone Land	Yes, as the proposal affects 'flood prone land' (defined as land subject to flooding in a Probable Maximum Flood or PMF).	The reference for flooding is the 2016 *Albury Floodplain Risk Management Study* and *Plan* ("the Flood Study"), which supersedes the reference used in the previous proposal. The Flood Study indicates that the levee would be overtopped in a PMF, which is defined in the *Floodplain Development Manual 2005* as "*the largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation, and where applicable, snow melt, coupled with the worst flood producing catchment conditions. Generally, it is not physically or economically possible to provide complete protection against this event*." A PMF event in Albury would have significant impacts across a broad area. This direction prohibits rezoning 'flood prone land' from rural to industrial, and hence the proposal is inconsistent. The inconsistency is however justified on the basis that the Flood Study confirms that the subject land is protected from flooding in a 1 in 100 year event by the South Albury Levee and it is this level that is used for the purposes of determining the suitability of flood prone land for development. The Flood Study is considered to be "*a floodplain risk management plan prepared with the principles and guidelines of the Floodplain Development Manual 2005*" (clause 9 of this direction).
4.4	Planning for Bushfire Protection	Not applicable	Not applicable
2.	**Regional Planning**		
5.1	Implementation of Regional Strategies	No, as the draft RMRP is not on the list of regional strategies to which this direction applies.	Not applicable
5.2	Sydney Drinking Water Catchment	No (does not apply to the AlburyCity LGA)	Not applicable
5.3	Farmland of State & Regional Significance on the NSW Far North Coast	No (does not apply to the AlburyCity LGA)	Not applicable
5.4	Commercial and Retail Development along the Pacific Highway, North Coast	No (does not apply to the AlburyCity LGA)	Not applicable

No.	Direction Title	Applicable	Consistency
5.5	Development in the Vicinity of Ellalong, Paxton and Millfield (Cessnock LGA)	Not applicable. Revoked 18 June 2010	Not applicable
5.6	Sydney to Canberra Corridor	Not applicable. Revoked 10 July 2008.	Not applicable
5.7	Central Coast	Not applicable. Revoked 10 July 2008.	Not applicable
5.8	Second Sydney Airport: Badgerys Creek	No (does not apply to the AlburyCity LGA)	Not applicable
5.9	North West Rail Link Corridor Strategy	No (does not apply to the AlburyCity LGA)	Not applicable
6.	**Local Plan Making**		
6.1	Approval and Referral Requirements	Yes, because it applies to all Planning Proposals.	The Planning Proposal does not propose to alter any provisions relating to approval and referral requirements and is consequently not inconsistent with this direction.
6.2	Reserving Land for Public Purposes	Yes, because it applies to all Planning Proposals.	This direction seeks to protect land zoned for public purposes from rezoning which would remove them from that purpose. As identified, this direction would apply if the RE1 zone currently applying to the river frontage were affected by the Planning Proposal. However, no change to this zone or to the Land Acquisition Map of Albury LEP 2010 is proposed. Consequently, the proposal is not inconsistent with this direction.
6.3	Site Specific Provisions	No, as the proposal is not to facilitate a particular development.	Not applicable
7.	**Metropolitan Planning**		
7.1	Implementation of *A Plan for Growing Sydney*	No (does not apply to the AlburyCity LGA)	Not applicable

No.	Direction Title	Applicable	Consistency
7.2	Implementation of Greater Macarthur Land Release Investigation	No (does not apply to the AlburyCity LGA)	Not applicable

Appendix ‘C’

Indicative subdivision layout



GENERAL ARRANGEMENT PLAN – OPTION 1

SCALE 1:2500

REV.	AMENDMENTS	DATE	INIT.

PRINTED : 03/08/2011 BY: JONATHAN KEYS

CLIENT:

PROJECT REFERENCE: **50066**

SJE Consulting

SUITE 2, 490 DAVID ST. ALBURY, N.S.W. 2640

PH:(02) 60217233, FAX.:(02) 60412579. EMAIL: CONSULTING@SJE.COM.AU

TITLE:

DESIGN: JONOTHAN KEYS	DRAWN: NEIL BURBIDGE	A3
CHECKED:	DRAWING NO.	REVISION
SHEET: OF	50066_CO1	

Appendix 'D'

Preliminary Groundwater Level Assessment

April 2016

Habitat Planning
1/622 Macauley Street
Albury-Wodonga NSW 2640

Dear Sir,

Re: Proposed Industrial Subdivision
Preliminary Groundwater Level Assessment
Willowbank Drive, East Albury

We refer to our recent discussions, and now have pleasure in submitting the following groundwater impact at the above mentioned property during September In accordance with our initial proposal, our assessment focuses on groundwater levels and not groundwater quality issues, which are beyond the scope of this preliminary assessment.

Following our site inspection to establish groundwater depth, we confirm that two locations could be identified where groundwater was observed.. These include two locations, the first being the irrigation bore which has been installed in August 2007 and the irrigation dam which is filled by groundwater. Based upon our observations, we have estimated that the current groundwater level on site is at approximately (reduced level) 151.50 AHD.

Due to the close proximity of the nearby Murray River, we anticipate there is a high likelihood that the groundwater throughout the site is directly connected to the Murray River surface flows. Therefore, we consider it likely that site groundwater levels will fluctuate periodically across the site in response to surface water level fluctuations within the nearby Murray River. For this reason, further assessment of groundwater levels and impacts may be warranted closer to the detailed design stage, if rezoning is successful.

We note that during the construction period, it is possible that deeper excavations may intersect the groundwater level, potentially requiring dewatering from deeper service excavations. However, we consider that these impacts are of a temporary nature and can be mitigated through the development of an appropriate dewatering methodology and a site construction environmental management plan which considers water quality impacts.

We have assumed that in relation to groundwater quality, that any future subdivision will be constructed in accordance with Council and EPA requirements, including appropriate bunding, storage facilities and construction of stormwater drainage infrastructure. Based upon our preliminary assessment of groundwater levels and assumptions, we do not anticipate long term negative impacts to groundwater levels from development at this site.

Please do not hesitate to contact Jonathan Keys on 02 60 217 233 if you require any further information on this matter.

Yours faithfully
<u>SJE Consulting PTY LTD</u>

Jonathan Keys
Civil Design Manager

Appendix ‘E’

Traffic Impact Assessment

Review of Traffic Impacts

Willowbank Road

Industrial Subdivision

Willowbank Road, East Albury, NSW

Revision C

Report, November 2016

Prepared by

PETER MEREDITH CONSULTING

19 Orchard Way
Lavington NSW 2641
M. 0427012894

Document Control

Version	Date	Issue	Author	Reviewed	Approved
A	16/6/2015	DRAFT	PJM	WH	PJM
B	9/11/2016	DRAFT	PJM	WH	PJM
C	17/11/2016	FINAL	PJM	WH	PJM

TABLE OF CONTENTS

1. Executive Summary

Peter Meredith Consulting has been engaged to prepare a revised traffic report to review future land use activities and operating hours and the traffic impacts on the existing East Street/Schubach Street roundabout and East Street/Hume Highway Interchange for any proposed industrial subdivision in Willowbank Road.

It is recommended that the type of businesses that can be established within the proposed industrial subdivision should be in accordance with the Albury Local Environmental Plan 2010 (ALEP 2010) for a zoning classification of IN1 General Industrial and IN2 Light Industrial. In addition, it is also recommended that the process of managing future traffic types/volumes, movement and hours of operation for various types of industrial/commercial development for the proposed subdivision is by the Albury City Councils Development Application (DA) process.

To ensure safety and provide improved traffic flows it is recommended that a roundabout be constructed at the intersection of Schubach Street/Doctors Point Road and Willowbank Road at the start of stage two of the industrial subdivision development.

There is no significant impact by the proposed development midblock of Schubach Street on the section of road that carries the largest amount of traffic from the proposed development; the impact on the broader road network is likely to be minimal/insignificant.

SIDRA traffic modelling results indicated that the peak hour traffic generated by a fully developed industrial subdivision will not impact on the operations of the East Street/Schubach Street roundabout up to year 2037 with the roundabout operating at a LOS A for PM and LOS B for AM peak traffic flows.

SIDRA results indicate that the 2016 peak hour traffic volumes for the northern approach Hume Freeway off-ramp right-turn and the East Street approach right-turn are close to capacity. Remedial measures to the phasing/and or geometry of the right-turn lane length between East Street and Bridge Street at the Hume Highway Interchange are required to manage the annual and proposed future development peak hour traffic growth.

The identical results of the SIDRA analysis for the forecast 2037 AM and PM peak hour traffic with and without additional subdivision generated traffic indicates the proposed industrial subdivision **will not significantly exacerbate the operations** of the Freeway Interchange in 2037.

The SIDRA results of LOS F for the East Street approach right-turn and northern approach Hume Freeway off-ramp right-turn indicates the existing short north-bound right-turn lane length between East Street and Bridge Street will still cause 2037 peak hour traffic to queue past holding lines and restrict the progress of arriving traffic.

The SIDRA result LOS F for 2037 for south off-ramp approach right and left-turns indicate that the single lane flow through the interchange along East Street heading west causes the restrictions to the volume of traffic able to turn right and left at the off-ramp.

It is concluded that he SIDRA results indicate that any proposed development has **no impact** and that it is the overall growth in traffic volumes that cause the issues at the East Street/Hume Freeway interchange.

Therefore, it is recommended that remedial measures should be carried out at the East Street/Hume Freeway Interchange to provide capacity for annual and future development peak hour traffic growth and that this needs to be managed more broadly by Council and RMS and not by the developer.

1.1 Locality Plan

1.2 Concept Subdivision Development Plan

Figure 1: General Arrangements

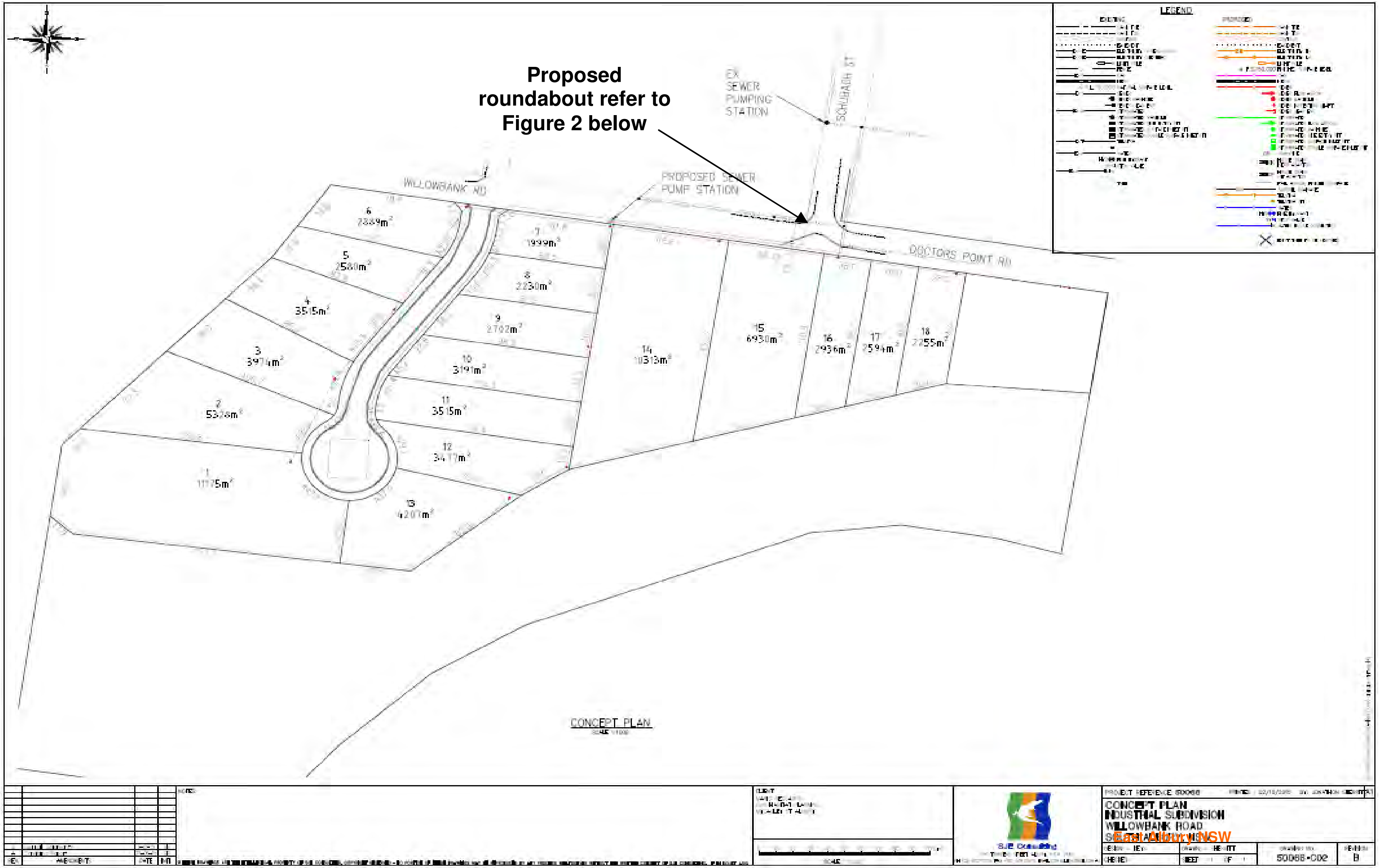
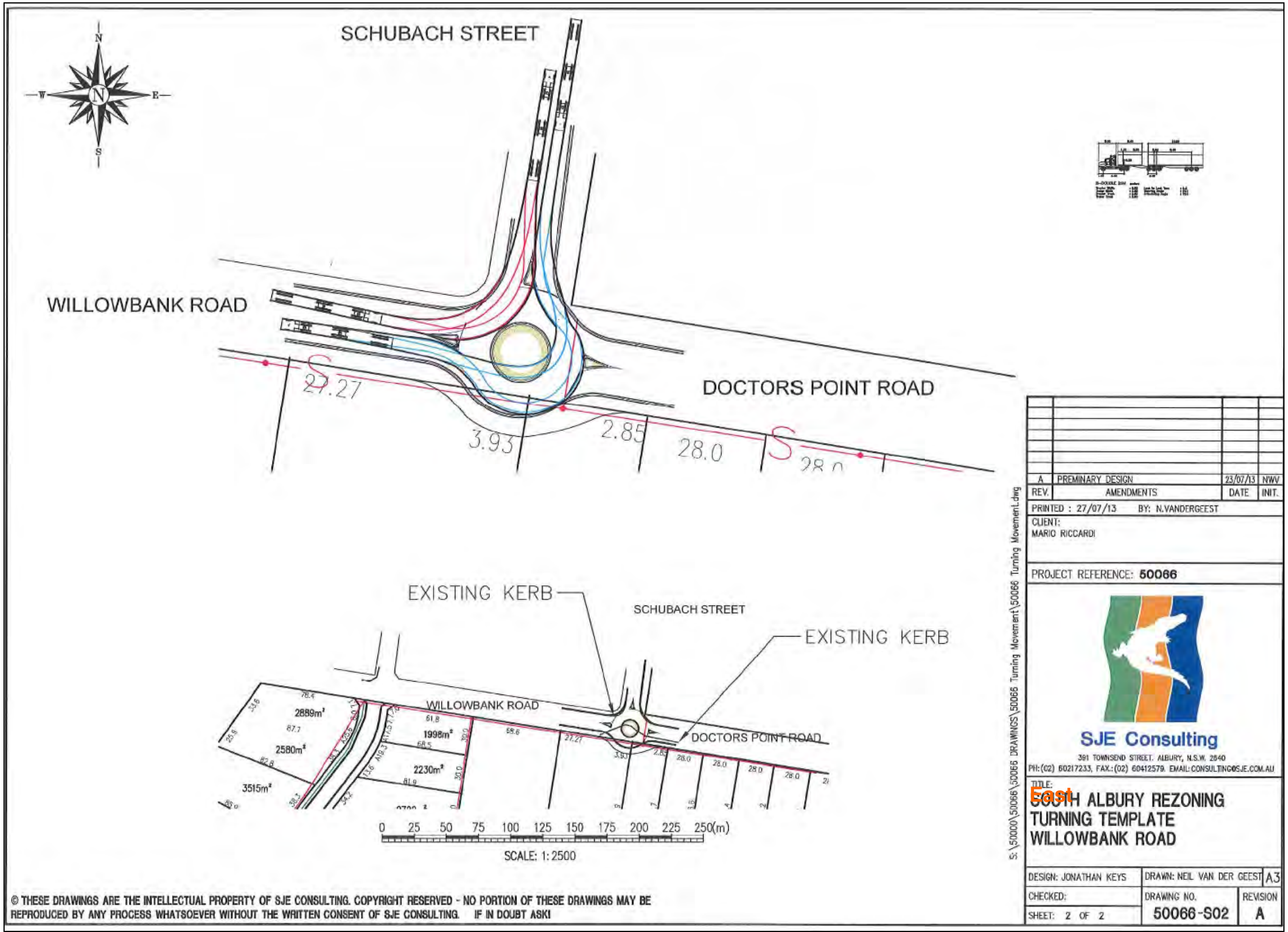


Figure 2: Proposed Roundabout Layout and Turning Swept Path



2. Introduction

A Planning Proposal for rezoning at Willowbank Road was submitted to Albury City Council in March 2013, inclusive of a Traffic Impact Assessment Report (TIAR version 3 August 2013) prepared by SJE. *Refer to Appendix A for TIAR by SJE.*

The SJE TIAR recommended the following mitigating works determined and conclusions:

Recommendations:

- *The existing T-junction intersection at Schubach Street/Doctors Point Road and Willowbank Road is to be modified to a roundabout to better accommodate the safe turning of larger vehicles across the north bound traffic from Doctors Point Rd and to overcome the limited sight distance. The southern intersection property line is to be realigned to the south to allow the roundabout to be positioned to overcome limited sight distance to the east in Doctors Point Road and to avoid the turning of articulated vehicles crossing the road centre line;*

- *The southern side of both Doctors Point Road and Willowbank Road along the frontage of the property is to be constructed with kerb and gutter to match the existing road width in Schubach Street;*

- *The proposed layout is designed to reduce the number of lots directly accessing Willowbank and Doctors Point Road the provision of a new internal road. The subdivisions access road to the west of Schubach Street has an internal road width and an adequate radius to accommodate the turning movement of a B-double should the need arise.*

- *All lots are designed with adequate width for a crossing to accommodate site access/ egress in a forward direction;*

- *Access / egress to the lots closest to the intersection are to be kept clear of the intersection. This will need to be addressed in the preparing the final subdivision layout. The adjacent external roads are to be constructed to a standard in accordance with AlburyCity design standards (i.e. width of 12m).*

Conclusions:

- *The existing traffic entering Schubach Street is estimated at 740 vpd growing to 1080vpd over a 20 year period on the basis of a 2%pa growth rate. When the traffic from the proposed development is included the traffic on the northern side of the intersection in Schubach Street the 20 years' projection becomes 2180vpd and 218vph. This indicates that the existing roads remain well within the lane capacity of 900vph providing for a level-of-service (LOS) A;*

- *Overall the current level of service (LOS) is expected to reduce to LOS B on the Doctors Point Rd northbound lane due to the proposed roundabout traffic control at the intersection. This is required due to limited sight distance for vehicles turning from Schubach St into Willowbank Road.*

On 23 March 2016 and 12 May 2016 AlburyCity requested a review of the SJE traffic report and in particular required further information in relation to the following:

23 March 2016

- *Review of Traffic Impact Report assumptions, particularly in relation to future land use activities and operating hours, consideration of impacts on the wider road network (East Street/Schubach Street roundabout and East street/Hume Highway Interchange) and forecast traffic volumes noting the date of the original report;*

12 May 2016

- *Further review of the Traffic Impact Report to address matters including:*
    - *Confirmation of road infrastructure improvement works and associated costs (including roundabout/intersection construction and road widening works);*
    - *Confirmation of the capacity of the local and wider road network to accommodate anticipated traffic including B-doubles;*
- *Impacts of anticipated traffic on the wider road network, including:*
    - *Pedestrian and cyclist safety)associated with shared use in the absence of footpaths, pedestrian crossings and concerns surrounding impacts on an existing bus stop in Schubach Street), in particular. Impacts on the uses of the Hume and Hovel track;*
    - *Emergency service movements between Wodonga and Albury hospital; and*
- *Conflicts between local traffic from the Doctors Point area and vehicles accessing the subject site along Doctors Point Road or the Willowbank Road/ Doctors Point Road intersection.*

Peter Meredith Consulting has been engaged to prepare a revised traffic report to review the following:

- **Future land use activities and operating hours;**

- **Impacts on the wider road network (East Street/Schubach Street roundabout and East Street/Hume Highway Interchange) and forecast traffic volumes; and**

- **In addition, the proposed roundabout at the intersection of Schubach Street/Doctors Point Road and Willowbank Road is discussed.**

This assessment uses calculated traffic flow figures; on-site observations and peak hour traffic counts and traffic data obtained from Albury City Council and Roads and Maritime Services.

2.1 Documentation

The documentation and information provided for this assessment includes:

- Traffic Impact Assessment Report (TIAR) by SJE version 3 August 2013. *Refer to Appendix A for details.*
- General Arrangements Plans by SJE Consulting 1/10/2015. *Refer to Section 1.2 Figure 1 above for details.*
- Proposed Roundabout Layout and Turning Swept Path by SJE Consulting 7/04/2013. *Refer to Section 1.2 Figure 2 above for details.*

2.2 References

References used in the preparation of this assessment include the following:

- *Roads and Maritime Services (RMS) Guide to Traffic Generating Developments, Version 2.2 October 2002 for traffic generation predictions and Technical Direction TDT 2013/04a Updated Traffic Surveys.*
- *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.*
- *RMS supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.*
- *Austroads Guide to Road Design Part 6: Roadside Design, Safety and Barriers.*
- *Austroads Guide to Road Design Part 4B: Roundabouts Section 4 Geometric Designs.*
- Signalised and Unsignalised Intersection Design and Research Aid (SIDRA). SIDRA Intersections 6.1 Plus software.

3. Future Land Use Activities and Operating Hours

3.1 Land use activities

The SJE TIA report statements relating to land uses and operating hours are considered speculative, and accordingly have not guided the current TIA.

The decision to establish a particular type of business in any subdivision cannot be controlled by the developer. The type of business development that can be established within any proposed industrial subdivision will be in accordance with the Albury Local Environmental Plan 2010 (ALEP 2010) for a zoning classification of IN1 General Industrial and IN2 Light Industrial The ALEP 2010 is a legal document that provides the rules and guidelines that control the use of private and public land.

In addition, it is expected that AlburyCity will manage future traffic types/volumes and movement for different types of industrial/commercial development for any subdivision using the Albury Development Control Plan 2010 (ADCP 2010) via Councils Development Application (DA) process.

The Albury Development Control Plan 2010 (ADCP) is a supporting document that compliments the requirements contained within the ALEP 2010. The ADCP 2010 encourages and facilitates a high standard of design, minimises land use conflicts and clearly sets out the process, procedure and responsibilities of applicants. It also seeks to protect heritage significance, encourage innovative design and ensure developments are economically, socially and environmentally sustainable.

3.2 Operating hours

Again, it is expected that AlburyCity will manage hours of operation for different types of industrial/commercial developments using the Albury Development Control Plan 2010 (ADCP 2010) via Councils Development Application (DA) process.

4. Impacts on the Wider Road Network

This section investigates the impacts of any proposed industrial development on the wider traffic network. The issues to be discussed are the impact of the proposed development midblock Schubach Street between East Street and Doctors Point Road, as well as on the existing roundabout at the intersection of Schubach Street and East Street and the East Street/Hume Highway Interchange.

Intersection analysis was undertaken using the modelling software SIDRA Intersection. SIDRA Intersection is an advanced micro-analytical traffic evaluation tool that employs lane-by-lane and vehicle drive cycle models. It allows users to evaluate and compare capacity, level of service and performance of existing intersections and alternative treatments of a range of intersection types.

4.1 Existing Traffic

4.1.1 Schubach Street between East Street and Doctors Point Road (midblock)

A manual peak hour traffic movement survey of the roundabout at Schubach Street and East Street was conducted on 1 June 2016 between 8.00am and 9.00am and 4.00pm to 5.30pm the results are shown below in Figures 4 and 5. The existing 2016 and forecast 2037 midblock peak hour traffic volumes for Schubach Street are shown in the table below:

Existing Schubach St midblock 2016	**North Bound**	**South Bound**	**Total**
AM (8.00 to 9.00)	49	58	107
PM (4.00 to 5.00)	34	52	86
Forecast Schubach St midblock 2037			
AM (8.00 to 9.00)	67	155	222
PM (4.00 to 5.00)	155	67	222

4.1.2 Schubach Street and East Street roundabout

A manual peak hour traffic movement survey of the roundabout at Schubach Street and East Street was conducted on 1 June 2016 between 8.00am and 9.00am and 4.00pm to 5.30pm the results are shown below in Figures 4 and 5.

Note: Manual peak hour (one day) traffic counts at roundabouts are common traffic engineering practice. In this instance the manual count is particularly accurate because the above manual AM and

PM peak traffic count times coincide with the AM and PM peaks times of the East Street and Hume Highway Interchange. Refer to AlburyCity's turning movement data sheets in Appendix B.

4.1.3 East Street/Hume Highway Interchange

Albury City Council conducted a camera traffic survey and recorded AM and PM peak hour traffic movement data for the East Street/Hume Highway Interchange on 6 November 2014. *Refer to Appendix B for copies of traffic movement data sheets for the East Street/Hume Highway Interchange.*

4.1.4 Schubach Street/Doctors Point Road and Willowbank Road intersection.

A manual peak hour traffic movement survey of the T-junction Schubach Street/Doctors Point Road and Willowbank Road was conducted from 7.30am to 9.00am on 9th August 2011 by SJE.

Albury City Council conducted an additional weekly traffic count using traffic classifiers in Schubach Street from the period 8 to 15 May 2013. The results of the two traffic counts are shown in Table 1.

Table1 below has been extracted from the SJE TIAR and show the existing and 20 year forecast AM and PM traffic flows for any industrial development. Figure 3 below shows the forecast volumes (year 2037) with directional splits of 70/30 AM and 30/70 for the PM peak hours respectively.

Table 1: SJE TIAR Forecast AM and PM

AM Projected Peak Hour Traffic to 20 years

Traffic Distribution - AM	Exist Traffic			Prop Estate Traffic	
Traffic Split	VPH	VPH20	VPH20-allow	VPH20 - am	Total- am
Willowbank to Schubach	8	12	15	56	**71**
Willowbank to Doctors Point	3	4	5	6	**11**
Schubach to Willow Bank	3	4	5	130	**135**
Shubach to Doctors Point	19	28	30	25	**55**
Doctors Point to Schubach	44	64	70	11	**81**
Doctors Point to Willowbank	3	4	5	6	**11**

PM Projected Peak Hour Traffic to 20 years

Traffic Distribution - PM	Exist Traffic			Prop Estate Traffic	
Traffic Split	VPH	VPH20	VPH20-allow	VPH20 - pm	Total- pm
Willowbank to Schubach	3	4	5	130	**135**
Willowbank to Doctors Point	3	4	5	6	**11**
Schubach to Willow Bank	8	12	15	56	**71**
Shubach to Doctors Point	44	64	70	11	**81**
Doctors Point to Schubach	19	28	30	25	**55**
Doctors Point to Willowbank	3	4	5	6	**11**

The peak traffic volume periods in Albury are generally around commuter peaks – particularly at the East Street interchange. The peak traffic generated by the proposed development will most likely be from light vehicles, as staff drive to and from work – heavy vehicle numbers will generally be outside commuter peaks.

4.2 Traffic Generation

The types of businesses that may be established in any new subdivision will have different traffic generation rates. Therefore, when calculating traffic generation rates for 20 year traffic forecasts a ratio of gross floor area/vehicles per hour traffic applied to the whole subdivision is appropriate and is in accordance with general traffic engineering practices. The gross floor area (GFA) is calculated as 25% of the developable site area, which is consistent with rates observed in other recently-developed light industrial areas in the region.

The traffic generation rates were established by SJE using the rates suggested in *RMS Guide to Traffic Generating Developments TDT 2013/04a Updated Traffic Surveys Section 3.10.1 Factories.* In Section 3.10.1 Factories, the traffic generation rates are quoted as:

- 5 vpd/100m2 for daily traffic and;
- Peak traffic of 1 vph/ 100m2.

Traffic generation rates from the SJE report are considered valid/appropriate.

Figure 3: Forecast year 2037 AM and PM peak hour traffic flows for the Schubach Street/Doctors Point Road and Willowbank Road intersection.

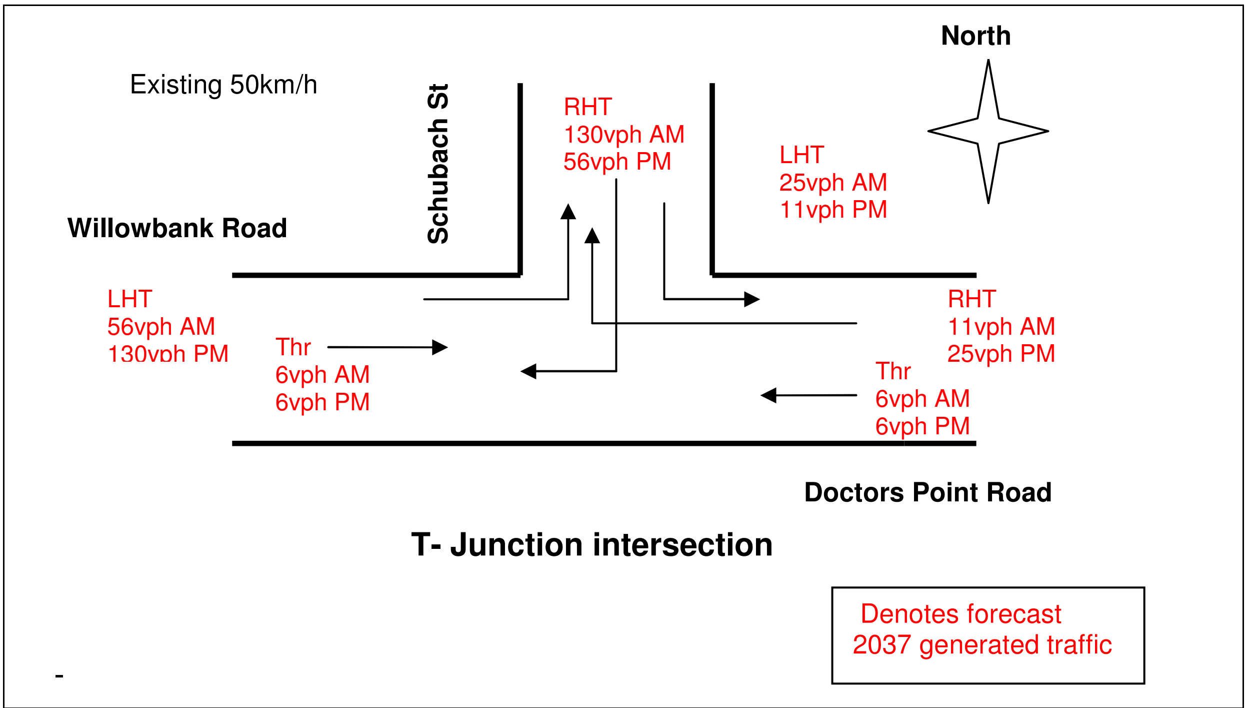


Figure 4: Existing and forecast (2037) AM (8.00 to 9.00) peak hour traffic flows for the East Street and Schubach Street roundabout

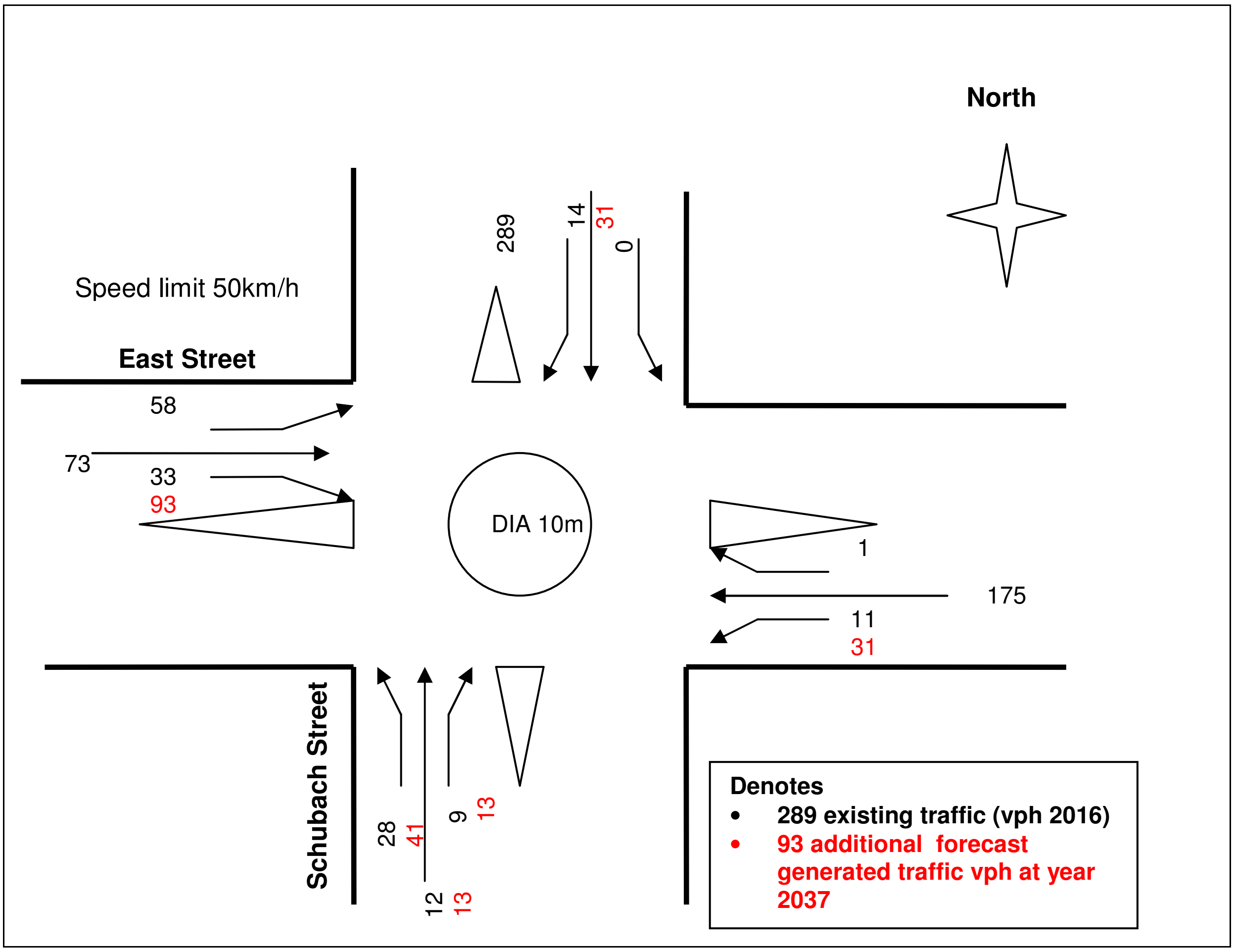
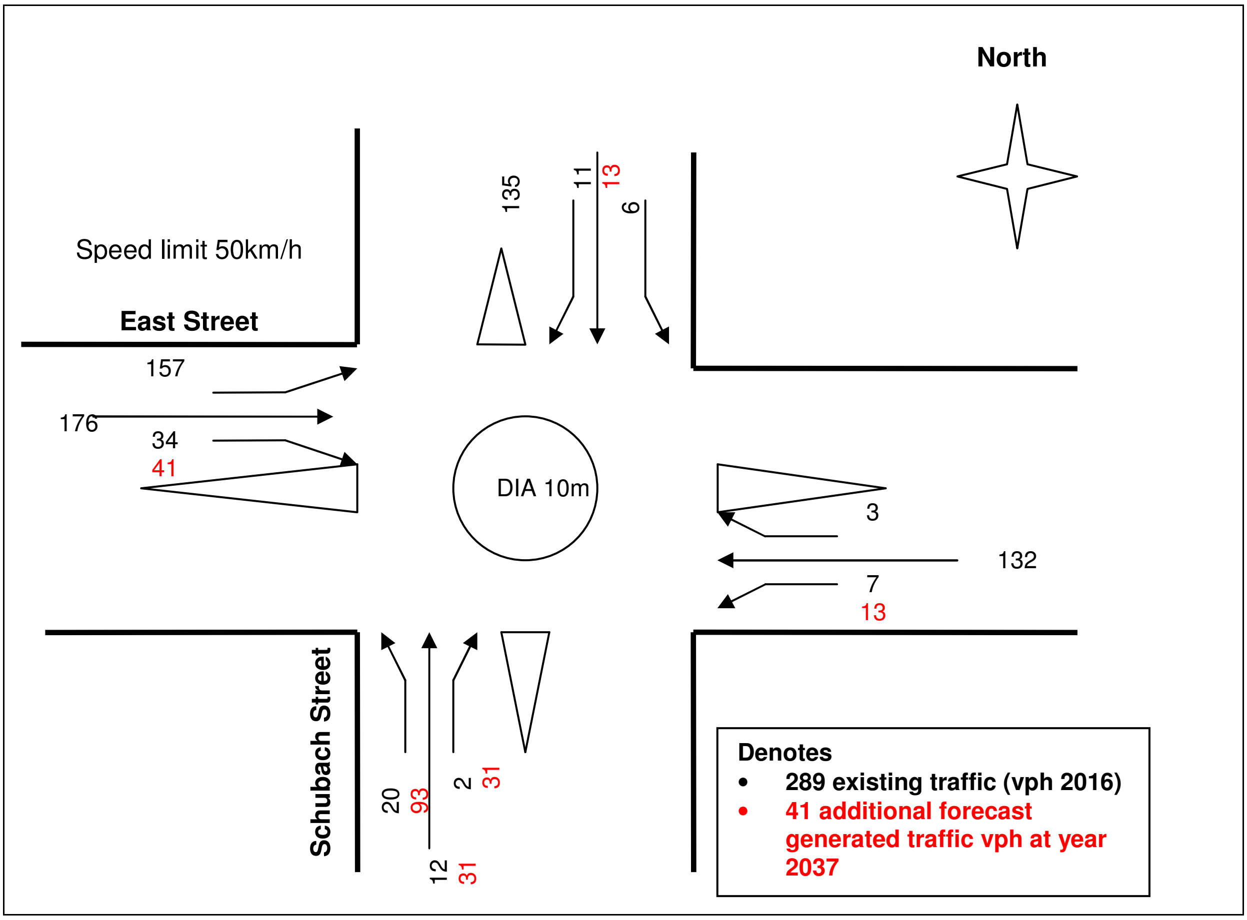


Photo 1 looking north along Schubach Street approaching roundabout

Figure 5: Existing and forecast (2037) PM (4.00 to 5.00) peak hour traffic flows for the East Street and Schubach Street roundabout.



4.3 Traffic Analysis Midblock on Schubach Street between East Street and Doctors Point Road

The SJE report concluded that there was no significant impact midblock on Schubach Street as a result of any proposed development.

"*The existing traffic entering Schubach Street is estimated at 740 vpd growing to 1080vpd over a 20-year period on the basis of a 2%pa growth rate. When the traffic from any proposed development is included the traffic on the northern side of the intersection in Schubach Street the 20 years' projection becomes 2180vpd and 218vph. This indicates that the existing roads remain well within the lane capacity of 900vph for level of service A.*"

Typically, in regional centres such as Albury, delays and congestion on the road network are characteristically experienced at intersections, and not midblock. It is concluded that as there is no significant impact by any proposed development midblock on the section of road that carries the largest amount of traffic from the proposed development, the impact on the broader road network is likely to be minimal/insignificant.

4.4 Traffic Distribution and Analysis at Schubach Street/East Street Roundabout

The following determinations had been made using the SJE TIAR traffic volumes as shown above in Table 1 for the distribution of peak hour traffic arriving at the Schubach Street/East Street roundabout in 2037. *Refer to Figures 4 and 5 above.*

- The AM and PM Proposed Estate Traffic volumes as shown in Table 1 in column 4 (VPH 20-am) or (VPH 20-pm) will be used in traffic calculations. For existing network impacts the time-line for full development of any subdivision will be 20 years with the first stage of development estimated at starting in year 2017 and full development at year 2037;

- In keeping with the SJE TIAR there will be a 70% inflow and 30% outflow of traffic from any development during the AM peak hour and the reverse will occur during the PM peak hour;

- The estimated south bound AM peak hour split for inflow traffic volumes 155vph (70%) to any subdivision at the Schubach Street/East Street roundabout is as follows:
    - 60% (93vph) travelling east from Hume Freeway on East Street turning right south bound into Schubach Street;
    - 20% (31vph) south bound on Schubach Street;
    - 20% (31vph) travelling west on East Street turning left south bound into Schubach Street;

  It is estimate that the reverse of AM traffic inflows will occur during the PM. *Refer to Figures 4 and 5 above for details.*

- The estimated north bound AM peak hour split for outflow traffic volumes 67vph (30%) from any subdivision at the Schubach Street/East Street roundabout is as follows:
    - 60% (41vph) turning left from Schubach Street into East Street to interchange;
    - 20% (13vph) north bound on Schubach Street;
    - 20% (13vph) turning right from Schubach Street into East Street;

  It is anticipated that the reverse of AM traffic inflows and outflows to any subdivision will occur during the PM. *Refer to Figures 4 and 5 above for details.*

4.4.1 Details of SIDRA analysis

- A standard 2.0% per annum traffic growth has been applied to the existing traffic volumes on the Schubach Street/East Street to forecast traffic volumes to year 2037.

- A SIDRA analysis of the existing AM and PM peak hour traffic flows for year 2016 to determine the current LOS of the Schubach Street/East Street roundabout. A standard 2.0% per annum traffic growth has been applied to the existing traffic volumes. A one year design life and 5% heavy has also been applied. *SIDRA Movement Summary results are shown at Appendix C;*

- A SIDRA analysis of the existing 2016 AM and PM peak hour traffic flows to determine the future LOS for year 2037 of the Schubach Street/East Street roundabout with no contribution of traffic generated from any proposed industrial subdivision. A standard 2.0% per annum traffic growth has been applied to the existing traffic volumes. A 20 year design life and 5% heavy vehicles has also been applied. *SIDRA Movement Summary results are shown at Appendix C;*

- A SIDRA analysis of the 2037 AM and PM peak hour traffic flows to determine the future LOS for year 2037 of the Schubach Street/East Street roundabout with traffic generated from full development of any industrial subdivision added. A standard 2.0% per annum traffic growth has been applied to the existing traffic volumes. A one year design life has also been applied to the inward and out movements of generated traffic. *SIDRA Movement Summary results are shown at Appendix C;*

Discussion

4.5 Capacity of Schubach Street/East Street Roundabout for Existing and Forecast Traffic Flows

Existing 2016

The results of SIDRA analysis for the existing roundabout intersection representing the existing AM and PM peak hour traffic flows for2016 indicates a LOS A for all movements. These results indicate that the intersection operates **well within** capacity with good operating conditions and few delays. *Refer to Table 2 below for the Austroads definitions of level-of-service. A movement summary of the SIDRA results is shown at Appendix C.*

Future year 2037

The results of SIDRA analysis for the existing roundabout intersection representing the forecast AM and PM peak hour traffic flows for year 2037 with and without the addition of any industrial subdivisions generated peak hour traffic indicates the following LOS for the roundabout:

Results **without** additional future generated traffic from any proposed development:

- Year 2037 an unaffected LOS A for all AM and PM movements. *Refer Appendix C3 & C4*

Results **with** additional future generated traffic from any proposed development:

- Year 2037 indicates an average overall LOS A for the PM peak traffic flow and LOS B for the AM peak traffic flow at the roundabout intersection. *Refer movement summary's in Appendix C5 & C6*. These results indicate that the intersection operates **well within** capacity with good operating conditions and few delays.

4.4.1 Summary and impacts

The LOS A and LOS B (existing year 2016 and future year 2037 with contributing generated subdivision traffic) results indicate that the roundabout intersection operates below capacity with good operating conditions and few delays. It is concluded that the traffic generated by any industrial subdivision development will not impact on the operations of the roundabout up to year 2037. *A summary of the SIDRA results is shown at Appendix C.*

During the AM traffic movement survey at the roundabout between 8.25am and 8.43am it was observed that west bound traffic in East Street queued into the roundabout on eight occasions. This traffic cleared on all occasions. It was observed that the traffic queue was the result of traffic being held up by the short south-bound left turn lane at the traffic signals at the eastern approach of the East Street/Hume Freeway Interchange

Table 2: Level-of-service (LOS) for capacity and operational analysis for all types of road facilities

Level of service A	A condition of free-flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.
Level of service B	In the zone of stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is a little less than with level of service A.
Level of service C	Also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.
Level of service D	Close to the limit of stable flow and approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.
Level of service E	Traffic volumes are at or close to capacity, and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause breakdown.
Level of service F	In the zone of forced flow, where the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow breakdown occurs, and queuing and delays result.

4.6 Traffic Distribution and Analysis East Street/Hume Freeway Interchange

Given that any proposed development has been shown to have no significant impact on the operation of the intersection of East Street and Schubach Street, it is extremely unlikely that there would be any significant impact elsewhere in the broader traffic network. This is because traffic from the proposed development gets dispersed throughout the network, and becomes a smaller proportion of the overall flow.

However, Albury City Council has specifically requested an assessment of the development's impact in the East Street/Hume Freeway Interchange.

The following determinations have been made have using the Albury City Council traffic volumes (November 2014) as shown in Appendix D for the distribution of peak hour traffic arriving at the East Street/Hume Freeway Interchange in 2037.

- The AM and PM Proposed Estate Traffic volumes as shown in Table 1 in column 4 (VPH 20-am) or (VPH 20-pm) will be used in traffic calculations. For existing network impacts the time-line for full development of any subdivision will be 20 years with the first stage of development estimated at starting in year 2017 and full development at year 2037. *Albury City Council turning movement peak hour data plots diagrams have been used to show existing (2014) and forecast 2037 traffic volumes at the East Street/Hume Freeway interchange. Refer to Figures 6, 7, 8 and 9 below for details;*

- In keeping with the SJE TIAR there will be a 70% inflow and 30% outflow of traffic from the development during the AM peak hour and the reverse will occur during the PM peak hour;

- It has been determined that of the estimated 155vph (70%) of south bound AM peak hour inflow traffic accessing any subdivision via the Schubach Street/East Street roundabout 60**% (93vph) of this AM inflow will access the subdivision by travelling east from Hume Freeway Interchange on Bridge Street/East Street and turning right south bound into Schubach Street.** *Refer to Section 4.3 above.*

  It is estimated that the 93vph AM inflow arriving at the East Street/Hume Highway Interchange to access any subdivision will be distributed as follows:

  - 40% (37vph) will arrive from at the interchange north bound off-ramp and turn right onto East Street;
  - 40% (37vph) will arrive from Hume Freeway at the interchange south bound off-ramp and turn left onto East Street;
  - 20% (19vph) will arrive at the interchange east bound on Bridge Street/East Street via Atkins Street.

  It is anticipated that the reverse of AM traffic inflows will occur during the PM. *Refer to Figures 6, 7, 8 and 9 below for details.*

- It has been determined that of the estimated 67vph (30%) of north bound AM peak hour outflow traffic exiting from any subdivision via the Schubach Street/East Street roundabout **60% (41vph) of this AM outflow will access the Hume Freeway Interchange on Bridge Street/East Street by turning left from Schubach Street into East Street west bound towards the interchange.** *Refer to Section 4.3 above.*

  It is estimated that the 41vph AM outflow arriving at the East Street/Hume Freeway Interchange will be distributed as follows:
  - 20% (9vph) from East Street will head north bound turning right on the Hume Freeway;
  - 40% (16vph) from East Street will head south bound turning left on the Hume Freeway;
  - 40% (16vph) from East Street will head west bound on Bridge Street/East Street via Atkins Street.

  It is anticipated that the reverse of AM traffic outflows will occur during the PM. *Refer to Figures 6, 7, 8 and 9 below for details;*

4.5.1 Details of SIDRA analysis

- A standard 2.0% per annum traffic growth has been applied to the existing traffic volumes (2014) on the East Street/ Hume Freeway Interchange to forecast traffic volumes to year 2037;

- The AlburyCity SIDRA file for 2014 traffic analysis was supplied to the consultant. This allowed an analysis of various scenarios (years 2016 and 2037) using the existing traffic signal phasing times;

- A SIDRA analysis of the existing (2014) AM and PM peak hour traffic flows to determine the current LOS for year 2016 of the East Street/Hume Freeway Interchange. A two year design life and variable % actual heavy vehicles (represents actual % of heavy counted on each road leg) has also been applied. *SIDRA Movement Summary results are shown at Appendix D;*

- A SIDRA analysis of the existing (2016) AM and PM peak hour traffic flows to determine the future LOS for year 2037 of the East Street/Hume Freeway Interchange with no contribution of traffic generated from any proposed industrial subdivision. A 20 year design life and variable % actual heavy vehicles (represents actual % of heavy counted on each road leg) has also been applied to the existing 2014 traffic volumes. *SIDRA Movement Summary results are shown at Appendix D;*

- A SIDRA analysis of the 2037 AM and PM peak hour traffic flows to determine the future LOS for year 2037 of the East Street/Hume Freeway Interchange with traffic generated from full development of any industrial subdivision added. A variable % of actual heavy vehicles (represents actual % of heavy counted on each road leg) has also been applied to the inward and out movements of generated traffic. *SIDRA Movement Summary results are shown at Appendix D.*

Discussion

4.7 Capacity of East Street/Hume Freeway Interchange

Existing 2016

The results of SIDRA analysis for the existing East Street/Hume Freeway Interchange representing the forecast AM and PM peak hour traffic flows for existing 2016 indicates a satisfactory average overall LOS C for the intersection. *Refer to Appendix D1 to D4 for details of SIDRA movement Summaries.*

The results also indicated that the traffic volumes for the movements listed below are at or close to capacity:

- East AM, LOS F Northern approach Hume Freeway off-ramp right-turn. *Refer Appendix D1*;
- East PM, LOS E East Street approach right-turn. *Refer Appendix D3;*
- West PM, LOS F East Street approach right-turn. *Refer Appendix D4.*

The result West PM, LOS F East Street approach right-turn indicates the existing short north-bound right-turn lane length between East Street and Atkins Street causes traffic to queue past holding lines and does not allow the progress of arriving traffic. Similarly, the result East AM, LOS F Northern approach Hume Freeway off-ramp right-turn also indicates the existing short north-bound right-turn lane length between East Street and Atkins Street causes traffic to queue past holding lines and does not allow the progress of arriving traffic. This problem has been observed during peak traffic flows.

Year 2037 results without any additional subdivision generated traffic

The results of SIDRA analysis for the existing East Street/Hume Freeway Interchange representing the forecast AM and PM peak hour traffic flows for 2037 without any additional subdivision generated traffic indicate the following LOS for the intersection legs:

- AM (East) peak flow for North approach off-ramp, East Street eastern approach and East Street western approach gives peak overall of LOS F. The LOS F for the Northern approach off-ramp right-turn into East Street affects the LOS for all other movements which are in a satisfactory performance range of LOS B to D;

- AM (West) peak flow for South approach off-ramp, East Street eastern approach and East Street western approach gives peak overall of LOS E. The south off-ramp approach right and left-turns have a LOS F;

- PM (East) peak flow for East Street eastern approach, North approach off-ramp and East Street western approach gives peak overall of LOS D;

- PM (West) peak flow for South approach off-ramp, East Street eastern approach and East Street western approach gives peak overall of LOS D. The south off-ramp approach right and left-turns have a LOS F;

Refer to Appendix D5 to D8 for details of SIDRA movement Summaries.

Year 2037 results with additional subdivision generated traffic

The results of SIDRA analysis for the existing East Street/Hume Freeway Interchange representing the forecast AM and PM peak hour traffic flows for 2037 with additional subdivision generated traffic indicate the following LOS for the intersection legs:

- AM (East) peak flow for North approach off-ramp, East Street eastern approach and East Street western approach gives peak overall of LOS F. The LOS F for the Northern approach off-ramp right-turn into East Street affects the LOS for all other movements which are in a satisfactory performance range of LOS B to D;

- AM (West) peak flow for South approach off-ramp, East Street eastern approach and East Street western approach gives peak overall of LOS E. The south off-ramp approach right and left-turns have a LOS F;

- PM (East) peak flow for East Street eastern approach, North approach off-ramp and East Street western approach gives peak overall of LOS D;

- PM (West) peak flow for South approach off-ramp, East Street eastern approach and East Street western approach gives peak overall of LOS D. The south off-ramp approach right and left-turns have a LOS F.

Refer to Appendix D9 to D12 for details of SIDRA movement Summaries.

4.7.1 Summary and impacts

Existing 2016

The results of SIDRA analysis for the East Street/Hume Freeway Interchange representing the forecast AM and PM peak hour traffic flows for existing 2016 indicate that the intersection is operating at an overall satisfactory performance with a of LOS C.

The LOS F results for East Street approach right-turn and Northern approach Hume Freeway off-ramp right-turn indicates the existing short north-bound right-turn lane length between East Street and Bridge Street causes traffic to queue past holding lines and does not allow the progress of arriving traffic. This problem has been observed during peak traffic flows.

Year 2037 results with and without any additional subdivision generated traffic

The results of SIDRA analysis for the East Street/Hume Freeway Interchange representing the forecast AM and PM peak hour traffic flows for 2037 with and without any additional subdivision generated traffic give identical results. This indicates that the addition of generated subdivision peak hour traffic **will have no effect on the operations** of the Freeway Interchange in 2037.

The volume of traffic from any proposed development would represent approximately 6% of the overall traffic volume at the East Street/Hume Freeway interchange. This is reinforcing the earlier statement that any proposed development was shown to have no impact on the operation of the East Street and Schubach Street roundabout, it would not be expected to have any impact on the broader road network.

The LOS F results for East Street approach right-turn and Northern approach Hume Freeway off-ramp right-turn indicates the existing short north-bound right-turn lane length between East Street and Bridge Street still causes 2037 peak traffic to queue past holding lines and does not allow the progress of arriving traffic.

The LOS F results for south off-ramp approach right and left-turns indicate that the single lane flow through the interchange along East Street heading west causes the restrictions to the volume of traffic able to turn right and left at the off-ramp.

The above results indicate that any proposed development has **no impact** and that it is the overall growth in traffic volumes that cause the issues at the East Street/Hume Freeway interchange, and that this needs to be managed more broadly by Council and RMS.

4.8 Potential Treatments East Street/Hume Freeway Interchange

The Hume Freeway and its interchanges at Albury are a classified as State Roads. State Roads are the major arterial links throughout NSW and within major urban areas. They are the principle traffic carrying and linking routes for the movement of people and goods. The RMS takes responsibility for managing the primary traffic function of State Roads including funding and determining priorities, and regulates the activities of third parties on the road and access to adjoining land to promote road safety, traffic efficiency and protect the road asset.

State Roads are maintained by either the RMS own Road Services organisation or by contractual arrangements with councils and private contractors. In carrying out work under the contract arrangements, councils work in the capacity of a contractor, rather than as the road authority. Any proposed improvements/works to a State Road requires the concurrence of the RMS.

It was concluded that the SIDRA results indicate that any proposed development has **no impact** and that it is the overall growth in traffic volumes that cause the issues at the East Street/Hume Freeway interchange, and that this needs to be managed more broadly by Council and RMS and **not by the developer.**

However, as requested by Council potential treatments to continue the satisfactory performance of the East Street/Hume Freeway Interchange are presented:

1. Ban the north-bound right turn onto the Freeway from East Street. This would require north bound motorists to access the Hume Freeway by proceeding to the western roundabout at East Street/ Atkins Street and completing a U-turn around the roundabout and left-turn onto the north bound on-ramp. This would provide two through-lanes west bound at the Interchange. This in turn will have a positive effect of the south approach off-ramp approach right and left-turns because more green phase time can be added to these movements because the right-turn phase will be removed;

2. Increase the length (by 50m) of the south bound left-turn lane on the East Street eastern approach to the Hume Freeway Interchange. The increase length will allow increased queuing in both the through and left-turn lanes reduce queuing into the East Street/Schubach Street roundabout.

Figure 6: Existing (2014) and forecast (2037) AM traffic volumes East Street/ Hume Freeway Interchange East side

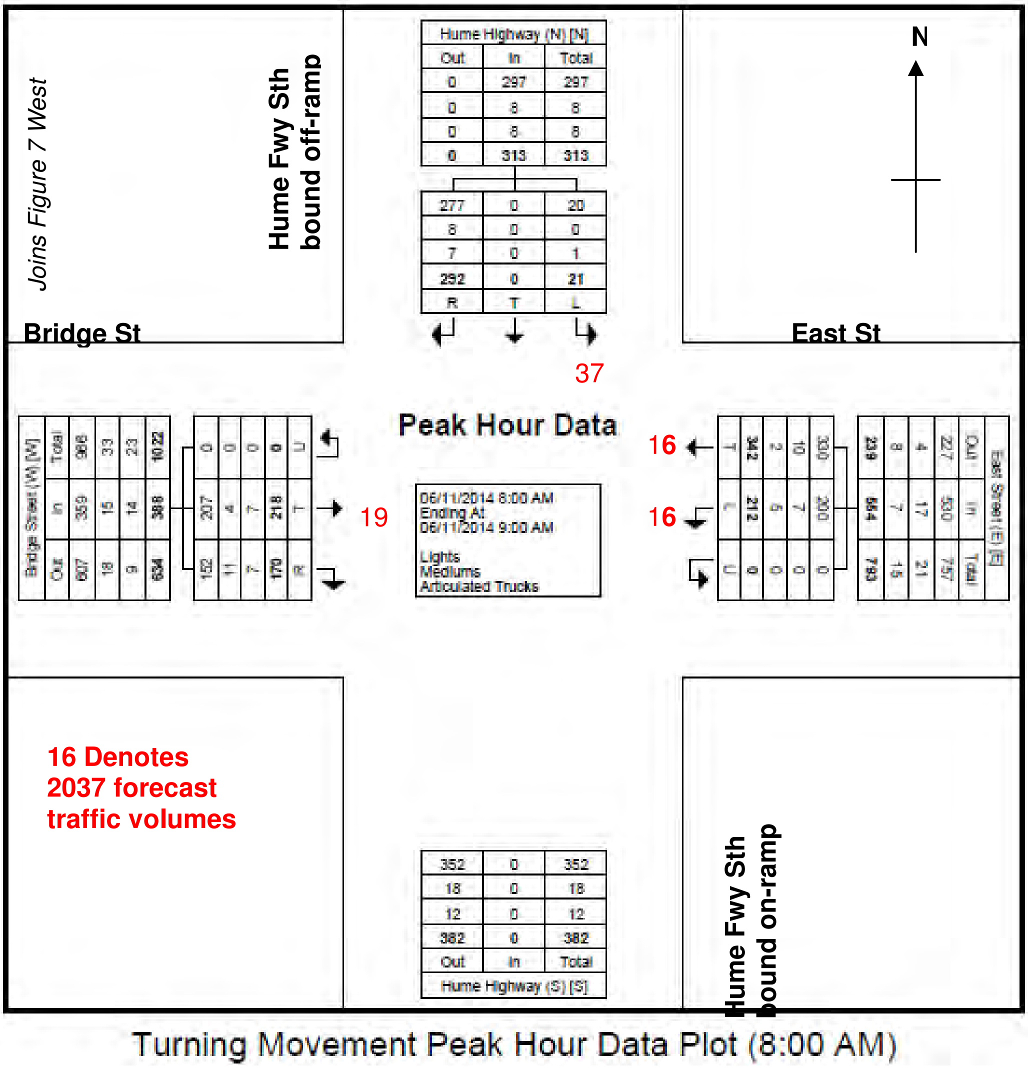
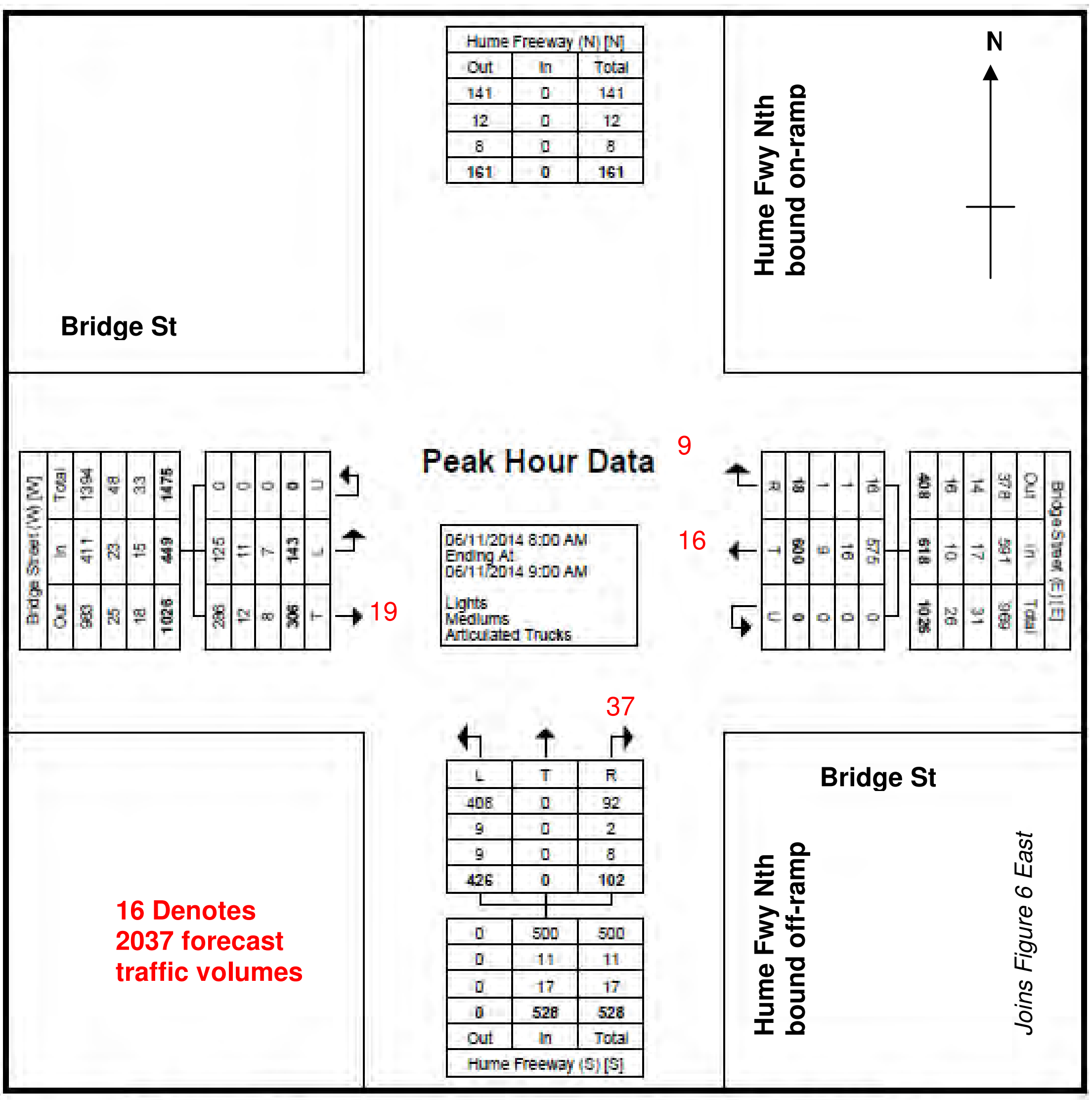


Figure 7: Existing (2014) and forecast (2037) AM traffic volumes East Street/ Hume Freeway Interchange West side



Turning Movement Peak Hour Data Plot (8:00 AM)

Figure 8: Existing (2014) and forecast (2037) PM traffic volumes East Street/ Hume Freeway Interchange East side

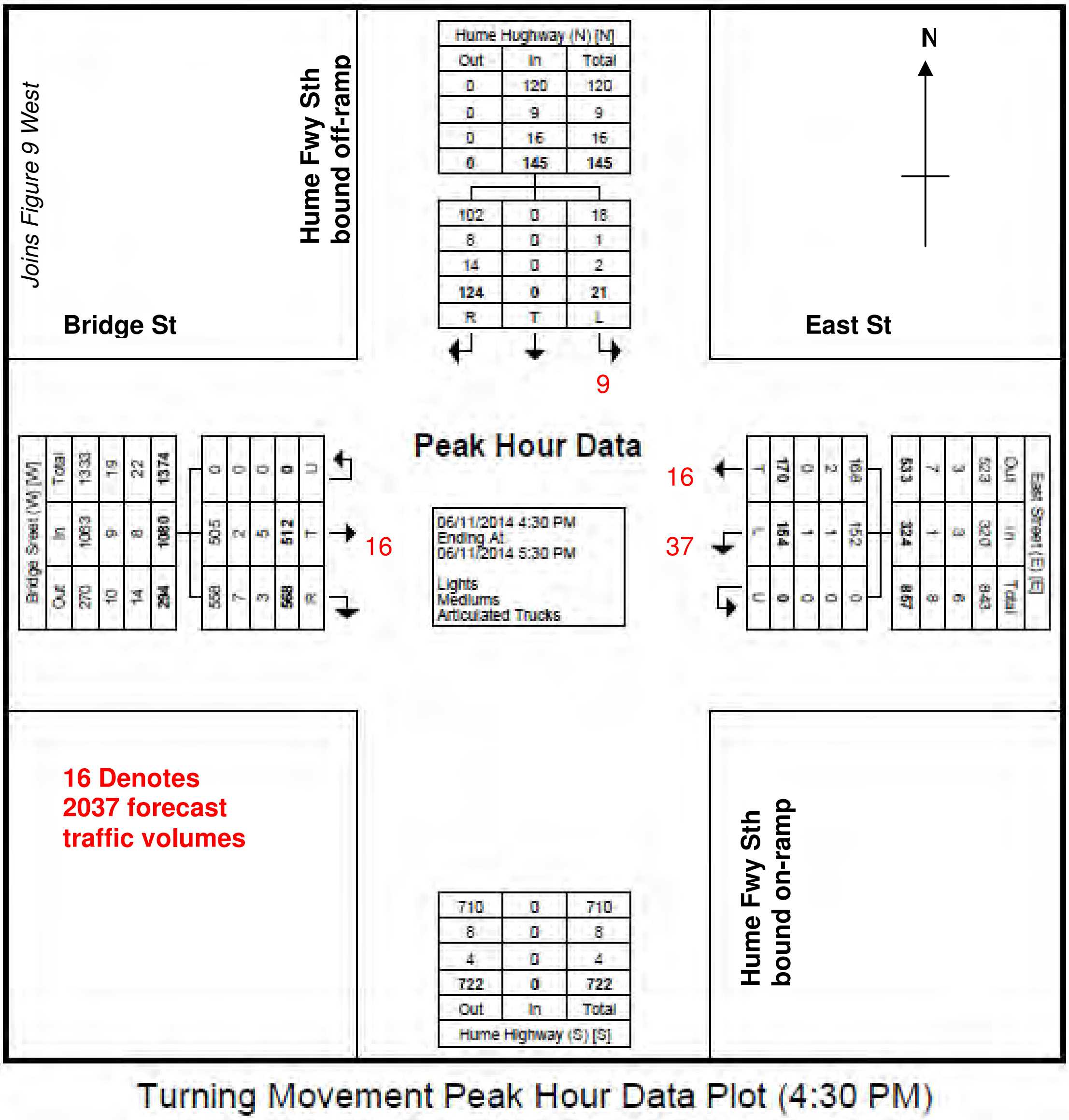
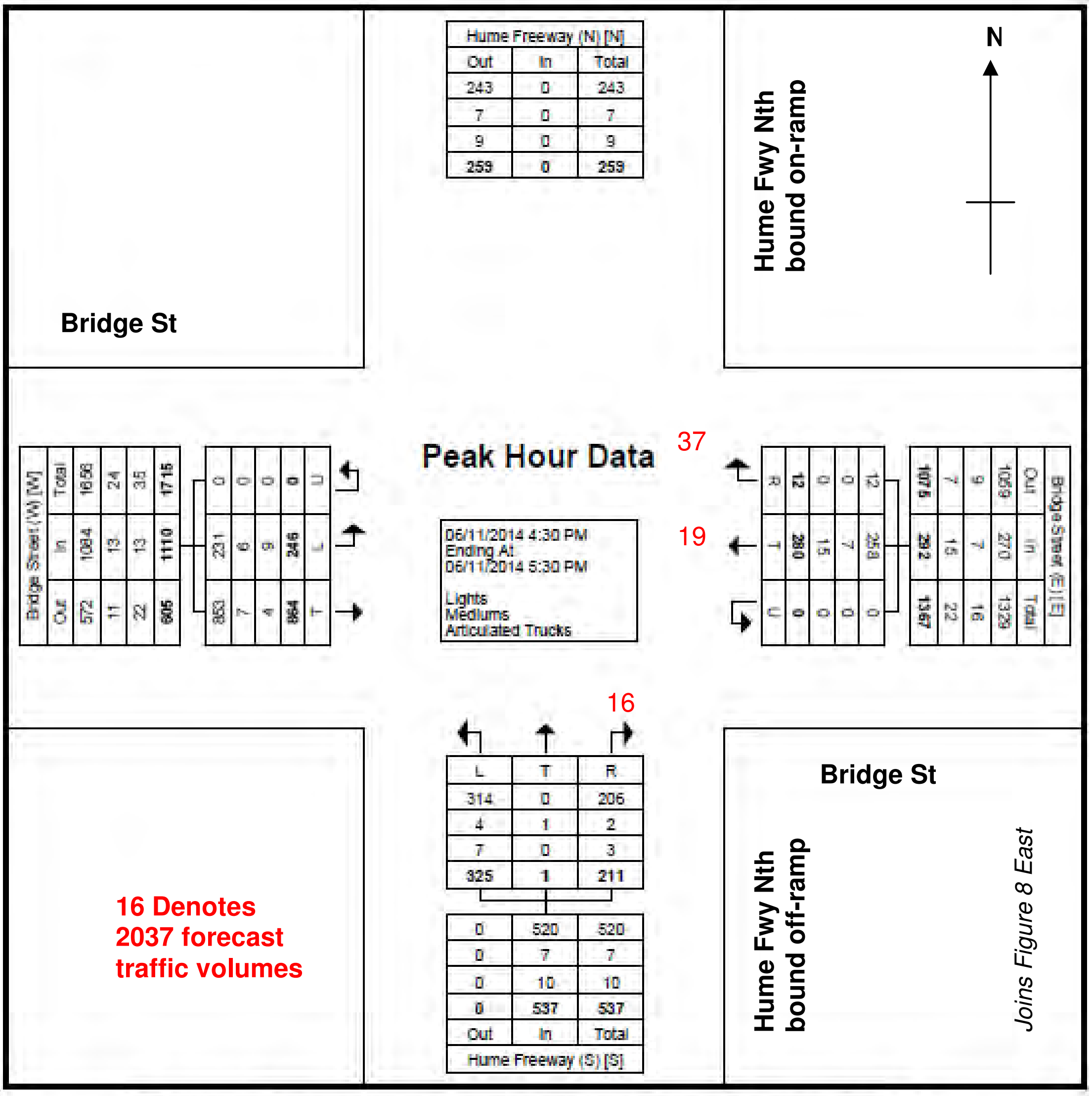


Figure 9: Existing (2014) and forecast (2037) PM traffic volumes East Street/ Hume Freeway Interchange West side



Turning Movement Peak Hour Data Plot (4:30 PM)

Photo 2 looking west along East Street approaching East Street/ Hume Freeway Interchange

5. Proposed Roundabout at the Intersection of Schubach Street/Doctors Point Road and Willowbank Road

The existing speed limit along the frontage of the development section of Schubach Street/Doctors Point Road and Willowbank Road is posted at 50km/h. The minimum safe intersection sight distance (SISD) as set out in the *Austroads Guide to Road Design Part 4A: Section 3 Sight Distance, Table 3.2* for a design speed of 50km/h is 97m for a reaction time of 2.0 seconds.

A review of the SJE TIAR and on-site measurements indicates this criteria is satisfied at the existing T-junction intersection in both directions. Sight distances of over 250m on Doctors Point Road and 200m on Willowbank Road were measured from Schubach Street. However, there are a row of medium sized private property landscaping trees on the north-east corner of Schubach Street and Doctors Point Road that restricts vision when approaching the intersection. To ensure safety and that sight distances are not restricted these trees should be removed or the lower branches lifted. *Refer to Photos 3 and 4 below.*

An analysis of the SJE 20 year forecast traffic volumes (refer page 12 and Appendix C of SJE TIAR) for the T-junction intersection of Schubach Street/Doctors Point Road and Willowbank Road indicates that warrants are met for the minimum turning treatments in accordance with *Austroads Guide to Road Design Part 4A, Section 4.8 Warrants for BA, AU and CH Turn Treatments.* Figure 4.9 (for speeds less than 100km/h) indicates that CHR right-turn treatments could be applied to Doctors Point Road and Schubach Street.

Whilst it is evident that the existing T-junction could be channelised and upgraded to accommodate any future subdivisional traffic volumes and future area traffic growth the developer is recommending that a higher-order roundabout be constructed at the intersection to ensure safety of turning traffic and improved traffic flow.

The development is proposed to consist of two stages. Stage one will involve the release of land parcels fronting Doctors Point Road and Willowbank Road. Stage two will involve the construction of Cul-de-Sac connecting to Willowbank Road and the release of land parcels with the Cul-de-Sac.

A roundabout will be constructed at the intersection of Schubach Street/Doctors Point Road and Willowbank Road and is to commence at the start of Stage 2 development (construction of Cul-de-Sac connecting to Willowbank Road)

The construction of the roundabout will essentially consist of the following elements:

- Circulating width to accommodate B-double vehicles;
- Reinforced concrete mountable central island to allow turning of heavy vehicles;
- Removal of the kerb blister on the southern side of the existing intersection;
- The reconstruction/ construction of kerb and gutter and road pavement along the southern frontage of the proposed subdivision in Doctors Point road and Willow Bank Road;
- Retain the alignments of kerb and gutter and kerb returns in Schubach Street;
- The new section of road on Doctors Point Road is to be 11m wide to match the existing alignment. The new section of road on Willowbank Road is to be 12m wide to match the existing alignment and constructed as part of stage 1. *Refer to Figure 1 in Section 1.2 for details;*
- The southern outside circulating path of the proposed roundabout will be constructed outside the existing road reserve on land provided by the developer. *Refer to Figure 2 in Section 1.2 for details;*
- Splitter islands to divide approaching traffic will be constructed on all legs of the roundabout;
- Pedestrian access will be provided on all legs of the roundabout;
- Appropriate street lighting and to alert motorist of the give-way requirements of the intersection and also ensure safety particularly during night time operations;
- The estimate cost of the roundabout is $200,000.

Accurate engineering design drawings will be completed after the approval of any subdivision development application and submitted to Albury City Council for the approval/issue of a construction certificate.

Photo 3 looking east along Doctors Point Road from Schubach Street at intersection

Photo 4 looking west along Willowbank Road from Schubach Street at intersection

6. Conclusions and Recommendations

It is concluded that:

- The type of businesses that can be established within any proposed industrial subdivision will be in accordance with the Albury Local Environmental Plan 2010 (ALEP 2010) for a zoning classification of IN1 General Industrial;

- The most efficient process of managing future land use activities and associated traffic types/volumes, movement and hours of operation for any proposed subdivision will be through Albury City Councils Development Application (DA) process.

Schubach Street midblock

- There is no significant impact by any proposed development midblock on the section of road that carries the largest amount of traffic from the proposed development; the impact on the broader road network is likely to be minimal/insignificant.

East Street/Schubach Street roundabout

- The peak hour traffic generated by the industrial subdivision development will not impact on the operations of the East Street/Schubach Street roundabout up to year 2037 with the roundabout operating at a LOS A for the PM peak traffic flow and LOS B for the AM peak traffic flow;

East Street/Hume Freeway Interchange

- SIDRA results indicate that the 2016 peak hour traffic volumes for the northern approach Hume Freeway off-ramp right-turn and the East Street approach right-turn are close to capacity. Remedial measures to the phasing/and or geometry of the right-turn lane length between East Street and Bridge Street at the Hume Highway Interchange are required to manage the annual and proposed future development peak hour traffic growth;

- The identical results of the SIDRA analysis for the forecast 2037 AM and PM peak hour traffic flows both with and without any additional subdivision generated traffic indicates the proposed industrial subdivision **will have no effect on the operations** of the Freeway Interchange in 2037;

- The SIDRA results of LOS F for the East Street approach right-turn and Northern approach Hume Freeway off-ramp right-turn indicates the existing short north-bound right-turn lane length between East Street and Bridge Street will still cause 2037 peak hour traffic to queue past holding lines and restrict the progress of arriving traffic;

- The SIDRA result LOS F for 2037 for south off-ramp approach right and left-turns indicate that the single lane flow through the interchange along East Street heading west causes the restrictions to the volume of traffic able to turn right and left at the off-ramp;

- The SIDRA results indicate that any proposed development has **no impact** and that it is the overall growth in traffic volumes that cause the issues at the East Street/Hume Freeway interchange.

- Remedial measures should be carried out at the East Street/Hume Freeway Interchange to provide capacity for annual and future development peak hour traffic growth and that this needs to be managed more broadly by Council and RMS and not by the developer.

Schubach Street/Doctors Point Road and Willowbank Road

- Although a channelised and upgraded T-junction intersection would accommodate future subdivisional traffic volumes and future area traffic growth; the provision of an appropriately designed roundabout at the intersection of Schubach Street/Doctors Point Road and Willowbank Road will help to ensure safety and provide improved traffic flows at the intersection;

- Sight-distance criteria are adequately satisfied for traffic at the intersection on Schubach Street/Doctors Point Road and Willowbank Road;

- The realignment of the southern intersection property line will improve traffic safety by allowing the roundabout to be positioned to overcome the limited sight distance to the east in Doctors Point Road and to avoid the turning of articulated vehicles crossing the road centre line;

- The removal of trees or lifting of low tree branches on the north-east corner of Schubach Street and Doctor Point Road will ensure that sight distances are not restricted;

- The provision of street lighting and roundabout warning signs, give-way signs, keep left signs and hazard direction signs will alert motorist of the give-way requirements of the intersection and also ensure safety particularly during night time operations;

It is recommended that:

- The type of land use activities that can be established within any proposed industrial subdivision will be in accordance with the Albury Local Environmental Plan 2010 (ALEP 2010) for a zoning classification of IN1 General Industrial and IN1 Light Industrial

- Albury City Council manage land use activities and associated traffic types/volumes, movement and hours of operation for any subdivision will be via the Development Application (DA) procedures;

- A roundabout be constructed at the intersection of Schubach Street/Doctors Point Road and Willowbank Road at the start of stage two (construction of Cul-de-Sac connecting to Willowbank Road) of any industrial subdivision development or subsequent development;

- Remedial measures are carried out at the East Street/Hume Freeway Interchange to provide capacity for annual and future development peak hour traffic growth and that this be managed by Council and RMS and not by the developer.

Appendix A

Traffic Impact Assessment Report (TIAR) by SJE version 3 August 2013.

INDUSTRIAL DEVELOPMENT

TRAFFIC IMPACT ASSESSMENT REPORT

FOR

INDUSTRIAL DEVELOPMENT

ON WILLBANK ROAD AND DOCTORS POINT ROAD

EAST ALBURY, NSW

Our Reference 50066
April 2016

INDUSTRIAL DEVELOPMENT

Willowbank Road, East Albury

Prepared By: ___________________________ Date: __________________

Peter Lenaghan

Project Engineer

Reviewed By: ___________________________ Date: __________________

Jonathon Keys

Engineering Manager

Authorised by: ___________________________ Date: __________________

Ron Emptage

Managing Director

This report is to provide advice and recommendations in accordance with the scope of services set out in the attached brief. That scope of services was defined and limited by the requests of the Client, by the time and budgetary constraints imposed by the Client, and by the uncertainties inherent in the planning and political processes.

The date in this report is derived from examination of records in the public domain, and interviews with officers of various Authorities which have a stake holding in this site. Time and impacts of future events may require further examination and data analysis, and may change the conclusions in this report.

SJE has relied upon presumed accurate information provided by Authorities, the Client and others identified herein.

No warranty or guarantee, whether express or implied, is made with respect to the data reported or to the findings, observations and conclusions expressed in this report. Further, such data, findings, observations and conclusions are based solely upon site conditions, information, drawings supplied by the Client in existence at the time of the investigation.

No liability or responsibility can be accepted by SJE if this Report is relied upon by any third party.

TABLE OF CONTENTS

1. Executive Summary

This proposal is to develop the existing 9.6ha orchard on the southern side of Willowbank Road into an industrial estate to cater for mixed industrial uses.

The land opposite has recently been developed for a large lot industrial estate with access primarily from Schubach St.

Traffic passing through the area is predominantly to Doctors Point Estate several kilometres to the east.

The existing traffic entering Schubach Street is estimated at 740 vpd growing to 1080vpd over a 20 year period on the basis of a 2%pa growth rate. When the traffic from the proposed development is included the traffic on the northern side of the intersection in Schubach Street the 20 years projection becomes 2180vpd and 218vph. This indicates that the existing roads remain well within the lane capacity of 900vph for level of service A.

The intersection at Willowbank Road is to be modified to a roundabout to better accommodate safe turning of larger vehicles across the north bound traffic from Doctors Point Rd. This is to be achieved by moving the intersection southern boundary to the south in the vicinity of the intersection.

The subdivision to the west of Schubach Street has an internal road with an adequate radius to accommodate the turning movement of a B double should the need arise. B doubles are not proposed for Doctors Point Road.

All lots are designed with adequate width for a crossing to accommodate site access/ egress in a forward direction.

Access / egress to the lots closest to the intersection are to be kept clear of the intersection. This will need to be addressed in the preparing the final subdivision layout.

Overall the current level of service (LOS) is expected to reduce to LOS B on the Doctors Point Rd northbound lane due to the proposed roundabout traffic control at the intersection. This is required due to limited sight distance for vehicles turning from Schubach St into Willowbank Rd.

2. Introduction

   a. History of development

      i. Location

         1. The site is an existing orchard and has an area of 9.6ha. It is located adjacent to the Doctors Point Road and the Willowbank Road.

      ii. Brief description of development proposal

         1. It is proposed to develop the area as an industrial subdivision with a mix of lot sizes ranging from 0.1ha to 1ha. Several lots are to have direct access to the roads they front and an internal road is proposed to service some additional lots.

         2. The anticipated yield is expected to be approx 30 lots. The developed lots are expected to have a gross floor area (GFA) of about 25% of the total lot areas (8.8ha).

3. It is anticipated the most businesses would operate between the hours of 7.00am and 5.00pm 5 days a week.
4. The development is expected to create positions for approx 250 employees (based on 28 employees per ha – RTA - GTGD – 3.10.1).

iii. Summary of surrounding road and traffic network

1. The estate impacts on three roads.
    a. Doctors Point Road which leads to Schubach St to the west and the Riverina Hwy to the east.
    b. Willowbank Road which is a link road from Schubach Street to South Albury. There is a 3m low clearance height where it passes under the freeway and railway.
    c. Schubach St which provides access to the freeway, south Albury, central Albury and the Riverina Hwy. This will be the primary access route for any heavy vehicles.

iv. Sources of traffic generation

1. Existing traffic from Doctors Point, Schubach St and Willowbank Rd.
2. The recently developed industrial Estate opposite the site
3. The proposed development
4. An area of land on the northern side of Doctors Point Road to the east of this development.

b. Statutory authority to undertake development

i. Planning Zone

1. The land is Rural Landscape (RU2) under the Albury Local Environment Plan (LEP) and a proposal is being prepared to rezone it to Industrial 1(IN1).

ii. Objectives for traffic from the Development

1. The development is to provide for a smooth transition of traffic from this development into the existing traffic streams with adequate safety for other road users.

3. Performance Objectives

a. New Access Locations

i. Accesses are to be located clear of intersections and of adequate width to provide access to the lots without vehicles crossing to the opposite side of the road to enter / exit the lots.

ii. Lots are to be designed to allow access / egress from the lots is to be in a forward direction.

b. Level of Service

   i. The level of service in the immediate vicinity of the estate will be maintained at LOS A with no interference to the existing traffic streams.

c. Crashes

   i. All roads are to conform to current Albury City Road Design Standards to minimise the potential for crashes.

4. Existing Conditions

a. Existing layout (refer Appendix B)

b. Traffic volumes.

   i. A traffic count was conducted from 7.30am to 9.00am on 9th August 2011. The peak hour traffic is assumed to be 10% of the daily traffic to enable a daily traffic volume to be extrapolated.

   ii. An additional 7 day count was conducted in Schubach St for the period 8th to 15th May 2013 by Albury City Council.

   iii. The directional splits are assumed to be 70/30 and 30/70 for the AM and PM peak hours respectively.

   iv. The evening peak is assumed to reflect the reverse of the morning peak. There were no articulated vehicles observed and the traffic comprised cars, some service trucks, 2 school buses and several push bikes.

c. Traffic movements / speed environment

   i. The speed environment in this area is 50kph.

   ii. The predominant traffic direction is towards / from the Schubach Street / East St intersection.

d. Sight distances

   i. The desirable sight distances for 60kph are:

      1. Approach Sight Distance (ASD) – 73m from the approaching vehicle to the intersection lane control line.

      2. Safe Intersection Sight Distance (SSID) – 123m from the approaching vehicle to the conflict point.

      3. Minimum Gap Sight Distance (SSID) – 83m from an approaching vehicle to the conflict point.

ii. Sight distance to the intersection from Doctors Point is approx 160m. to the east and 265 m to the west, however the sight distance from Schubach St to the east along Doctors point Road is limited at the intersection due to topography and landscaping works.

1. As a vehicle commences to turn across the Doctors Point Rd traffic the MGSD is approx 160m which is adequate.
2. As a vehicle approaches along Doctors Point Rd to the intersection it has an ASD of approx 160 which is adequate.
3. It is proposed to create a safer traffic environment by constructing a roundabout at the intersection.

e. Parking / Loading

i. All parking and loading associated with the existing orchard is carried out on site.

f. Pedestrian / cycle activity

i. Internal – Not applicable.

ii. External – the adjacent roads are used by recreational pedestrians and cyclists on an ad hoc basis. Most of the activity is expected to occur outside the anticipated operating times for these businesses (early mornings, evenings and weekends). There were 5 bicycles which passed through the count site during the peak hour.

g. Public transport

i. Doctors Point is serviced by 2 school buses.

ii. There is a public bus service linking the civic centre and the Albury Base Hospital via East Albury that includes the roundabout at the intersection of Schubach St and East St

iii. Taxis and club buses provide the only other form of public transport.

h. Crash statistics

i. Crash statistics are available for Albury City via the RTA website on a city wide basis. However they do not provide data to an individual road level.

5. Proposed Development

   a. Proposed Site Usage

      i. The developments in this estate are expected to be a combination of:

         1. Service industries- such as suppliers to trades
         2. Trades depots
         3. Small Fabricators
         4. Commercial Activities – eg boutique brewery etc
         5. Storage facilities.
         6. Major anchor fabricator / supplier

   b. Proposed Layout (Refer Appendix D)

      i. The layout allows for several sites to directly access the Doctors Point Road

      ii. Willowbank Road will have several direct access lots and a new service road.

   c. Access requirements / points of conflict

      i. 10 lots are expected to access directly to both Doctors Point Rd and Willow Bank Rd via a single industrial crossing. The accesses are to be a minimum of 20 m clear of the projected Schubach St property lines to provide for safe traffic movements at the intersection.

      ii. A new road is to be created off Willowbank Road for access to the internal lots. The road will have a court bowl to enable turning in a forward direction.

      iii. Currently B Double access has been approved to the development south of East St. At this stage it is envisioned that B Double Access will not be required to this subdivision. However the layout has been designed to allow a B Double to enter Willowbank Road, enter the internal road and U turn in the court bowl should it be necessary.

      iv. There is potential conflict

         1. for vehicles accessing or exiting Willowbank Rd with northbound traffic in Doctors Point Rd.
         2. for vehicles accessing or exiting individual sites turning across the opposing traffic lane or merging into the through traffic lane.
         3. for vehicles entering/ exiting the internal access road turning across the opposing traffic lane or merging into the through traffic lane.

d. Travel movements

    i. Employee traffic will come from the three access roads but predominately via Schubach St.

    ii. Customer traffic will come via the three access roads but predominately via Schubach St

    iii. Heavier delivery vehicles either delivering or collecting products will be in a north/ south direction along Schubach St.

    iv. The existing general traffic movements in the area are not expected to change as the surrounding areas are substantially developed, are reserves or are flood prone.

e. Safety Issues

    i. There is potential conflict

        1. for vehicles turning across the northbound traffic lane on Doctors Point Rd.

        2. for vehicles turning into Schubach Street from Doctors Point Rd and Willowbank Rd.

        3. for vehicles turning from Schubach Street into Willowbank Rd across the northbound Doctors Point traffic lane.

        4. between various modes of transport

f. Pedestrian / cycle activity

    i. Currently there is no link to any of the Albury bike pedestrian walkways / cycle paths.

    ii. Internal – There may be some activity due to those staff choosing to ride or walk to work.

    iii. External –

        1. There may be some activity due to those staff choosing to ride or walk to work.

        2. The adjacent roads will continue to be used by recreational pedestrians, runners and cyclists on an ad hoc basis. Most of the activity is expected to occur outside the anticipated operating times for these businesses (early mornings, evenings and weekends).

6. Traffic Generation

a. There will be some growth of the existing traffic and an allowance of 2% per year has been made.

b. Traffic generation by area in development:

   i. Predicted traffic generation is based on 5 vpd/100m2 for daily traffic and 1 1 vph/ 100m2 of gross floor area (RTA- GTGD-3.10.1).

   ii. The gross floor area is taken as 25% of the developable site area.

c. Peak traffic generation

   i. The peak hour traffic generation was taken as 1vph per 100m2 of gross floor area (RTA- GTGD-3.10.1).

   ii. The traffic volumes were derived as follows:

      1. The existing traffic peak hour counts were extrapolated to over a 20 year period based on a 2% growth rate.

      2. The peak hour traffic values for the areas to be developed were predicted using the RTA guidelines and apportioned to either side of the intersection on the basis of area.

      3. ACC advised that a direction spilt of 70/30 was for the respective peak hour traffic and an allowance for 15% heavy vehicles was appropriate.

      4. The total of the existing and proposed traffic was then apportioned around the intersection.

d. Directional splits

   i. The traffic was apportioned on a 70/30 between inflows and outflows to reflect the number of lots being accessed by the respective roads.

e. Network Traffic Volumes

i. The following table shows the derivation of the traffic volumes.

AM Projected Peak Hour Traffic to 20 years

Traffic Distribution - AM	Exist Traffic			Prop Estate Traffic	
Traffic Split	VPH	VPH20	VPH20-allow	VPH20 - am	Total- am
Willowbank to Schubach	8	12	15	56	**71**
Willowbank to Doctors Point	3	4	5	6	**11**
Schubach to Willow Bank	3	4	5	130	**135**
Shubach to Doctors Point	19	28	30	25	**55**
Doctors Point to Schubach	44	64	70	11	**81**
Doctors Point to Willowbank	3	4	5	6	**11**

PM Projected Peak Hour Traffic to 20 years

Traffic Distribution - PM	Exist Traffic			Prop Estate Traffic	
Traffic Split	VPH	VPH20	VPH20-allow	VPH20 - pm	Total- pm
Willowbank to Schubach	3	4	5	130	**135**
Willowbank to Doctors Point	3	4	5	6	**11**
Schubach to Willow Bank	8	12	15	56	**71**
Shubach to Doctors Point	44	64	70	11	**81**
Doctors Point to Schubach	19	28	30	25	**55**
Doctors Point to Willowbank	3	4	5	6	**11**

7. Parking and Loading

   a. Requirements

      i. All parking and loading is to be undertaken on site.

   b. Internal traffic movements

      i. All internal traffic movements are to provide for site access/ egress in a forward direction.

   c. Impact on surrounding properties

      i. There are no properties immediately adjacent to the either the east or the west of the site.

      ii. The rural property to the south uses Willowbank road for access in either direction depending on the size of vehicle. The level of traffic generated from agricultural pursuits on the floodplain is unlikely to be adversely affected due to the low traffic volumes.

      iii. The industrial estate opposite will operate in harmony with this estate with most traffic using Schubach St for access.

      iv. Noise levels may be more noticeable but as the businesses will essentially be small businesses noise is likely to be restricted to reversing forklifts. This noise generating source will occur during normal daytime working hours.

8. Current Conditions

   a. Base Case LOS

      i. The current area operates at LOS A with little impediment to driver speeds due to the 50kph speed limit and peak traffic coming from predominately Doctors Point.

      ii. The 7day traffic count indicates an operating 85th percentile speed of 51.8 kph.

   b. Design speed:

      i. The design speed is elected using operating speed plus 10% or 57kph.A design speed of 60 kph is adopted to test the operation of the intersection.

9. Post Development Conditions

   a. Level of Service (LOS)

      i. The intersection was analysed using SIDRA software for a number of scenarios to minimise the impact of the poor sight distance from Schubach St along Doctors Point Road

      ii. After the development the area will continue to operate at LOS A for most of the day due to the 50kph speed limit and the lane capacities of the roads being well below capacity. The midblock lane capacity of 900 vph for LOS A is considerably greater than the anticipated peak hour traffic of approx 360vph.

      iii. During the AM peak hour the LOS in Doctors Point Rd may reduce to LOS B due to the requirement for traffic to give way to traffic turning from Schubach St to Willowbank Rd.

      iv. Depending on the time of day (AM peak) the roundabout at East Street could hold drivers due to vehicles approaching from Schubach St and East St. This may be at LOS B with drivers held for up to give way to traffic from both East St and Schubach St north.

   b. Extent of network impact

      i. The overall traffic pattern in the area is not likely to change due to the 3m low clearance constraint on Willowbank Rd and the alignment of the Doctors Point Rd beyond Doctors Point.

      ii. The greatest impact envisioned is at the Schubach St/ East St intersection. Currently there are minor delays as traffic approaches the intersection from Schubach St north and East St on route to either accessing the freeway, South Albury or Albury Central.

      iii. Future develop on the Northern side of the Doctors Point Road may add additional traffic of a similar magnitude to the subject development. However access may be taken directly off Schubach St.

10. Mitigating Treatments

a. Proposed treatments

i. The southern side of both Doctors Point Road and Willowbank Road along the frontage of the property is to be constructed with kerb and gutter to match the existing road width in Schubach Street.

ii. The southern intersection property line is to be realigned to the south. This will allow a roundabout to be positioned to overcome the limited sight distance to the east in Doctors Point Rd and avoid the turning of articulated vehicles crossing the road centrelines.

b. Design standards

i. The adjacent external roads are to be constructed to a standard in accordance with Albury City Council design standards (i.e. width of 12m).

ii. The internal roads are to be constructed to a standard in accordance with Albury City Council design standards (i.e. width of 11m).

c. Proposed Layout

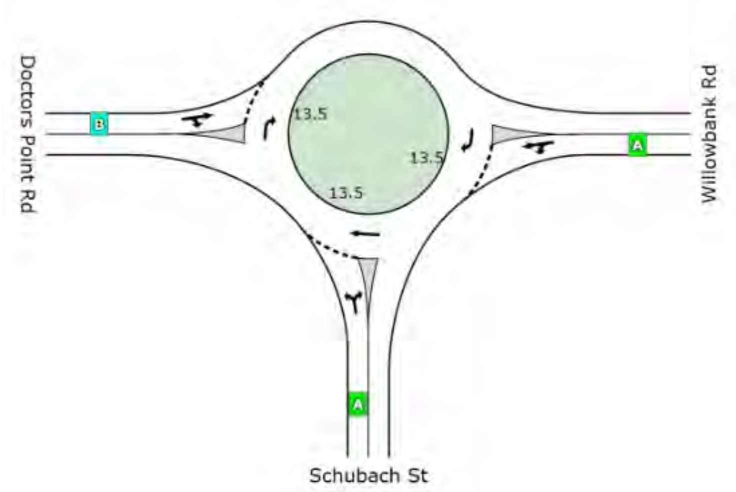
i. The proposed layout is designed to reduce the number of lots directly accessing the Willowbank Road and Doctors Point Road by the provision of a new internal road. This road also has a court bowl of adequate radius to permit a B Double to execute a U turn.

11. Appendices
    a. APPENDIX A - Locality Plan

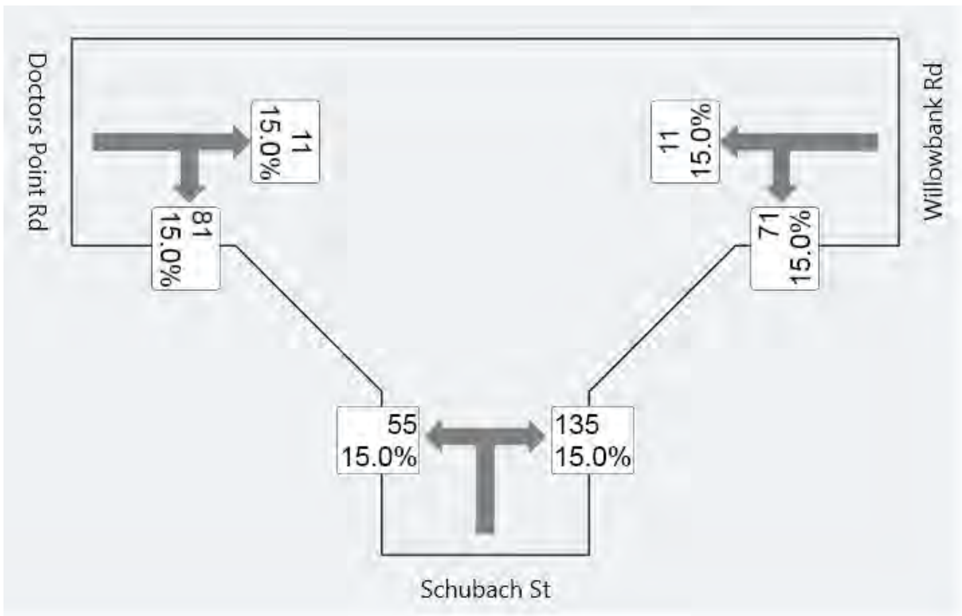
b. APPENDIX B - Existing Layout

c. APPENDIX C – SIDRA Analysis

AM – LOS



AM – Traffic

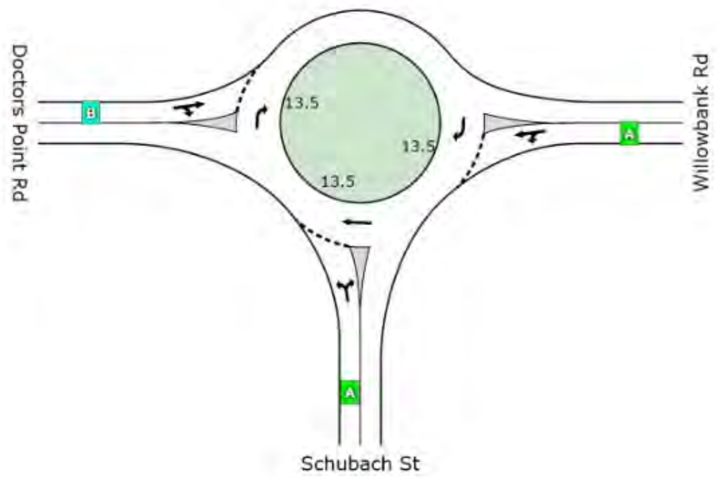


AM – Intersection Performance

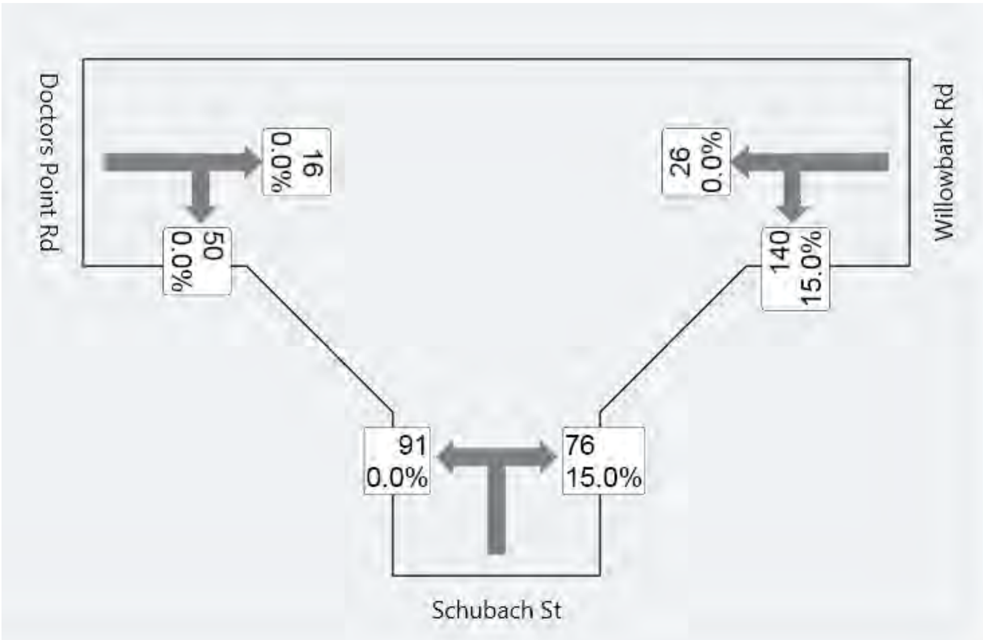
Intersection Performance - Hourly Values

Performance Measure	Vehicles
Demand Flows (Total)	383 veh/h
Percent Heavy Vehicles	15.0 %
Degree of Saturation	0.142
Practical Spare Capacity	496.5 %
Effective Intersection Capacity	2689 veh/h
Control Delay (Total)	0.99 veh-h/h
Control Delay (Average)	9.3 sec
Control Delay (Worst Lane)	12.0 sec
Control Delay (Worst Movement)	12.6 sec
Geometric Delay (Average)	8.8 sec
Stop-Line Delay (Average)	0.5 sec
Intersection Level of Service (LOS)	LOS A

PM LOS



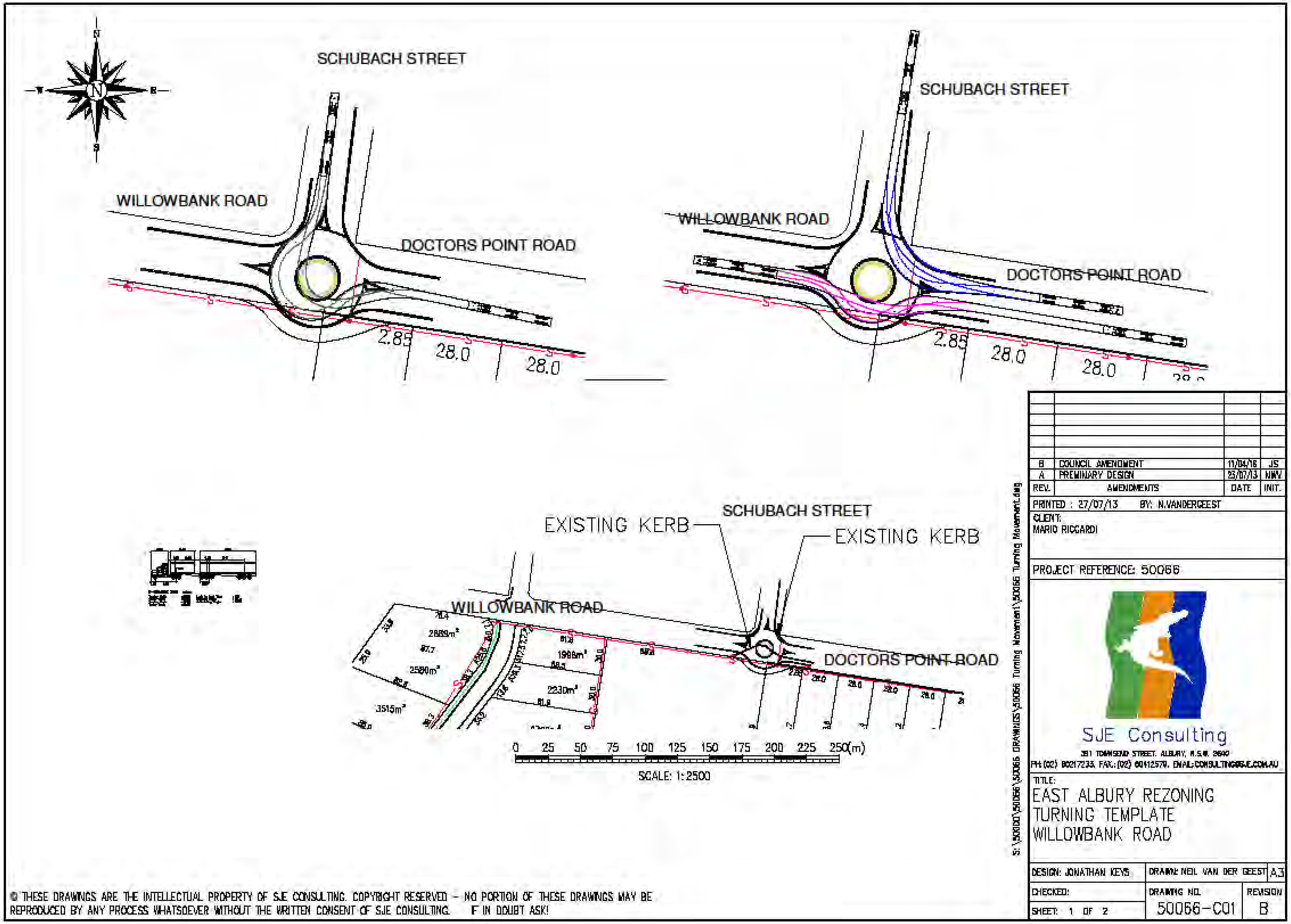
PM Traffic

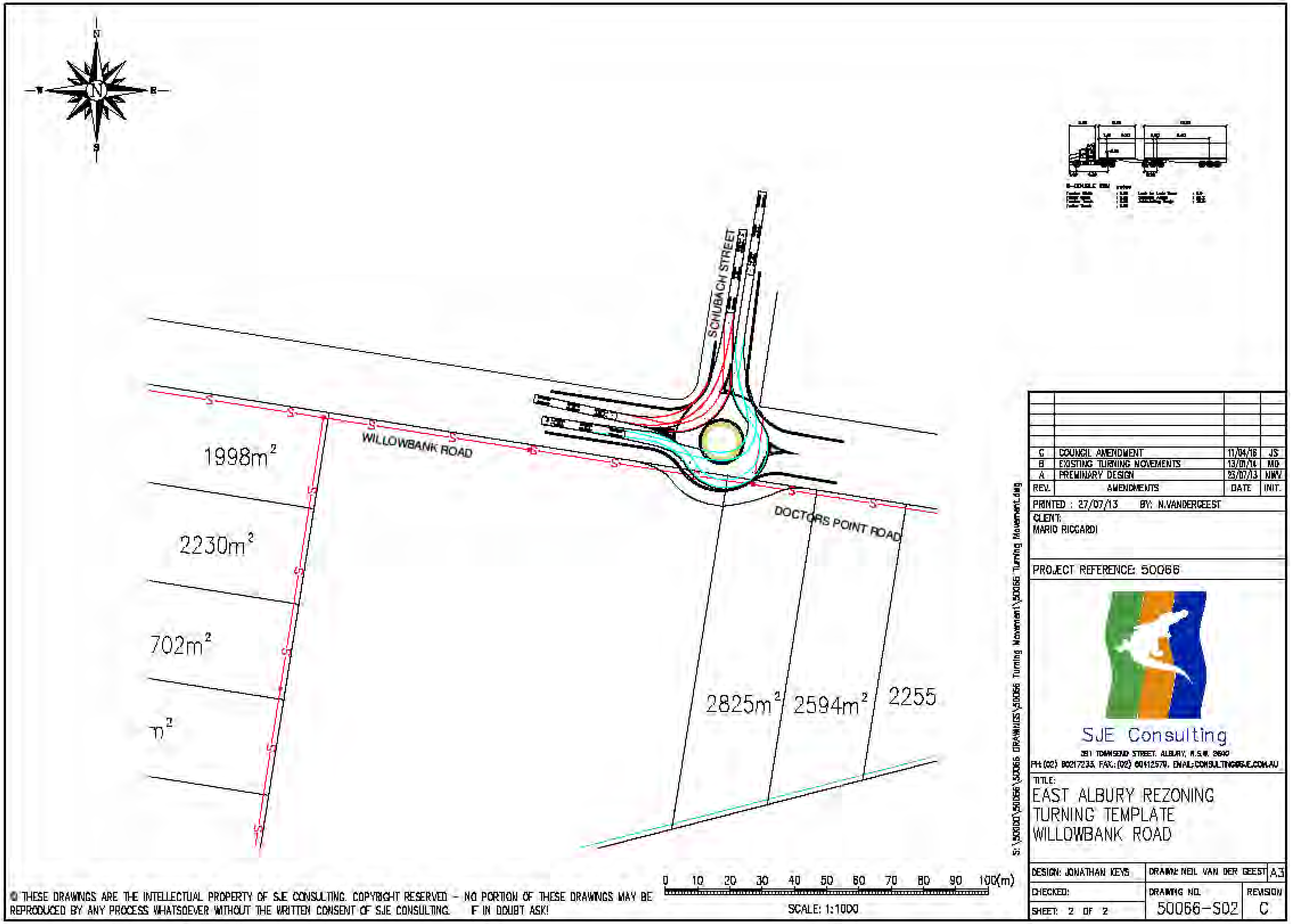


PM- Intersection Performance

Intersection Performance - Hourly Values	
Performance Measure	**Vehicles**
Demand Flows (Total)	420 veh/h
Percent Heavy Vehicles	8.1 %
Degree of Saturation	0.141
Practical Spare Capacity	503.6 %
Effective Intersection Capacity	2982 veh/h
Control Delay (Total)	1.01 veh-h/h
Control Delay (Average)	8.7 sec
Control Delay (Worst Lane)	10.3 sec
Control Delay (Worst Movement)	11.6 sec
Geometric Delay (Average)	8.4 sec
Stop-Line Delay (Average)	0.3 sec
Intersection Level of Service (LOS)	LOS A

d. APPENDIX D – Proposed Layout




N
S
E
W
SCHUBACH STREET
WILLOWBANK ROAD
DOCTORS POINT ROAD
1998m²
2230m²
702m²
2825m²
2594m²
2255
C COUNCIL AMENDMENT 11/04/16 JS
B EXISTING TURNING MOVEMENTS 13/01/14 MD
A PREMINARY DESIGN 25/07/13 NWV
REV. AMENDMENTS DATE INIT.
PRINTED : 27/07/13 BY: N.VANDERGEEST
CLIENT:
MARIO RICCARDI
PROJECT REFERENCE: 50066
SJE Consulting
TITLE:
EAST ALBURY REZONING
TURNING TEMPLATE
WILLOWBANK ROAD
DESIGN: JONATHAN KEYS
DRAWN: NEIL VAN DER GEEST
A3
CHECKED:
DRAWING NO.
REVISION
SHEET: 2 OF 2
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0 10 20 30 40 50 60 70 80 90 100(m)
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e. APPENDIX E – Existing Photos

Figure 1 Doctors Point Road:- approx 180m east of the intersection

Figure 2 Willowbank Road:- approx 250m west of the intersection

Figure 3 Willowbank Road: Approx 10m from the intersection looking east to Doctors Point Road

Figure 4 Schubach St to north

Figure 5 Intersection to west

Figure 6 Schubach St: approx 200m looking south to the intersection

f. APPENDIX F – Traffic Count 8th to 15th May 2013

Counts (Virtual Week)

VirtWeeklyVehicle-36
Site: 68512.0.0NS
Descriptio **Schubach st - East st to Doctors point rd**
Filter time 8:43 Wednesday, 8 May 2013 => 12:22 Wednesday, 15 May 2013
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	6.0	2.0	2.0	5.0	0.0	7.0	5.0	3.0	3.9
0100-0200	4.0	1.0	2.0	1.0	3.0	3.0	5.0	2.2	2.7
0200-0300	0.0	0.0	0.0	4.0	0.0	4.0	4.0	0.8	1.7
0300-0400	1.0	1.0	0.0	0.0	0.0	1.0	2.0	0.4	0.7
0400-0500	3.0	0.0	1.0	0.0	1.0	2.0	3.0	1.0	1.4
0500-0600	3.0	7.0	6.0	9.0	8.0	6.0	3.0	6.6	6.0
0600-0700	12.0	13.0	11.0	17.0	12.0	13.0	6.0	13.0	12.0
0700-0800	46.0	27.0	36.0	58.0	38.0	11.0	8.0	41.0	32.0
0800-0900	**76.0<**	65.0	35.5	**74.0<**	**82.0<**	29.0	19.0	**61.3<**	**52.0<**
0900-1000	31.0	**71.0<**	21.5	49.0	46.0	37.0	38.0	40.0	39.4
1000-1100	39.0	39.0	**53.5<**	42.0	54.0	**54.0<**	41.0	46.8	47.0
1100-1200	47.0	33.0	25.0	50.0	52.0	50.0	**56.0<**	38.7	42.3
1200-1300	40.0	55.0	31.5	63.0	53.0	58.0	46.0	45.7	47.3
1300-1400	37.0	44.0	51.0	52.0	46.0	47.0	44.0	46.0	45.9
1400-1500	43.0	32.0	61.0	56.0	67.0	**59.0<**	54.0	51.8	53.1
1500-1600	59.0	**78.0<**	75.0	**89.0<**	73.0	50.0	**76.0<**	**74.8<**	**71.4<**
1600-1700	**64.0<**	63.0	**87.0<**	74.0	**74.0<**	46.0	69.0	72.4	68.1
1700-1800	61.0	68.0	78.0	82.0	71.0	52.0	34.0	72.0	63.7
1800-1900	47.0	43.0	45.0	45.0	48.0	42.0	25.0	45.6	42.1
1900-2000	31.0	18.0	18.0	33.0	30.0	20.0	13.0	26.0	23.3
2000-2100	18.0	21.0	13.0	13.0	23.0	13.0	8.0	17.6	15.6
2100-2200	5.0	11.0	6.0	11.0	16.0	17.0	8.0	9.8	10.6
2200-2300	4.0	7.0	8.0	6.0	8.0	15.0	2.0	6.6	7.1
2300-2400	3.0	4.0	1.0	2.0	5.0	9.0	3.0	3.0	3.9
Totals									
0700-1900	590.0	618.0	600.0	734.0	704.0	535.0	510.0	636.1	604.3
0600-2200	656.0	681.0	648.0	808.0	785.0	598.0	545.0	702.5	665.7
0600-0000	663.0	692.0	657.0	816.0	798.0	622.0	550.0	712.1	676.7
0000-0000	680.0	703.0	668.0	835.0	810.0	645.0	572.0	726.1	693.2
AM Peak	0800	0900	1000	0800	0800	1000	1100		
	76.0	71.0	53.5	74.0	82.0	54.0	56.0		
PM Peak	1600	1500	1600	1500	1600	1400	1500		
	64.0	78.0	87.0	89.0	74.0	59.0	76.0		

g. APPENDIX G - References

i. RTA – Guide to Traffic Generating Developments (RTA-GTGD)

ii. Austroads Guides to Traffic Management Parts 3 Traffic Studies and Analysis (AGTM-3),

iii. Austroads Guides to Traffic Management Part 6 Intersections Interchanges and Crossings (AGTM-6)

iv. Austroads Guide to Road Design Part 3 Geometric Road Design (AGRD-3)

v. Austroads Guide to Road Design Part 4a Unsignalised and Signalised Intersections (AGRD-4a)

Appendix B

Albury City Council Traffic Data November 2014 East Street/Hume Freeway Interchange

- Appendix B1: East Street/Hume Freeway Interchange East AM Peak
- Appendix B2: East Street/Hume Freeway Interchange West AM Peak
- Appendix B3: East Street/Hume Freeway Interchange East PM Peak
- Appendix B4: East Street/Hume Freeway Interchange West PM Peak

Appendix B1: East Street/Hume Freeway Interchange East AM Peak

AlburyCity Council
553 Kiewa Street
PO Box 323
Albury, Australia 2640
(02) 6023-8111 sswann@alburycity.nsw.gov.au

Count Name: East Street Interchange East - AM Peak
Site Code:
Start Date: 06/11/2014
Page No: 3

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Hume Highway (N) Southbound				East Street (E) Westbound				Bridge Street (W) Eastbound				
	Right	Thru	Left	App. Total	Thru	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
8:00 AM	60	0	3	63	53	57	0	110	39	44	0	83	256
8:15 AM	76	0	4	80	110	68	0	178	32	57	0	89	347
8:30 AM	89	0	8	97	102	47	0	149	62	61	0	123	369
8:45 AM	67	0	6	73	77	40	0	117	37	56	0	93	283
Total	292	0	21	313	342	212	0	554	170	218	0	388	1255
Approach %	93.3	0.0	6.7	-	61.7	38.3	0.0	-	43.8	56.2	0.0	-	-
Total %	23.3	0.0	1.7	24.9	27.3	16.9	0.0	44.1	13.5	17.4	0.0	30.9	-
PHF	0.820	0.000	0.656	0.807	0.777	0.779	0.000	0.778	0.685	0.893	0.000	0.789	0.850
Lights	277	0	20	297	330	200	0	530	152	207	0	359	1186
% Lights	94.9	-	95.2	94.9	96.5	94.3	-	95.7	89.4	95.0	-	92.5	94.5
Mediums	8	0	0	8	10	7	0	17	11	4	0	15	40
% Mediums	2.7	-	0.0	2.6	2.9	3.3	-	3.1	6.5	1.8	-	3.9	3.2
Articulated Trucks	7	0	1	8	2	5	0	7	7	7	0	14	29
% Articulated Trucks	2.4	-	4.8	2.6	0.6	2.4	-	1.3	4.1	3.2	-	3.6	2.3

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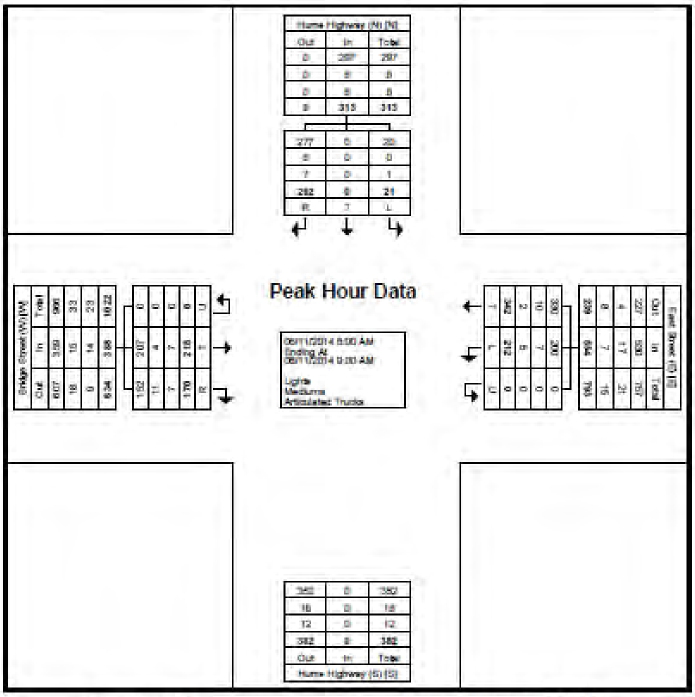
Count Name: East Street Interchange East - AM Peak
Site Code:
Start Date: 06/11/2014
Page No: 4



Turning Movement Peak Hour Data Plot (8:00 AM)

Appendix B2: East Street/Hume Freeway Interchange West AM Peak

AlburyCity Council
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Count Name: East Street Interchange West - AM Peak
Site Code:
Start Date: 06/11/2014
Page No: 3

Turning Movement Peak Hour Data (8:00 AM)

	Bridge Street (E) Westbound				Hume Freeway (S) Northbound				Bridge Street (W) Eastbound				
Start Time	Right	Thru	U-Turn	App. Total	Right	Thru	Left	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
8:00 AM	4	104	0	108	20	0	78	98	68	27	0	95	301
8:15 AM	7	165	0	172	27	0	126	153	72	41	0	113	438
8:30 AM	3	187	0	190	29	0	109	138	86	32	0	118	446
8:45 AM	4	144	0	148	26	0	113	139	80	43	0	123	410
Total	18	600	0	618	102	0	426	528	306	143	0	449	1595
Approach %	2.9	97.1	0.0	-	19.3	0.0	80.7	-	68.2	31.8	0.0	-	-
Total %	1.1	37.6	0.0	38.7	6.4	0.0	26.7	33.1	19.2	9.0	0.0	28.2	-
PHF	0.643	0.802	0.000	0.813	0.879	0.000	0.845	0.863	0.890	0.831	0.000	0.913	0.894
Lights	16	575	0	591	92	0	408	500	286	125	0	411	1502
% Lights	88.9	95.8	-	95.6	90.2	-	95.8	94.7	93.5	87.4	-	91.5	94.2
Mediums	1	16	0	17	2	0	9	11	12	11	0	23	51
% Mediums	5.6	2.7	-	2.8	2.0	-	2.1	2.1	3.9	7.7	-	5.1	3.2
Articulated Trucks	1	9	0	10	8	0	9	17	8	7	0	15	42
% Articulated Trucks	5.6	1.5	-	1.6	7.8	-	2.1	3.2	2.6	4.9	-	3.3	2.6

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Count Name: East Street Interchange West - AM Peak
Site Code:
Start Date: 06/11/2014
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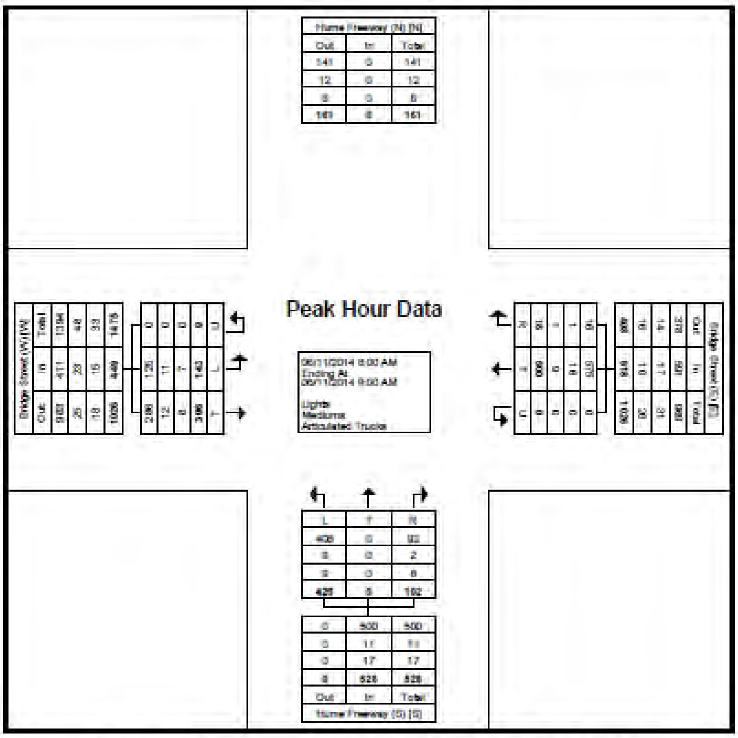

Turning Movement Peak Hour Data Plot (8:00 AM)

Appendix B3: East Street/Hume Freeway Interchange East PM Peak

AlburyCity Council
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Count Name: East Street Interchnage East - PM Peak
Site Code:
Start Date: 06/11/2014
Page No: 3

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Hume Hughway (N) Southbound				East Street (E) Westbound				Bridge Sreet (W) Eastbound				
	Right	Thru	Left	App. Total	Thru	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
4:30 PM	31	0	2	33	45	34	0	79	139	111	0	250	362
4:45 PM	33	0	5	38	42	43	0	85	122	130	0	252	375
5:00 PM	27	0	8	35	46	45	0	91	169	124	0	293	419
5:15 PM	33	0	6	39	37	32	0	69	138	147	0	285	393
Total	124	0	21	145	170	154	0	324	568	512	0	1080	1549
Approach %	85.5	0.0	14.5	-	52.5	47.5	0.0	-	52.6	47.4	0.0	-	-
Total %	8.0	0.0	1.4	9.4	11.0	9.9	0.0	20.9	36.7	33.1	0.0	69.7	-
PHF	0.939	0.000	0.656	0.929	0.924	0.856	0.000	0.890	0.840	0.871	0.000	0.922	0.924
Lights	102	0	18	120	168	152	0	320	558	505	0	1063	1503
% Lights	82.3	-	85.7	82.8	98.8	98.7	-	98.8	98.2	98.6	-	98.4	97.0
Mediums	8	0	1	9	2	1	0	3	7	2	0	9	21
% Mediums	6.5	-	4.8	6.2	1.2	0.6	-	0.9	1.2	0.4	-	0.8	1.4
Articulated Trucks	14	0	2	16	0	1	0	1	3	5	0	8	25
% Articulated Trucks	11.3	-	9.5	11.0	0.0	0.6	-	0.3	0.5	1.0	-	0.7	1.6

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Count Name: East Street Interchnage East - PM Peak
Site Code:
Start Date: 06/11/2014
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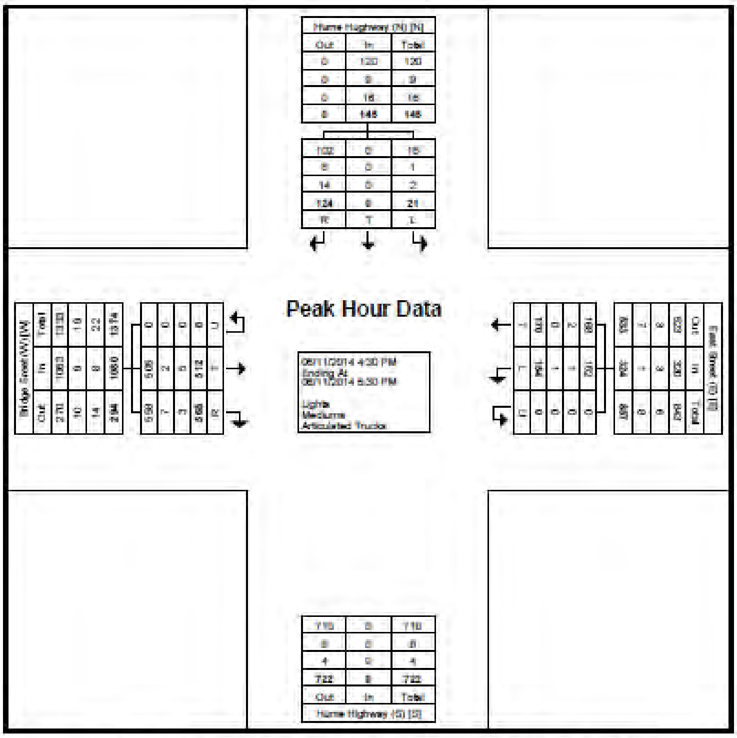

Turning Movement Peak Hour Data Plot (4:30 PM)

Appendix B4: East Street/Hume Freeway Interchange West PM Peak

AlburyCity Council
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Count Name: East Street Interchange West - PM Peak
Site Code:
Start Date: 06/11/2014
Page No: 3

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Bridge Street (E) Westbound				Hume Freeway (S) Northbound				Bridge Street (W) Eastbound				
	Right	Thru	U-Turn	App. Total	Right	Thru	Left	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
4:30 PM	2	74	0	76	46	0	90	136	198	57	0	255	467
4:45 PM	4	71	0	75	68	0	85	153	196	53	0	249	477
5:00 PM	3	69	0	72	44	0	89	133	253	80	0	333	538
5:15 PM	3	66	0	69	53	1	61	115	217	56	0	273	457
Total	12	280	0	292	211	1	325	537	864	246	0	1110	1939
Approach %	4.1	95.9	0.0	-	39.3	0.2	60.5	-	77.8	22.2	0.0	-	-
Total %	0.6	14.4	0.0	15.1	10.9	0.1	16.8	27.7	44.6	12.7	0.0	57.2	-
PHF	0.750	0.946	0.000	0.961	0.776	0.250	0.903	0.877	0.854	0.769	0.000	0.833	0.901
Lights	12	258	0	270	206	0	314	520	853	231	0	1084	1874
% Lights	100.0	92.1	-	92.5	97.6	0.0	96.6	96.8	98.7	93.9	-	97.7	96.6
Mediums	0	7	0	7	2	1	4	7	7	6	0	13	27
% Mediums	0.0	2.5	-	2.4	0.9	100.0	1.2	1.3	0.8	2.4	-	1.2	1.4
Articulated Trucks	0	15	0	15	3	0	7	10	4	9	0	13	38
% Articulated Trucks	0.0	5.4	-	5.1	1.4	0.0	2.2	1.9	0.5	3.7	-	1.2	2.0

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Count Name: East Street Interchange West - PM Peak
Site Code:
Start Date: 06/11/2014
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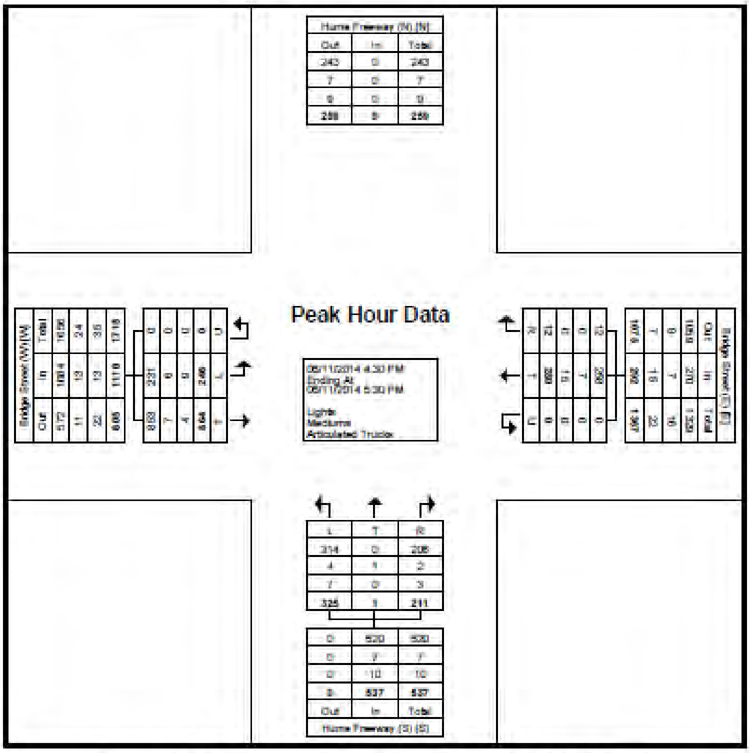

Turning Movement Peak Hour Data Plot (4:30 PM)

Appendix C

SIDRA Movement Summary's Schubach Street/East Street Roundabout

- Appendix C1: Schubach Street/East Street RBT existing AM year 2016
- Appendix C2: Schubach Street/East Street RBT existing PM year 2016
- Appendix C3: Schubach Street/East Street RBT existing AM year 2037
- Appendix C4: Schubach Street/East Street RBT existing PM year 2037
- Appendix C5: Schubach Street/East Street RBT generated traffic AM year 2037
- Appendix C6: Schubach Street/East Street RBT generated traffic PM year 2037

Appendix C1: Schubach Street/East Street RBT existing AM year 2016

MOVEMENT SUMMARY

Site: Schubach East RBT AM 2016

Schubach East roundabout
Roundabout
Design Life Analysis (Practical Capacity): Results for 1 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Schubach St											
1	L2	30	5.0	0.052	4.5	LOS A	0.2	1.4	0.41	0.56	36.2
2	T1	13	5.0	0.052	5.1	LOS A	0.2	1.4	0.41	0.56	35.7
3	R2	10	5.0	0.052	8.8	LOS A	0.2	1.4	0.41	0.56	37.8
Approach		53	5.0	0.052	5.4	LOS A	0.2	1.4	0.41	0.56	36.4
East: East St											
4	L2	12	5.0	0.184	4.1	LOS A	0.7	5.1	0.37	0.52	36.3
5	T1	188	5.0	0.184	4.7	LOS A	0.7	5.1	0.37	0.52	35.8
6	R2	1	5.0	0.184	8.4	LOS A	0.7	5.1	0.37	0.52	37.9
Approach		201	5.0	0.184	4.7	LOS A	0.7	5.1	0.37	0.52	35.8
North: Schubach St											
7	L2	1	5.0	0.252	3.3	LOS A	0.9	6.5	0.20	0.60	35.7
8	T1	15	5.0	0.252	3.9	LOS A	0.9	6.5	0.20	0.60	35.1
9	R2	310	5.0	0.252	7.7	LOS A	0.9	6.5	0.20	0.60	37.2
Approach		326	5.0	0.252	7.5	LOS A	0.9	6.5	0.20	0.60	37.1
West: East St											
10	L2	62	5.0	0.122	3.0	LOS A	0.4	3.2	0.08	0.44	36.7
11	T1	78	5.0	0.122	3.6	LOS A	0.4	3.2	0.08	0.44	36.1
12	R2	35	5.0	0.122	7.4	LOS A	0.4	3.2	0.08	0.44	38.3
Approach		176	5.0	0.122	4.2	LOS A	0.4	3.2	0.08	0.44	36.8
All Vehicles		756	5.0	0.252	5.8	LOS A	0.9	6.5	0.23	0.54	36.6

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix C2: Schubach Street/East Street RBT existing PM year 2016

MOVEMENT SUMMARY

Site: Schubach East RBT PM 2016

Schubach East roundabout
Roundabout
Design Life Analysis (Practical Capacity): Results for 1 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Schubach St											
1	L2	21	5.0	0.032	3.7	LOS A	0.1	0.8	0.28	0.47	36.5
2	T1	13	5.0	0.032	4.3	LOS A	0.1	0.8	0.28	0.47	36.0
3	R2	2	5.0	0.032	8.0	LOS A	0.1	0.8	0.28	0.47	38.2
Approach		37	5.0	0.032	4.2	LOS A	0.1	0.8	0.28	0.47	36.4
East: East St											
4	L2	8	5.0	0.129	3.5	LOS A	0.4	3.2	0.25	0.45	36.6
5	T1	142	5.0	0.129	4.1	LOS A	0.4	3.2	0.25	0.45	36.0
6	R2	3	5.0	0.129	7.8	LOS A	0.4	3.2	0.25	0.45	38.2
Approach		152	5.0	0.129	4.1	LOS A	0.4	3.2	0.25	0.45	36.1
North: Schubach St											
7	L2	6	5.0	0.139	3.6	LOS A	0.5	3.4	0.26	0.61	35.7
8	T1	12	5.0	0.139	4.2	LOS A	0.5	3.4	0.26	0.61	35.1
9	R2	145	5.0	0.139	7.9	LOS A	0.5	3.4	0.26	0.61	37.2
Approach		163	5.0	0.139	7.5	LOS A	0.5	3.4	0.26	0.61	36.9
West: East St											
10	L2	169	5.0	0.257	3.0	LOS A	1.0	7.1	0.07	0.42	36.9
11	T1	189	5.0	0.257	3.6	LOS A	1.0	7.1	0.07	0.42	36.3
12	R2	37	5.0	0.257	7.4	LOS A	1.0	7.1	0.07	0.42	38.5
Approach		394	5.0	0.257	3.7	LOS A	1.0	7.1	0.07	0.42	36.7
All Vehicles		746	5.0	0.257	4.7	LOS A	1.0	7.1	0.16	0.47	36.6

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: PETER MEREDITH CONSULTING | Processed: Thursday, 2 June 2016 1:01:31 PM
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Appendix C3: Schubach Street/East Street RBT existing AM year 2037

MOVEMENT SUMMARY

Site: Schubach East RBT PM 2037

Schubach East roundabout
Roundabout
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Schubach St											
1	L2	29	5.0	0.047	4.1	LOS A	0.2	1.2	0.35	0.51	36.4
2	T1	18	5.0	0.047	4.7	LOS A	0.2	1.2	0.35	0.51	35.9
3	R2	3	5.0	0.047	8.4	LOS A	0.2	1.2	0.35	0.51	38.0
Approach		50	5.0	0.047	4.6	LOS A	0.2	1.2	0.35	0.51	36.3
East: East St											
4	L2	10	5.0	0.184	3.8	LOS A	0.7	5.0	0.32	0.49	36.4
5	T1	195	5.0	0.184	4.4	LOS A	0.7	5.0	0.32	0.49	35.9
6	R2	4	5.0	0.184	8.1	LOS A	0.7	5.0	0.32	0.49	38.0
Approach		209	5.0	0.184	4.4	LOS A	0.7	5.0	0.32	0.49	35.9
North: Schubach St											
7	L2	9	5.0	0.199	4.0	LOS A	0.7	5.3	0.33	0.64	35.6
8	T1	16	5.0	0.199	4.6	LOS A	0.7	5.3	0.33	0.64	35.0
9	R2	199	5.0	0.199	8.3	LOS A	0.7	5.3	0.33	0.64	37.0
Approach		224	5.0	0.199	7.8	LOS A	0.7	5.3	0.33	0.64	36.8
West: East St											
10	L2	231	5.0	0.354	3.1	LOS A	1.6	11.4	0.10	0.42	36.8
11	T1	259	5.0	0.354	3.6	LOS A	1.6	11.4	0.10	0.42	36.2
12	R2	50	5.0	0.354	7.4	LOS A	1.6	11.4	0.10	0.42	38.4
Approach		541	5.0	0.354	3.7	LOS A	1.6	11.4	0.10	0.42	36.7
All Vehicles		1024	5.0	0.354	4.8	LOS A	1.6	11.4	0.21	0.49	36.5

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix C4: Schubach Street/East Street RBT existing PM year 2037

MOVEMENT SUMMARY

Site: Schubach East RBT AM 2037

Schubach East roundabout
Roundabout
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Schubach St											
1	L2	41	5.0	0.081	5.5	LOS A	0.3	2.5	0.52	0.64	35.9
2	T1	18	5.0	0.081	6.1	LOS A	0.3	2.5	0.52	0.64	35.4
3	R2	13	5.0	0.081	9.8	LOS A	0.3	2.5	0.52	0.64	37.5
Approach		72	5.0	0.081	6.5	LOS A	0.3	2.5	0.52	0.64	36.1
East: East St											
4	L2	16	5.0	0.275	4.8	LOS A	1.2	9.0	0.49	0.60	36.1
5	T1	258	5.0	0.275	5.4	LOS A	1.2	9.0	0.49	0.60	35.6
6	R2	1	5.0	0.275	9.2	LOS A	1.2	9.0	0.49	0.60	37.7
Approach		276	5.0	0.275	5.4	LOS A	1.2	9.0	0.49	0.60	35.6
North: Schubach St											
7	L2	1	5.0	0.355	3.6	LOS A	1.4	10.6	0.27	0.62	35.6
8	T1	21	5.0	0.355	4.1	LOS A	1.4	10.6	0.27	0.62	35.0
9	R2	426	5.0	0.355	7.9	LOS A	1.4	10.6	0.27	0.62	37.1
Approach		448	5.0	0.355	7.7	LOS A	1.4	10.6	0.27	0.62	37.0
West: East St											
10	L2	85	5.0	0.169	3.1	LOS A	0.7	4.8	0.10	0.44	36.7
11	T1	108	5.0	0.169	3.7	LOS A	0.7	4.8	0.10	0.44	36.1
12	R2	49	5.0	0.169	7.4	LOS A	0.7	4.8	0.10	0.44	38.3
Approach		242	5.0	0.169	4.2	LOS A	0.7	4.8	0.10	0.44	36.7
All Vehicles		1037	5.0	0.355	6.2	LOS A	1.4	10.6	0.31	0.57	36.5

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix C5: Schubach Street/East Street RBT generated traffic AM year 2037

MOVEMENT SUMMARY

Site: Schubach East RBT generated traffic AM 2037

Schubach East roundabout
Roundabout
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Schubach St											
1	L2	121	15.0	0.362	10.4	LOS B	2.2	17.8	0.83	0.92	34.3
2	T1	46	15.0	0.362	11.0	LOS B	2.2	17.8	0.83	0.92	33.8
3	R2	38	15.0	0.362	14.7	LOS B	2.2	17.8	0.83	0.92	35.8
Approach		205	15.0	0.362	11.3	LOS B	2.2	17.8	0.83	0.92	34.5
East: East St											
4	L2	69	15.0	0.686	14.7	LOS B	6.9	50.9	0.93	1.16	33.3
5	T1	380	5.0	0.686	15.0	LOS B	6.9	50.9	0.93	1.16	32.8
6	R2	1	5.0	0.686	18.7	LOS B	6.9	50.9	0.93	1.16	34.6
Approach		451	6.5	0.686	15.0	LOS B	6.9	50.9	0.93	1.16	32.9
North: Schubach St											
7	L2	1	5.0	0.641	6.2	LOS A	4.9	35.8	0.63	0.84	34.9
8	T1	52	15.0	0.641	7.0	LOS A	4.9	35.8	0.63	0.84	34.4
9	R2	628	5.0	0.641	10.5	LOS B	4.9	35.8	0.63	0.84	36.3
Approach		681	5.8	0.641	10.3	LOS B	4.9	35.8	0.63	0.84	36.2
West: East St											
10	L2	125	5.0	0.375	3.3	LOS A	2.1	15.5	0.26	0.51	36.2
11	T1	159	5.0	0.375	3.9	LOS A	2.1	15.5	0.26	0.51	35.6
12	R2	209	15.0	0.375	7.7	LOS A	2.1	15.5	0.26	0.51	37.8
Approach		494	9.2	0.375	5.3	LOS A	2.1	15.5	0.26	0.51	36.7
All Vehicles		1830	7.9	0.686	10.2	LOS B	6.9	50.9	0.63	0.84	35.2

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix C6: Schubach Street/East Street RBT generated traffic PM year 2037

MOVEMENT SUMMARY

Site: Schubach East RBT genearted traffic PM 2037

Schubach East roundabout
Roundabout
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Schubach St											
1	L2	180	15.0	0.341	5.7	LOS A	1.7	13.1	0.58	0.72	35.9
2	T1	72	15.0	0.341	6.3	LOS A	1.7	13.1	0.58	0.72	35.3
3	R2	49	15.0	0.341	10.0	LOS B	1.7	13.1	0.58	0.72	37.4
Approach		301	15.0	0.341	6.5	LOS A	1.7	13.1	0.58	0.72	36.0
East: East St											
4	L2	34	15.0	0.333	5.0	LOS A	1.6	12.0	0.53	0.61	36.0
5	T1	287	5.0	0.333	5.4	LOS A	1.6	12.0	0.53	0.61	35.5
6	R2	6	5.0	0.333	9.2	LOS A	1.6	12.0	0.53	0.61	37.6
Approach		327	6.0	0.333	5.5	LOS A	1.6	12.0	0.53	0.61	35.6
North: Schubach St											
7	L2	13	5.0	0.378	5.5	LOS A	2.0	14.6	0.60	0.78	35.2
8	T1	43	15.0	0.378	6.2	LOS A	2.0	14.6	0.60	0.78	34.7
9	R2	293	5.0	0.378	9.8	LOS A	2.0	14.6	0.60	0.78	36.7
Approach		349	6.2	0.378	9.2	LOS A	2.0	14.6	0.60	0.78	36.4
West: East St											
10	L2	340	5.0	0.649	3.7	LOS A	4.9	36.0	0.43	0.51	36.2
11	T1	382	5.0	0.649	4.3	LOS A	4.9	36.0	0.43	0.51	35.6
12	R2	134	15.0	0.649	8.1	LOS A	4.9	36.0	0.43	0.51	37.8
Approach		856	6.6	0.649	4.6	LOS A	4.9	36.0	0.43	0.51	36.2
All Vehicles		1833	7.8	0.649	6.0	LOS A	4.9	36.0	0.50	0.61	36.1

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix D

SIDRA Movement Summary's East Street/Hume Freeway Interchange

- Appendix D1: East Street/Hume Freeway Interchange existing East AM year 2016
- Appendix D2: East Street/Hume Freeway Interchange existing West AM year 2016
- Appendix D3: East Street/Hume Freeway Interchange existing East PM year 2016
- Appendix D4: East Street/Hume Freeway Interchange existing West PM year 2016
- Appendix D5: East Street/Hume Freeway Interchange existing East AM year 2037
- Appendix D6: East Street/Hume Freeway Interchange existing West AM year 2037
- Appendix D7: East Street/Hume Freeway Interchange existing East PM year 2037
- Appendix D8: East Street/Hume Freeway Interchange existing West PM year 2037
- Appendix D9: East Street/Hume Freeway Interchange generated traffic East AM year 2037
- Appendix D10: East Street/Hume Freeway Interchange generated traffic West AM year 2037
- Appendix D11: East Street/Hume Freeway Interchange generated traffic East PM year 2037
- Appendix D12: East Street/Hume Freeway Interchange generated traffic West PM year 2037

Appendix D1: East Street/Hume Freeway Interchange existing East AM year 2016

MOVEMENT SUMMARY

Site: East Street Interchange East_AM 2016

Hume Freeway East Street Interchange - East
AM Peak Period
Signals - Fixed Time Isolated   Cycle Time = 69 seconds (User-Given Phase Times)
Design Life Analysis (Practical Capacity): Results for 2 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	100% Back of Queue Vehicles veh	100% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: East (E)											
4	L2	227	7.0	0.295	19.3	LOS B	5.3	39.1	0.69	0.76	44.4
5	T1	381	7.0	0.586	15.1	LOS B	9.7	72.2	0.76	0.65	48.1
Approach		608	7.0	0.586	16.7	LOS B	9.7	72.2	0.73	0.69	46.6
North: Off-Ramp (N)											
7	L2	27	7.0	0.096	33.2	LOS C	0.9	6.3	0.88	0.71	38.0
8	T1	1	7.0	1.031	91.3	LOS F	19.6	145.3	1.00	1.37	23.2
9	R2	290	7.0	1.031	96.9	LOS F	19.6	145.3	1.00	1.37	22.9
Approach		318	7.0	1.031	91.4	LOS F	19.6	145.3	0.99	1.31	23.7
West: East (W)											
11	T1	308	7.0	0.604	11.5	LOS B	6.4	47.6	0.56	0.47	49.9
12	R2	256	7.0	0.604	36.7	LOS D	6.4	47.6	0.98	0.82	36.8
Approach		564	7.0	0.604	22.9	LOS C	6.4	47.6	0.75	0.63	43.0
All Vehicles		1491	7.0	1.031	35.0	LOS C	19.6	145.3	0.79	0.80	37.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix D2: East Street/Hume Freeway Interchange existing West AM year 2016

MOVEMENT SUMMARY

Site: East Street Interchange East_PM 2016

Hume Freeway East Street Interchange - East
PM Peak Period
Signals - Fixed Time Isolated   Cycle Time = 78 seconds (User-Given Phase Times)
Design Life Analysis (Practical Capacity): Results for 2 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: East (E)											
4	L2	167	2.9	0.265	25.5	LOS C	4.6	33.0	0.76	0.76	41.4
5	T1	221	2.9	0.338	20.5	LOS C	6.3	45.0	0.78	0.65	44.9
Approach		388	2.9	0.338	22.6	LOS C	6.3	45.0	0.77	0.70	43.3
North: Off-Ramp (N)											
7	L2	24	2.9	0.128	41.5	LOS D	0.9	6.2	0.94	0.71	35.1
8	T1	1	2.9	0.690	40.1	LOS D	5.2	37.2	1.00	0.85	34.3
9	R2	128	2.9	0.690	45.6	LOS D	5.2	37.2	1.00	0.85	33.7
Approach		153	2.9	0.690	45.0	LOS D	5.2	37.2	0.99	0.83	33.9
West: East (W)											
11	T1	562	2.9	0.686	12.8	LOS B	15.0	107.8	0.60	0.54	48.8
12	R2	588	2.9	0.686	30.4	LOS C	15.0	107.8	0.92	0.84	39.4
Approach		1149	2.9	0.686	21.8	LOS C	15.0	107.8	0.77	0.69	43.5
All Vehicles		1689	2.9	0.690	24.1	LOS C	15.0	107.8	0.79	0.71	42.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix D3: East Street/Hume Freeway Interchange existing East PM year 2016

MOVEMENT SUMMARY

Site: East Street Interchange West_AM 2016

Hume Freeway East Street Interchange - West
AM Peak Period
Signals - Fixed Time Isolated   Cycle Time = 138 seconds (User-Given Phase Times)
Design Life Analysis (Practical Capacity): Results for 2 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Off-Ramp (S)											
1	L2	503	6.6	0.812	39.4	LOS D	13.0	96.1	1.00	0.89	35.7
2	T1	1	6.6	0.812	33.8	LOS C	13.0	96.1	1.00	0.89	36.4
3	R2	123	6.6	0.812	39.4	LOS D	13.0	96.1	1.00	0.89	35.5
Approach		627	6.6	0.812	39.4	LOS D	13.0	96.1	1.00	0.89	35.7
East: East (E)											
5	T1	600	6.6	0.527	8.4	LOS A	11.7	86.6	0.62	0.55	52.7
6	R2	23	6.6	0.220	75.7	LOS E	1.5	11.3	0.99	0.71	26.4
Approach		622	6.6	0.527	10.8	LOS B	11.7	86.6	0.63	0.56	50.9
West: East (W)											
10	L2	170	6.6	0.198	11.8	LOS B	3.8	28.0	0.45	0.62	50.3
11	T1	419	6.6	0.198	10.0	LOS A	4.2	30.9	0.57	0.50	51.2
Approach		589	6.6	0.198	10.5	LOS B	4.2	30.9	0.53	0.53	50.9
All Vehicles		1838	6.6	0.812	20.5	LOS C	13.0	96.1	0.73	0.66	44.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix D4: East Street/Hume Freeway Interchange existing West PM year 2016

MOVEMENT SUMMARY

Site: East Street Interchange West_PM 2016

Hume Freeway East Street Interchange - West
PM Peak Period
Signals - Fixed Time Isolated   Cycle Time = 156 seconds (User-Given Phase Times)
Design Life Analysis (Practical Capacity): Results for 2 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Off-Ramp (S)											
1	L2	377	3.3	0.784	40.5	LOS D	13.4	96.1	1.00	0.87	35.4
2	T1	1	3.3	0.784	34.9	LOS C	13.4	96.1	1.00	0.87	36.0
3	R2	242	3.3	0.784	40.4	LOS D	13.4	96.1	1.00	0.87	35.2
Approach		620	3.3	0.784	40.5	LOS D	13.4	96.1	1.00	0.87	35.3
East: East (E)											
5	T1	342	3.3	0.285	7.0	LOS A	5.9	42.1	0.48	0.42	53.8
6	R2	17	3.3	0.248	88.9	LOS F	1.4	9.8	1.00	0.70	24.1
Approach		359	3.3	0.285	11.0	LOS B	5.9	42.1	0.51	0.43	50.8
West: East (W)											
10	L2	261	3.4	0.367	13.9	LOS B	8.9	63.9	0.53	0.64	49.5
11	T1	908	3.4	0.367	10.5	LOS B	9.6	69.4	0.59	0.54	50.8
Approach		1169	3.4	0.367	11.2	LOS B	9.6	69.4	0.58	0.56	50.5
All Vehicles		2148	3.3	0.784	19.6	LOS B	13.4	96.1	0.69	0.63	44.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix D5: East Street/Hume Freeway Interchange existing East AM year 2037

MOVEMENT SUMMARY

Site: East Street Interchange East_AM 2037

Hume Freeway East Street Interchange - East
AM Peak Period
Signals - Fixed Time Isolated   Cycle Time = 69 seconds (User-Given Phase Times)
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	100% Back of Queue Vehicles veh	100% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: East (E)											
4	L2	305	7.0	0.535	20.1	LOS C	7.5	55.7	0.73	0.77	44.0
5	T1	513	7.0	0.882	30.5	LOS C	19.8	146.6	0.84	0.96	39.9
Approach		819	7.0	0.882	26.6	LOS C	19.8	146.6	0.80	0.89	41.4
North: Off-Ramp (N)											
7	L2	37	7.0	0.130	33.4	LOS C	1.2	8.6	0.89	0.72	37.9
8	T1	1	7.0	1.388	394.1	LOS F	64.0	475.0	1.00	2.45	7.9
9	R2	391	7.0	1.388	399.8	LOS F	64.0	475.0	1.00	2.45	7.9
Approach		428	7.0	1.388	368.5	LOS F	64.0	475.0	0.99	2.30	8.5
West: East (W)											
11	T1	415	7.0	0.813	13.1	LOS B	9.8	72.7	0.58	0.53	48.8
12	R2	345	7.0	0.813	41.9	LOS D	9.8	72.7	1.00	0.95	35.0
Approach		760	7.0	0.813	26.2	LOS C	9.8	72.7	0.77	0.72	41.3
All Vehicles		2007	7.0	1.388	99.4	LOS F	64.0	475.0	0.83	1.13	22.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix D6: East Street/Hume Freeway Interchange existing West AM year 2037

MOVEMENT SUMMARY

Site: East Street Interchange West_AM 2037

Hume Freeway East Street Interchange - West
AM Peak Period
Signals - Fixed Time Isolated   Cycle Time = 138 seconds (User-Given Phase Times)
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Off-Ramp (S)											
1	L2	677	6.6	1.094	149.7	LOS F	38.1	281.5	1.00	1.23	17.2
2	T1	1	6.6	1.094	144.1	LOS F	38.1	281.5	1.00	1.22	17.3
3	R2	165	6.6	1.094	149.7	LOS F	38.1	281.5	1.00	1.22	17.1
Approach		843	6.6	1.094	149.7	LOS F	38.1	281.5	1.00	1.23	17.2
East: East (E)											
5	T1	807	6.6	0.729	10.0	LOS B	18.9	139.7	0.74	0.68	51.5
6	R2	30	6.6	0.296	76.3	LOS E	2.1	15.3	0.99	0.72	26.2
Approach		838	6.6	0.729	12.4	LOS B	18.9	139.7	0.75	0.68	49.7
West: East (W)											
10	L2	229	6.6	0.267	12.1	LOS B	5.4	39.6	0.47	0.64	50.1
11	T1	564	6.6	0.267	10.4	LOS B	5.9	43.3	0.59	0.53	50.9
Approach		793	6.6	0.267	10.9	LOS B	5.9	43.3	0.56	0.56	50.6
All Vehicles		2474	6.6	1.094	58.7	LOS E	38.1	281.5	0.77	0.83	30.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix D7: East Street/Hume Freeway Interchange existing East PM year 2037

MOVEMENT SUMMARY

Site: East Street Interchange East_PM 2037

Hume Freeway East Street Interchange - East
PM Peak Period
Signals - Fixed Time Isolated   Cycle Time = 78 seconds (User-Given Phase Times)
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: East (E)											
4	L2	224	2.9	0.377	26.3	LOS C	6.4	46.2	0.79	0.78	41.1
5	T1	297	2.9	0.568	21.5	LOS C	8.9	63.5	0.82	0.70	44.3
Approach		522	2.9	0.568	23.5	LOS C	8.9	63.5	0.81	0.73	42.8
North: Off-Ramp (N)											
7	L2	32	2.9	0.172	41.8	LOS D	1.2	8.4	0.95	0.72	35.0
8	T1	1	2.9	0.929	53.5	LOS D	8.4	60.2	1.00	1.09	30.5
9	R2	173	2.9	0.929	59.1	LOS E	8.4	60.2	1.00	1.09	30.0
Approach		205	2.9	0.929	56.4	LOS E	8.4	60.2	0.99	1.03	30.7
West: East (W)											
11	T1	756	2.9	0.923	23.0	LOS C	30.4	217.7	0.66	0.70	43.0
12	R2	791	2.9	0.923	51.0	LOS D	30.4	217.7	1.00	1.07	32.2
Approach		1547	2.9	0.923	37.3	LOS D	30.4	217.7	0.83	0.89	36.7
All Vehicles		2274	2.9	0.929	35.9	LOS D	30.4	217.7	0.84	0.87	37.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix D8: East Street/Hume Freeway Interchange existing West PM year 2037

MOVEMENT SUMMARY

Site: East Street Interchange West_PM 2037

Hume Freeway East Street Interchange - West
PM Peak Period
Signals - Fixed Time Isolated   Cycle Time = 156 seconds (User-Given Phase Times)
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Off-Ramp (S)											
1	L2	507	3.3	1.055	124.8	LOS F	35.1	252.7	1.00	1.13	19.5
2	T1	2	3.3	1.055	119.2	LOS F	35.1	252.7	1.00	1.12	19.7
3	R2	326	3.3	1.055	124.7	LOS F	35.1	252.7	1.00	1.12	19.4
Approach		835	3.3	1.055	124.7	LOS F	35.1	252.7	1.00	1.13	19.5
East: East (E)											
5	T1	460	3.3	0.383	7.6	LOS A	8.5	61.5	0.53	0.46	53.3
6	R2	23	3.3	0.334	89.5	LOS F	1.8	13.3	1.00	0.71	24.0
Approach		483	3.3	0.383	11.5	LOS B	8.5	61.5	0.55	0.48	50.3
West: East (W)											
10	L2	351	3.4	0.544	15.8	LOS B	15.3	110.2	0.63	0.69	48.5
11	T1	1223	3.4	0.544	11.4	LOS B	15.3	110.2	0.65	0.60	50.1
Approach		1574	3.4	0.544	12.4	LOS B	15.3	110.2	0.64	0.62	49.7
All Vehicles		2892	3.3	1.055	44.7	LOS D	35.1	252.7	0.73	0.74	34.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix D9: East Street/Hume Freeway Interchange generated traffic East AM year 2037

MOVEMENT SUMMARY

Site: East Street Interchange generated traffic East_AM 2037

Hume Freeway East Street Interchange - East
AM Peak Period
Signals - Fixed Time Isolated   Cycle Time = 69 seconds (User-Given Phase Times)
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	100% Back of Queue Vehicles veh	100% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: East (E)											
4	L2	322	7.0	0.606	20.3	LOS C	8.0	59.3	0.74	0.78	43.9
5	T1	530	7.0	0.924	39.8	LOS D	23.4	173.8	0.85	1.07	36.2
Approach		851	7.0	0.924	32.4	LOS C	23.4	173.8	0.80	0.96	38.8
North: Off-Ramp (N)											
7	L2	74	7.0	0.263	34.3	LOS C	2.4	17.9	0.92	0.75	37.6
8	T1	1	7.0	1.388	394.1	LOS F	64.0	475.0	1.00	2.45	7.9
9	R2	391	7.0	1.388	399.8	LOS F	64.0	475.0	1.00	2.45	7.9
Approach		466	7.0	1.388	341.6	LOS F	64.0	475.0	0.99	2.18	9.0
West: East (W)											
11	T1	424	7.0	0.820	13.5	LOS B	10.0	74.6	0.59	0.54	48.5
12	R2	345	7.0	0.820	42.2	LOS D	10.0	74.6	1.00	0.96	34.9
Approach		769	7.0	0.820	26.4	LOS C	10.0	74.6	0.77	0.73	41.3
All Vehicles		2086	7.0	1.388	99.2	LOS F	64.0	475.0	0.83	1.15	22.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix D10: East Street/Hume Freeway Interchange generated traffic West AM year 2037

MOVEMENT SUMMARY

Site: East Street Interchange generated traffic West_AM 2037

Hume Freeway East Street Interchange - West
AM Peak Period
Signals - Fixed Time Isolated Cycle Time = 138 seconds (User-Given Phase Times)
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Off-Ramp (S)											
1	L2	677	6.6	1.139	187.0	LOS F	45.2	334.0	1.00	1.31	14.6
2	T1	1	6.6	1.139	181.3	LOS F	45.2	334.0	1.00	1.30	14.7
3	R2	200	6.6	1.139	186.9	LOS F	45.2	334.0	1.00	1.30	14.6
Approach		879	6.6	1.139	186.9	LOS F	45.2	334.0	1.00	1.31	14.6
East: East (E)											
5	T1	823	6.6	0.747	10.2	LOS B	19.5	144.4	0.76	0.69	51.4
6	R2	39	6.6	0.379	76.8	LOS E	2.7	19.7	1.00	0.74	26.1
Approach		861	6.6	0.747	13.2	LOS B	19.5	144.4	0.77	0.69	49.2
West: East (W)											
10	L2	229	6.6	0.274	12.6	LOS B	5.6	41.6	0.49	0.64	49.8
11	T1	582	6.6	0.274	10.5	LOS B	6.0	44.7	0.60	0.53	50.8
Approach		811	6.6	0.274	11.1	LOS B	6.0	44.7	0.57	0.56	50.5
All Vehicles		2551	6.6	1.139	72.4	LOS E	45.2	334.0	0.78	0.86	27.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix D11: East Street/Hume Freeway Interchange generated traffic East PM year 2037

MOVEMENT SUMMARY

Site: East Street Interchange generated traffic East_PM 2037

Hume Freeway East Street Interchange - East
PM Peak Period
Signals - Fixed Time Isolated   Cycle Time = 78 seconds (User-Given Phase Times)
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: East (E)											
4	L2	268	2.9	0.552	26.9	LOS C	7.9	56.7	0.81	0.79	40.8
5	T1	326	2.9	0.671	22.4	LOS C	10.1	72.1	0.84	0.73	43.8
Approach		594	2.9	0.671	24.4	LOS C	10.1	72.1	0.83	0.76	42.4
North: Off-Ramp (N)											
7	L2	45	2.9	0.242	42.2	LOS D	1.7	12.0	0.96	0.73	34.8
8	T1	1	2.9	0.929	53.5	LOS D	8.4	60.2	1.00	1.09	30.5
9	R2	173	2.9	0.929	59.1	LOS E	8.4	60.2	1.00	1.09	30.0
Approach		219	2.9	0.929	55.6	LOS E	8.4	60.2	0.99	1.02	30.9
West: East (W)											
11	T1	785	2.9	0.936	25.1	LOS C	32.4	232.3	0.67	0.73	41.9
12	R2	791	2.9	0.936	54.4	LOS D	32.4	232.3	1.00	1.09	31.3
Approach		1576	2.9	0.936	39.8	LOS D	32.4	232.3	0.83	0.91	35.8
All Vehicles		2388	2.9	0.936	37.4	LOS D	32.4	232.3	0.85	0.88	36.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix D12: East Street/Hume Freeway Interchange generated traffic West PM year 2037

MOVEMENT SUMMARY

Site: East Street Interchange generated traffic West_PM 2037

Hume Freeway East Street Interchange - West
PM Peak Period
Signals - Fixed Time Isolated Cycle Time = 156 seconds (User-Given Phase Times)
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Off-Ramp (S)											
1	L2	507	3.3	1.072	137.4	LOS F	37.6	270.9	1.00	1.16	18.3
2	T1	2	3.3	1.072	131.8	LOS F	37.6	270.9	1.00	1.14	18.4
3	R2	339	3.3	1.072	137.3	LOS F	37.6	270.9	1.00	1.14	18.2
Approach		848	3.3	1.072	137.3	LOS F	37.6	270.9	1.00	1.15	18.2
East: East (E)											
5	T1	491	3.3	0.409	7.8	LOS A	9.3	67.1	0.54	0.48	53.2
6	R2	54	3.3	0.776	94.3	LOS F	4.5	32.4	1.00	0.84	23.3
Approach		545	3.3	0.776	16.4	LOS B	9.3	67.1	0.58	0.51	47.1
West: East (W)											
10	L2	351	3.4	0.641	17.5	LOS B	20.3	146.5	0.72	0.73	47.7
11	T1	1236	3.4	0.641	11.5	LOS B	20.3	146.5	0.65	0.60	49.9
Approach		1587	3.4	0.641	12.8	LOS B	20.3	146.5	0.67	0.63	49.4
All Vehicles		2980	3.3	1.072	48.9	LOS D	37.6	270.9	0.75	0.76	33.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix ‘F’

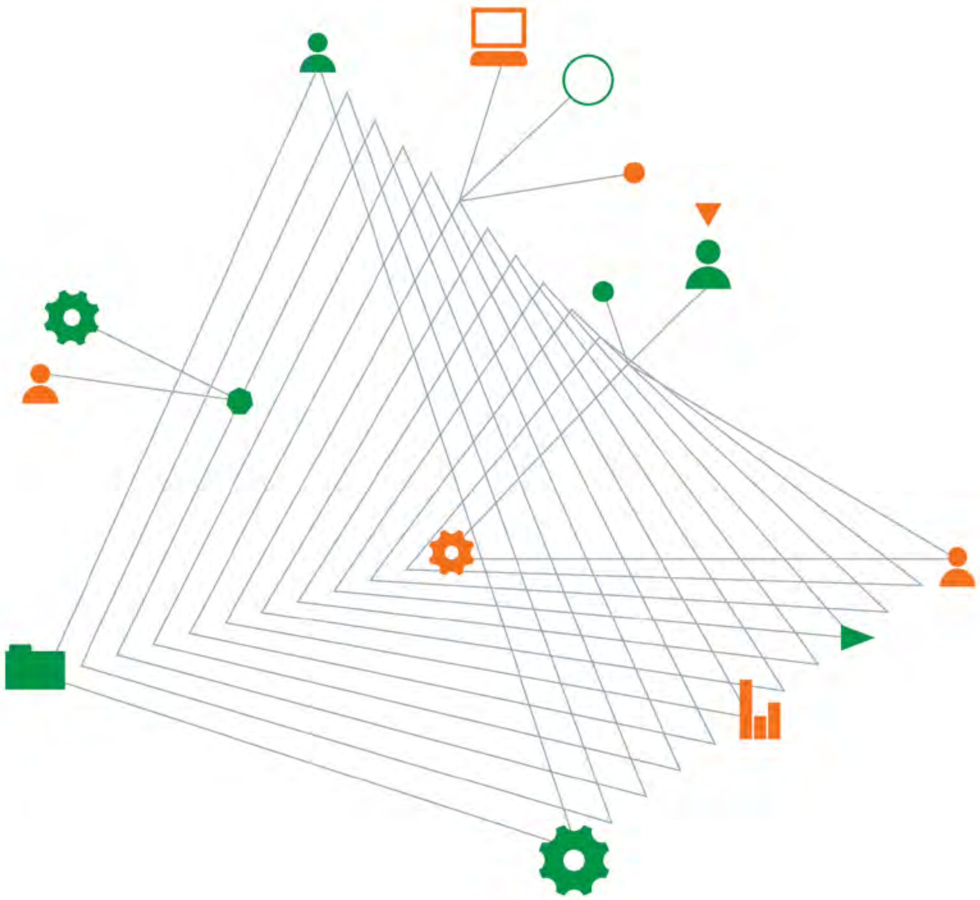
Preliminary Environmental Site Assessment (potential land contamination)

Mario Riccardi

Environmental Site Assessment

Former Willowbank Orchard, East Albury, NSW

13 April 2016



Experience
comes to life
when it is
powered by
expertise

Environmental Site Assessment

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13 April 2016

INFOALBU10761AB-R01_V03

Quality information

Revision History

Revision	Description	Date	Originator	Reviewer	Approver
R01	Final	27/07/2015	PH	DT	DT
R01_V02	Final	03/11/2015	PH	DT	DT
R01_V03	Final	13/04/2016	PH	DT	DT

Distribution

Report Status	No. of copies	Format	Distributed to	Date
Final	1	PDF	Mario Riccardi	27/07/15
Final	1	PDF	Habitat Planning	27/07/15
Final	1	PDF	Coffey Testing	27/07/15
Final	1	PDF	Mario Riccardi	03/12/15
Final	1	PDF	Habitat Planning	03/12/15

Final	1	PDF	Coffey Testing	03/12/15
Final	1	PDF	Habitat Planning	13/04/16
Final	1	PDF	Coffey Testing	13/04/16

Executive summary

Mario Riccardi commissioned Coffey Testing Pty Ltd (Coffey) to conduct an environmental site assessment (ESA) at the former Willowbank Orchard located at Willowbank Road, East Albury, NSW (the site).

A previous Phase 1 assessment was completed on the above site by Coffey in 2013. The assessment included a desktop site history assessment, as well as limited soil sampling of surface soils on site. One location sampled (BH8) reported a TRH C_{16}-C_{34} concentration above adopted ecological screening levels (ESL) criteria for commercial industrial use.

A request for information (RFI) (dated 24 March 2015) was issued by Albury City Council in response to a submission by Habitat Planning regarding the proposed re-zoning of the above site, which stated that further clarity on the site conditions was required.

A meeting was held between Habitat Planning, SJE, Coffey, Mr Riccardi and Council in order to establish a clear understanding on what was required for Council to approve the proposed development.

The soil assessment undertaken indicated levels of some metals and a pesticide above laboratory reporting limits however all report analytes were below the adopted assessment criteria. Laboratory analytical results do not indicate any other evidence of contamination existing in the soil on the site.

Further delineation of previously identified hotspot BH8 did not find any analytical concentration that exceeded the adopted criteria. It is noted that possible staining was observed in the soil during drilling works.

Based on the site groundwater quality results arsenic and copper were the only chemicals of concern reported over laboratory limits of reporting however all recorded analytes did not preclude the adopted criteria for groundwater.

Based on the site soil and groundwater quality results, contamination associated with previous site activities is not evident and the site is considered to not preclude its intended Industrial use.

This report should be read in conjunction with the *Important Information About your Coffey Environmental Report*, as attached.

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Tables

Appendices

1. Introduction

1.1. Background

Mario Riccardi commissioned Coffey Testing Pty Ltd (Coffey) to conduct an environmental site assessment (ESA) at the former Willowbank Orchard located on Willowbank Road, East Albury, NSW (the site). It is understood that these works are required to further assess the potential for contamination based on current and historical land use and form part of an application to Albury City Council for re-zoning from RU2 Rural Landscape to IN1 General Industrial. A site location plan is included as Figure 1.

A Phase 1 desktop preliminary environmental site assessment (ESA) was completed on the above site by Coffey in 2013 (ref: GEOTALBU10761AA-R01_V02). The assessment included a desktop site history assessment, as well as limited soil sampling of surface soils on site. One location sampled (BH8) in the mechanical services area of the orchard reported a concentration of $>C_{16}$-C_{34} fraction petroleum hydrocarbons above adopted ecological screening levels (ESL) criteria for commercial industrial use.

A request for information (RFI) (dated 24 March 2015) was issued by Albury City Council in response to a submission by Habitat Planning regarding the proposed re-zoning of the above site, which stated that further clarity on the site conditions was required.

A meeting was held between Habitat Planning, SJE, Coffey, Mr Riccardi and Council in order to establish a clear understanding on what was required for Council to approve the proposed development. The below scope was developed in order to meet Councils request.

It should be noted that this report should be read in conjunction with the preliminary ESA GEOTALBU10761AA-R01_V02 dated 25 November 2014.

1.2. Objective

It is understood that the intended future use of the site is for industrial use. The aim of the environmental assessment of the works is to provide an indication of potential soil and groundwater contamination at the site. This assessment will assist in providing preliminary advice for the following:

- Potential risk of adverse health impacts to workers on-site.
- Potential risk of adverse health impacts to future users of the site.
- An indication of the depth and quality of groundwater.

1.3. Scope of work

1.3.1. Stage 2 detailed site investigation (DSI)

For the purposes of this assessment the site has been divided into four sections. Figure 2 shows the overview location of each section of the site. The following assessment works were carried out at each section.

<u>Land surrounding the residential building (See Figure 3)</u>

- 4 x soil bores;
- Analysis of 8 soil samples for metals and organochlorine pesticides (OCPs); and
- Analysis of 4 samples for asbestos.

Former Orchard – Cultivated Areas (See Figure 4)

- Analysis of fifteen (15) composite samples (composites of 2) for metals and OCPs, herbicides; and
- Analysis of one soil sample for soil physiochemical parameters which allows for comparison to ecological investigation levels.

North-east Section (See Figure 5)

- 4 x soil bores;
- Analysis of 8 soil samples for metals and OCPs; and
- Analysis of 4 samples for asbestos.

Mechanical Shed (See Figure 6)

- 4 x test pits surrounding borehole BH8 undertaken during the previous site assessment, where elevated concentrations of $>C_{16}$-C_{34} fraction petroleum hydrocarbons were identified in the surface sample ; and
- Analysis of eight soil samples (two separate depths from each location) for TPH, BTEX, metals and OCPs.

2. Site information

2.1. Site identification

Site identification details are summarised below:

Table 2.1: Site Identification Details

Site Address	Willowbank Road, East Albury, NSW
Total Site Area	Approximately 2.2 ha.
Title Identification Details	Lot 37 DP1007315 Lot 2 DP999814. Lot 156 DP753326.
Current Zoning	Rural Landscape (RU2)
Current Site Use	Grazing, residence and packaging/transport
Adjoining Site Uses:	North: Industrial Estate East: A reserve and then the Murray River South: Continuation of orchard, then the Murray River West: Hume Freeway

The location and layout of the site is show in Figure 1 and Figure 2.

2.2. Site inspection

A site inspection was conducted on 9 June 2015 by a Coffey environmental scientist. A summary of the findings of the walkover is provided below.

2.3. Site walkover

The site walkover was on 9 June 2015. The site owner, Mr Riccardi, provided anecdotal information during the walkover. The main features observed during the site walkover and information obtained during discussions includes:

<u>Land surrounding the residential building</u>

- This section of the site is covers approximately 0.2 hectares;
- Structures included a brick residence with adjoining car port and 'granny flat';
- The majority of the surface was covered in a lawn;
- Introduced trees lined the northern and southern boundaries of this section; and
- No asbestos containing material was observed during the site walkover.

<u>Former Orchard</u>

- All orchard trees had been removed with the row mounts still visible. It is understood the trees were removed in 2013;

- Sheep were observed to be grazing within this section;
- A large dam was located in the north-western corner of this section of the site;
- A chemical and tractor storage shed was located in the middle of this section of the site; and
- A groundwater well was located approximately 15 metres to the north of the chemical and tractor storage shed.

<u>North-east Section</u>

- A run-down cottage, caravan and shed are located beneath tree cover in this section of the site.
- Several scrap cars are located throughout the yard as well as scape metal, old appliances and tyres; and
- Some grass covers the soil surface however the majority of the surface is bare earth.

<u>Mechanical Shed</u>

- Scrap metal was observed to be stored along the western side of the mechanical shed;
- A transport truck was parked west of the mechanical shed;
- Mr Riccardi explained that a road previously ran along the western boundary of the mechanical shed; and
- The above ground storage tanks previously reported in the initial investigation had been removed.

3. Site setting

3.1. Geology

The Geological Survey of Victoria map (Scale 1 :50,000) indicated the geology of the general site area is typically being Coonambidgal Formation of the Recent Quaternary Age consisting of clay, sand, sandy clay, gravel, slight soil development, grey in colour.

3.2. Hydrogeology and hydrology

It is expected that the majority of site surface waters would percolate into sub-surface soils.

The nearest surface water body is the dam situated on site. There are also two dams approximately 50m from the edge of the site in the north and west directions. The Murray River is located approximately 80 m south of the site. The river meanders, however the general flow direction appears to be to the south west.

There are 6 registered groundwater bores located within 0.5 km of the site. Detailed information related to the three closest registered bores is provided in Table 3.1 and provided in Appendix B.

Table 3.1: Registered Groundwater Bore Search

Bore No.	Approx. distance and direction from site	Location with respect to hydraulic gradient	Groundwater depth (m)	Geology (water bearing zone)	Registered use
GW505393	Located on site	-	-	Not known	Irrigation
GW505179 (abandoned)	Located on site	-	3.5	River Gravel	Test Bore
GW024589	245 m west	Cross-gradient	4.0	Gravel	Waste disposal
GW028006	214 m west	Cross-gradient	2.9	Gravel	Waste disposal
GW504238 (decommissioned)	310 m west	Cross-gradient	4.0	Sand	Industrial

The information provided for GW028006 is limited with a description of “waste disposal” as a registered use. The installation date for this bore is recorded as 1968 and given the age of the bore it is not clear what the registered use refers to.

3.3. Potential receptors

Table 3.2 below summarises the identified key receptors potentially affected by land contamination associated with the site.

Table 3.2: Key receptors potentially affected by land contamination

Potential Receptor	Sub-groups	Potential Impact
Human	Current & future users of the site	Adverse effect on health
	Temporary workers on a site, including maintenance, service contractors, construction and demolition workers	
	People in the vicinity of a site	
Water	Groundwater	Pollution (release of poisonous, noxious or polluting substances, including solids) Harm to the health of human, flora or fauna receptors that may drink, live in, come into contact with or take up water
	Surface waters, sediments and associated biota	
Ecosystems	Terrestrial plants	Adverse impact on health of individual species Adverse effect on larger ecosystems due to deterioration in specific species or bioaccumulation of contaminants in the food chain
	Micro-organisms, soil invertebrates, terrestrial wildlife	
Property	Other domesticated animals	Damage to structural integrity, serviceability Threat to health & safety Loss of value
	Buildings, building materials & services	

4. Soil and groundwater assessment

4.1. Methodology

Coffey undertook a soil and groundwater assessment at the site. Field activities are summarised below in Table 4.1.

Table 4.1: Field work methodology

Activity	Detail / Comments
Date of Works	9-11 June 2015
Sampling Method	A backhoe was used to excavate the test pit samples (TP1 – TP4) adjacent to the mechanical shed on 9 and 10 June 2015. Hand auger bores were undertaken in the residential area and north-east section of the site on 11 June 2015. Samples were collected from the surface, 0.5 mbgs, 1.0 mbgs and 2.0 mbgs from each location. Surface samples were collected from the former orchard with the use of a stainless steel hand trowel. Surface samples were composited by laboratory staff. Composite sampling was carried out in accordance with Guideline for Assessing Former Orchards and Market Gardens (DEC 2005). Work was conducted in general accordance with Coffey standard operating procedures (SOP). Soil samples were sealed into 250 mL glass soil sampling jars provided by the laboratory. A clean pair of disposable nitrile gloves was used for each sample. All sample containers were uniquely labelled, placed in eskies with ice packs and dispatched for analysis to ALS Laboratories under standard chain-of-custody documentation procedures. Copies of the chain of custody documentation and laboratory analytical reports are presented in Appendix C.
Decontamination of Sampling Equipment	Between each sampling location, the stainless steel trowel and hand-auger were decontaminated with a phosphate free detergent to remove any residual material left behind form the previous sample location and to minimise cross contamination.
Soil Screening	Soil samples were screened using a Photoionisation Detector (PID) which was calibrated daily to 100ppmv iso-butylene calibration gas. For all samples analysed an additional sample was taken, sealed in a plastic bag and the headspace measured with the PID. The PID readings, together with other field observations, were used to assess which samples should be further analysed in the laboratory. Soil laboratory analytical results are included in Appendix C.
Disposal of Soil Cuttings	Excess soil cuttings were disposed of on-site as discussed with the client.
Well Gauging	The existing monitoring well (MW1) was gauged using an oil/water interface probe (IP). The IP was decontaminated between each measurement.
Well Purging	The well was purged by removing three well volumes from the monitoring well, or until dry, using a disposable bailer.
Groundwater Sampling Method	A groundwater sample was collected from the monitoring well using a new disposable bailer for each well. Groundwater laboratory analytical results are included in Appendix C.
Groundwater Decontamination Procedure	Water sampling equipment, such as the IP, was decontaminated with laboratory grade detergent and rinsed with deionised water prior to purging of the well.
Groundwater Sample Preservation	The groundwater sample was placed in laboratory supplied bottles containing appropriate preservatives. Bottles were stored on ice, in an esky, while on-site and in transit to the laboratory. Samples collected for metals analysis were filtered in the field using a disposable filter.
Groundwater Sample Holding Times	Sample holding times were within acceptable range (based on EPA Victoria Guidelines Sampling and Analysis of Waters, Wastewaters, Soils and Wastes, IWRG701, 2009) from collection to extraction.
Disposal of Purged Groundwater	Purged groundwater was disposed of on-site as discussed with the client.
Laboratory Analysis	The primary laboratory was ALS. The secondary laboratory was Eurofins-MGT.

4.2. Field observations

4.2.1. Soil

During the field works, soil types were logged in accordance with the Unified Soil Classification System (USCS). The general subsurface conditions encountered during this assessment are summarised in Table 4.2 below. A copy of the soil logs are included in Appendix D.

Table 4.2: Site Specific Geology

Depth (mbgs)	Soil Description
0.0 – 0.1	Silty Sandy CLAY: medium plasticity, dark brown, fine grained sand. TP1 to TP4: FILL: Road Base
0.1 – 0.5 0.1 – 0.8	Sandy CLAY, low to medium plasticity, dark brown, fine grained sand. TP1 to TP4: FILL: Sandy CLAY, low plasticity, grey, fine to medium grained sand. Staining.
0.5 – 0.8	CLAY, low to medium plasticity, brown/orange, with some fine grained sand.
0.8 – 1.6 (limit of investigation)	TP1 to TP4: Sandy CLAY: low to medium plasticity, brown/yellow/grey, fine grained sand.

Observations of potential contamination within the soil samples were also undertaken during the field works. Soil staining (grey) was observed in test pits TP1, TP2, TP3 and TP4. All PID readings were below 1 ppm.

4.2.2. Groundwater

The groundwater monitoring event was carried out on 10 June 2015. Field observations are summarised below.

Table 4.3: Site specific hydrogeology

Item	Description
Light non-aqueous phase liquid (LNAPL)	No LNAPL or sheen was observed at the well.
Odours	An organic odour was noted during the purging of the well.
Groundwater gauging data	Standing groundwater level was encountered at 2.294 m below top of casing (BTOC).
Groundwater flow direction and gradient	The inferred groundwater flow direction is to the southwest, towards the Murray River.

Field groundwater quality parameters

Groundwater quality parameters measured during field activities are presented in the following table and field notes provided in Appendix E.

Table 4.4: Field groundwater quality parameters

Parameter	Value	Comment
Dissolved Oxygen	1.10 mg/L	Indicates moderate oxygen content exists in the groundwater at the well.
Redox Potential (Eh)	-32 mV	Indicates slightly reducing conditions on-site.
Electrical Conductivity (EC)	773 μScm^{-1}	Indicates low electrical conductivity and therefore likely high groundwater quality beneath the site.
pH	6.57	Indicates relatively neutral pH values.
Temperature (^oC)	18.8	Typical groundwater temperatures.

Information provided by Albury City Council (David Christy, ref: DOC13/89894 dated 3 October 2013) noted that groundwater gauging works at the site by SJE Consulting identified groundwater at a depth between 2.5 m bgs and 3.5 m below ground surface (bgs). The groundwater depth measured on 10 June 2015, at 2.3 m bgs, is consistent with the standing water levels measured by SJE.

5. Assessment criteria

5.1. General

Assessment criteria were selected with consideration of the current and proposed use of the site; namely, commercial/industrial use.

Assessment criteria presented below are applicable to a generic commercial/industrial land use scenario which is generally consistent with the proposed site setting.

The criteria presented below are intended to apply to a Tier 1 risk assessment, based on certain site-specific characteristics. Where concentrations of a Contaminants of Potential Concern (COPC) exceed the generic assessment criteria, then further consideration of the specific exposure pathway is required which may warrant further investigation, assessment or the development of a strategy to mitigate the potential risks identified.

5.2. Soil criteria

5.2.1. Health investigation levels

The assessment criteria proposed for this project were sourced from:

- NEPC (1999) National Environment Protection (Assessment of Site Contamination) Amendment Measure (No. 1) 2013 (ASC NEPM).
- Friebel and Nadebaum (2011); CRC CARE Technical Report No. 10 – Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater

NEPC (1999 as amended) provides health and ecological based soil investigation levels for various exposure settings. We consider that the exposure setting for site is reasonably represented by that for commercial/industrial land use described in Section 3 of NEPM Schedule B7.

Based on NEPM Schedule B1, Guideline on the Investigation Levels for Soil and Groundwater, the following criteria were adopted:

- Table 1A(1) - Health Investigation Levels (HILs) for Commercial/Industrial D.
- Table 1A(3) – Soil Health Screening Levels (HSLs) for vapour intrusion for Commercial / Industrial (HSL D).

For compounds where the allowable soil vapour HSL exceeds the chemical constituent saturation concentration, HSL for direct contact pathways listed in Table B4 of CRC CARE Technical Report No. 10 (Friebel and Nadebaum; 2011) have been adopted as the health risk screening level for this assessment. The values adopted assume conservative characteristics regarding site conditions; namely, a sand soil profile.

The HSL presented within CRC CARE Technical Report No. 10 were developed on a scientifically defensible basis and have been subject to independent and expert peer review prior to publication. Consequently, the approach described in CRC CARE Technical Report No. 10 has been adopted for health risk screening for worker exposure by direct contact regarding the presence of petroleum hydrocarbons in the subsurface, within the limitations of that report.

Appendix F provide a summary of the laboratory data assessed against the adopted health based soil and groundwater investigation levels.

It should be noted that for comparison of composite samples to the adopted criteria the guideline analytical limit was adjusted using ‘Method 1’ as describe in Section 6 of ‘Sampling Design Guidelines’, (NSW EPA 1995).

5.2.2. Ecological investigation levels

The assessment criteria for Ecological Investigation Levels (EILs) proposed for this project was sourced from:

- NEPC (1999) National Environment Protection (Assessment of Site Contamination) Amendment Measure (No. 1) 2013 (ASC NEPM).

In accordance with Section 2.5 of ASC NEPM Schedule B1, EILs for the purposes of EIL derivation, a contaminant incorporated in soil for at least two years is considered to be aged for the purpose of EIL derivation. The majority of contaminated sites are likely to be affected by aged contamination. As no site specific EIL levels are available at the time of this assessment Coffey will be referring to Ecological Screening Levels (ESLs).

Based on ASC NEPM Schedule B1, Guideline on the Investigation Levels for Soil and Groundwater, the following ESLs for petroleum hydrocarbons were adopted:

- Table 1B(6) – Soil ESLs for Commercial and Industrial Use.

Appendix F provides a summary of the laboratory data assessed against the adopted ESLs.

5.3. Groundwater criteria

To assess groundwater quality, reference needs to be made to environmental and/or human health threshold levels or acceptance criteria. Groundwater investigation levels (GILs) are selected based on published criteria for beneficial use of groundwater and potential environmental impact.

5.3.1. Assessment of environmental values

The ASC NEPM describes the process involved in identifying the likely environmental values which must be considered during groundwater investigations at contaminated sites. Based on this, assessment of relevant environmental values follows the steps below:

- Determine whether the aquifer beneath the site is included in the NSW Office of Water list of major aquifers of drinking water quality;
- Assess the identified uses of groundwater from the aquifer; and
- Use groundwater indicators to assess whether the aquifer is suitable for use as a drinking water source (i.e. based on measured concentrations of total dissolved solids (TDS) within the groundwater).

Based on these steps, Coffey identified the following:

- The groundwater underlying the site is considered to be part of the NSW Office of Water list of protected aquifers as an actual or potential drinking water supply.
- Given the presence of animal husbandry on site and in the surrounding area, stock watering has been considered.
- The nearest groundwater bore with a registered beneficial use (irrigation use) is located on-site. Groundwater in this bore appears to be sourced from a shallow aquifer (approximately 7mbgs).
- A review of the NSW Natural Resources Atlas found five registered bore within a 0.5km radius of the site used for monitoring, industrial, irrigation and waste disposal.
- Field measurements indicate that total dissolved solids (TDS) at the site was494mg/L, which is indicative of freshwater environments (NSW DEC, 2007).
- Based on the above, Coffey considers that potential beneficial uses of groundwater are:
    - Protection of Aquatic Ecosystems;
    - Drinking water;
    - Industrial water use;
    - Primary Industry (Irrigation and Livestock); and
    - Primary Contact.

5.3.2. Protection of aquatic ecosystems

The investigation levels presented in ANZECC (2000) Australia and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC (2000) are considered applicable for the protection of aquatic ecosystems of the receiving waters.

ANZECC (2000) advocates a site-specific approach to developing guideline trigger values based on such factors as local biological affects data, the current level of disturbance of the ecosystem etc. The guidelines present 'low risk guidelines trigger values' which are defined as concentrations of key performance parameters below which there is a low risk that adverse biological effects will occur. It is important to note that these are not threshold values at which an environmental problem is likely to occur if exceeded. Rather, if the trigger values are exceeded, then further action is required which may include either further site-specific investigations to assess whether or not there is an actual problem or management / remedial action.

Low risk trigger values are provided for the protection of 80% to 99% of species in fresh waters (presented in Table 3.4.1 of the guidelines), with the trigger value depending on the health of the receiving waters.

It is considered that the fresh water trigger values are applicable for investigating chemical concentrations in groundwater at the investigation area, as the potential receiving body (Murray River) is a freshwater body.

ANZECC (2000) states that there is currently insufficient data to derive high reliability trigger values for various contaminants. For these contaminants, low reliability trigger values have been adopted.

ANZECC (2000) states that there is currently insufficient data to derive a high reliability trigger value for total petroleum hydrocarbons (TPH) but propose a low reliability trigger value for TPH of 7 μg/L. This guideline is generally considered by industry to be overly conservative and is also well below the TPH detection limit, which most laboratories can achieve.

World Health Organisation (WHO) (2008) guidelines concentrations for Petroleum Products in Drinking Water has been adopted for TPH in groundwater at this site.

5.3.3. Drinking water

As access to the National Health and Medical Research Council (NHMRC) Australian Drinking water guidelines (2011), updated in March 2015 were used to evaluate if there is a risk to using groundwater as potable water.

5.3.4. Primary industry

The groundwater quality objectives that have been adopted for the beneficial use Agriculture, parks and gardens have been sourced from ANZECC 2000 *irrigation and general water use* for long term use (<100 years). It is noted that criteria are only available for inorganics and pesticides.

The groundwater quality objectives that have been adopted to assess the beneficial use of Stock Watering have been sourced from the ANZECC (2000) Section 4 *Primary Industries (Livestock drinking water quality)* guideline values. Where there are no stock watering specific objectives in ANZECC (2000) (e.g. organic toxicants) the Australian Drinking Water guidelines (2011, revised in 2013) have been used. The drinking water guidelines can be multiplied by a factor of 10 if toxicity data is available and allows.

5.3.5. Industrial water use

Based on the intended use of the site and the availability of reticulated was in the area the likelihood of this beneficial use being realised on or near by to the site is considered to be low and therefore this beneficial uses has not been assessed as part of this assessment.

6. Data quality

6.1. Field quality assurance / quality control program

Work on this project was completed in accordance with Australian Standard AS4482.1 (2005) *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds* which specify sampling protocols, number and type of sample containers per sampling location, sample preservation methods, approved holding times, sample identification codes, QC sample requirements and chain of custody documentation procedures.

In addition to the primary samples, two soil and one groundwater intra-laboratory (duplicate) quality control samples were collected to assess aspects of field protocols, laboratory performance and to classify the validity of the laboratory data. The blind coded intra-laboratory soil and groundwater sample duplicates were sent to the primary laboratory (Australian Laboratory Services (ALS)). Two soil and one groundwater inter-laboratory (triplicate) quality control samples were also collected and sent to the secondary laboratory (Eurofins/MGT) to assess the validity of the laboratory data. Three rinsate samples were collected off the gloves following sampling to assess for cross contamination potentially caused by the equipment and one trip blank sample was collected to assess for potential cross contamination of samples during transport.

6.2. Field QC results

Data validation of intra-laboratory quality control samples was carried out by calculation of the relative percentage differences (RPDs) from the mean, i.e. the difference between the primary and duplicate sample results divided by the average of the two results and expressed as a percentage. Results of QC samples are presented in the results summary in Appendix F and the ALS and Eurofins mgt NATA accredited reports are included in Appendix C.

The laboratory analysis for intra-laboratory duplicate and inter-laboratory triplicate sample RPDs that were analysed were all within the acceptable range of ± 50% (AS4482.1- 2005).

6.3. Laboratory QC results

ALS and Eurofins mgt conducted an internal QC program comprising matrix duplicates on sample matrices (refer Appendix C). Relative percentage differences (RPD) between samples and laboratory duplicates were within acceptance limits with the exception of laboratory sample EM151114-006 which exceeded the laboratory limit of reporting (LOR) based limits for copper (50.9%) and lead (62.2%).

Spiked sample analyses recorded recoveries that were all within acceptable control limits (70-130% and 30%-130% for phenols) and are considered acceptable with the exception of a number of laboratory samples. Details on these exceedances can be found in Appendix C - laboratory report EM1511017.

The results of laboratory blanks were below detection limits indicating that there is a low potential for sample contamination as a result of handling in the laboratory.

6.4. QC conclusions

On the basis of the field and laboratory QC results, it is considered that the field and laboratory programs have provided acceptable QC results and that the results of the sampling and analysis program are sufficiently reliable.

7. Results

7.1. Soil

Soil analytical results and comparison to relevant soil quality guidelines are presented in Tables 1, 2 and 3 in Appendix F. Certified laboratory reports and Chain of Custody documentation are included in Appendix C.

Samples reported concentrations of contaminants above the laboratory LOR for the following locations and chemicals:

- 4,4-Dichlorodiphenyldichloroethylene **(**DDE): Composite GS_1+GS_4, Composite GS_13+GS_17, Composite GS_14+GS_15, Composite GS_2+GS_3, Composite GS_21+GS_24, Composite GS_7+GS_8, Composite GS_9+GS_10 (0.08 mg/kg, 0.08 mg/kg , 0.08 mg/kg, 0.19 mg/kg, 0.16 mg/kg, 0.12 mg/kg, 0.13 mg/kg and 0.06 mg/kg respectively); and

- Most samples reported detectable concentrations of metals including arsenic, chromium, copper, lead, nickel and zinc.

4,4-DDE is a common breakdown product of the pesticide dichlorodiphenyltrichloroethane (DDT).

However, these COPCs were below the adopted soil screening criteria and not considered to present a potential risk to identified receptors.

7.2. Groundwater

Groundwater analytical results and comparison to relevant guidelines are presented in Table 6 in Appendix F. Certified laboratory reports and Chain of Custody documentation is included in Appendix C.

A number of potential contaminants of concern were identified in groundwater at the site above the laboratory reporting limits including:

- Arsenic; and

- Nickel.

However, these COPCs were below the adopted groundwater screening criteria and not considered to present a potential risk to identified receptors.

7.3. Contamination status

A number of contaminants of potential concern (COPC) were identified during the Phase 1 assessment. These included:

- Pesticides;

- Herbicides;

- Metals;

- Petroleum hydrocarbons; and

- Polycyclic aromatic hydrocarbons (PAHs).

Elevated concentrations of TRH C_{16}-C_{34} were recorded above the adopted ESL criteria in sample BH8_0.0-0.1 located in the mechanical service area during the initial site investigation. Further delineation of this potential hotspot was undertaken during this investigation which found no exceedances of adopted criteria in deeper and surrounding soils.

The pesticide breakdown product 4,4-DDE and several metals were measured in soil above the laboratory reporting limit from across the site however all results were below the adopted soil criteria.

The COPC in groundwater were all recorded below the laboratory limit of reporting with the exception of arsenic and nickel however all analytical concentrations were below adopted groundwater criteria.

7.4. Discussions and conclusion

The Phase 1 ESA indicated that the site use in the past was predominately an agricultural and/or orchard type use. Associated potential contaminants with agricultural areas may include fertilisers, herbicides, pesticides, storage of fuels and chemicals and importation of contaminated fill.

The soil assessment undertaken indicated levels of some metals and a pesticide breakdown product above the laboratory LOR however all were below adopted screening assessment criteria. Laboratory analytical results do not indicate any other evidence of contamination existing in the soil on the site. It is noted that possible staining was observed in the soil during test pitting works. It is therefore recommended that all future excavations are closely inspected and any unusually coloured, odorous or noxious substances revealed during any excavations at the site are considered to be suspect until proven otherwise.

Based on the site groundwater quality results arsenic and nickel were detected above laboratory reporting limits however did not preclude adopted criteria.

Based on the site soil and groundwater quality results, contamination associated with previous site activities that might pose an unacceptable risk to identified potential receptors (see Table 3.2) related to commercial/industrial land use is not evident and the findings of this assessment do not preclude use of the site for commercial/industrial purposes.

It is important to note that this investigation has been conducted based on commercial/industrial land use. If any other land use is proposed, further investigation is likely to be required.

This report should be read in conjunction with the *Important Information About your Coffey Environmental Report*, as attached.

8. Limitations

The findings contained within this report are the result of discrete/specific sampling methodologies used in accordance with normal practices and standards, with some variations as indicated in the report. To the best of our knowledge, they represent a reasonable interpretation of the general condition of the site within the sampled areas. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.

In conducting this review and preparing the report, current guidelines for assessment and management of contaminated land were generally followed. This work has been conducted in good faith in accordance with Coffey's understanding of the client's brief and general accepted practice for environmental consulting.

This report should be read in conjunction with the *Important Information About your Coffey Environmental Report*, as attached.

Important information about your Coffey Environmental Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice,

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

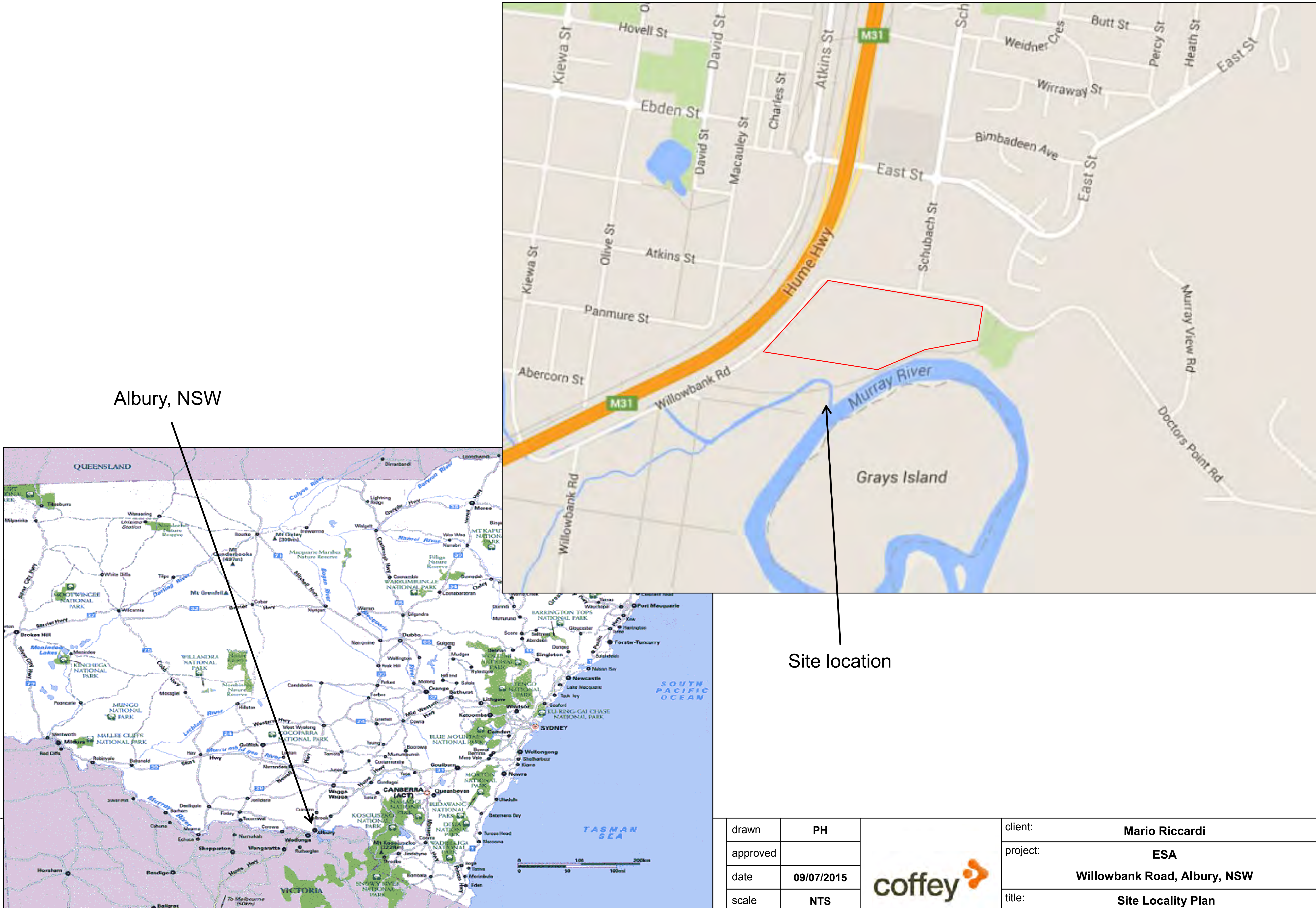
The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

Appendix A - Figures



drawn	PH	client:	Mario Riccardi	
approved		project:	ESA Willowbank Road, Albury, NSW	
date	09/07/2015			
scale	NTS	title:	Site Locality Plan	
original size	A4	project no:	INFOALBU10761AB	figure no: FIGURE 1

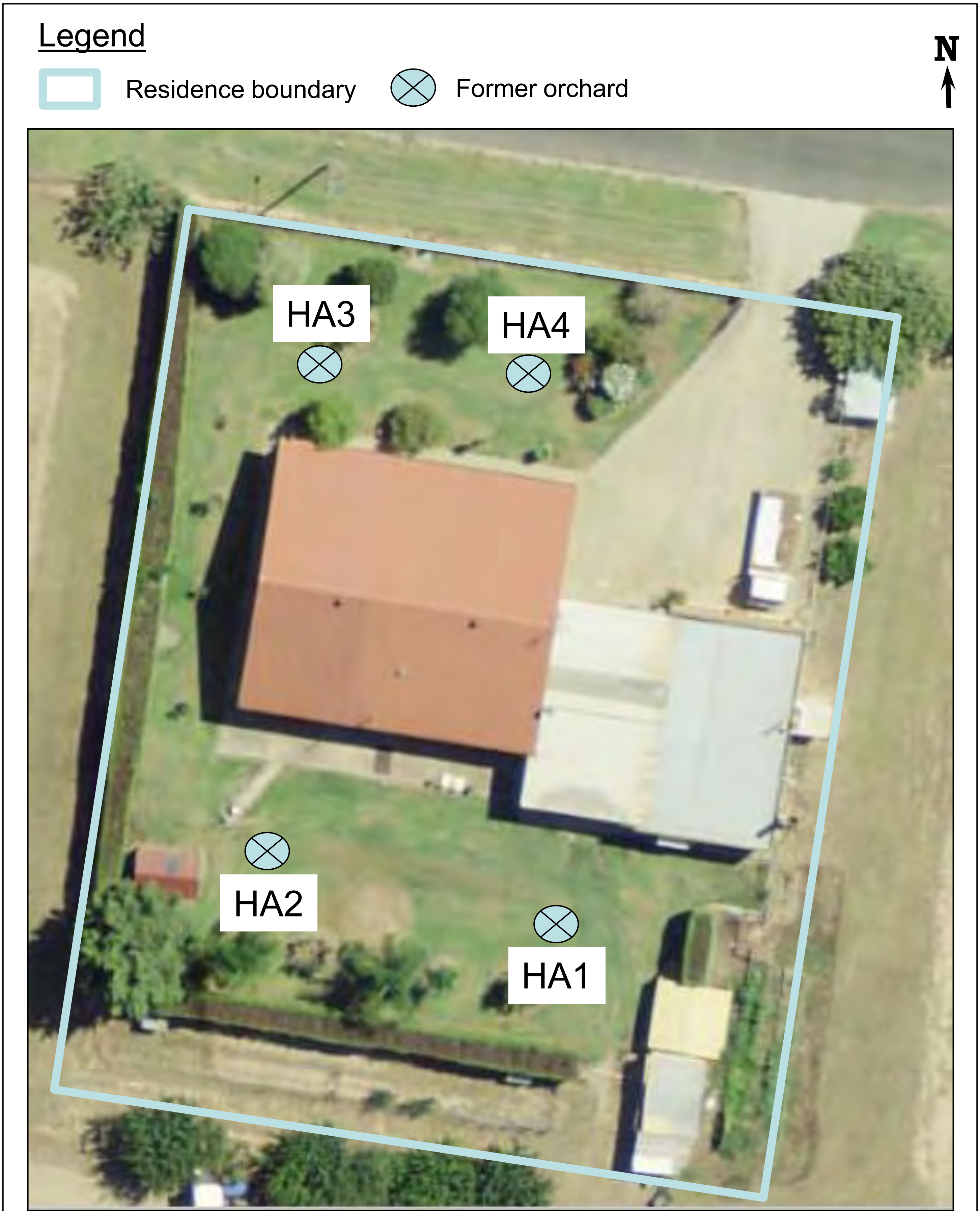
Legend

Former orchard	North-eastern section
Residential area	Test-pit investigation

MW1 (Existing monitoring well)

drawn	PH	client:	Mario Riccardi
approved		project:	ESA Willowbank Road, Albury, NSW
date	09/07/2015	title:	Site Locality Plan
scale	NTS	project no:	INFOALBU10761AB
original size	A4	figure no:	FIGURE 2

coffey



drawn	PH	coffey	client:	Mario Riccardi
approved			project:	ESA Willowbank Road, Albury, NSW
date	9/07/2015			
scale	NTS		title:	Residence Sampling Locations
original size	A4		project no: INFOALBU10761AB	figure no: 3

Legend

Surface sample

Site boundary

drawn	PH	client:	Mario Riccardi
approved		project:	ESA Willowbank Road, Albury, NSW
date	09/07/2015		
scale	NTS	title:	Former Orchard Sampling Locations
original size	A4	project no: INFOALBU10761AB	figure no: FIGURE 4

coffey

Legend

House
Van
Shed
Site boundary

drawn	PH	coffey	client:	Mario Riccardi
approved			project:	ESA Willowbank Road, Albury, NSW
date	09/07/2015			
scale	NTS		title:	North-eastern Section Sampling Locations
original size	A4		project no: INFOALBU10761AB	figure no: FIGURE 5

Legend

- Investigation area
- Test pit location
- BH8 (location of initial investigation exceedance)

drawn	PH	coffey	client:	Mario Riccardi
approved			project:	ESA Willowbank Road, Albury, NSW
date	09/07/2015		title:	Test pit Locations
scale	NTS			
original size	A4		project no: INFOALBU10761AB	figure no: FIGURE 6

Appendix B - Groundwater Bore Data

drawn	PH	coffey	client:	Mario Riccardi
approved	MF		project:	ESA Willowbank Road, South Albury, NSW
date	26/05/2015			
scale	NTS		title:	Registered Groundwater well Map
original size	A4		project no: INFOALBU10761AB	figure no: B1

NSW Office of Water
Work Summary

GW024589

Licence: 50BL016630

Licence Status: LAPSED

Authorised Purpose (s): WASTE DISPOSAL
Intended Purpose(s): WASTE DISPOSAL

Work Type: Excavation
Work Status:
Construct.Method: Hand Dug
Owner Type: Private

Commenced Date:
Completion Date: 01/10/1965

Final Depth: 3.10 m
Drilled Depth: 3.10 m

Contractor Name:
Driller:
Assistant Driller:

Property: N/A
GWMA: -
GW Zone: -

Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	GOULB	GOULB.001	L6 (SEC 57)
Licensed:	GOULBURN	ALBURY	Whole Lot //

Region: 50 - Murray
CMA Map: 8225-N

River Basin: 409 - MURRAY RIVERINA
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6005466.0
Easting: 492711.0
Latitude: 36°05'43.5"S
Longitude: 146°55'08.5"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Nil	0.00	0.00	2134			

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	2.74	2.74	Subsoil Gravel	Subsoil	
2.74	3.12	0.38	Gravel	Gravel	

Remarks

13/08/1980: TRENCH IS 2.1M BY 0.6M
02/11/1987: LOT 6 SEC 57 PANMURE ST ALBURY

***** End of GW024589 *****

NSW Office of Water
Work Summary

GW028006

Licence:	50BL018082	**Licence Status:**	CANCELLED
		Authorised Purpose (s):	WASTE DISPOSAL
		Intended Purpose(s):	WASTE DISPOSAL
Work Type:	Excavation		
Work Status:	Supply Obtained		
Construct.Method:			
Owner Type:	Private		
Commenced Date:		**Final Depth:**	
Completion Date:	01/03/1968	**Drilled Depth:**	3.70 m
Contractor Name:			
Driller:			
Assistant Driller:			
Property:	N/A (KYILLA P/L) 236 MACAULEY STREET ALBURY 2640 NSW	**Standing Water Level (m):**	
GWMA:	015 - UPPER MURRAY (U/S COROWA)	**Salinity Description:**	
GW Zone:	-	**Yield (L/s):**	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	GOULB	GOULB.001	22
Licensed:	GOULBURN	ALBURY	Whole Lot 1//226702

Region:	50 - Murray	**CMA Map:**	8225-N		
River Basin: Area/District:	409 - MURRAY RIVERINA	**Grid Zone:**		**Scale:**	
Elevation:	0.00 m (A.H.D.)	**Northing:**	6005528.0	**Latitude:**	36°05'41.5"S
Elevation Source:	(Unknown)	**Easting:**	492786.0	**Longitude:**	146°55'11.5"E
GS Map:	-	**MGA Zone:**	0	**Coordinate Source:**	GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Backfill	Backfill	0.00	3.70	2438			

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.00	3.00	0.00	Unconsolidated	2.90					

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	Topsoil	Topsoil	
0.30	2.74	2.44	Clay	Clay	
2.74	3.66	0.92	Gravel Water Bearing	Gravel	

Remarks

13/08/1980: TRENCH FILLED IN BY ORDER OF COUNCIL
02/11/1987: LOT 1 MCCAULEY ST ALBURY

***** End of GW028006 *****

NSW Office of Water
Work Summary

GW504238

Licence: 50BL200032

Licence Status: CONVERTED

Authorised Purpose (s): INDUSTRIAL
Intended Purpose(s): INDUSTRIAL

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Rotary Air
Owner Type: Private

Commenced Date:
Completion Date: 06/11/2007

Final Depth: 27.00 m
Drilled Depth: 27.00 m

Contractor Name: Alpine Drilling Pty Ltd
Driller: Robert Mark Mclean
Assistant Driller: Noel Brindley

Property: FACTORY 458 PANMURE ALBURY 2640 NSW
GWMA:
GW Zone:

Standing Water Level: 4.000
Salinity:
Yield: 1.000

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	GOULB	GOULB.1	5//255915
Licensed:			

Region: 50 - Murray
River Basin: 409 - MURRAY RIVERINA
Area/District:

CMA Map: 8225-N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown

Northing: 6005510.0
Easting: 492663.0

Latitude: 36°05'42.0"S
Longitude: 146°55'06.6"E

GS Map: -
MGA Zone: 0
Coordinate Source: Map Interpretation

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	27.00	125			Rotary Air
1	1	Casing	Steel - Erw	0.00	27.00	125	115		Seated on Bottom, Welded - Butt
1	1	Opening	Slots - Vertical	24.00	27.00	125		1	Casing - Hand Sawn Slot, Concrete Cylinder, Welded - Butt, SL: 200.0mm, A: 2.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

24.00	27.00	3.00	Unknown	4.00		1.00	02:00:00	60.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	topsoil	Topsoil	
1.00	6.00	5.00	clay	Clay	
6.00	24.00	18.00	gravel, heavy river	Gravel	
24.00	27.00	3.00	sand, medium	Sand	

Remarks

06/11/2007: Form A Remarks:
Helen Lester: Coordinates based on location map provided with the Form A.

***** End of GW504238 *****

NSW Office of Water
Work Summary

GW505179

Licence: 50BL199848

Licence Status: ACTIVE

Authorised Purpose (s): TEST BORE
Intended Purpose(s): TEST BORE

Work Type: Bore
Work Status: Abandoned
Construct.Method: Rotary Mud
Owner Type: Private

Commenced Date:
Completion Date: 26/08/2007

Final Depth: 24.00 m
Drilled Depth: 24.00 m

Contractor Name: Alpine Drilling Pty Ltd
Driller: Robert Mark Mclean
Assistant Driller: Noel Brindley

Property: N / A (RICCARDI) 373 ATKIN STREET ALBURY 2640
GWMA:
GW Zone:

Standing Water Level: 3.500
Salinity:
Yield: 1.500

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	GOULB	GOULB.1	2//999814
Licensed:			

Region: 50 - Murray
River Basin: 409 - MURRAY RIVERINA
Area/District:

CMA Map: 8225-N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown

Northing: 6005483.0
Easting: 493271.0

Latitude: 36°05'42.9"S
Longitude: 146°55'30.9"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	24.00	120			Rotary Mud
1		Backfill	Gravel	0.00	24.00				

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
7.00	15.00	8.00	Unknown	3.50		1.50		02:00:00	250.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	topsoil, sandy	Topsoil	
1.00	5.00	4.00	clay	Clay	
5.00	15.00	10.00	sand, medium, and gravel, layered	Sand	
15.00	24.00	9.00	gravel, heavy river	Gravel	

Remarks

26/08/2007: Form A Remarks:
Helen Lester: Coordinates are taken from charted licence location.
Test hole - abandoned

***** End of GW505179 *****

NSW Office of Water
Work Summary

GW505393

Licence: 50BL199990

Licence Status: CONVERTED

Authorised Purpose (s): IRRIGATION

Intended Purpose(s): IRRIGATION

Work Type: Excavation

Work Status: Supply Obtained

Construct.Method:

Owner Type: Private

Commenced Date:

Completion Date: 01/09/2007

Final Depth: 7.00 m

Drilled Depth:

Contractor Name:

Driller:

Assistant Driller:

Property: N / A (RICCARDI) 373 ATKIN STREET ALBURY 2640

GWMA:

GW Zone:

Standing Water Level:

Salinity: Good

Yield: 20.000

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	GOULB	GOULB.1	37//1007315
Licensed:			

Region: 50 - Murray

CMA Map: 8225-N

River Basin: 409 - MURRAY RIVERINA

Area/District:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)

Elevation Source: Unknown

Northing: 6005549.0

Easting: 493101.0

Latitude: 36°05'40.8"S

Longitude: 146°55'24.1"E

GS Map: -

MGA Zone: 0

Coordinate Source: GPS - Global Positioning System

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.00	0			(Unknown)
1	1	Casing	Lining	0.00	7.00				

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

01/09/2007: Form A Remarks:
Helen Lester: Coordinates are taken from charted licence location.
Form AG
Excavation - Can yield 20 l/s for about 6 hours (approx). Then need to let it recharge.

***** End of GW505393 *****

Appendix C - Laboratory Reports

coffey

Chain of Custody

Laboratory Quotation / Order No: Albu-1435 | Job No: IA10761AB | No: 08830 | Sheet 1 of 6

Dispatch to: (Address & Phone No.) ALS 2-4 Westall Rd. Springvale.	Sampled by: Jack McBain	Consigning Officer: J. McBain Date Dispatched: 15/6/15
Attention: Sample receipt (Bronwyn Sheen)	Project Manager: (report results to) Patricia Halpin (invoice: albury@coffey.com)	Courier Service: TNT. Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
J. McBain	15/6/15	2pm	TNT	16/15	

Comments	Sample Matrix	Container Type and Preservative		Sample No.	Date Sampled	PAHs	TPHs	MAHs = BTEX	Metals: ~~S2~~	S26	~~EP068A~~ EP202								Sample Condition on Receipt
	Soil	Soil jar	1	GS-1] 88	9/6/15														
* composite samples in two's			2	GS-2															
			3	GS-3] 89															
			4	GS-4															
			5	GS-5] 90															
			6	GS-6															
			7	GS-7] 91															
			8	GS-8															
			9	GS-9] 92															
			10	GS-10															
			11	GS-11] 93															
			12	GS-12															
			13	GS-13] 95															
			14	GS-14] 94															
			15	GS-15															
			16	GS-16 → GS196															
			17	GS-17															

sample each composite for EP068A

Environmental Division Melbourne
Work Order Reference
EM1511017
Telephone : +61-3-8549 9600

SO 17/6

Special Laboratory Instructions:

Marva (Aei) 17/6 11-20

Detection Limits:

Turnaround Required:

JOB NUMBER **MUST** BE REFERENCED ON ALL SUBSEQUENT PAGES

64220/9-06

Copies: **WHITE:** Sign on release. **YELLOW:** If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. **BLUE:** To be returned with results.

coffey

Chain of Custody

Laboratory Quotation / Order No: A16u-1435 —

Job No: IA10761AB

No: 08831

Sheet 2 of 6

Dispatch to: (Address & Phone No.) ALS 2-4 Westall Rd. Springvale	Sampled by: Jack McBain	Consigning Officer: J. McBain	Date Dispatched: 15/6/15
Attention: Sample receipt	Project Manager: (report results to) Patricia Halpin	Courier Service: TNT.	Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
J. McBain	15/6/15	2pm	(ALS)	17/6	11-20

Comments	Sample Matrix	Container Type and Preservative		Sample No.	Date Sampled	PAHs	TPHs	MAHs = BTEX	Metals:	~~[illegible]~~	~~[illegible]~~	S2	EP068A	EP202							Sample Condition on Receipt
	Soil	Soil jar	18	GS_18	9/6/15							↓	↓	↓							
* composite samples in twos			19	GS_19 → GS16	\																
			20	GS_20 97	\																
			21	GS_21	\							each composite									
			22	GS_22 98	\																
			23	GS_23 99	\																
			24	GS_24	\							for									
			25	GS_25	\							the					30/46				
			26	GS_26 100	\							above									
			27	GS_27	\																
			28	GS_28 101	\																
			29	GS_29	\																
			30	GS_30 102	\																
			14																		
			15																		
			16																		
			17																		

Special Laboratory Instructions:

Detection Limits:

Turnaround Required:

(ALS) 17/6

JOB NUMBER **MUST** BE REFERENCED ON ALL SUBSEQUENT PAGES

64220/8-06

Copies: **WHITE:** Sign on release. **YELLOW:** If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. **BLUE:** To be returned with results.

coffey

Chain of Custody

Laboratory Quotation / Order No: Albu-1435   Job No: IA1076IAB   No: 08832   Sheet 3 of 5

Dispatch to: (Address & Phone No.) ALS 2-4 Westall Rd. Springvale Vic	Sampled by: Jack McBain	Consigning Officer: J. McBain Date Dispatched: 15/6/15
Attention: Sample receipt. Bronwyn Sheen	Project Manager: (report results to) Patricia Halpin invoice: albury@coffey.com	Courier Service: TNT Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
J. McBain	15/6/15	2pm	~~TNT~~ Pamaru (ALS)	17/6	11:20

Comments	Sample Matrix	Container Type and Preservative		Sample No.	Date Sampled	PAHs	TPHs	MAHs = BTEX	Metals:	S5	EP068A								Sample Condition on Receipt
	Soil	Soil jar	31	TP1 _ 0.1-0.2	9/6/15														
			32	_ 0.5-0.7	9/6/15					X	X								
			33	_ 1.0-1.1	↓														
			34	_ 1.5-1.6						X	X								
			35	TP2 _ 0.1-0.2															
			36	_ 0.5-0.7	↓					X	X								
			37	_ 1.2	10/6/15					X	X								
			38	TP3 _ 0.1						X	X								
			39	_ 0.5						X	X								
			40	_ 1.0															
			41	_ 1.5						X	X								
			42	TP4 _ 0.1															
			43	_ 0.5						X	X								
			44	_ 1.0															
			45	_ 1.5	↓					X	X								
			46																
			47																

Special Laboratory Instructions:

Detection Limits: Turnaround Required: Pamaru (ALS) 17/6

JOB NUMBER MUST BE REFERENCED ON ALL SUBSEQUENT PAGES

64220/9-06

Copies: WHITE: Sign on release. **YELLOW:** If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. **BLUE:** To be returned with results.

coffey

Chain of Custody

Laboratory Quotation / Order No: ALBU-1435

No: 08833

Job No: A10761AB

Sheet 4 of 5

Dispatch to: (Address & Phone No.) AlS. 2-4 westall Rd.	Sampled by: J. McBain	Consigning Officer: J. McBain	Date Dispatched: 16/15
Attention: Sample receipt	Project Manager: (report results to) Patricia Halpin invoice: coffey@albury.com	Courier Service: TNT.	Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
J. McBain	15/6/15	2pm	Moora (ALS)	17/6	11.20
			MANU (ALS)	17/6	11:20

Comments	Sample Matrix	Container Type and Preservative		Sample No.	Date Sampled	PAHs	TPHs	MAHs = BTEX	Metals:	S2	EP068A	EA200F	Sample Condition on Receipt
	Soil	Soil jar	46	HA1_0.0-0.1	11/6/15					X	X		
			47	0.5-0.7						X	X		
			48	1.0-1.1									
			49	HA2_0.0-0.1						X	X		
			50	0.5-0.7									
			51	1.0-1.1						X	X		
			52	HA3_0.0-0.1						X	X		
			53	_0.5-0.7						X	X		
			54	-1.0-1.1									
			55	HA4_0.0-0.1						X	X		
			56	_0.5-0.7									
			57	-1.0-1.1						X	X		
			58	HA5_0.0-0.1						X	X		
			59	_0.5-0.7						X	X		
			60	-1.0-1.1									
			61	HA6_0.0-0.1						X	X		
			62	-0.5-0.7									

Special Laboratory Instructions:

Detection Limits:

Turnaround Required:

JOB NUMBER **MUST** BE REFERENCED ON ALL SUBSEQUENT PAGES

MANU (ALS) 17/6

64220/9-08

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coffey

No: 08835

Chain of Custody

Laboratory Quotation / Order No: Albu-1435 Job No: IA10761AB Sheet 5 of 6

Dispatch to: (Address & Phone No.) ALS 2-4 Westall Rd Springvale VIC	Sampled by: Jack McBain	Consigning Officer: J. McBain Date Dispatched: 15/6/15
Attention: Sample Receipt	Project Manager: (report results to) Patricia Halpin	Courier Service: TNT Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
J. McBain	15/6/15	2pm	[illegible] (ALS)	17/6	11-20
			[illegible] (ALS)	17/6	11-[illegible]

Comments	Sample Matrix	Container Type and Preservative		Sample No.	Date Sampled	PAHs	TPHs	MAHs = BTEX	Metals:	S2	EP068A	EA200F	Sample Condition on Receipt
		Soil Jar	63	HA6_1.0-1.1	11/6/15					X	X		
			64	HA7_0.0-0.1						X	X	X	
			65	-0.5-0.7						X	X		
			66	-1.0-1.1						X	X		
			67	HA8_0.0-0.1						X	X	X	
			68	_0.5-0.7									
			69	_1.0-1.1						X	X		
				~~HA~~									
		2x Asbestos bag	70	HA1								X	
			71	HA2								X	
			72	HA3								X	
			73	HA4								X	
			74	HA5								X	
			75	HA6								X	
			76	HA7								X	
			77	HA8								X	

Special Laboratory Instructions:

Detection Limits: Turnaround Required:

JOB NUMBER **MUST** BE REFERENCED ON ALL SUBSEQUENT PAGES

64220/9-06

Copies: WHITE: Sign on release. **YELLOW:** If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. **BLUE:** To be returned with results.

coffey

Chain of Custody

No: 08836

Laboratory Quotation / Order No: ALBU-1435 Job No: 1A10761AB Sheet 6 of 6

Dispatch to: (Address & Phone No.) ALS 2-4 Westall Rd Springvale	Sampled by: Jack McBain	Consigning Officer: J. McBain Date Dispatched: 15/6/15
Attention: Sample Receipt	Project Manager: (report results to) Patricia Halpin	Courier Service: TNT Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
J. McBain	15/6/15	2pm	Mauru , CA47	17/6	11:20

Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled (6-9)	TRH/BTEX (~~PAHs~~)	EP068A (~~TPHs~~)	MAHs = BTEX	~~Metals:~~ S5	S2(6)	metals 8	OCPs	herbicides	TPH	BTEX	hardness	TDS	S2	S26	EP202	Sample Condition on Receipt
	Water	1x plastic 78	MW1	11/6/15						X	X	X	X	X	X	X				
		2x vial																		
		1x metals																		
		1x Amber																		
	Soil	1x soil jar 79	QC1	9/6/15													X	X	X	
		80	QC3	" "																
		81	QC6	10/6/15		X		X												
		82	QC9	11/6/15																
	water	1x plastic 83	QC5	9/6/15		X		X												
		2x vial 84	QC8	10/6/15		X		X												
		1x metals 85	QC11	11/6/15						X	X	X	X	X	X	X				
		1x amber 86	QC13	" "						X	X	X	X	X	X	X				
		2x vials 87	QC14	" "	X															

Special Laboratory Instructions:

Detection Limits: Turnaround Required:

JOB NUMBER **MUST** BE REFERENCED ON ALL SUBSEQUENT PAGES

64220/9-06

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ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1511017**

Client	: **COFFEY TESTING**	Laboratory	: Environmental Division Melbourne
Contact	: MS PATRICIA HALPIN	Contact	: Bronwyn Sheen
Address	: 1/314 Kiewa Street ALBURY 2640	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: patricia.halpin@coffey.com	E-mail	: bronwyn.sheen@alsglobal.com
Telephone	: 02 6023 3799	Telephone	: +61-3-8549 9636
Facsimile	: ----	Facsimile	: +61-3-8549 9601
Project	: IA10761AB	Page	: 1 of 5
Order number	: ----	Quote number	: EB2014COFTEST0002 (EN/007/14)
C-O-C number	: 08830-3 & 08835-6	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
Sampler	: JACK MCBAIN		

Dates

Date Samples Received	: 17-Jun-2015	Issue Date	: 18-Jun-2015
Client Requested Due Date	: 26-Jun-2015	Scheduled Reporting Date	: **26-Jun-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 7.2°C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 102 / 56

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Melbourne & ALS Sydney.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EM1511017-092	: [09-Jun-2015]	: Composite GS_9+GS_10
EM1511017-093	: [09-Jun-2015]	: Composite GS_11+GS_12
EM1511017-094	: [09-Jun-2015]	: Composite GS_13+GS_17
EM1511017-095	: [09-Jun-2015]	: Composite GS_14+GS_15
EM1511017-096	: [09-Jun-2015]	: Composite GS_16+GS_19
EM1511017-097	: [09-Jun-2015]	: Composite GS_18+GS_22
EM1511017-098	: [09-Jun-2015]	: Composite GS_20+GS_23
EM1511017-099	: [09-Jun-2015]	: Composite GS_21+GS_24
EM1511017-100	: [09-Jun-2015]	: Composite GS_25+GS_26
EM1511017-101	: [09-Jun-2015]	: Composite GS_27+GS_28
EM1511017-102	: [09-Jun-2015]	: Composite GS_29+GS_30

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EA200F Friable Asbestos Quantitation in Soil by	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-05 TRH/BTEXN/8 Metals
EM1511017-031	[09-Jun-2015]	TP1_0.1-0.2	✓					
EM1511017-032	[09-Jun-2015]	TP1_0.5-0.7		✓		✓		✓
EM1511017-033	[09-Jun-2015]	TP1_1.0-1.1	✓					
EM1511017-034	[09-Jun-2015]	TP1_1.5-1.6		✓		✓		✓
EM1511017-035	[09-Jun-2015]	TP2_0.1-0.2	✓					
EM1511017-036	[09-Jun-2015]	TP2_0.5-0.7		✓		✓		✓
EM1511017-037	[10-Jun-2015]	TP2_1.2		✓		✓		✓
EM1511017-038	[10-Jun-2015]	TP3_0.1		✓		✓		✓
EM1511017-039	[10-Jun-2015]	TP3_0.5		✓		✓		✓
EM1511017-040	[10-Jun-2015]	TP3_1.0	✓					
EM1511017-041	[10-Jun-2015]	TP3_1.5		✓		✓		✓
EM1511017-042	[10-Jun-2015]	TP4_0.1	✓					
EM1511017-043	[10-Jun-2015]	TP4_0.5		✓		✓		✓
EM1511017-044	[10-Jun-2015]	TP4_1.0	✓					
EM1511017-045	[10-Jun-2015]	TP4_1.5		✓		✓		✓
EM1511017-046	[11-Jun-2015]	HA1_0.0-0.1		✓		✓	✓	
EM1511017-047	[11-Jun-2015]	HA1_0.5-0.7		✓		✓	✓	
EM1511017-048	[11-Jun-2015]	HA1_1.0-1.1	✓					
EM1511017-049	[11-Jun-2015]	HA2_0.0-0.1		✓		✓	✓	
EM1511017-050	[11-Jun-2015]	HA2_0.5-0.7	✓					
EM1511017-051	[11-Jun-2015]	HA2_1.0-1.1		✓		✓	✓	
EM1511017-052	[11-Jun-2015]	HA3_0.0-0.1		✓		✓	✓	
EM1511017-053	[11-Jun-2015]	HA3_0.5-0.7		✓		✓	✓	
EM1511017-054	[11-Jun-2015]	HA3_1.0-1.1	✓					
EM1511017-055	[11-Jun-2015]	HA4_0.0-0.1		✓		✓	✓	

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EA200F Friable Asbestos Quantitation in Soil by	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-05 TRH/BTEXN/8 Metals
EM1511017-056	[11-Jun-2015]	HA4_0.5-0.7	✓					
EM1511017-057	[11-Jun-2015]	HA4_1.0-1.1		✓		✓	✓	
EM1511017-058	[11-Jun-2015]	HA5_0.0-0.1		✓		✓	✓	
EM1511017-059	[11-Jun-2015]	HA5_0.5-0.7		✓		✓	✓	
EM1511017-060	[11-Jun-2015]	HA5_1.0-1.1	✓					
EM1511017-061	[11-Jun-2015]	HA6_0.0-0.1		✓		✓	✓	
EM1511017-062	[11-Jun-2015]	HA6_0.5-0.7	✓					
EM1511017-063	[11-Jun-2015]	HA6_1.0-1.1		✓		✓	✓	
EM1511017-064	[11-Jun-2015]	HA7_0.0-0.1		✓		✓	✓	
EM1511017-065	[11-Jun-2015]	HA7_0.5-0.7		✓		✓	✓	
EM1511017-066	[11-Jun-2015]	HA7_1.0-1.1	✓					
EM1511017-067	[11-Jun-2015]	HA8_0.0-0.1		✓		✓	✓	
EM1511017-068	[11-Jun-2015]	HA8_0.5-0.7	✓					
EM1511017-069	[11-Jun-2015]	HA8_1.0-1.1		✓		✓	✓	
EM1511017-070	[11-Jun-2015]	HA1			✓			
EM1511017-071	[11-Jun-2015]	HA2			✓			
EM1511017-072	[11-Jun-2015]	HA3			✓			
EM1511017-073	[11-Jun-2015]	HA4			✓			
EM1511017-074	[11-Jun-2015]	HA5			✓			
EM1511017-075	[11-Jun-2015]	HA6			✓			
EM1511017-076	[11-Jun-2015]	HA7			✓			
EM1511017-077	[11-Jun-2015]	HA8			✓			
EM1511017-079	[09-Jun-2015]	QC1		✓				
EM1511017-080	[09-Jun-2015]	QC3	✓					
EM1511017-081	[10-Jun-2015]	QC6		✓		✓		✓
EM1511017-082	[11-Jun-2015]	QC9	✓					
EM1511017-088	[09-Jun-2015]	Composite GS_1+GS_4		✓		✓	✓	
EM1511017-089	[09-Jun-2015]	Composite GS_2+GS_3		✓		✓	✓	
EM1511017-090	[09-Jun-2015]	Composite GS_5+GS_6		✓		✓	✓	
EM1511017-091	[09-Jun-2015]	Composite GS_7+GS_8		✓		✓	✓	
EM1511017-092	[09-Jun-2015]	Composite GS_9+GS_10		✓		✓	✓	
EM1511017-093	[09-Jun-2015]	Composite GS_11+GS_12		✓		✓	✓	
EM1511017-094	[09-Jun-2015]	Composite GS_13+GS_17		✓		✓	✓	
EM1511017-095	[09-Jun-2015]	Composite GS_14+GS_15		✓		✓	✓	
EM1511017-096	[09-Jun-2015]	Composite GS_16+GS_19		✓		✓	✓	
EM1511017-097	[09-Jun-2015]	Composite GS_18+GS_22		✓		✓	✓	
EM1511017-098	[09-Jun-2015]	Composite GS_20+GS_23		✓		✓	✓	
EM1511017-099	[09-Jun-2015]	Composite GS_21+GS_24		✓		✓	✓	
EM1511017-100	[09-Jun-2015]	Composite GS_25+GS_26		✓		✓	✓	
EM1511017-101	[09-Jun-2015]	Composite GS_27+GS_28		✓		✓	✓	
EM1511017-102	[09-Jun-2015]	Composite GS_29+GS_30		✓		✓	✓	

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EP202(solids) Phenoxyacetic acids	SOIL - S-26 8 metals/TRH/BTEXN/PAH
EM1511017-079	[09-Jun-2015]	QC1	✓	✓
EM1511017-088	[09-Jun-2015]	Composite GS_1+GS_4	✓	
EM1511017-089	[09-Jun-2015]	Composite GS_2+GS_3	✓	
EM1511017-090	[09-Jun-2015]	Composite GS_5+GS_6	✓	
EM1511017-091	[09-Jun-2015]	Composite GS_7+GS_8	✓	
EM1511017-092	[09-Jun-2015]	Composite GS_9+GS_10	✓	
EM1511017-093	[09-Jun-2015]	Composite GS_11+GS_12	✓	
EM1511017-094	[09-Jun-2015]	Composite GS_13+GS_17	✓	
EM1511017-095	[09-Jun-2015]	Composite GS_14+GS_15	✓	
EM1511017-096	[09-Jun-2015]	Composite GS_16+GS_19	✓	
EM1511017-097	[09-Jun-2015]	Composite GS_18+GS_22	✓	
EM1511017-098	[09-Jun-2015]	Composite GS_20+GS_23	✓	
EM1511017-099	[09-Jun-2015]	Composite GS_21+GS_24	✓	
EM1511017-100	[09-Jun-2015]	Composite GS_25+GS_26	✓	
EM1511017-101	[09-Jun-2015]	Composite GS_27+GS_28	✓	
EM1511017-102	[09-Jun-2015]	Composite GS_29+GS_30	✓	

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-05 TRH/BTEXN/8 Metals
EM1511017-078	[11-Jun-2015]	MW1	✓
EM1511017-083	[09-Jun-2015]	QC5	✓
EM1511017-084	[10-Jun-2015]	QC8	✓
EM1511017-085	[11-Jun-2015]	QC11	✓
EM1511017-086	[11-Jun-2015]	QC13	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EA015H Total Dissolved Solids - High Level	WATER - EA065 Total Hardness as CaCO3	WATER - EP068A (PEST-WA) Pesticides (OC)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1511017-078	[11-Jun-2015]	MW1	✓	✓	✓	
EM1511017-083	[09-Jun-2015]	QC5			✓	
EM1511017-084	[10-Jun-2015]	QC8			✓	
EM1511017-085	[11-Jun-2015]	QC11	✓	✓	✓	
EM1511017-086	[11-Jun-2015]	QC13	✓	✓	✓	
EM1511017-087	[11-Jun-2015]	QC14				✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received Date	Samples Received Evaluation	Instructions Received Date	Instructions Received Evaluation
EP068: Pesticides by GCMS							
QC5	Amber Glass Bottle - Unpreserv	16-Jun-2015	26-Jul-2015	17-Jun-2015	×	----	----
EP071: TRH - Semivolatile Fraction							
QC5	Amber Glass Bottle - Unpreserv	16-Jun-2015	26-Jul-2015	17-Jun-2015	×	----	----

Requested Deliverables

ALL INVOICES UNKNOWN

- A4 - AU Tax Invoice (INV)	Email	albury@coffey.com

PATRICIA HALPIN

- *AU Certificate of Analysis - NATA (COA)	Email	patricia.halpin@coffey.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	patricia.halpin@coffey.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	patricia.halpin@coffey.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	patricia.halpin@coffey.com
- A4 - AU Tax Invoice (INV)	Email	patricia.halpin@coffey.com
- Chain of Custody (CoC) (COC)	Email	patricia.halpin@coffey.com
- EDI Format - ENMRG (ENMRG)	Email	patricia.halpin@coffey.com
- EDI Format - ESDAT (ESDAT)	Email	patricia.halpin@coffey.com

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1511017**	Page	: 1 of 13
Client	: **COFFEY TESTING**	Laboratory	: Environmental Division Melbourne
Contact	: MS PATRICIA HALPIN	Telephone	: +61-3-8549 9636
Project	: IA10761AB	Date Samples Received	: 17-Jun-2015
Site	: ----	Issue Date	: 26-Jun-2015
Sampler	: JACK MCBAIN	No. of samples received	: 102
Order number	: ----	No. of samples analysed	: 56

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005T: Total Metals by ICP-AES	EM1511114--006	Anonymous	**Copper**	7440-50-8	50.9 %	0% - 20%	**RPD exceeds LOR based limits**
EG005T: Total Metals by ICP-AES	EM1511114--006	Anonymous	**Lead**	7439-92-1	62.2 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP068A: Organochlorine Pesticides (OC)	EM1511017--039	TP3_0.5	**Aldrin**	309-00-2	19.6 %	23-136%	**Recovery less than lower data quality objective**
EP080/071: Total Petroleum Hydrocarbons	EM1511017--034	TP1_1.5-1.6	**C10 - C14 Fraction**	----	115 %	53-123%	
EP080/071: Total Petroleum Hydrocarbons	EM1511017--038	TP3_0.1	**C10 - C14 Fraction**	----	122 %	53-123%	
EP080/071: Total Petroleum Hydrocarbons	EM1511017--034	TP1_1.5-1.6	**C15 - C28 Fraction**	----	116 %	70-124%	
EP080/071: Total Petroleum Hydrocarbons	EM1511017--038	TP3_0.1	**C15 - C28 Fraction**	----	122 %	70-124%	
EP080/071: Total Petroleum Hydrocarbons	EM1511014--018	Anonymous	**C29 - C36 Fraction**	----	123 %	64-118%	**Recovery greater than upper data quality objective**
EP080/071: Total Petroleum Hydrocarbons	EM1511017--034	TP1_1.5-1.6	**C29 - C36 Fraction**	----	118 %	64-118%	
EP080/071: Total Petroleum Hydrocarbons	EM1511017--038	TP3_0.1	**C29 - C36 Fraction**	----	118 %	64-118%	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1511017--038	TP3_0.1	**>C10 - C16 Fraction**	>C10_C16	119 %	65-123%	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1511014--018	Anonymous	**>C16 - C34 Fraction**	----	114 %	67-121%	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1511017--034	TP1_1.5-1.6	**>C16 - C34 Fraction**	----	118 %	67-121%	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1511017--038	TP3_0.1	**>C16 - C34 Fraction**	----	116 %	67-121%	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1511014--018	Anonymous	**>C34 - C40 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1511017--034	TP1_1.5-1.6	**>C34 - C40 Fraction**	----	116 %	44-126%	

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)	*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA015: Total Dissolved Solids						
Clear Plastic Bottle - Natural MW1, QC11, QC13	----	----	----	19-Jun-2015	18-Jun-2015	**0**
EP068A: Organochlorine Pesticides (OC)						
Amber Glass Bottle - Unpreserved QC5	18-Jun-2015	16-Jun-2015	**2**	----	----	----
Amber Glass Bottle - Unpreserved QC8	18-Jun-2015	17-Jun-2015	**1**	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
Amber Glass Bottle - Unpreserved QC5	18-Jun-2015	16-Jun-2015	**2**	----	----	----

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Due for extraction	Days overdue	Analysis: Date analysed	Due for analysis	Days overdue
EP080/071: Total Petroleum Hydrocarbons - Analysis Holding Time Compliance						
Amber Glass Bottle - Unpreserved						
QC8	18-Jun-2015	17-Jun-2015	**1**	----	----	----

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Regular	Rate (%): Actual	Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Pesticides by GCMS	0	4	0.00	10.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	0	4	0.00	10.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)					
Pesticides by GCMS	0	4	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	0	4	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Due for extraction	Evaluation	Analysis: Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103)								
TP1_0.5-0.7,	TP1_1.5-1.6,	**09-Jun-2015**	**----**	----	----	**19-Jun-2015**	23-Jun-2015	✓
TP2_0.5-0.7,	QC1,							
Composite GS_1+GS_4,	Composite GS_2+GS_3,							
Composite GS_5+GS_6,	Composite GS_7+GS_8,							
Composite GS_9+GS_10,	Composite GS_11+GS_12,							
Composite GS_13+GS_17,	Composite GS_14+GS_15,							
Composite GS_16+GS_19,	Composite GS_18+GS_22,							
Composite GS_20+GS_23,	Composite GS_21+GS_24,							
Composite GS_25+GS_26,	Composite GS_27+GS_28,							
Composite GS_29+GS_30								
Soil Glass Jar - Unpreserved (EA055-103)								

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content - Continued								
TP2_1.2,	TP3_0.1,	**10-Jun-2015**	**----**	----	----	**19-Jun-2015**	24-Jun-2015	✓
TP3_0.5,	TP3_1.5,							
TP4_0.5,	TP4_1.5,							
QC6								
Soil Glass Jar - Unpreserved (EA055-103)								
HA1_0.0-0.1,	HA1_0.5-0.7,	**11-Jun-2015**	**----**	----	----	**19-Jun-2015**	25-Jun-2015	✓
HA2_0.0-0.1,	HA2_1.0-1.1,							
HA3_0.0-0.1,	HA3_0.5-0.7,							
HA4_0.0-0.1,	HA4_1.0-1.1,							
HA5_0.0-0.1,	HA5_0.5-0.7,							
HA6_0.0-0.1,	HA6_1.0-1.1,							
HA7_0.0-0.1,	HA7_0.5-0.7,							
HA8_0.0-0.1,	HA8_1.0-1.1							
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Snap Lock Bag - Separate bag received (EA200)								
HA1,	HA2,	**11-Jun-2015**	**----**	----	----	**26-Jun-2015**	08-Dec-2015	✓
HA3,	HA4,							
HA5,	HA6,							
HA7,	HA8							
EA200F: Friable Asbestos in Soil (non-NATA)								
Snap Lock Bag - Separate bag received (EA200N)								
HA1,	HA2,	**11-Jun-2015**	**----**	----	----	**26-Jun-2015**	08-Dec-2015	✓
HA3,	HA4,							
HA5,	HA6,							
HA7,	HA8							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
Composite GS_27+GS_28,	Composite GS_29+GS_30	**09-Jun-2015**	**20-Jun-2015**	06-Dec-2015	✓	**22-Jun-2015**	06-Dec-2015	✓
Soil Glass Jar - Unpreserved (EG005T)								
TP1_0.5-0.7,	TP1_1.5-1.6,	**09-Jun-2015**	**24-Jun-2015**	06-Dec-2015	✓	**24-Jun-2015**	06-Dec-2015	✓
TP2_0.5-0.7,	QC1,							
Composite GS_1+GS_4,	Composite GS_2+GS_3,							
Composite GS_5+GS_6,	Composite GS_7+GS_8,							
Composite GS_9+GS_10,	Composite GS_11+GS_12,							
Composite GS_13+GS_17,	Composite GS_14+GS_15,							
Composite GS_16+GS_19,	Composite GS_18+GS_22,							
Composite GS_20+GS_23,	Composite GS_21+GS_24,							
Composite GS_25+GS_26								
Soil Glass Jar - Unpreserved (EG005T)								
TP2_1.2,	TP3_0.1,	**10-Jun-2015**	**24-Jun-2015**	07-Dec-2015	✓	**24-Jun-2015**	07-Dec-2015	✓
TP3_0.5,	TP3_1.5,							
TP4_0.5,	TP4_1.5,							
QC6								
Soil Glass Jar - Unpreserved (EG005T)								
HA1_0.0-0.1,	HA1_0.5-0.7,	**11-Jun-2015**	**24-Jun-2015**	08-Dec-2015	✓	**24-Jun-2015**	08-Dec-2015	✓
HA2_0.0-0.1,	HA2_1.0-1.1,							
HA3_0.0-0.1,	HA3_0.5-0.7,							
HA4_0.0-0.1,	HA4_1.0-1.1,							
HA5_0.0-0.1,	HA5_0.5-0.7,							
HA6_0.0-0.1,	HA6_1.0-1.1,							
HA7_0.0-0.1,	HA7_0.5-0.7,							
HA8_0.0-0.1,	HA8_1.0-1.1							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
Composite GS_27+GS_28,	Composite GS_29+GS_30	**09-Jun-2015**	**20-Jun-2015**	07-Jul-2015	✓	**23-Jun-2015**	07-Jul-2015	✓
Soil Glass Jar - Unpreserved (EG035T)								
TP1_0.5-0.7,	TP1_1.5-1.6,	**09-Jun-2015**	**24-Jun-2015**	07-Jul-2015	✓	**25-Jun-2015**	07-Jul-2015	✓
TP2_0.5-0.7,	QC1,							
Composite GS_1+GS_4,	Composite GS_2+GS_3,							
Composite GS_5+GS_6,	Composite GS_7+GS_8,							
Composite GS_9+GS_10,	Composite GS_11+GS_12,							
Composite GS_13+GS_17,	Composite GS_14+GS_15,							
Composite GS_16+GS_19,	Composite GS_18+GS_22,							
Composite GS_20+GS_23,	Composite GS_21+GS_24,							
Composite GS_25+GS_26								
Soil Glass Jar - Unpreserved (EG035T)								
TP2_1.2,	TP3_0.1,	**10-Jun-2015**	**24-Jun-2015**	08-Jul-2015	✓	**25-Jun-2015**	08-Jul-2015	✓
TP3_0.5,	TP3_1.5,							
TP4_0.5,	TP4_1.5,							
QC6								
Soil Glass Jar - Unpreserved (EG035T)								
HA1_0.0-0.1,	HA1_0.5-0.7,	**11-Jun-2015**	**24-Jun-2015**	09-Jul-2015	✓	**25-Jun-2015**	09-Jul-2015	✓
HA2_0.0-0.1,	HA2_1.0-1.1,							
HA3_0.0-0.1,	HA3_0.5-0.7,							
HA4_0.0-0.1,	HA4_1.0-1.1,							
HA5_0.0-0.1,	HA5_0.5-0.7,							
HA6_0.0-0.1,	HA6_1.0-1.1,							
HA7_0.0-0.1,	HA7_0.5-0.7,							
HA8_0.0-0.1,	HA8_1.0-1.1							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068)								
TP1_0.5-0.7, TP2_0.5-0.7, Composite GS_2+GS_3, Composite GS_7+GS_8, Composite GS_11+GS_12, Composite GS_14+GS_15, Composite GS_18+GS_22, Composite GS_21+GS_24, Composite GS_27+GS_28,	TP1_1.5-1.6, Composite GS_1+GS_4, Composite GS_5+GS_6, Composite GS_9+GS_10, Composite GS_13+GS_17, Composite GS_16+GS_19, Composite GS_20+GS_23, Composite GS_25+GS_26, Composite GS_29+GS_30	**09-Jun-2015**	**23-Jun-2015**	23-Jun-2015	✓	**24-Jun-2015**	02-Aug-2015	✓
Soil Glass Jar - Unpreserved (EP068)								
TP2_1.2, TP3_0.5, TP4_0.5, QC6	TP3_0.1, TP3_1.5, TP4_1.5,	**10-Jun-2015**	**24-Jun-2015**	24-Jun-2015	✓	**25-Jun-2015**	03-Aug-2015	✓
Soil Glass Jar - Unpreserved (EP068)								
HA7_0.5-0.7, HA8_1.0-1.1	HA8_0.0-0.1,	**11-Jun-2015**	**23-Jun-2015**	25-Jun-2015	✓	**24-Jun-2015**	02-Aug-2015	✓
Soil Glass Jar - Unpreserved (EP068)								
HA1_0.0-0.1, HA2_0.0-0.1, HA3_0.0-0.1, HA4_0.0-0.1, HA5_0.0-0.1, HA6_0.0-0.1, HA7_0.0-0.1	HA1_0.5-0.7, HA2_1.0-1.1, HA3_0.5-0.7, HA4_1.0-1.1, HA5_0.5-0.7, HA6_1.0-1.1,	**11-Jun-2015**	**24-Jun-2015**	25-Jun-2015	✓	**25-Jun-2015**	03-Aug-2015	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071)								
QC1		**09-Jun-2015**	**19-Jun-2015**	23-Jun-2015	✓	**22-Jun-2015**	29-Jul-2015	✓
Soil Glass Jar - Unpreserved (EP071)								
TP1_0.5-0.7, TP2_0.5-0.7	TP1_1.5-1.6,	**09-Jun-2015**	**23-Jun-2015**	23-Jun-2015	✓	**24-Jun-2015**	02-Aug-2015	✓
Soil Glass Jar - Unpreserved (EP071)								
TP2_1.2, TP3_0.5, TP4_0.5, QC6	TP3_0.1, TP3_1.5, TP4_1.5,	**10-Jun-2015**	**24-Jun-2015**	24-Jun-2015	✓	**25-Jun-2015**	03-Aug-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))								
QC1		**09-Jun-2015**	**19-Jun-2015**	23-Jun-2015	✓	**22-Jun-2015**	29-Jul-2015	✓

Matrix: **SOIL**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Due for extraction	Evaluation	Analysis: Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)								
TP1_0.5-0.7,	TP1_1.5-1.6,	**09-Jun-2015**	**18-Jun-2015**	23-Jun-2015	✓	**19-Jun-2015**	23-Jun-2015	✓
TP2_0.5-0.7,	QC1							
Soil Glass Jar - Unpreserved (EP080)								
TP2_1.2,	TP3_0.1,	**10-Jun-2015**	**18-Jun-2015**	24-Jun-2015	✓	**19-Jun-2015**	24-Jun-2015	✓
TP3_0.5,	TP3_1.5,							
TP4_0.5,	TP4_1.5,							
QC6								
EP202A: Phenoxyacetic Acid Herbicides by LCMS								
Soil Glass Jar - Unpreserved (EP202)								
QC1,	Composite GS_1+GS_4,	**09-Jun-2015**	**22-Jun-2015**	23-Jun-2015	✓	**22-Jun-2015**	01-Aug-2015	✓
Composite GS_2+GS_3,	Composite GS_5+GS_6,							
Composite GS_7+GS_8,	Composite GS_9+GS_10,							
Composite GS_11+GS_12,	Composite GS_13+GS_17,							
Composite GS_14+GS_15,	Composite GS_16+GS_19,							
Composite GS_18+GS_22,	Composite GS_20+GS_23,							
Composite GS_21+GS_24,	Composite GS_25+GS_26,							
Composite GS_27+GS_28,	Composite GS_29+GS_30							

Matrix: **WATER**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Due for extraction	Evaluation	Analysis: Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids								
Clear Plastic Bottle - Natural (EA015H)								
MW1,	QC11,	**11-Jun-2015**	----	----	----	**19-Jun-2015**	18-Jun-2015	✗
QC13								
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)								
QC5		**09-Jun-2015**	----	----	----	**23-Jun-2015**	06-Dec-2015	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)								
QC8		**10-Jun-2015**	----	----	----	**23-Jun-2015**	07-Dec-2015	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)								
MW1,	QC11,	**11-Jun-2015**	----	----	----	**22-Jun-2015**	08-Dec-2015	✓
QC13								
EG035F: Dissolved Mercury by FIMS								
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)								
QC5		**09-Jun-2015**	----	----	----	**24-Jun-2015**	07-Jul-2015	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)								
QC8		**10-Jun-2015**	----	----	----	**24-Jun-2015**	08-Jul-2015	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)								
MW1,	QC11,	**11-Jun-2015**	----	----	----	**22-Jun-2015**	09-Jul-2015	✓
QC13								

Matrix: **WATER**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068) QC5	**09-Jun-2015**	**18-Jun-2015**	16-Jun-2015	✗	**19-Jun-2015**	28-Jul-2015	✓
Amber Glass Bottle - Unpreserved (EP068) QC8	**10-Jun-2015**	**18-Jun-2015**	17-Jun-2015	✗	**19-Jun-2015**	28-Jul-2015	✓
Amber Glass Bottle - Unpreserved (EP068) MW1, QC11, QC13	**11-Jun-2015**	**18-Jun-2015**	18-Jun-2015	✓	**19-Jun-2015**	28-Jul-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) QC5	**09-Jun-2015**	**18-Jun-2015**	16-Jun-2015	✗	**19-Jun-2015**	28-Jul-2015	✓
Amber Glass Bottle - Unpreserved (EP071) QC8	**10-Jun-2015**	**18-Jun-2015**	17-Jun-2015	✗	**19-Jun-2015**	28-Jul-2015	✓
Amber Glass Bottle - Unpreserved (EP071) MW1, QC11, QC13	**11-Jun-2015**	**18-Jun-2015**	18-Jun-2015	✓	**19-Jun-2015**	28-Jul-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080) QC5	**09-Jun-2015**	**18-Jun-2015**	23-Jun-2015	✓	**19-Jun-2015**	23-Jun-2015	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC8	**10-Jun-2015**	**18-Jun-2015**	24-Jun-2015	✓	**19-Jun-2015**	24-Jun-2015	✓
Amber VOC Vial - Sulfuric Acid (EP080) MW1, QC11, QC13, QC14	**11-Jun-2015**	**18-Jun-2015**	25-Jun-2015	✓	**19-Jun-2015**	25-Jun-2015	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	14	**14.29**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	2	18	**11.11**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	15	**13.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	18	**5.56**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	18	**5.56**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	18	**5.56**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type / *Analytical Methods*	*Method*	*Count QC*	*Count Regular*	***Rate (%) Actual***	***Rate (%) Expected***	*Evaluation*	*Quality Control Specification*
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	11	**18.18**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	16	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	15	**13.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	0	4	**0.00**	**10.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	0	4	**0.00**	**10.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	6	**16.67**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	11	**9.09**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	4	**25.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	4	**25.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	6	**16.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	11	**9.09**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	4	**25.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	4	**25.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	6	**16.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	11	**9.09**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	0	4	**0.00**	**5.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	0	4	**0.00**	**5.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	6	**16.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Asbestos Classification and Quantitation per NEPM 2013	EA200N	SOIL	Asbestos Classification and Quantitation per NEPM 2013 with Confirmation of Identification by AS 4964 - 2004 Gravimetric determination of Asbestos Containing Material, Friable Asbestos and sample weight and calculation of percentage concentrations per NEPM protocols. Friable Asbestos is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Pesticides by GCMS	EP068	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202	SOIL	In-House, LCMS (Electrospray in negative mode). Residues of acid herbicides are extracted from soil samples under the alkaline condition. An aliquot of the alkaline aqueous phase is taken and acidified before a SPE cleanup. After eluting off from the SPE cartridge, residues of acid herbicides are dissolved in HPLC mobile phase prior to instrument analysis.
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of \`filterable\` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (2013) Schedule B(3)
Hardness as CaCO3	EA065	WATER	In house: Referenced to APHA 2340 B. This method is compliant with NEPM (2013) Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Pesticides by GCMS	EP068	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Sample Compositing	EN020	SOIL	Equal weights of each original soil are taken, then mixed and homogenised. The combined mixture is labelled as a new sample.
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

QUALITY CONTROL REPORT

Work Order	: **EM1511017**	Page	: 1 of 23
Client	: **COFFEY TESTING**	Laboratory	: Environmental Division Melbourne
Contact	: MS PATRICIA HALPIN	Contact	: Bronwyn Sheen
Address	: 1/314 Kiewa Street ALBURY 2640	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: patricia.halpin@coffey.com	E-mail	: bronwyn.sheen@alsglobal.com
Telephone	: 02 6023 3799	Telephone	: +61-3-8549 9636
Facsimile	: ----	Facsimile	: +61-3-8549 9601
Project	: IA10761AB	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 17-Jun-2015
C-O-C number	: 08830-3 & 08835-6	Date Analysis Commenced	: 18-Jun-2015
Sampler	: JACK MCBAIN	Issue Date	: 26-Jun-2015
Site	: ----	No. of samples received	: 102
Quote number	: ----	No. of samples analysed	: 56

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
- Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
- CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
- LOR = Limit of reporting
- RPD = Relative Percentage Difference
- # = Indicates failed QC

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Anandaraj Ramanujam	Senior Analyst	Melbourne Asbestos
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics
Steven McGrath	Technical Manager - Client Services	Melbourne Organics
Xing Lin	Senior Organic Chemist	Melbourne Organics

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (QC Lot: 131017)									
EM1511017-032	TP1_0.5-0.7	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	16.0	15.9	0.00	0% - 50%
EM1511071-005	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	21.6	22.2	2.60	0% - 20%
EA055: Moisture Content (QC Lot: 131093)									
EM1511017-037	TP2_1.2	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	14.6	14.9	2.10	0% - 50%
EM1511017-052	HA3_0.0-0.1	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	30.2	31.2	3.12	0% - 20%
EA055: Moisture Content (QC Lot: 131094)									
EM1511017-067	HA8_0.0-0.1	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	13.8	13.4	3.10	0% - 50%
EM1511017-095	Composite GS_14+GS_15	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	17.5	18.9	7.74	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 131416)									
EM1511017-032	TP1_0.5-0.7	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	22	22	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	12	12	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	6	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	15	16	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	16	17	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	66	68	4.52	0% - 50%
EM1511017-046	HA1_0.0-0.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	15	8.46	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	8	8	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	24	23	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	18	38	72.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	70	65	8.79	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 131417)									
EM1511017-063	HA6_1.0-1.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	29	28	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	18	18	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	9	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	19	19	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	16	18	9.94	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	63	62	0.00	0% - 50%
EM1511017-090	Composite GS_5+GS_6	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	23	23	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	12	12	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	6	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 131417) - continued									
EM1511017-090	Composite GS_5+GS_6	EG005T: Copper	7440-50-8	5	mg/kg	97	114	16.5	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	16	15	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	69	68	0.00	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 131557)									
EM1511114-006	Anonymous	EG005T: Copper	7440-50-8	5	mg/kg	410	# 244	50.9	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	725	# 381	62.2	0% - 20%
EM1511017-101	Composite GS_27+GS_28	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	27	26	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	15	15	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	6	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	30	34	12.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	16	16	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	63	68	7.06	0% - 50%
EM1511114-006	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	24	22	8.50	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	23	21	6.40	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	24	22	7.42	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	142	130	9.18	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 131415)									
EM1511017-032	TP1_0.5-0.7	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1511017-046	HA1_0.0-0.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 131418)									
EM1511017-063	HA6_1.0-1.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1511017-090	Composite GS_5+GS_6	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 131558)									
EM1511017-101	Composite GS_27+GS_28	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1511114-006	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.5	0.4	29.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 131124)									
EM1511017-095	Composite GS_14+GS_15	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	0.08	0.06	27.3	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP068A: Organochlorine Pesticides (OC) (QC Lot: 131124) - continued									
EM1511017-095	Composite GS_14+GS_15	EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EM1511017-032	TP1_0.5-0.7	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	0.12	0.10	22.3	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	0.28	0.25	11.3	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 131164)									
EM1511017-052	HA3_0.0-0.1	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 131164) - continued									
EM1511017-052	HA3_0.0-0.1	EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EM1511017-037	TP2_1.2	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 131480)									
EM1511113-001	Anonymous	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP068A: Organochlorine Pesticides (OC) (QC Lot: 131480) - continued									
EM1511113-001	Anonymous	EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EM1511114-008	Anonymous	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.11	<0.11	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 131120)									
EM1511014-003	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 131120) - continued									
EM1511014-003	Anonymous	EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1511101-045	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	0.6	0.5	22.2	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	1.8	2.1	11.2	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	2.6	2.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	3.0	3.2	5.34	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.8	0.8	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	0.8	0.7	18.7	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	1.3	0.8	47.3	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	2.1	2.3	5.38	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	2.4	1.4	50.1	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	1.5	1.0	40.8	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	1.5	1.1	31.5	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 130135)									
EM1511014-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1511017-043	TP4_0.5	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 131121)									
EM1511014-003	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 131121) - continued									
EM1511101-045	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	670	600	11.4	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	590	610	3.36	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	1260	1210	4.05	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 131123)									
EM1511017-032	TP1_0.5-0.7	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 131163)									
EM1511017-037	TP2_1.2	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 130135)									
EM1511014-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1511017-043	TP4_0.5	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 131121)									
EM1511014-003	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1511101-045	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	1100	1040	5.47	0% - 50%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	350	400	13.3	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	80	60	16.0	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	1530	1500	1.98	0% - 20%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 131123)									
EM1511017-032	TP1_0.5-0.7	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 131163)									
EM1511017-037	TP2_1.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 130135)									
EM1511014-003	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP080: BTEXN (QC Lot: 130135) - continued									
EM1511014-003	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EM1511017-043	TP4_0.5	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QC Lot: 131879)									
EM1511017-079	QC1	EP202: 2.4.5-T	93-76-5	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: 2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: 2.4-D	94-75-7	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: 2.4-DB	94-82-6	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: 2.4-DP	120-36-5	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: 4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: Clopyralid	1702-17-6	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: Dicamba	1918-00-9	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: Fluroxypyr	69377-81-7	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: MCPA	94-74-6	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: MCPB	94-81-5	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: Mecoprop	93-65-2	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: Picloram	1918-02-1	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: Triclopyr	55335-06-3	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
EM1511017-097	Composite GS_18+GS_22	EP202: 2.4.5-T	93-76-5	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: 2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: 2.4-D	94-75-7	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: 2.4-DB	94-82-6	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: 2.4-DP	120-36-5	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: 4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: Clopyralid	1702-17-6	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: Dicamba	1918-00-9	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: Fluroxypyr	69377-81-7	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: MCPA	94-74-6	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: MCPB	94-81-5	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: Mecoprop	93-65-2	0.02	mg/kg	<0.04	<0.04	0.00	No Limit
		EP202: Picloram	1918-02-1	0.02	mg/kg	<0.04	<0.04	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QC Lot: 131879) - continued									
EM1511017-097	Composite GS_18+GS_22	EP202: Triclopyr	55335-06-3	0.02	mg/kg	<0.04	<0.04	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EA015: Total Dissolved Solids (QC Lot: 130645)									
EM1511011-003	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	837	841	0.477	0% - 20%
EM1511039-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	50	56	11.2	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 130699)									
EM1511017-078	MW1	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.004	0.004	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.002	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
EM1511080-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.001	0.002	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 133270)									
EM1511017-083	QC5	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
EM1511138-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0005	<0.0005	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.016	0.014	10.6	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.005	0.005	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.005	0.006	21.4	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.086	0.084	3.29	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 130700)									
EM1511080-006	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1511017-078	MW1	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EG035F: Dissolved Mercury by FIMS (QC Lot: 133271)									
EM1511017-083	QC5	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1511138-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 130094)									
EM1511017-078	MW1	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 130094)									
EM1511017-078	MW1	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 130094)									
EM1511017-078	MW1	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 131416)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	94.1	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	98.9	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	98.5	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	97.6	90	116
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	93.5	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	97.2	89	111
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	99.4	89	111
EG005T: Total Metals by ICP-AES (QCLot: 131417)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	98.6	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	99.0	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	98.6	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	97.9	90	116
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	93.9	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	96.9	89	111
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	99.4	89	111
EG005T: Total Metals by ICP-AES (QCLot: 131557)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	95.2	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	100	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	99.5	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	96.0	90	116
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	94.2	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	97.9	89	111
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	98.7	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 131415)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	89.8	85	103
EG035T: Total Recoverable Mercury by FIMS (QCLot: 131418)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	87.9	85	103
EG035T: Total Recoverable Mercury by FIMS (QCLot: 131558)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	92.7	85	103
EP068A: Organochlorine Pesticides (OC) (QCLot: 131124)								
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	116	50	134
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	116	51	131
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	86.1	38	140
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	52	128

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 131124) - continued								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	96.2	45	133
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	109	57	135
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	106	46	134
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	112	52	132
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	107	51	131
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	112	52	128
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.1	51	131
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.0	50	132
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	115	41	141
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	85.5	38	130
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	89.7	52	132
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	116	49	133
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.4	48	128
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	113	52	130
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	104	43	133
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	85.7	41	141
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	113	51	131
EP068A: Organochlorine Pesticides (OC) (QCLot: 131164)								
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.0	50	134
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	99.8	51	131
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	84.7	38	140
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	117	52	128
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	84.4	45	133
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.0	57	135
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	87.9	46	134
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.7	52	132
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	97.7	51	131
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	107	52	128
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	51	131
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.6	50	132
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.0	41	141
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	65.1	38	130
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.7	52	132
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	105	49	133
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.7	48	128
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	97.3	52	130
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	93.4	43	133
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	68.2	41	141
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	88.0	51	131

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 131480)								
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	105	50	134
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	51	131
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	76.1	38	140
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	101	52	128
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	97.6	45	133
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.6	57	135
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	73.3	46	134
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	111	52	132
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.4	51	131
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.9	52	128
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	104	51	131
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	63.0	50	132
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	105	41	141
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	82.8	38	130
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	88.2	52	132
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	90.6	49	133
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.3	48	128
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	96.2	52	130
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	93.8	43	133
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	75.6	41	141
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	95.3	51	131
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 131120)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	102	68	114
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	101	61	125
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	102	68	116
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	106	62	116
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	103	64	114
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	100	64	114
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	100	59	117
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	106	67	115
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	104	63	119
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	107	62	114
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	108	67	115
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	108	62	120
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	108	62	116
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	96.9	65	119
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	104	69	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	107	66	116

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 130135)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	115	66	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 131121)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	96.6	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	95.2	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	92.9	70	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 131123)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	126	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	118	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	117	70	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 131163)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	108	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	103	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	104	70	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 130135)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	115	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 131121)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	1051 mg/kg	97.7	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	94.0	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	67.2	38	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 131123)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	1051 mg/kg	119	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	110	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	94.4	38	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 131163)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	1051 mg/kg	103	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	103	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	93.2	38	132
EP080: BTEXN (QCLot: 130135)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	108	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	100	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	104	72	132

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	High
EP080: BTEXN (QCLot: 130135) - continued								
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	100	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	101	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	106	75	129
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 131879)								
EP202: 2.4.5-T	93-76-5	0.02	mg/kg	<0.02	0.1 mg/kg	102	57	142
EP202: 2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.02	0.1 mg/kg	103	41	135
EP202: 2.4-D	94-75-7	0.02	mg/kg	<0.02	0.1 mg/kg	93.9	69	139
EP202: 2.4-DB	94-82-6	0.02	mg/kg	<0.02	0.1 mg/kg	102	46	144
EP202: 2.4-DP	120-36-5	0.02	mg/kg	<0.02	0.1 mg/kg	95.3	50	141
EP202: 4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	<0.02	0.1 mg/kg	94.7	54	136
EP202: Clopyralid	1702-17-6	0.02	mg/kg	<0.02	0.1 mg/kg	96.9	49	149
EP202: Dicamba	1918-00-9	0.02	mg/kg	<0.02	0.1 mg/kg	93.8	52	146
EP202: Fluroxypyr	69377-81-7	0.02	mg/kg	<0.02	0.1 mg/kg	103	53	145
EP202: MCPA	94-74-6	0.02	mg/kg	<0.02	0.1 mg/kg	93.8	57	143
EP202: MCPB	94-81-5	0.02	mg/kg	<0.02	0.1 mg/kg	104	39	147
EP202: Mecoprop	93-65-2	0.02	mg/kg	<0.02	0.1 mg/kg	103	60	140
EP202: Picloram	1918-02-1	0.02	mg/kg	<0.02	0.1 mg/kg	103	49	138
EP202: Triclopyr	55335-06-3	0.02	mg/kg	<0.02	0.1 mg/kg	95.8	51	145

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	High
EA015: Total Dissolved Solids (QCLot: 130645)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	101	97	105
EG020F: Dissolved Metals by ICP-MS (QCLot: 130699)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.3	94	108
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.6	86	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.1	86	110
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.6	87	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.6	87	109
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	92.2	87	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	90.9	87	107
EG020F: Dissolved Metals by ICP-MS (QCLot: 133270)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	94	108
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	86	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.4	86	110
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.3	87	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.7	87	109
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.2	87	109

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	LCS Report Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EG020F: Dissolved Metals by ICP-MS (QCLot: 133270) - continued								
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	100	87	107
EG035F: Dissolved Mercury by FIMS (QCLot: 130700)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	106	83	117
EG035F: Dissolved Mercury by FIMS (QCLot: 133271)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	106	83	117
EP068A: Organochlorine Pesticides (OC) (QCLot: 130141)								
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	60.9	50	126
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	59.1	49	124
EP068: 4.4`-DDT	50-29-3	2	µg/L	<2.0	5 µg/L	68.7	38	129
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	63.6	46	122
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	60.1	53	123
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	62.7	48	132
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	65.6	52	127
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	60.8	50	129
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	63.4	49	125
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	65.0	53	124
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	58.6	49	127
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	62.7	49	125
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	61.3	45	128
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	60.2	40	124
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	59.6	53	115
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	66.3	52	131
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	59.3	45	119
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	60.4	51	122
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	59.2	47	120
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	5 µg/L	70.1	33	123
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	67.2	48	125
EP068A: Organochlorine Pesticides (OC) (QCLot: 130147)								
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	118	50	126
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	115	49	124
EP068: 4.4`-DDT	50-29-3	2	µg/L	<2.0	5 µg/L	79.6	38	129
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	109	46	122
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	84.9	53	123
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	110	48	132
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	100	52	127
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	117	50	129
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	115	49	125
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	116	53	124

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 130147) - continued								
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	82.2	49	127
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	115	49	125
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	116	45	128
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	98.6	40	124
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	112	53	115
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	114	52	131
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	99.2	45	119
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	113	51	122
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	91.6	47	120
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	5 µg/L	87.0	33	123
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	91.0	48	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 130094)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	88.0	67	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 130140)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	88.9	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	111	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	100	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 130146)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	60.2	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	80.5	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	73.2	55	141
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 130094)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	85.7	65	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 130140)								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	5753 µg/L	101	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	101	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	126	51	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 130146)								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	5753 µg/L	67.4	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	74.2	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	85.7	51	137
EP080: BTEXN (QCLot: 130094)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	93.2	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	91.0	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	91.8	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	91.7	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	95.9	75	127

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP080: BTEXN (QCLot: 130094) - continued								
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	90.7	76	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 131416)							
EM1511017-034	TP1_1.5-1.6	EG005T: Arsenic	7440-38-2	50 mg/kg	104	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	102	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	104	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	101	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	99.4	78	120
		EG005T: Zinc	7440-66-6	50 mg/kg	100	74	128
EG005T: Total Metals by ICP-AES (QCLot: 131417)							
EM1511017-064	HA7_0.0-0.1	EG005T: Arsenic	7440-38-2	50 mg/kg	95.9	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	104	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	91.1	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	93.1	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	99.3	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	100	78	120
		EG005T: Zinc	7440-66-6	50 mg/kg	85.0	74	128
EG005T: Total Metals by ICP-AES (QCLot: 131557)							
EM1511017-102	Composite GS_29+GS_30	EG005T: Arsenic	7440-38-2	50 mg/kg	97.2	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.0	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	93.1	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	93.7	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	93.2	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	95.3	78	120
		EG005T: Zinc	7440-66-6	50 mg/kg	86.4	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 131415)							
EM1511017-034	TP1_1.5-1.6	EG035T: Mercury	7439-97-6	5 mg/kg	94.6	76	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 131418)							
EM1511017-064	HA7_0.0-0.1	EG035T: Mercury	7439-97-6	5 mg/kg	96.6	76	116

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 131558)							
EM1511017-102	Composite GS_29+GS_30	EG035T: Mercury	7439-97-6	5 mg/kg	92.4	76	116
EP068A: Organochlorine Pesticides (OC) (QCLot: 131124)							
EM1511017-036	TP2_0.5-0.7	EP068: 4.4`-DDT	50-29-3	0.5 mg/kg	58.2	20	133
		EP068: Aldrin	309-00-2	0.5 mg/kg	73.9	23	136
		EP068: Dieldrin	60-57-1	0.5 mg/kg	111	42	136
		EP068: Endrin	72-20-8	0.5 mg/kg	99.3	23	146
		EP068: gamma-BHC	58-89-9	0.5 mg/kg	116	22	139
		EP068: Heptachlor	76-44-8	0.5 mg/kg	92.3	18	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 131164)							
EM1511017-039	TP3_0.5	EP068: 4.4`-DDT	50-29-3	0.5 mg/kg	33.0	20	133
		EP068: Aldrin	309-00-2	0.5 mg/kg	# 19.6	23	136
		EP068: Dieldrin	60-57-1	0.5 mg/kg	91.6	42	136
		EP068: Endrin	72-20-8	0.5 mg/kg	75.6	23	146
		EP068: gamma-BHC	58-89-9	0.5 mg/kg	98.7	22	139
		EP068: Heptachlor	76-44-8	0.5 mg/kg	75.0	18	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 131480)							
EM1511017-067	HA8_0.0-0.1	EP068: 4.4`-DDT	50-29-3	0.5 mg/kg	60.8	20	133
		EP068: Aldrin	309-00-2	0.5 mg/kg	66.6	23	136
		EP068: Dieldrin	60-57-1	0.5 mg/kg	73.6	42	136
		EP068: Endrin	72-20-8	0.5 mg/kg	73.1	23	146
		EP068: gamma-BHC	58-89-9	0.5 mg/kg	93.5	22	139
		EP068: Heptachlor	76-44-8	0.5 mg/kg	55.8	18	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 131120)							
EM1511014-019	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	105	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	120	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 130135)							
EM1511014-018	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	94.4	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 131121)							
EM1511014-018	Anonymous	EP071: C10 - C14 Fraction	----	658 mg/kg	106	53	123
		EP071: C15 - C28 Fraction	----	3160 mg/kg	111	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	# 123	64	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 131123)							
EM1511017-034	TP1_1.5-1.6	EP071: C10 - C14 Fraction	----	658 mg/kg	# 115	53	123
		EP071: C15 - C28 Fraction	----	3160 mg/kg	# 116	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	# 118	64	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 131163)							
EM1511017-038	TP3_0.1	EP071: C10 - C14 Fraction	----	658 mg/kg	# 122	53	123

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 131163) - continued							
EM1511017-038	TP3_0.1	EP071: C15 - C28 Fraction	----	3160 mg/kg	# 122	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	# 118	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 130135)							
EM1511014-018	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	96.1	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 131121)							
EM1511014-018	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	1051 mg/kg	107	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	# 114	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	# Not Determined	44	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 131123)							
EM1511017-034	TP1_1.5-1.6	EP071: >C10 - C16 Fraction	>C10_C16	1051 mg/kg	113	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	# 118	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	# 116	44	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 131163)							
EM1511017-038	TP3_0.1	EP071: >C10 - C16 Fraction	>C10_C16	1051 mg/kg	# 119	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	# 116	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	110	44	126
EP080: BTEXN (QCLot: 130135)							
EM1511014-018	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	106	50	136
		EP080: Toluene	108-88-3	2 mg/kg	115	56	139
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 131879)							
EM1511017-088	Composite GS_1+GS_4	EP202: 2.4.5-T	93-76-5	0.1 mg/kg	92.0	57	142
		EP202: 2.4-D	94-75-7	0.1 mg/kg	69.2	68	139
		EP202: Clopyralid	1702-17-6	0.1 mg/kg	60.7	49	149
		EP202: MCPA	94-74-6	0.1 mg/kg	68.7	57	143
		EP202: Mecoprop	93-65-2	0.1 mg/kg	75.4	60	140
		EP202: Picloram	1918-02-1	0.1 mg/kg	88.7	49	138
		EP202: Triclopyr	55335-06-3	0.1 mg/kg	81.5	51	145

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 130699)							
EM1511017-078	MW1	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	94.4	85	131
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	104	81	133
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	84.1	71	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	87.1	76	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	88.5	75	133

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 130699) - continued							
EM1511017-078	MW1	EG020A-F: Nickel	7440-02-0	0.2 mg/L	85.7	73	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	85.3	75	131
EG020F: Dissolved Metals by ICP-MS (QCLot: 133270)							
EM1511017-083	QC5	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	94.0	85	131
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	107	81	133
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	93.3	71	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	90.9	76	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	95.0	75	133
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	92.2	73	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	92.3	75	131
EG035F: Dissolved Mercury by FIMS (QCLot: 130700)							
EM1511017-085	QC11	EG035F: Mercury	7439-97-6	0.01 mg/L	97.8	70	120
EG035F: Dissolved Mercury by FIMS (QCLot: 133271)							
EM1511017-084	QC8	EG035F: Mercury	7439-97-6	0.01 mg/L	108	70	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 130094)							
EM1511017-083	QC5	EP080: C6 - C9 Fraction	----	280 µg/L	78.3	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 130094)							
EM1511017-083	QC5	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	77.2	44	122
EP080: BTEXN (QCLot: 130094)							
EM1511017-083	QC5	EP080: Benzene	71-43-2	20 µg/L	89.9	68	130
		EP080: Toluene	108-88-3	20 µg/L	92.9	72	132

CERTIFICATE OF ANALYSIS

Work Order	: **EM1511017**	Page	: 1 of 49
Client	: **COFFEY TESTING**	Laboratory	: Environmental Division Melbourne
Contact	: MS PATRICIA HALPIN	Contact	: Bronwyn Sheen
Address	: 1/314 Kiewa Street ALBURY 2640	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: patricia.halpin@coffey.com	E-mail	: bronwyn.sheen@alsglobal.com
Telephone	: 02 6023 3799	Telephone	: +61-3-8549 9636
Facsimile	: ----	Facsimile	: +61-3-8549 9601
Project	: IA10761AB	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 17-Jun-2015 11:20
C-O-C number	: 08830-3 & 08835-6	Date Analysis Commenced	: 18-Jun-2015
Sampler	: JACK MCBAIN	Issue Date	: 26-Jun-2015 15:35
Site	: ----		
		No. of samples received	: 102
Quote number	: ----	No. of samples analysed	: 56

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

WORLD RECOGNISED ACCREDITATION

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Anandaraj Ramanujam	Senior Analyst	Melbourne Asbestos
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics
Steven McGrath	Technical Manager - Client Services	Melbourne Organics
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- Herbicides (EP202) conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP068: Poor matrix spike recovery (Aldrin) for sample EM1511017_39 due to matrix interferences.
- EP202: Particular samples required dilution due to matrix interferences. LOR values have been adjusted accordingly.
- EG005T:EM1511114#6 Poor duplicate precision for Copper and Lead due to sample heterogeneity. Confirmed by re-digestion and re-analysis.
- Samples have been received with limited time to adhere to recommended analytical holding times for EA015H. Results should be scrutinised accordingly.
- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.
  Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)
  The Friable Asbestos weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos
  Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.
  All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR.
  Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP1_0.5-0.7	TP1_1.5-1.6	TP2_0.5-0.7	TP2_1.2	TP3_0.1
			Client sampling date / time	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[10-Jun-2015]	[10-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-032	EM1511017-034	EM1511017-036	EM1511017-037	EM1511017-038
				Result	Result	Result	Result	Result
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	**16.0**	**15.4**	**14.9**	**14.6**	**7.6**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	----
Asbestos Type	1332-21-4	-	--	----	----	----	----	----
Sample weight (dry)	----	0.01	g	----	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	----
EA200F: Friable Asbestos in Soil (non-NATA)								
^ Friable Asbestos	1332-21-4	0.0004	g	----	----	----	----	----
Free Fibres	----	5	Fibres	----	----	----	----	----
^ Friable Asbestos (as Asbestos in Soil)	1332-21-4	0.001	%	----	----	----	----	----
Weight Used for % Calculation	----	0.0001	kg	----	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**5**	**10**	**6**	**9**	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**22**	**30**	**24**	**31**	**10**
Copper	7440-50-8	5	mg/kg	**15**	**17**	**13**	**17**	**17**
Lead	7439-92-1	5	mg/kg	**16**	**14**	**14**	**16**	**20**
Nickel	7440-02-0	2	mg/kg	**12**	**15**	**13**	**15**	**6**
Zinc	7440-66-6	5	mg/kg	**66**	**44**	**55**	**49**	**48**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP1_0.5-0.7	TP1_1.5-1.6	TP2_0.5-0.7	TP2_1.2	TP3_0.1
			Client sampling date / time	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[10-Jun-2015]	[10-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-032	EM1511017-034	EM1511017-036	EM1511017-037	EM1511017-038
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	**0.28**	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	**0.12**	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg	**0.40**	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	TP1_0.5-0.7	TP1_1.5-1.6	TP2_0.5-0.7	TP2_1.2	TP3_0.1
Client sampling date / time				[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[10-Jun-2015]	[10-Jun-2015]
				EM1511017-032	EM1511017-034	EM1511017-036	EM1511017-037	EM1511017-038
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP202A: Phenoxyacetic Acid Herbicides by LCMS								
4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	----	----	----	----	----
2.4-DB	94-82-6	0.02	mg/kg	----	----	----	----	----
Dicamba	1918-00-9	0.02	mg/kg	----	----	----	----	----
Mecoprop	93-65-2	0.02	mg/kg	----	----	----	----	----
MCPA	94-74-6	0.02	mg/kg	----	----	----	----	----
2.4-DP	120-36-5	0.02	mg/kg	----	----	----	----	----
2.4-D	94-75-7	0.02	mg/kg	----	----	----	----	----
Triclopyr	55335-06-3	0.02	mg/kg	----	----	----	----	----
2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	----	----	----	----	----
2.4.5-T	93-76-5	0.02	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP1_0.5-0.7	TP1_1.5-1.6	TP2_0.5-0.7	TP2_1.2	TP3_0.1
			Client sampling date / time	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[10-Jun-2015]	[10-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-032	EM1511017-034	EM1511017-036	EM1511017-037	EM1511017-038
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
MCPB	94-81-5	0.02	mg/kg	----	----	----	----	----
Picloram	1918-02-1	0.02	mg/kg	----	----	----	----	----
Clopyralid	1702-17-6	0.02	mg/kg	----	----	----	----	----
Fluroxypyr	69377-81-7	0.02	mg/kg	----	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**93.9**	**93.5**	**95.2**	**98.6**	**97.7**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**117**	**96.8**	**86.9**	**90.8**	**88.9**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**86.3**	**77.5**	**82.8**	**81.8**	**88.6**
Toluene-D8	2037-26-5	0.2	%	**109**	**99.2**	**108**	**105**	**108**
4-Bromofluorobenzene	460-00-4	0.2	%	**105**	**93.5**	**102**	**94.3**	**104**
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP3_0.5	TP3_1.5	TP4_0.5	TP4_1.5	HA1_0.0-0.1
			Client sampling date / time	[10-Jun-2015]	[10-Jun-2015]	[10-Jun-2015]	[10-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-039	EM1511017-041	EM1511017-043	EM1511017-045	EM1511017-046
				Result	Result	Result	Result	Result
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	14.5	15.3	13.9	11.7	20.6
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	----
Asbestos Type	1332-21-4	-	--	----	----	----	----	----
Sample weight (dry)	----	0.01	g	----	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	----
EA200F: Friable Asbestos in Soil (non-NATA)								
^ Friable Asbestos	1332-21-4	0.0004	g	----	----	----	----	----
Free Fibres	----	5	Fibres	----	----	----	----	----
^ Friable Asbestos (as Asbestos in Soil)	1332-21-4	0.001	%	----	----	----	----	----
Weight Used for % Calculation	----	0.0001	kg	----	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	12	8	6	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	22	35	25	21	14
Copper	7440-50-8	5	mg/kg	17	19	16	13	24
Lead	7439-92-1	5	mg/kg	15	18	18	15	18
Nickel	7440-02-0	2	mg/kg	12	16	15	12	8
Zinc	7440-66-6	5	mg/kg	66	46	48	58	70
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP3_0.5	TP3_1.5	TP4_0.5	TP4_1.5	HA1_0.0-0.1
			Client sampling date / time	[10-Jun-2015]	[10-Jun-2015]	[10-Jun-2015]	[10-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-039	EM1511017-041	EM1511017-043	EM1511017-045	EM1511017-046
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	**0.19**	<0.05	**0.05**	**0.19**	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	**0.08**	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg	**0.27**	<0.05	**0.05**	**0.19**	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP3_0.5	TP3_1.5	TP4_0.5	TP4_1.5	HA1_0.0-0.1
			Client sampling date / time	[10-Jun-2015]	[10-Jun-2015]	[10-Jun-2015]	[10-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-039	EM1511017-041	EM1511017-043	EM1511017-045	EM1511017-046
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS								
4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	----	----	----	----	----
2.4-DB	94-82-6	0.02	mg/kg	----	----	----	----	----
Dicamba	1918-00-9	0.02	mg/kg	----	----	----	----	----
Mecoprop	93-65-2	0.02	mg/kg	----	----	----	----	----
MCPA	94-74-6	0.02	mg/kg	----	----	----	----	----
2.4-DP	120-36-5	0.02	mg/kg	----	----	----	----	----
2.4-D	94-75-7	0.02	mg/kg	----	----	----	----	----
Triclopyr	55335-06-3	0.02	mg/kg	----	----	----	----	----
2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	----	----	----	----	----
2.4.5-T	93-76-5	0.02	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TP3_0.5	TP3_1.5	TP4_0.5	TP4_1.5	HA1_0.0-0.1
			Client sampling date / time	[10-Jun-2015]	[10-Jun-2015]	[10-Jun-2015]	[10-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-039	EM1511017-041	EM1511017-043	EM1511017-045	EM1511017-046
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
MCPB	94-81-5	0.02	mg/kg	----	----	----	----	----
Picloram	1918-02-1	0.02	mg/kg	----	----	----	----	----
Clopyralid	1702-17-6	0.02	mg/kg	----	----	----	----	----
Fluroxypyr	69377-81-7	0.02	mg/kg	----	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**107**	**97.7**	**99.4**	**104**	**105**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**87.7**	**78.0**	**115**	**79.8**	**96.6**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**88.8**	**86.9**	**75.2**	**76.6**	----
Toluene-D8	2037-26-5	0.2	%	**112**	**118**	**97.8**	**101**	----
4-Bromofluorobenzene	460-00-4	0.2	%	**107**	**111**	**92.8**	**95.9**	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA1_0.5-0.7	HA2_0.0-0.1	HA2_1.0-1.1	HA3_0.0-0.1	HA3_0.5-0.7
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-047	EM1511017-049	EM1511017-051	EM1511017-052	EM1511017-053
				Result	Result	Result	Result	Result
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	**17.2**	**18.6**	**16.1**	**30.2**	**17.7**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	----
Asbestos Type	1332-21-4	-	--	----	----	----	----	----
Sample weight (dry)	----	0.01	g	----	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	----
EA200F: Friable Asbestos in Soil (non-NATA)								
^ Friable Asbestos	1332-21-4	0.0004	g	----	----	----	----	----
Free Fibres	----	5	Fibres	----	----	----	----	----
^ Friable Asbestos (as Asbestos in Soil)	1332-21-4	0.001	%	----	----	----	----	----
Weight Used for % Calculation	----	0.0001	kg	----	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**8**	**7**	**9**	**8**	**9**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**29**	**23**	**30**	**24**	**30**
Copper	7440-50-8	5	mg/kg	**18**	**24**	**19**	**25**	**17**
Lead	7439-92-1	5	mg/kg	**15**	**16**	**16**	**15**	**16**
Nickel	7440-02-0	2	mg/kg	**15**	**12**	**17**	**13**	**14**
Zinc	7440-66-6	5	mg/kg	**60**	**79**	**55**	**72**	**55**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA1_0.5-0.7	HA2_0.0-0.1	HA2_1.0-1.1	HA3_0.0-0.1	HA3_0.5-0.7
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-047	EM1511017-049	EM1511017-051	EM1511017-052	EM1511017-053
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA1_0.5-0.7	HA2_0.0-0.1	HA2_1.0-1.1	HA3_0.0-0.1	HA3_0.5-0.7
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-047	EM1511017-049	EM1511017-051	EM1511017-052	EM1511017-053
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued								
C6 - C9 Fraction	----	10	mg/kg	----	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	----	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	----	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	----	----	----	----	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS								
4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	----	----	----	----	----
2.4-DB	94-82-6	0.02	mg/kg	----	----	----	----	----
Dicamba	1918-00-9	0.02	mg/kg	----	----	----	----	----
Mecoprop	93-65-2	0.02	mg/kg	----	----	----	----	----
MCPA	94-74-6	0.02	mg/kg	----	----	----	----	----
2.4-DP	120-36-5	0.02	mg/kg	----	----	----	----	----
2.4-D	94-75-7	0.02	mg/kg	----	----	----	----	----
Triclopyr	55335-06-3	0.02	mg/kg	----	----	----	----	----
2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	----	----	----	----	----
2.4.5-T	93-76-5	0.02	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA1_0.5-0.7	HA2_0.0-0.1	HA2_1.0-1.1	HA3_0.0-0.1	HA3_0.5-0.7
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-047	EM1511017-049	EM1511017-051	EM1511017-052	EM1511017-053
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
MCPB	94-81-5	0.02	mg/kg	----	----	----	----	----
Picloram	1918-02-1	0.02	mg/kg	----	----	----	----	----
Clopyralid	1702-17-6	0.02	mg/kg	----	----	----	----	----
Fluroxypyr	69377-81-7	0.02	mg/kg	----	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	98.6	97.6	99.7	90.2	99.2
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	79.8	91.2	80.1	92.8	73.9
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA4_0.0-0.1	HA4_1.0-1.1	HA5_0.0-0.1	HA5_0.5-0.7	HA6_0.0-0.1
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-055	EM1511017-057	EM1511017-058	EM1511017-059	EM1511017-061
				Result	Result	Result	Result	Result
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	31.0	13.7	12.8	7.5	17.0
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	----
Asbestos Type	1332-21-4	-	--	----	----	----	----	----
Sample weight (dry)	----	0.01	g	----	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	----
EA200F: Friable Asbestos in Soil (non-NATA)								
^ Friable Asbestos	1332-21-4	0.0004	g	----	----	----	----	----
Free Fibres	----	5	Fibres	----	----	----	----	----
^ Friable Asbestos (as Asbestos in Soil)	1332-21-4	0.001	%	----	----	----	----	----
Weight Used for % Calculation	----	0.0001	kg	----	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	8	11	6	7	6
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	25	34	20	23	21
Copper	7440-50-8	5	mg/kg	27	20	21	13	40
Lead	7439-92-1	5	mg/kg	16	18	129	11	85
Nickel	7440-02-0	2	mg/kg	14	17	11	15	13
Zinc	7440-66-6	5	mg/kg	83	54	152	62	142
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA4_0.0-0.1	HA4_1.0-1.1	HA5_0.0-0.1	HA5_0.5-0.7	HA6_0.0-0.1
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-055	EM1511017-057	EM1511017-058	EM1511017-059	EM1511017-061
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA4_0.0-0.1	HA4_1.0-1.1	HA5_0.0-0.1	HA5_0.5-0.7	HA6_0.0-0.1
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-055	EM1511017-057	EM1511017-058	EM1511017-059	EM1511017-061
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued								
C6 - C9 Fraction	----	10	mg/kg	----	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	----	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	----	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	----	----	----	----	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS								
4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	----	----	----	----	----
2.4-DB	94-82-6	0.02	mg/kg	----	----	----	----	----
Dicamba	1918-00-9	0.02	mg/kg	----	----	----	----	----
Mecoprop	93-65-2	0.02	mg/kg	----	----	----	----	----
MCPA	94-74-6	0.02	mg/kg	----	----	----	----	----
2.4-DP	120-36-5	0.02	mg/kg	----	----	----	----	----
2.4-D	94-75-7	0.02	mg/kg	----	----	----	----	----
Triclopyr	55335-06-3	0.02	mg/kg	----	----	----	----	----
2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	----	----	----	----	----
2.4.5-T	93-76-5	0.02	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA4_0.0-0.1	HA4_1.0-1.1	HA5_0.0-0.1	HA5_0.5-0.7	HA6_0.0-0.1
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-055	EM1511017-057	EM1511017-058	EM1511017-059	EM1511017-061
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
MCPB	94-81-5	0.02	mg/kg	----	----	----	----	----
Picloram	1918-02-1	0.02	mg/kg	----	----	----	----	----
Clopyralid	1702-17-6	0.02	mg/kg	----	----	----	----	----
Fluroxypyr	69377-81-7	0.02	mg/kg	----	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	98.2	90.0	89.2	96.0	95.4
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	89.9	68.8	76.3	60.6	78.0
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA6_1.0-1.1	HA7_0.0-0.1	HA7_0.5-0.7	HA8_0.0-0.1	HA8_1.0-1.1
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-063	EM1511017-064	EM1511017-065	EM1511017-067	EM1511017-069
				Result	Result	Result	Result	Result
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	**10.7**	**11.1**	**8.0**	**13.8**	**6.2**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	----
Asbestos Type	1332-21-4	-	--	----	----	----	----	----
Sample weight (dry)	----	0.01	g	----	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	----
EA200F: Friable Asbestos in Soil (non-NATA)								
^ Friable Asbestos	1332-21-4	0.0004	g	----	----	----	----	----
Free Fibres	----	5	Fibres	----	----	----	----	----
^ Friable Asbestos (as Asbestos in Soil)	1332-21-4	0.001	%	----	----	----	----	----
Weight Used for % Calculation	----	0.0001	kg	----	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**9**	**6**	**8**	**7**	**6**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**29**	**25**	**25**	**26**	**21**
Copper	7440-50-8	5	mg/kg	**19**	**22**	**19**	**23**	**15**
Lead	7439-92-1	5	mg/kg	**16**	**15**	**21**	**16**	**15**
Nickel	7440-02-0	2	mg/kg	**18**	**15**	**13**	**15**	**12**
Zinc	7440-66-6	5	mg/kg	**63**	**69**	**65**	**68**	**60**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA6_1.0-1.1	HA7_0.0-0.1	HA7_0.5-0.7	HA8_0.0-0.1	HA8_1.0-1.1
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-063	EM1511017-064	EM1511017-065	EM1511017-067	EM1511017-069
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

	Compound	CAS Number	LOR	Unit	HA6_1.0-1.1	HA7_0.0-0.1	HA7_0.5-0.7	HA8_0.0-0.1	HA8_1.0-1.1
	Client sampling date / time				[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
					EM1511017-063	EM1511017-064	EM1511017-065	EM1511017-067	EM1511017-069
					Result	Result	Result	Result	Result
	EP080/071: Total Petroleum Hydrocarbons - Continued								
	C6 - C9 Fraction	----	10	mg/kg	----	----	----	----	----
	C10 - C14 Fraction	----	50	mg/kg	----	----	----	----	----
	C15 - C28 Fraction	----	100	mg/kg	----	----	----	----	----
	C29 - C36 Fraction	----	100	mg/kg	----	----	----	----	----
^	C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
	EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
	C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	----	----	----
^	C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	----	----	----
	>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	----	----	----	----
	>C16 - C34 Fraction	----	100	mg/kg	----	----	----	----	----
	>C34 - C40 Fraction	----	100	mg/kg	----	----	----	----	----
^	>C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
^	>C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	----	----	----
	EP080: BTEXN								
	Benzene	71-43-2	0.2	mg/kg	----	----	----	----	----
	Toluene	108-88-3	0.5	mg/kg	----	----	----	----	----
	Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	----	----
	meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	----	----
	ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	----	----
^	Sum of BTEX	----	0.2	mg/kg	----	----	----	----	----
^	Total Xylenes	1330-20-7	0.5	mg/kg	----	----	----	----	----
	Naphthalene	91-20-3	1	mg/kg	----	----	----	----	----
	EP202A: Phenoxyacetic Acid Herbicides by LCMS								
	4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	----	----	----	----	----
	2.4-DB	94-82-6	0.02	mg/kg	----	----	----	----	----
	Dicamba	1918-00-9	0.02	mg/kg	----	----	----	----	----
	Mecoprop	93-65-2	0.02	mg/kg	----	----	----	----	----
	MCPA	94-74-6	0.02	mg/kg	----	----	----	----	----
	2.4-DP	120-36-5	0.02	mg/kg	----	----	----	----	----
	2.4-D	94-75-7	0.02	mg/kg	----	----	----	----	----
	Triclopyr	55335-06-3	0.02	mg/kg	----	----	----	----	----
	2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	----	----	----	----	----
	2.4.5-T	93-76-5	0.02	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA6_1.0-1.1	HA7_0.0-0.1	HA7_0.5-0.7	HA8_0.0-0.1	HA8_1.0-1.1
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-063	EM1511017-064	EM1511017-065	EM1511017-067	EM1511017-069
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
MCPB	94-81-5	0.02	mg/kg	----	----	----	----	----
Picloram	1918-02-1	0.02	mg/kg	----	----	----	----	----
Clopyralid	1702-17-6	0.02	mg/kg	----	----	----	----	----
Fluroxypyr	69377-81-7	0.02	mg/kg	----	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**93.5**	**107**	**105**	**84.5**	**101**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**66.2**	**87.3**	**85.8**	**98.6**	**104**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA1	HA2	HA3	HA4	HA5
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-070	EM1511017-071	EM1511017-072	EM1511017-073	EM1511017-074
				Result	Result	Result	Result	Result
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	----	----	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	116	132	135	144	159
APPROVED IDENTIFIER:	----	-	--	Anand.Ramanujam	Anand.Ramanujam	Anand.Ramanujam	Anand.Ramanujam	Anand.Ramanujam
EA200F: Friable Asbestos in Soil (non-NATA)								
^ Friable Asbestos	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Free Fibres	----	5	Fibres	No	No	No	No	No
^ Friable Asbestos (as Asbestos in Soil)	1332-21-4	0.001	%	<0.001	<0.001	<0.001	<0.001	<0.001
Weight Used for % Calculation	----	0.0001	kg	0.116	0.132	0.135	0.144	0.159
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	----	----	----	----	----
Chromium	7440-47-3	2	mg/kg	----	----	----	----	----
Copper	7440-50-8	5	mg/kg	----	----	----	----	----
Lead	7439-92-1	5	mg/kg	----	----	----	----	----
Nickel	7440-02-0	2	mg/kg	----	----	----	----	----
Zinc	7440-66-6	5	mg/kg	----	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	----	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	----	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	HA1	HA2	HA3	HA4	HA5
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
				EM1511017-070	EM1511017-071	EM1511017-072	EM1511017-073	EM1511017-074
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	----	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	----	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	----	----	----	----
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg	----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA1	HA2	HA3	HA4	HA5
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-070	EM1511017-071	EM1511017-072	EM1511017-073	EM1511017-074
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued								
C6 - C9 Fraction	----	10	mg/kg	----	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	----	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	----	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	----	----	----	----	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS								
4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	----	----	----	----	----
2.4-DB	94-82-6	0.02	mg/kg	----	----	----	----	----
Dicamba	1918-00-9	0.02	mg/kg	----	----	----	----	----
Mecoprop	93-65-2	0.02	mg/kg	----	----	----	----	----
MCPA	94-74-6	0.02	mg/kg	----	----	----	----	----
2.4-DP	120-36-5	0.02	mg/kg	----	----	----	----	----
2.4-D	94-75-7	0.02	mg/kg	----	----	----	----	----
Triclopyr	55335-06-3	0.02	mg/kg	----	----	----	----	----
2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	----	----	----	----	----
2.4.5-T	93-76-5	0.02	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA1	HA2	HA3	HA4	HA5
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-070	EM1511017-071	EM1511017-072	EM1511017-073	EM1511017-074
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
MCPB	94-81-5	0.02	mg/kg	----	----	----	----	----
Picloram	1918-02-1	0.02	mg/kg	----	----	----	----	----
Clopyralid	1702-17-6	0.02	mg/kg	----	----	----	----	----
Fluroxypyr	69377-81-7	0.02	mg/kg	----	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	HA6	HA7	HA8	QC1	QC6
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[09-Jun-2015]	[10-Jun-2015]
				EM1511017-075	EM1511017-076	EM1511017-077	EM1511017-079	EM1511017-081
				Result	Result	Result	Result	Result
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	----	----	----	14.2	14.0
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	----	----
Asbestos Type	1332-21-4	-	--	-	-	-	----	----
Sample weight (dry)	----	0.01	g	154	190	188	----	----
APPROVED IDENTIFIER:	----	-	--	Anand.Ramanujam	Anand.Ramanujam	Anand.Ramanujam	----	----
EA200F: Friable Asbestos in Soil (non-NATA)								
^ Friable Asbestos	1332-21-4	0.0004	g	<0.0004	<0.0004	<0.0004	----	----
Free Fibres	----	5	Fibres	No	No	No	----	----
^ Friable Asbestos (as Asbestos in Soil)	1332-21-4	0.001	%	<0.001	<0.001	<0.001	----	----
Weight Used for % Calculation	----	0.0001	kg	0.154	0.190	0.188	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	----	5	<5
Cadmium	7440-43-9	1	mg/kg	----	----	----	<1	<1
Chromium	7440-47-3	2	mg/kg	----	----	----	22	20
Copper	7440-50-8	5	mg/kg	----	----	----	44	14
Lead	7439-92-1	5	mg/kg	----	----	----	14	16
Nickel	7440-02-0	2	mg/kg	----	----	----	13	12
Zinc	7440-66-6	5	mg/kg	----	----	----	66	66
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	----	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	----	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA6	HA7	HA8	QC1	QC6
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[09-Jun-2015]	[10-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-075	EM1511017-076	EM1511017-077	EM1511017-079	EM1511017-081
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	----	----	**0.19**
Endrin	72-20-8	0.05	mg/kg	----	----	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	----	----	**0.08**
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	----	----	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	----	----	----	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	----	----	----	----
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg	----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	----	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	----	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	----	----	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	----	----	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	----	----	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	----	----	----	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	----	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	**0.6**	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	HA6	HA7	HA8	QC1	QC6
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[09-Jun-2015]	[10-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-075	EM1511017-076	EM1511017-077	EM1511017-079	EM1511017-081
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued								
C6 - C9 Fraction	----	10	mg/kg	----	----	----	<10	<10
C10 - C14 Fraction	----	50	mg/kg	----	----	----	<50	<50
C15 - C28 Fraction	----	100	mg/kg	----	----	----	<100	<100
C29 - C36 Fraction	----	100	mg/kg	----	----	----	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	----	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	----	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	----	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	----	----	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	----	----	----	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	----	----	----	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	----	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	----	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	----	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	----	----	----	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	----	----	----	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	----	----	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	----	----	----	<1	<1
EP202A: Phenoxyacetic Acid Herbicides by LCMS								
4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	----	----	----	<0.04	----
2.4-DB	94-82-6	0.02	mg/kg	----	----	----	<0.04	----
Dicamba	1918-00-9	0.02	mg/kg	----	----	----	<0.04	----
Mecoprop	93-65-2	0.02	mg/kg	----	----	----	<0.04	----
MCPA	94-74-6	0.02	mg/kg	----	----	----	<0.04	----
2.4-DP	120-36-5	0.02	mg/kg	----	----	----	<0.04	----
2.4-D	94-75-7	0.02	mg/kg	----	----	----	<0.04	----
Triclopyr	55335-06-3	0.02	mg/kg	----	----	----	<0.04	----
2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	----	----	----	<0.04	----
2.4.5-T	93-76-5	0.02	mg/kg	----	----	----	<0.04	----

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

			Client sample ID	HA6	HA7	HA8	QC1	QC6
			Client sampling date / time	[11-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]	[09-Jun-2015]	[10-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-075	EM1511017-076	EM1511017-077	EM1511017-079	EM1511017-081
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
MCPB	94-81-5	0.02	mg/kg	----	----	----	<0.04	----
Picloram	1918-02-1	0.02	mg/kg	----	----	----	<0.04	----
Clopyralid	1702-17-6	0.02	mg/kg	----	----	----	<0.04	----
Fluroxypyr	69377-81-7	0.02	mg/kg	----	----	----	<0.04	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	----	----	----	**92.6**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	----	----	----	**93.0**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	**87.6**	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	**91.6**	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	**82.3**	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	**80.9**	----
Anthracene-d10	1719-06-8	0.5	%	----	----	----	**111**	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	**101**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	**81.2**	**80.1**
Toluene-D8	2037-26-5	0.2	%	----	----	----	**108**	**106**
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	**102**	**98.7**
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	----	----	----	**65.2**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	Composite GS_1+GS_4	Composite GS_2+GS_3	Composite GS_5+GS_6	Composite GS_7+GS_8	Composite GS_9+GS_10
			Client sampling date / time	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-088	EM1511017-089	EM1511017-090	EM1511017-091	EM1511017-092
				Result	Result	Result	Result	Result
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	16.1	16.0	16.9	18.7	19.6
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	----
Asbestos Type	1332-21-4	-	--	----	----	----	----	----
Sample weight (dry)	----	0.01	g	----	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	----
EA200F: Friable Asbestos in Soil (non-NATA)								
^ Friable Asbestos	1332-21-4	0.0004	g	----	----	----	----	----
Free Fibres	----	5	Fibres	----	----	----	----	----
^ Friable Asbestos (as Asbestos in Soil)	1332-21-4	0.001	%	----	----	----	----	----
Weight Used for % Calculation	----	0.0001	kg	----	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	7	6	7	7
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	22	24	23	24	26
Copper	7440-50-8	5	mg/kg	25	49	97	98	77
Lead	7439-92-1	5	mg/kg	16	18	16	17	18
Nickel	7440-02-0	2	mg/kg	14	13	12	13	14
Zinc	7440-66-6	5	mg/kg	65	75	69	73	74
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	Composite GS_1+GS_4	Composite GS_2+GS_3	Composite GS_5+GS_6	Composite GS_7+GS_8	Composite GS_9+GS_10
			Client sampling date / time	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-088	EM1511017-089	EM1511017-090	EM1511017-091	EM1511017-092
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	**0.08**	**0.19**	<0.05	**0.13**	**0.06**
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg	**0.08**	**0.19**	<0.05	**0.13**	**0.06**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

	Compound	CAS Number	LOR	Unit	Composite GS_1+GS_4	Composite GS_2+GS_3	Composite GS_5+GS_6	Composite GS_7+GS_8	Composite GS_9+GS_10
				Client sampling date / time	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]
					EM1511017-088	EM1511017-089	EM1511017-090	EM1511017-091	EM1511017-092
					Result	Result	Result	Result	Result
	EP080/071: Total Petroleum Hydrocarbons								
	C6 - C9 Fraction	----	10	mg/kg	----	----	----	----	----
	C10 - C14 Fraction	----	50	mg/kg	----	----	----	----	----
	C15 - C28 Fraction	----	100	mg/kg	----	----	----	----	----
	C29 - C36 Fraction	----	100	mg/kg	----	----	----	----	----
^	C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
	EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
	C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	----	----	----
^	C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	----	----	----
	>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	----	----	----	----
	>C16 - C34 Fraction	----	100	mg/kg	----	----	----	----	----
	>C34 - C40 Fraction	----	100	mg/kg	----	----	----	----	----
^	>C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
^	>C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	----	----	----
	EP080: BTEXN								
	Benzene	71-43-2	0.2	mg/kg	----	----	----	----	----
	Toluene	108-88-3	0.5	mg/kg	----	----	----	----	----
	Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	----	----
	meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	----	----
	ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	----	----
^	Sum of BTEX	----	0.2	mg/kg	----	----	----	----	----
^	Total Xylenes	1330-20-7	0.5	mg/kg	----	----	----	----	----
	Naphthalene	91-20-3	1	mg/kg	----	----	----	----	----
	EP202A: Phenoxyacetic Acid Herbicides by LCMS								
	4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	2.4-DB	94-82-6	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	Dicamba	1918-00-9	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	Mecoprop	93-65-2	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	MCPA	94-74-6	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	2.4-DP	120-36-5	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	2.4-D	94-75-7	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	Triclopyr	55335-06-3	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	2.4.5-T	93-76-5	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Composite GS_1+GS_4	Composite GS_2+GS_3	Composite GS_5+GS_6	Composite GS_7+GS_8	Composite GS_9+GS_10
Client sampling date / time				[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]
				EM1511017-088	EM1511017-089	EM1511017-090	EM1511017-091	EM1511017-092
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
MCPB	94-81-5	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
Picloram	1918-02-1	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
Clopyralid	1702-17-6	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
Fluroxypyr	69377-81-7	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	94.8	96.6	94.6	85.4	88.2
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	99.8	97.3	102	89.7	97.5
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	60.2	57.1	56.1	57.0	66.5

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Composite GS_11+GS_12	Composite GS_13+GS_17	Composite GS_14+GS_15	Composite GS_16+GS_19	Composite GS_18+GS_22
Client sampling date / time				[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]
				EM1511017-093	EM1511017-094	EM1511017-095	EM1511017-096	EM1511017-097
				Result	Result	Result	Result	Result
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	**22.2**	**19.4**	**17.5**	**17.0**	**13.9**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	----
Asbestos Type	1332-21-4	-	--	----	----	----	----	----
Sample weight (dry)	----	0.01	g	----	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	----
EA200F: Friable Asbestos in Soil (non-NATA)								
^ Friable Asbestos	1332-21-4	0.0004	g	----	----	----	----	----
Free Fibres	----	5	Fibres	----	----	----	----	----
^ Friable Asbestos (as Asbestos in Soil)	1332-21-4	0.001	%	----	----	----	----	----
Weight Used for % Calculation	----	0.0001	kg	----	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**7**	**6**	<5	**5**	**5**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**21**	**22**	**20**	**21**	**21**
Copper	7440-50-8	5	mg/kg	**68**	**77**	**65**	**80**	**45**
Lead	7439-92-1	5	mg/kg	**15**	**15**	**13**	**14**	**15**
Nickel	7440-02-0	2	mg/kg	**12**	**13**	**12**	**12**	**12**
Zinc	7440-66-6	5	mg/kg	**61**	**66**	**73**	**72**	**70**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	Composite GS_11+GS_12	Composite GS_13+GS_17	Composite GS_14+GS_15	Composite GS_16+GS_19	Composite GS_18+GS_22
			Client sampling date / time	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-093	EM1511017-094	EM1511017-095	EM1511017-096	EM1511017-097
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	**0.08**	**0.08**	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg	<0.05	**0.08**	**0.08**	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

				Client sample ID	Composite GS_11+GS_12	Composite GS_13+GS_17	Composite GS_14+GS_15	Composite GS_16+GS_19	Composite GS_18+GS_22
				Client sampling date / time	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]
	Compound	CAS Number	LOR	Unit	EM1511017-093	EM1511017-094	EM1511017-095	EM1511017-096	EM1511017-097
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons									
	C6 - C9 Fraction	----	10	mg/kg	----	----	----	----	----
	C10 - C14 Fraction	----	50	mg/kg	----	----	----	----	----
	C15 - C28 Fraction	----	100	mg/kg	----	----	----	----	----
	C29 - C36 Fraction	----	100	mg/kg	----	----	----	----	----
^	C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
	C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	----	----	----
^	C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	----	----	----
	>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	----	----	----	----
	>C16 - C34 Fraction	----	100	mg/kg	----	----	----	----	----
	>C34 - C40 Fraction	----	100	mg/kg	----	----	----	----	----
^	>C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
^	>C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	----	----	----
EP080: BTEXN									
	Benzene	71-43-2	0.2	mg/kg	----	----	----	----	----
	Toluene	108-88-3	0.5	mg/kg	----	----	----	----	----
	Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	----	----
	meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	----	----
	ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	----	----
^	Sum of BTEX	----	0.2	mg/kg	----	----	----	----	----
^	Total Xylenes	1330-20-7	0.5	mg/kg	----	----	----	----	----
	Naphthalene	91-20-3	1	mg/kg	----	----	----	----	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS									
	4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	2.4-DB	94-82-6	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	Dicamba	1918-00-9	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	Mecoprop	93-65-2	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	MCPA	94-74-6	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	2.4-DP	120-36-5	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	2.4-D	94-75-7	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	Triclopyr	55335-06-3	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
	2.4.5-T	93-76-5	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Composite GS_11+GS_12	Composite GS_13+GS_17	Composite GS_14+GS_15	Composite GS_16+GS_19	Composite GS_18+GS_22
Client sampling date / time				[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]
				EM1511017-093	EM1511017-094	EM1511017-095	EM1511017-096	EM1511017-097
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
MCPB	94-81-5	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
Picloram	1918-02-1	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
Clopyralid	1702-17-6	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
Fluroxypyr	69377-81-7	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	95.5	88.8	102	95.9	97.9
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	77.0	78.1	109	80.0	72.9
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	53.5	58.7	55.8	58.1	51.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	Composite GS_20+GS_23	Composite GS_21+GS_24	Composite GS_25+GS_26	Composite GS_27+GS_28	Composite GS_29+GS_30
			Client sampling date / time	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-098	EM1511017-099	EM1511017-100	EM1511017-101	EM1511017-102
				Result	Result	Result	Result	Result
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	**14.0**	**18.5**	**12.9**	**16.9**	**16.4**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	----
Asbestos Type	1332-21-4	-	--	----	----	----	----	----
Sample weight (dry)	----	0.01	g	----	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	----
EA200F: Friable Asbestos in Soil (non-NATA)								
^ Friable Asbestos	1332-21-4	0.0004	g	----	----	----	----	----
Free Fibres	----	5	Fibres	----	----	----	----	----
^ Friable Asbestos (as Asbestos in Soil)	1332-21-4	0.001	%	----	----	----	----	----
Weight Used for % Calculation	----	0.0001	kg	----	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**5**	**6**	<5	<5	**7**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**21**	**23**	**19**	**27**	**23**
Copper	7440-50-8	5	mg/kg	**42**	**72**	**64**	**30**	**23**
Lead	7439-92-1	5	mg/kg	**13**	**15**	**12**	**16**	**20**
Nickel	7440-02-0	2	mg/kg	**12**	**14**	**10**	**15**	**13**
Zinc	7440-66-6	5	mg/kg	**66**	**71**	**57**	**63**	**65**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Composite GS_20+GS_23	Composite GS_21+GS_24	Composite GS_25+GS_26	Composite GS_27+GS_28	Composite GS_29+GS_30
Client sampling date / time				[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]
				EM1511017-098	EM1511017-099	EM1511017-100	EM1511017-101	EM1511017-102
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	**0.16**	**0.12**	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg	**0.16**	**0.12**	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Composite GS_20+GS_23	Composite GS_21+GS_24	Composite GS_25+GS_26	Composite GS_27+GS_28	Composite GS_29+GS_30
Client sampling date / time				[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]
				EM1511017-098	EM1511017-099	EM1511017-100	EM1511017-101	EM1511017-102
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	----	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	----	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	----	----	----	----	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS								
4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
2.4-DB	94-82-6	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
Dicamba	1918-00-9	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
Mecoprop	93-65-2	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
MCPA	94-74-6	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
2.4-DP	120-36-5	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
2.4-D	94-75-7	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
Triclopyr	55335-06-3	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
2.4.5-T	93-76-5	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Client sample ID				Composite GS_20+GS_23	Composite GS_21+GS_24	Composite GS_25+GS_26	Composite GS_27+GS_28	Composite GS_29+GS_30
Client sampling date / time				[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]	[09-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-098	EM1511017-099	EM1511017-100	EM1511017-101	EM1511017-102
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
MCPB	94-81-5	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
Picloram	1918-02-1	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
Clopyralid	1702-17-6	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
Fluroxypyr	69377-81-7	0.02	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	106	99.5	102	105	100
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	98.3	93.3	88.8	90.6	97.7
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	52.8	62.9	54.2	63.8	52.9

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	MW1	QC5	QC8	QC11	QC13
			Client sampling date / time	[11-Jun-2015]	[09-Jun-2015]	[10-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-078	EM1511017-083	EM1511017-084	EM1511017-085	EM1511017-086
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	**592**	----	----	**596**	<10
EA065: Total Hardness as CaCO3								
^ Total Hardness as CaCO3	----	1	mg/L	**103**	----	----	**99**	<1
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	**0.004**	<0.001	<0.001	**0.004**	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	**0.001**	<0.001
Nickel	7440-02-0	0.001	mg/L	**0.001**	<0.001	<0.001	**0.002**	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	**0.006**	<0.005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
beta-BHC	319-85-7	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
gamma-BHC	58-89-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
delta-BHC	319-86-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Heptachlor	76-44-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Aldrin	309-00-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Dieldrin	60-57-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4.4`-DDE	72-55-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Endrin	72-20-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4.4`-DDD	72-54-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
4.4`-DDT	50-29-3	2	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Methoxychlor	72-43-5	2	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	MW1	QC5	QC8	QC11	QC13
			Client sampling date / time	[11-Jun-2015]	[09-Jun-2015]	[10-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-078	EM1511017-083	EM1511017-084	EM1511017-085	EM1511017-086
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
^ Total Chlordane (sum)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of DDD + DDE + DDT	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.5	%	**71.2**	**75.8**	**89.5**	**84.5**	**92.8**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.5	%	**66.1**	**58.7**	**99.9**	**68.0**	**77.7**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**104**	**99.9**	**99.9**	**99.7**	**102**
Toluene-D8	2037-26-5	2	%	**102**	**97.2**	**99.7**	**89.8**	**98.3**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	MW1	QC5	QC8	QC11	QC13
			Client sampling date / time	[11-Jun-2015]	[09-Jun-2015]	[10-Jun-2015]	[11-Jun-2015]	[11-Jun-2015]
Compound	CAS Number	LOR	Unit	EM1511017-078	EM1511017-083	EM1511017-084	EM1511017-085	EM1511017-086
				Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued								
4-Bromofluorobenzene	460-00-4	2	%	**112**	**114**	**122**	**110**	**112**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	QC14	----	----	----	----
			Client sampling date / time	[11-Jun-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1511017-087	--------	--------	--------	--------
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	----	----	----	----	----
EA065: Total Hardness as CaCO3								
^ Total Hardness as CaCO3	----	1	mg/L	----	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	----	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	----	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	----	----	----	----	----
Copper	7440-50-8	0.001	mg/L	----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	----	----	----	----	----
Lead	7439-92-1	0.001	mg/L	----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	----	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	----	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	----	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	----	----	----	----	----
beta-BHC	319-85-7	0.5	µg/L	----	----	----	----	----
gamma-BHC	58-89-9	0.5	µg/L	----	----	----	----	----
delta-BHC	319-86-8	0.5	µg/L	----	----	----	----	----
Heptachlor	76-44-8	0.5	µg/L	----	----	----	----	----
Aldrin	309-00-2	0.5	µg/L	----	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L	----	----	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L	----	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L	----	----	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L	----	----	----	----	----
Dieldrin	60-57-1	0.5	µg/L	----	----	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L	----	----	----	----	----
Endrin	72-20-8	0.5	µg/L	----	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L	----	----	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L	----	----	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L	----	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L	----	----	----	----	----
4.4`-DDT	50-29-3	2	µg/L	----	----	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L	----	----	----	----	----
Methoxychlor	72-43-5	2	µg/L	----	----	----	----	----

Analytical Results

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	QC14	----	----	----	----
			Client sampling date / time	[11-Jun-2015]	----	----	----	----
				EM1511017-087	--------	--------	--------	--------
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
^ Total Chlordane (sum)	----	0.5	µg/L	----	----	----	----	----
^ Sum of DDD + DDE + DDT	----	0.5	µg/L	----	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L	----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	----	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	----	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L	----	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	----	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	----	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.5	%	----	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.5	%	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**99.2**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**84.0**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

			Client sample ID	**QC14**	----	----	----	----
			Client sampling date / time	[11-Jun-2015]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1511017-087**	--------	--------	--------	--------
				Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued								
4-Bromofluorobenzene	460-00-4	2	%	**107**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	*Client sample ID - Client sampling date / time*	*Analytical Results*
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	HA1 - [11-Jun-2015]	Clay soil with plant matter
EA200: Description	HA2 - [11-Jun-2015]	Clay soil with plant matter
EA200: Description	HA3 - [11-Jun-2015]	Clay soil with plant matter
EA200: Description	HA4 - [11-Jun-2015]	Clay soil with plant matter
EA200: Description	HA5 - [11-Jun-2015]	Clay soil with plant matter
EA200: Description	HA6 - [11-Jun-2015]	Clay soil with plant matter
EA200: Description	HA7 - [11-Jun-2015]	Clay soil with plant matter
EA200: Description	HA8 - [11-Jun-2015]	Clay soil with plant matter

Analysis received by Scott 8/7/15 @ 15.48

Rebatch

Client / Client code: COFTEST
Project: IA10761AB
Project Manger: Patricia Halpin/Jack McBain
Instructions received: Wednesday, 8 July 2015
Due date: ASAP
Due date surcharge:

Client aware of any holding time issues

New Tray:
MS 1913
Tom 8/7

Additional Information:

URGENT

Environmental Division
Melbourne
Work Order Reference
EM1511798

Telephone : +61-3-8549 9600

New Lab ID	Sample information						Number of Containers	Analysis										Shortest Holding time expiry
								Standard					Leach					
	Client ID	Sampling Date / Time	Previous Work Order Reference	Previous ALS ID	Tray Number(s)	Container		CEC	pH CaCl									
1	GS_1	9/06/2015 0:00	EM1511017	1	MS1675-	250ml jar	1	X	X									16-Jun-15
2	GS_4	9/06/2015 0:00	EM1511017	4	1683	" "	1	X	X									16-Jun-15
						TOTAL	0											

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1511798**		
Client	: **COFFEY TESTING**	Laboratory	: Environmental Division Melbourne
Contact	: MS PATRICIA HALPIN	Telephone	: +61-3-8549 9636
Project	: IA10761AB	Date Samples Received	: 08-Jul-2015
Site	: ----	Issue Date	: 10-Jul-2015
Sampler	: JACK MCBAIN	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)		Extraction / Preparation: Date extracted	Due for extraction	Days overdue	Analysis: Date analysed	Due for analysis	Days overdue
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved							
GS_1,	GS_4	09-Jul-2015	16-Jun-2015	**23**	----	----	----
ED007: Exchangeable Cations							
Soil Glass Jar - Unpreserved							
GS_1,	GS_4	09-Jul-2015	07-Jul-2015	**2**	10-Jul-2015	07-Jul-2015	**3**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Exchangeable Cations with pre-treatment	0	0	0.00	10.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)					
Exchangeable Cations	0	2	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	0	0	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)					
Exchangeable Cations with pre-treatment	0	0	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ✘ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Due for extraction	Evaluation	Analysis: Date analysed	Due for analysis	Evaluation
EA001: pH in soil using 0.01M CaCl extract								
Soil Glass Jar - Unpreserved (EA001)								
GS_1,	GS_4	**09-Jun-2015**	**09-Jul-2015**	16-Jun-2015	✘	**09-Jul-2015**	09-Jul-2015	✓
ED007: Exchangeable Cations								
Soil Glass Jar - Unpreserved (ED007)								
GS_1,	GS_4	**09-Jun-2015**	**09-Jul-2015**	07-Jul-2015	✘	**10-Jul-2015**	07-Jul-2015	✘

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✘ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Exchangeable Cations	ED007	1	2	**50.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	ED008	0	0	**0.00**	**10.00**	✘	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH in soil using a 0.01M CaCl2 extract	EA001	1	2	**50.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Exchangeable Cations	ED007	0	2	**0.00**	**5.00**	✘	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	ED008	0	0	**0.00**	**5.00**	✘	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Exchangeable Cations	ED007	1	2	**50.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	ED008	0	0	**0.00**	**5.00**	✘	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Higginson 4B1 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons (2011) Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)

QUALITY CONTROL REPORT

Work Order	: **EM1511798**	Page	: 1 of 4
Client	: **COFFEY TESTING**	Laboratory	: Environmental Division Melbourne
Contact	: MS PATRICIA HALPIN	Contact	: Bronwyn Sheen
Address	: 1/314 Kiewa Street ALBURY 2640	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: patricia.halpin@coffey.com	E-mail	: bronwyn.sheen@alsglobal.com
Telephone	: 02 6023 3799	Telephone	: +61-3-8549 9636
Facsimile	: ----	Facsimile	: +61-3-8549 9601
Project	: IA10761AB	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 08-Jul-2015
C-O-C number	: ----	Date Analysis Commenced	: 09-Jul-2015
Sampler	: JACK MCBAIN	Issue Date	: 10-Jul-2015
Site	: ----	No. of samples received	: 2
Quote number	: ----	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 149419)									
EM1511798-001	GS_1	EA001: pH (CaCl2)	----	0.1	pH Unit	6.3	6.3	0.00	0% - 20%
ED007: Exchangeable Cations (QC Lot: 149418)									
EM1511798-001	GS_1	ED007: Cation Exchange Capacity	----	0.1	meq/100g	9.1	9.1	0.00	0% - 20%
		ED007: Exchangeable Calcium	----	0.1	meq/100g	7.9	7.9	0.00	0% - 20%
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	0.9	0.9	0.00	No Limit
		ED007: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	0.2	0.2	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED007: Exchangeable Cations (QCLot: 149418)								
ED007: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	----	----	----	----
ED007: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	----	----	----	----
ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	----	----	----	----
ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

CERTIFICATE OF ANALYSIS

Work Order	: **EM1511798**	Page	: 1 of 2
Client	: **COFFEY TESTING**	Laboratory	: Environmental Division Melbourne
Contact	: MS PATRICIA HALPIN	Contact	: Bronwyn Sheen
Address	: 1/314 Kiewa Street ALBURY 2640	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: patricia.halpin@coffey.com	E-mail	: bronwyn.sheen@alsglobal.com
Telephone	: 02 6023 3799	Telephone	: +61-3-8549 9636
Facsimile	: ----	Facsimile	: +61-3-8549 9601
Project	: IA10761AB	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 08-Jul-2015 15:48
C-O-C number	: ----	Date Analysis Commenced	: 09-Jul-2015
Sampler	: JACK MCBAIN	Issue Date	: 10-Jul-2015 13:23
Site	: ----		
		No. of samples received	: 2
Quote number	: ----	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl (Method 15G1) is a more suitable method for the determination of exchange acidity (H+ + Al3+).

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**GS_1**	**GS_4**	**----**	**----**	**----**
			Client sampling date / time	[09-Jun-2015]	[09-Jun-2015]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1511798-001**	**EM1511798-002**	**--------**	**--------**	**--------**
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	**6.3**	**5.9**	----	----	----
ED007: Exchangeable Cations								
^ **Exchangeable Calcium**	----	0.1	meq/100g	**7.9**	**6.6**	----	----	----
^ **Exchangeable Magnesium**	----	0.1	meq/100g	**0.9**	**1.4**	----	----	----
^ **Exchangeable Potassium**	----	0.1	meq/100g	**0.2**	**0.4**	----	----	----
^ **Exchangeable Sodium**	----	0.1	meq/100g	**0.2**	**0.1**	----	----	----
^ **Cation Exchange Capacity**	----	0.1	meq/100g	**9.1**	**8.5**	----	----	----

coffey

Chain of Custody

No: 08834

Laboratory Quotation / Order No: A160-1436

Job No: JA10761AB

Sheet 1 of 1

Dispatch to: (Address & Phone No.)	MGT 2-5 Kingstontown close oakleigh.
Sampled by:	J. McBain
Consigning Officer:	J. McBain
Date Dispatched:	15/6/15
Attention:	Sample receipt
Project Manager: (report results to)	Patricia Halpin (invoice: albury@coffey.com
Courier Service:	TNT
Consignment Note No:	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
J. McBain	15/6/15	2pm	TNT .		
			Catherine EF/mar	17/6	11.18am

Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled	PAHs	TPHs	MAHs = BTEX	Metals:	S26	metals 8	OCPs	herbicides	tph/btex							Sample Condition on Receipt
	Soil	Soil jar	QC2*	9/6/15						X	X	X								
			QC4																	
			QC7*	10/6/15						X	X		X							
			QC10	11/6/15																
			QC12	" "																

Special Laboratory Instructions:

461773

Detection Limits:

Turnaround Required:

JOB NUMBER **MUST** BE REFERENCED ON ALL SUBSEQUENT PAGES

642209-06

Copies: **WHITE:** Sign on release. **YELLOW:** If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. **BLUE:** To be returned with results.

Sample Receipt Advice

Company name:	**Coffey Testing Pty Ltd ALB**
Contact name:	Patricia Halpin
Project name:	IA10761AB
COC number:	08834
Turn around time:	5 Day
Date/Time received:	Jun 17, 2015 11:18 AM
Eurofins | mgt reference:	**461773**

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 10.9 degrees Celsius.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Appropriate sample containers have been used.
- ☑ Sample containers for volatile analysis received with zero headspace.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

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

Mary Makarios on Phone : +61 3 8564 5000 or by e.mail: MaryMakarios@eurofins.com.au

Results will be delivered electronically via e.mail to Patricia Halpin - Patricia_Halpin@coffey.com.

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Coffey Testing Pty Ltd ALB	**Order No.:**		**Received:**	Jun 17, 2015 11:18 AM
Address:	1/314 Kiewa Street Albury NSW 2640	**Report #:**	461773	**Due:**	Jun 24, 2015
		Phone:	02 6023 3799	**Priority:**	5 Day
		Fax:	02 6023 3644	**Contact Name:**	Patricia Halpin
Project Name:	IA10761AB				

Eurofins | mgt Client Manager: Mary Makarios

Sample Detail					HOLD	Organochlorine Pesticides	Acid Herbicides	Metals M8	BTEX	Total Recoverable Hydrocarbons	Moisture Set
Laboratory where analysis is conducted											
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
External Laboratory											
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
QC2	Jun 09, 2015		Soil	M15-Jn13959		X	X	X			X
QC7	Jun 10, 2015		Soil	M15-Jn13960		X		X	X	X	X
QC4	Jun 09, 2015		Soil	M15-Jn13961	X						
QC10	Jun 11, 2015		Soil	M15-Jn13962	X						
QC12	Jun 11, 2015		Water	M15-Jn13963	X						

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Coffey Testing Pty Ltd ALB
1/314 Kiewa Street
Albury
NSW 2640

Attention: **Patricia Halpin**

Report **461773-S**
Project name IA10761AB
Received Date Jun 17, 2015

Client Sample ID			**QC2**	**QC7**
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**M15-Jn13959**	**M15-Jn13960**
Date Sampled			**Jun 09, 2015**	**Jun 10, 2015**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	-	< 20
TRH C10-C14	20	mg/kg	-	< 20
TRH C15-C28	50	mg/kg	-	< 50
TRH C29-C36	50	mg/kg	-	< 50
TRH C10-36 (Total)	50	mg/kg	-	< 50
BTEX				
Benzene	0.1	mg/kg	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	116
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	0.13
4.4'-DDE	0.05	mg/kg	0.23	0.39
4.4'-DDT	0.05	mg/kg	< 0.1	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05

Client Sample ID			QC2	QC7
Sample Matrix			Soil	Soil
Eurofins | mgt Sample No.			M15-Jn13959	M15-Jn13960
Date Sampled			Jun 09, 2015	Jun 10, 2015
Test/Reference	LOR	Unit		
Organochlorine Pesticides				
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1
Dibutylchlorendate (surr.)	1	%	127	107
Tetrachloro-m-xylene (surr.)	1	%	146	121
Acid Herbicides				
2.4-D	0.5	mg/kg	< 0.5	-
2.4-DB	0.5	mg/kg	< 0.5	-
2.4.5-T	0.5	mg/kg	< 0.5	-
2.4.5-TP	0.5	mg/kg	< 0.5	-
Actril (loxynil)	0.5	mg/kg	< 0.5	-
Dicamba	0.5	mg/kg	< 0.5	-
Dichlorprop	0.5	mg/kg	< 0.5	-
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-
Dinoseb	0.5	mg/kg	< 0.5	-
MCPA	0.5	mg/kg	< 0.5	-
MCPB	0.5	mg/kg	< 0.5	-
Mecoprop	0.5	mg/kg	< 0.5	-
Warfarin (surr.)	1	%	78	-
Heavy Metals				
Arsenic	2	mg/kg	4.1	4.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4
Chromium	5	mg/kg	18	16
Copper	5	mg/kg	24	11
Lead	5	mg/kg	11	11
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	9.7	8.2
Zinc	5	mg/kg	54	51
% Moisture	0.1	%	13	15

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 18, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 18, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
BTEX	Melbourne	Jun 18, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Organochlorine Pesticides	Melbourne	Jun 18, 2015	14 Day
- Method: USEPA 8081 Organochlorine Pesticides			
Acid Herbicides	Melbourne	Jun 18, 2015	14 Day
- Method: MGT 530			
Metals M8	Melbourne	Jun 18, 2015	28 Day
- Method: USEPA 6010/6020 Heavy Metals & USEPA 7470/71 Mercury			
% Moisture	Melbourne	Jun 17, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name:	Coffey Testing Pty Ltd ALB	**Order No.:**		**Received:**	Jun 17, 2015 11:18 AM
Address:	1/314 Kiewa Street Albury NSW 2640	**Report #:**	461773	**Due:**	Jun 24, 2015
		Phone:	02 6023 3799	**Priority:**	5 Day
		Fax:	02 6023 3644	**Contact Name:**	Patricia Halpin
Project Name:	IA10761AB				

Eurofins | mgt Client Manager: Mary Makarios

Sample Detail					HOLD	Organochlorine Pesticides	Acid Herbicides	Metals M8	BTEX	Total Recoverable Hydrocarbons	Moisture Set
Laboratory where analysis is conducted											
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
External Laboratory											
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
QC2	Jun 09, 2015		Soil	M15-Jn13959		X	X	X			X
QC7	Jun 10, 2015		Soil	M15-Jn13960		X		X	X	X	X
QC4	Jun 09, 2015		Soil	M15-Jn13961	X						
QC10	Jun 11, 2015		Soil	M15-Jn13962	X						
QC12	Jun 11, 2015		Water	M15-Jn13963	X						

Eurofins | mgt Internal Quality Control Review and Glossary

General

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

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

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

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

UNITS

mg/kg: milligrams per Kilogram
ug/l: micrograms per litre
ppb: Parts per billion
org/100ml: Organisms per 100 millilitres
MPN/100mL: Most Probable Number of organisms per 100 millilitres
mg/l: milligrams per litre
ppm: Parts per million
%: Percentage
NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

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

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH C6-C10 less BTEX (F1)	mg/kg	< 20			20	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Acid Herbicides							
2.4-D	mg/kg	< 0.5			0.5	Pass	
2.4-DB	mg/kg	< 0.5			0.5	Pass	
2.4.5-T	mg/kg	< 0.5			0.5	Pass	
2.4.5-TP	mg/kg	< 0.5			0.5	Pass	
Actril (Ioxynil)	mg/kg	< 0.5			0.5	Pass	
Dicamba	mg/kg	< 0.5			0.5	Pass	
Dichlorprop	mg/kg	< 0.5			0.5	Pass	
Dinitro-o-cresol	mg/kg	< 0.5			0.5	Pass	
Dinoseb	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	92			70-130	Pass	
TRH C10-C14	%	111			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	88			70-130	Pass	
Toluene	%	82			70-130	Pass	
Ethylbenzene	%	79			70-130	Pass	
m&p-Xylenes	%	79			70-130	Pass	
Xylenes - Total	%	79			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	76			75-125	Pass	
TRH C6-C10	%	94			70-130	Pass	
TRH >C10-C16	%	112			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	105			70-130	Pass	
4.4'-DDE	%	110			70-130	Pass	
4.4'-DDT	%	123			70-130	Pass	
a-BHC	%	108			70-130	Pass	
Aldrin	%	110			70-130	Pass	
b-BHC	%	113			70-130	Pass	
d-BHC	%	113			70-130	Pass	
Dieldrin	%	103			70-130	Pass	
Endosulfan I	%	110			70-130	Pass	
Endosulfan II	%	108			70-130	Pass	
Endosulfan sulphate	%	110			70-130	Pass	
Endrin	%	108			70-130	Pass	
Endrin aldehyde	%	93			70-130	Pass	
Endrin ketone	%	107			70-130	Pass	
g-BHC (Lindane)	%	106			70-130	Pass	
Heptachlor	%	119			70-130	Pass	
Heptachlor epoxide	%	108			70-130	Pass	
Hexachlorobenzene	%	104			70-130	Pass	
Methoxychlor	%	104			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2.4-D	%	108			70-130	Pass	
2.4-DB	%	97			70-130	Pass	
2.4.5-T	%	106			70-130	Pass	
2.4.5-TP	%	102			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Actril (Ioxynil)			%	114			70-130	Pass	
Dicamba			%	113			70-130	Pass	
Dichlorprop			%	103			70-130	Pass	
Dinitro-o-cresol			%	104			70-130	Pass	
Dinoseb			%	105			70-130	Pass	
MCPA			%	110			70-130	Pass	
MCPB			%	92			70-130	Pass	
Mecoprop			%	109			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	95			80-120	Pass	
Cadmium			%	95			80-120	Pass	
Chromium			%	101			80-120	Pass	
Copper			%	115			80-120	Pass	
Lead			%	102			80-120	Pass	
Mercury			%	119			75-125	Pass	
Nickel			%	112			80-120	Pass	
Zinc			%	116			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M15-Jn11824	NCP	%	105			70-130	Pass	
4.4'-DDE	M15-Jn11824	NCP	%	92			70-130	Pass	
4.4'-DDT	M15-Jn11824	NCP	%	72			70-130	Pass	
a-BHC	M15-Jn11824	NCP	%	104			70-130	Pass	
Aldrin	M15-Jn11824	NCP	%	101			70-130	Pass	
b-BHC	M15-Jn11824	NCP	%	115			70-130	Pass	
d-BHC	M15-Jn11824	NCP	%	112			70-130	Pass	
Dieldrin	M15-Jn11824	NCP	%	100			70-130	Pass	
Endosulfan I	M15-Jn11824	NCP	%	90			70-130	Pass	
Endosulfan II	M15-Jn11824	NCP	%	88			70-130	Pass	
Endosulfan sulphate	M15-Jn11824	NCP	%	82			70-130	Pass	
Endrin	M15-Jn11824	NCP	%	94			70-130	Pass	
Endrin aldehyde	M15-Jn11824	NCP	%	77			70-130	Pass	
Endrin ketone	M15-Jn11824	NCP	%	84			70-130	Pass	
g-BHC (Lindane)	M15-Jn11824	NCP	%	100			70-130	Pass	
Heptachlor	M15-Jn11824	NCP	%	88			70-130	Pass	
Heptachlor epoxide	M15-Jn11824	NCP	%	97			70-130	Pass	
Hexachlorobenzene	M15-Jn11824	NCP	%	88			70-130	Pass	
Methoxychlor	M15-Jn11824	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Acid Herbicides				Result 1					
2.4-D	S15-Jn12076	NCP	%	94			70-130	Pass	
Actril (Ioxynil)	S15-Jn12076	NCP	%	96			70-130	Pass	
Dichlorprop	S15-Jn12076	NCP	%	92			70-130	Pass	
MCPA	S15-Jn12076	NCP	%	96			70-130	Pass	
MCPB	S15-Jn12076	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M15-Jn14527	NCP	%	95			75-125	Pass	
Cadmium	M15-Jn14527	NCP	%	85			75-125	Pass	
Chromium	M15-Jn14527	NCP	%	115			75-125	Pass	
Copper	M15-Jn14527	NCP	%	116			75-125	Pass	
Lead	M15-Jn14527	NCP	%	82			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mercury	M15-Jn16076	NCP	%	113			70-130	Pass	
Nickel	M15-Jn14527	NCP	%	87			75-125	Pass	
Zinc	M15-Jn14527	NCP	%	90			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M15-Jn14312	NCP	%	88			70-130	Pass	
TRH C10-C14	M15-Jn14312	NCP	%	120			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M15-Jn14312	NCP	%	99			70-130	Pass	
Toluene	M15-Jn14312	NCP	%	97			70-130	Pass	
Ethylbenzene	M15-Jn14312	NCP	%	99			70-130	Pass	
m&p-Xylenes	M15-Jn14312	NCP	%	98			70-130	Pass	
o-Xylene	M15-Jn14312	NCP	%	99			70-130	Pass	
Xylenes - Total	M15-Jn14312	NCP	%	99			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M15-Jn14312	NCP	%	95			70-130	Pass	
TRH C6-C10	M15-Jn14312	NCP	%	80			70-130	Pass	
TRH >C10-C16	M15-Jn14312	NCP	%	121			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M15-Jn12778	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M15-Jn12778	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M15-Jn12778	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Acid Herbicides				Result 1	Result 2	RPD			
2.4-D	M15-Jn10449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-DB	M15-Jn10449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-T	M15-Jn10449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-TP	M15-Jn10449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Actril (Ioxynil)	M15-Jn10449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dicamba	M15-Jn10449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorprop	M15-Jn10449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinitro-o-cresol	M15-Jn10449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

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Duplicate									
Acid Herbicides				Result 1	Result 2	RPD			
Dinoseb	M15-Jn10449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPA	M15-Jn10449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPB	M15-Jn10449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Mecoprop	M15-Jn10449	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M15-Jn14188	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	M15-Jn14188	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M15-Jn14188	NCP	mg/kg	65	65	1.0	30%	Pass	
Copper	M15-Jn14188	NCP	mg/kg	14	14	1.0	30%	Pass	
Lead	M15-Jn14188	NCP	mg/kg	5.6	< 5	21	30%	Pass	
Mercury	M15-Jn16076	NCP	mg/kg	0.60	0.50	15	30%	Pass	
Nickel	M15-Jn14188	NCP	mg/kg	25	25	<1	30%	Pass	
Zinc	M15-Jn14188	NCP	mg/kg	15	15	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M15-Jn13958	NCP	%	18	17	9.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M15-Jn13960	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M15-Jn13960	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M15-Jn13960	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M15-Jn13960	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M15-Jn13960	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M15-Jn13960	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M15-Jn13960	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M15-Jn13960	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M15-Jn13960	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M15-Jn13960	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M15-Jn13960	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B15-Jn13715	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10 less BTEX (F1)	B15-Jn13715	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M15-Jn13960	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M15-Jn13960	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M15-Jn13960	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.

Authorised By

Mary Makarios	Analytical Services Manager
Carroll Lee	Senior Analyst-Organic (VIC)
Carroll Lee	Senior Analyst-Volatile (VIC)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)

Glenn Jackson
National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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Appendix D - Borelogs

Soil Description Explanation Sheet (1 of 2)

DEFINITION:
In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME
Soils are described in accordance with the Unified Soil Classification (UCS) as shown in the table on Sheet 2.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	fine	2.36 mm to 6 mm
Sand	coarse	600 µm to 2.36 mm
	medium	200 µm to 600 µm
	fine	75 µm to 200 µm

MOISTURE CONDITION

Dry Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.

Moist Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.

Wet As for moist but with free water forming on hands when handled.

CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH s_u (kPa)	FIELD GUIDE
Very Soft	<12	A finger can be pushed well into the soil with little effort.
Soft	12 - 25	A finger can be pushed into the soil to about 25mm depth.
Firm	25 - 50	The soil can be indented about 5mm with the thumb, but not penetrated.
Stiff	50 - 100	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 - 200	The surface of the soil can be marked, but not indented with thumb pressure.
Hard	>200	The surface of the soil can be marked only with the thumbnail.
Friable	–	Crumbles or powders when scraped by thumbnail.

DENSITY OF GRANULAR SOILS

TERM	DENSITY INDEX (%)
Very loose	Less than 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	Greater than 85

MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 - 12% Fine grained soils: 15 - 30%

SOIL STRUCTURE

ZONING		CEMENTING	
Layers	Continuous across exposure or sample.	Weakly cemented	Easily broken up by hand in air or water.
Lenses	Discontinuous layers of lenticular shape.	Moderately cemented	Effort is required to break up the soil by hand in air or water.
Pockets	Irregular inclusions of different material.		

GEOLOGICAL ORIGIN

WEATHERED IN PLACE SOILS

Extremely weathered material	Structure and fabric of parent rock visible.
Residual soil	Structure and fabric of parent rock not visible.

TRANSPORTED SOILS

Aeolian soil	Deposited by wind.
Alluvial soil	Deposited by streams and rivers.
Colluvial soil	Deposited on slopes (transported downslope by gravity).
Fill	Man made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.
Lacustrine soil	Deposited by lakes.
Marine soil	Deposited in ocean basins, bays, beaches and estuaries.

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Soil Description Explanation Sheet (2 of 2)

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

(A 0.075 mm particle is about the smallest particle visible to the naked eye)

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 60 mm and basing fractions on estimated mass)				USC	PRIMARY NAME
COARSE GRAINED SOILS More than 50% of materials less than 63 mm is larger than 0.075 mm	GRAVELS More than half of coarse fraction is larger than 2.36 mm	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes.	GW	GRAVEL
			Predominantly one size or a range of sizes with more intermediate sizes missing.	GP	GRAVEL
		GRAVELS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below)	GM	SILTY GRAVEL
			Plastic fines (for identification procedures see CL below)	GC	CLAYEY GRAVEL
	SANDS More than half of coarse fraction is smaller than 2.36 mm	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate sizes	SW	SAND
			Predominantly one size or a range of sizes with some intermediate sizes missing.	SP	SAND
		SANDS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).	SM	SILTY SAND
			Plastic fines (for identification procedures see CL below).	SC	CLAYEY SAND

FINE GRAINED SOILS More than 50% of material less than 63 mm is smaller than 0.075 mm	IDENTIFICATION PROCEDURES ON FRACTIONS <0.2 mm.				
	DRY STRENGTH	**DILATANCY**	**TOUGHNESS**	**USC**	**PRIMARY NAME**
SILTS & CLAYS Liquid limit less than 50	None to Low	Quick to slow	None	ML	SILT
	Medium to High	None	Medium	CL	CLAY
	Low to medium	Slow to very slow	Low	OL	ORGANIC SILT
SILTS & CLAYS Liquid limit greater than 50	Low to medium	Slow to very slow	Low to medium	MH	SILT
	High	None	High	CH	CLAY
	Medium to High	None	Low to medium	OH	ORGANIC CLAY

		USC	PRIMARY NAME
HIGHLY ORGANIC SOILS	Readily identified by colour, odour, spongy feel and frequently by fibrous texture.	Pt	PEAT

• Low plasticity – Liquid Limit w_L less than 35%. • Medium plasticity – w_L between 35% and 50%. • High plasticity – w_L greater than 50%.

COMMON DEFECTS IN SOIL

TERM	DEFINITION	DIAGRAM
PARTING	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.	
JOINT	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. The term 'fissure' may be used for irregular joints <0.2 m in length.	
SHEARED ZONE	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.	
SHEARED SURFACE	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect.	

TERM	DEFINITION	DIAGRAM
SOFTENED ZONE	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere.	
TUBE	Tubular cavity. May occur singly or as one of a large number of separate or inter-connected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter	
TUBE CAST	Roughly cylindrical elongated body of soil different from the soil mass in which it occurs. In some cases the soil which makes up the tube cast is cemented.	
INFILLED SEAM	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open joints.	

Drilling Log

Soil Boring **HA1**

Project	Former Willowbank Orchard ESA			Owner	Mario Riccardi		
Location	Willowbank Road, South Albury, NSW			Proj. No.	INFOALBU10761AB		
Surface Elev.	NA	Total Hole Depth	1.0 m.	North	NA	East	NA
Top of Casing	NA	Water Level Initial	NA	Static	NA	Diameter	
Screen: Dia	NA	Length	NA	Type/Size	NA		
Casing: Dia	NA	Length	NA	Type	NA		
Fill Material				Rig/Core	N/A		
Drill Co.	N/A	Method	Hand-auger				
Driller	JM	Log By	JM	Date	11/6/15	Permit #	NA
Checked By	PH	License No.					

COMMENTS

Depth (m.)	PID (ppm)	Sample ID / % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic descriptions are based on ASTM Standard D 2487-93 and the USCS.
0		HA1_0.0-0.1			CL	TOPSOIL: Silty Sandy CLAY: medium plasticity, dark brown, fine grained sand.
					CL	Sandy CLAY: Low to medium plasticity, dark brown, fine grained sand.
		HA1_0.5-0.7			CL	CLAY: Low to medium plasticity, brown/orange, some fine grained sand.
1		HA1_1.0-1.2				
2						

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Drilling Log

Soil Boring **HA2**

Project	*Former Willowbank Orchard ESA*	Owner	*Mario Riccardi*
Location	*Willowbank Road, South Albury, NSW*	Proj. No.	*INFOALBU10761AB*

Surface Elev.	*NA*	Total Hole Depth	*1.0 m.*	North	*NA*	East	*NA*
Top of Casing	*NA*	Water Level Initial	*NA*	Static	*NA*	Diameter	
Screen: Dia	*NA*	Length	*NA*	Type/Size	*NA*		
Casing: Dia	*NA*	Length	*NA*	Type	*NA*		
Fill Material		Rig/Core	*N/A*				
Drill Co.	*N/A*	Method	*Hand-auger*				
Driller	*JM*	Log By	*JM*	Date	*11/6/15*	Permit #	*NA*
Checked By	*PH*	License No.					

COMMENTS

Depth (m.)	PID (ppm)	Sample ID / % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic descriptions are based on ASTM Standard D 2487-93 and the USCS.
0		HA2_0.0-0.1			CL	TOPSOIL: Silty Sandy CLAY: medium plasticity, dark brown, fine grained sand.
		HA2_0.5-0.7			CL	Sandy CLAY: Low to medium plasticity, dark brown, fine grained sand.
1		HA2_1.0-1.2			CL	CLAY: Low to medium plasticity, brown/orange, some fine grained sand.
2						

coffey

Drilling Log

Soil Boring **HA3**

Project *Former Willowbank Orchard ESA* Owner *Mario Riccardi*

Location *Willowbank Road, South Albury, NSW* Proj. No. *INFOALBU10761AB*

Surface Elev. *NA* Total Hole Depth *1.0 m.* North *NA* East *NA*

Top of Casing *NA* Water Level Initial *NA* Static *NA* Diameter

Screen: Dia *NA* Length *NA* Type/Size *NA*

Casing: Dia *NA* Length *NA* Type *NA*

Fill Material Rig/Core *N/A*

Drill Co. *N/A* Method *Hand-auger*

Driller *JM* Log By *JM* Date *11/6/15* Permit # *NA*

Checked By *PH* License No.

COMMENTS

Depth (m.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic descriptions are based on ASTM Standard D 2487-93 and the USCS.
0		HA3_0.0-0.1			CL	TOPSOIL: Silty Sandy CLAY: medium plasticity, dark brown, fine grained sand.
		HA3_0.5-0.7			CL	Sandy CLAY: Low plasticity, dark brown, fine grained sand.
1		HA3_1.0-1.2			CL	CLAY: Medium plasticity, brown, traces of fine grained sand.
2						

Drilling Log

Soil Boring **HA4**

Page: 1 of 1

Project	*Former Willowbank Orchard ESA*	Owner	*Mario Riccardi*		
Location	*Willowbank Road, South Albury, NSW*	Proj. No.	*INFOALBU10761AB*		
Surface Elev.	*NA*	Total Hole Depth	*1.0 m.*	North *NA*	East *NA*
Top of Casing	*NA*	Water Level Initial	*NA*	Static *NA*	Diameter
Screen: Dia	*NA*	Length	*NA*	Type/Size	*NA*
Casing: Dia	*NA*	Length	*NA*	Type	*NA*
Fill Material		Rig/Core	*N/A*		
Drill Co.	*N/A*	Method	*Hand-auger*		
Driller	*JM*	Log By	*JM*	Date *11/6/15*	Permit # *NA*
Checked By	*PH*	License No.			

COMMENTS

Depth (m.)	PID (ppm)	Sample ID / % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic descriptions are based on ASTM Standard D 2487-93 and the USCS.
0		HA4_0.0-0.1			CL	TOPSOIL: Silty Sandy CLAY: medium plasticity, dark brown, fine grained sand.
		HA4_0.5-0.7			CL	Sandy CLAY: Low plasticity, dark brown, fine grained sand.
1		HA4_1.0-1.2			CL	CLAY: Low to medium plasticity, brown, traces of fine grained sand.
2						

Drilling Log

Soil Boring **HA5**

Project	*Former Willowbank Orchard ESA*		Owner	*Mario Riccardi*			
Location	*Willowbank Road, South Albury, NSW*			Proj. No.	*INFOALBU10761AB*		
Surface Elev.	*NA*	Total Hole Depth	*1.0 m.*	North	*NA*	East	*NA*
Top of Casing	*NA*	Water Level Initial	*NA*	Static	*NA*	Diameter	
Screen: Dia	*NA*	Length	*NA*	Type/Size	*NA*		
Casing: Dia	*NA*	Length	*NA*	Type	*NA*		
Fill Material				Rig/Core	*N/A*		
Drill Co.	*N/A*		Method	*Hand-auger*			
Driller	*JM*	Log By	*JM*	Date	*11/6/15*	Permit #	*NA*
Checked By	*PH*		License No.				

COMMENTS

Depth (m.)	PID (ppm)	Sample ID / % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic descriptions are based on ASTM Standard D 2487-93 and the USCS.
0		HA5_0.0-0.1			CL	TOPSOIL: Silty Sandy CLAY: medium plasticity, dark brown, fine to medium grained sand.
					SC	Clayey SAND: Fine to medium grained sand, light brown, low plasticity.
		HA5_0.5-0.7			CL	Sandy CLAY: Low plasticity, light brown, fine to medium grained sand.
1		HA5_1.0-1.2				
2						

COFFEY ENVIRONMENTS Rev: 16/7/13 INFOALBU10761AB - LOGS.GPJ IT_CORP.GDT 21/7/15

Drilling Log

Soil Boring **HA6**

Project: *Former Willowbank Orchard ESA* — Owner: *Mario Riccardi*
Location: *Willowbank Road, South Albury, NSW* — Proj. No.: *INFOALBU10761AB*
Surface Elev.: *NA* — Total Hole Depth: *1.0 m.* — North: *NA* — East: *NA*
Top of Casing: *NA* — Water Level Initial: *NA* — Static: *NA* — Diameter:
Screen: Dia: *NA* — Length: *NA* — Type/Size: *NA*
Casing: Dia: *NA* — Length: *NA* — Type: *NA*
Fill Material: — Rig/Core: *N/A*
Drill Co.: *N/A* — Method: *Hand-auger*
Driller: *JM* — Log By: *JM* — Date: *11/6/15* — Permit #: *NA*
Checked By: *PH* — License No.:

COMMENTS

Depth (m.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic descriptions are based on ASTM Standard D 2487-93 and the USCS.
0		HA6_0.0-0.1			CL	TOPSOIL: Silty Sandy CLAY: medium plasticity, dark brown, fine to medium grained sand.
		HA6_0.5-0.7			SC	Clayey SAND: Fine to medium grained sand, light brown, low plasticity.
1		HA6_1.0-1.2			CL	Sandy CLAY: Low plasticity, light brown, fine to medium grained sand.
2						

Drilling Log

Soil Boring **HA7**

Project	*Former Willowbank Orchard ESA*			Owner	*Mario Riccardi*		
Location	*Willowbank Road, South Albury, NSW*			Proj. No.	*INFOALBU10761AB*		
Surface Elev.	*NA*	Total Hole Depth	*1.0 m.*	North	*NA*	East	*NA*
Top of Casing	*NA*	Water Level Initial	*NA*	Static	*NA*	Diameter	
Screen: Dia	*NA*	Length	*NA*	Type/Size	*NA*		
Casing: Dia	*NA*	Length	*NA*	Type	*NA*		
Fill Material				Rig/Core	*N/A*		
Drill Co.	*N/A*	Method	*Hand-auger*				
Driller	*JM*	Log By	*JM*	Date	*11/6/15*	Permit #	*NA*
Checked By	*PH*	License No.					

COMMENTS

Depth (m.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic descriptions are based on ASTM Standard D 2487-93 and the USCS.
0		HA7_0.0-0.1			CL	TOPSOIL: Silty Sandy CLAY: medium plasticity, dark brown, fine to medium grained sand.
		HA7_0.5-0.7			SC	Clayey SAND: Fine to medium grained sand, light brown, low plasticity.
1		HA7_1.0-1.2			CL	Sandy CLAY: Low plasticity, light brown, fine to medium grained sand.
2						

Drilling Log

Soil Boring **HA8**

Project: Former Willowbank Orchard ESA | Owner: Mario Riccardi

Location: Willowbank Road, South Albury, NSW | Proj. No.: INFOALBU10761AB

Surface Elev.: NA | Total Hole Depth: 1.0 m. | North: NA | East: NA

Top of Casing: NA | Water Level Initial: NA | Static: NA | Diameter:

Screen: Dia: NA | Length: NA | Type/Size: NA

Casing: Dia: NA | Length: NA | Type: NA

Fill Material: | Rig/Core: N/A

Drill Co.: N/A | Method: Hand-auger

Driller: JB | Log By: JB | Date: 11/6/15 | Permit #: NA

Checked By: PH | License No.:

COMMENTS

Depth (m.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic descriptions are based on ASTM Standard D 2487-93 and the USCS.
0		HA8_0.0-0.1			CL	TOPSOIL: Silty Sandy CLAY: medium plasticity, dark brown, fine to medium grained sand.
					SC	Clayey SAND: Fine to medium grained sand, light brown, low plasticity.
		HA8_0.5-0.7				
					CL	Sandy CLAY: Low plasticity, light brown, fine to medium grained sand.
1		HA8_1.0-1.2				
2						

Drilling Log

Test Pit **TP1**

Page: 1 of 1

Project	*Former Willowbank Orchard ESA*			Owner	*Mario Riccardi*		
Location	*Willowbank Road, South Albury, NSW*			Proj. No.	*INFOALBU10761AB*		
Surface Elev.	*NA*	Total Hole Depth	*1.4 m.*	North	*NA*	East	*NA*
Top of Casing	*NA*	Water Level Initial	*NA*	Static	*NA*	Diameter	
Screen: Dia	*NA*	Length	*NA*	Type/Size	*NA*		
Casing: Dia	*NA*	Length	*NA*	Type	*NA*		
Fill Material				Rig/Core	*N/A*		
Drill Co.	*N/A*	Method	*Backhoe*				
Driller	*JM*	Log By	*JM*	Date	*9/6/15*	Permit #	*NA*
Checked By	*PH*	License No.					

COMMENTS

Depth (m.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic descriptions are based on ASTM Standard D 2487-93 and the USCS.
0						ROAD BASE
	0.3	TP1_0.1-0.2				FILL: Sandy CLAY: Low plasticity, grey, fine to medium grained sand.
	0.5	TP1_0.5-0.7				Sandy CLAY: Low to medium plasticity, brown/yellow/grey, fine grained sand.
1	0.2	TP1_1.0-1.1			CL	
	0.1	TP1_1.5-1.6				
2						

Drilling Log

Test Pit **TP2**

Project *Former Willowbank Orchard ESA* Owner *Mario Riccardi*

Location *Willowbank Road, South Albury, NSW* Proj. No. *INFOALBU10761AB*

Surface Elev. *NA* Total Hole Depth *1.6 m.* North *NA* East *NA*

Top of Casing *NA* Water Level Initial *NA* Static *NA* Diameter

Screen: Dia *NA* Length *NA* Type/Size *NA*

Casing: Dia *NA* Length *NA* Type *NA*

Fill Material Rig/Core *N/A*

Drill Co. *N/A* Method *Backhoe*

Driller *JM* Log By *JM* Date *10/6/15* Permit # *NA*

Checked By *PH* License No.

COMMENTS

Depth (m.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic descriptions are based on ASTM Standard D 2487-93 and the USCS.
0						FILL: Clayey Sandy GRAVEL: Low plasticity, brown/grey, fine to coarse grained sand, fine to medium grained gravel. Traces of roadbase. Staining.
	0.3	TP2_0.1-0.2				
	0.5	TP2_0.5-0.7				Sandy CLAY: Low plasticity, grey/brown, fine to medium grained sand. Staining.
1						
	0.2	TP2_1.0-1.2			CL	
2						

COFFEY ENVIRONMENTS Rev: 16/7/13 INFOALBU10761AB - LOGS.GPJ IT_CORP.GDT 21/7/15

Drilling Log

Test Pit **TP3**

Project	*Former Willowbank Orchard ESA*			Owner	*Mario Riccardi*		
Location	*Willowbank Road, South Albury, NSW*			Proj. No.	*INFOALBU10761AB*		
Surface Elev.	*NA*	Total Hole Depth	*1.4 m.*	North	*NA*	East	*NA*
Top of Casing	*NA*	Water Level Initial	*NA*	Static	*NA*	Diameter	
Screen: Dia	*NA*	Length	*NA*	Type/Size	*NA*		
Casing: Dia	*NA*	Length	*NA*	Type	*NA*		
Fill Material				Rig/Core	*N/A*		
Drill Co.	*N/A*	Method	*Backhoe*				
Driller	*JM*	Log By	*JM*	Date	*10/6/15*	Permit #	*NA*
Checked By	*PH*	License No.					

COMMENTS

Depth (m.)	PID (ppm)	Sample ID / % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic descriptions are based on ASTM Standard D 2487-93 and the USCS.
0						FILL: Clayey Sandy GRAVEL: Brown, fine to coarse grained gravel, medium to coarse grained sand, low plasticity. Traces of road base.
	0.3	TP3_0.1-0.2				FILL:Sandy CLAY: Low to medium plasticity, brown/grey, fine grained sand. Staining.
	0.8	TP3_0.5-0.7				Sandy CLAY: Low to medium plasticity, brown/yellow, fine grained sand.
1	0.7	TP3_1.0-1.2			CL	
	0.6	TP3_1.5-1.7				
2						

Drilling Log

Test Pit **TP4**

Project	*Former Willowbank Orchard ESA*	Owner	*Mario Riccardi*
Location	*Willowbank Road, South Albury, NSW*	Proj. No.	*INFOALBU10761AB*
Surface Elev.	*NA*	Total Hole Depth	*1.6 m.*
North	*NA*	East	*NA*
Top of Casing	*NA*	Water Level Initial	*NA*
Static	*NA*	Diameter	
Screen: Dia	*NA*	Length	*NA*
Type/Size	*NA*		
Casing: Dia	*NA*	Length	*NA*
Type	*NA*		
Fill Material		Rig/Core	*N/A*
Drill Co.	*N/A*	Method	*Backhoe*
Driller	*JM*	Log By	*JM*
Date	*10/6/15*	Permit #	*NA*
Checked By	*PH*	License No.	

COMMENTS

Depth (m.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic descriptions are based on ASTM Standard D 2487-93 and the USCS.
0						FILL: Clayey Sandy GRAVEL: Brown, fine to coarse grained gravel, medium to coarse grained sand, low plasticity. Traces of road base.
	0.5	TP4_0.1-0.2				
						FILL: Gravelly Sandy CLAY: Medium plasticity, brown/grey, fine grained sand. Staining.
	0.5	TP4_0.5-0.7				Sandy CLAY: Medium plasticity, brown, fine to coarse grained sand, traces of fine to medium grained gravel.
					CL	
1	0.5	TP4_1.0-1.2				
						Sandy CLAY: Medium plasticity, brown/yellow, fine grained sand.
					CL	
	0.6	TP4_1.5-1.7				
2						

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Appendix E - Field Sheets

coffey

Groundwater Sampling Form (A) - General

PROJECT NAME: Willowbank **PROJECT NUMBER:** IA10761AQ

FIELD PERSONNEL: JM **DATE:** 11/6/15

PROJECT MANAGER: PH

WELL ID: MW1 **METER ID& TYPE :** V9368- **TOTAL WELL DEPTH:** **SCREEN INTERVAL:** ?

EQUIPMENT USED: BAILER ☒ WATERRA ☐ OTHER **WELL DIAMETER:** 50. **WELL STICK-UP:** N/A.

WELL GAUGING AND PURGE VOLUME CALCULATIONS

(TOTAL WELL DEPTH) – (DEPTH TO WATER) = (WATER COLUMN)

6.974 m - 2.294 = 4.5 m

Use water column calculation together with the procedures in 'SOP- Groundwater Sampling - Bailers' to determine the correct volume to be purged from the well (enter this value in the field to the right)

LITRES PER 1 WELL VOLUME 13.5 L

WELL HEADSPACE PID READING

PID READING

PPM:

ORP REFERENCE ELECTRODE: (circle) SHE / Calomel Saturated KCl / Ag/AgCl 1M KCl / Ag/AgCl 4M KCl / Ag/AgCl Saturated KCl

TIME OF DAY	CYCLE/ PUMP RATE (ml/min)	VOLUME (L)	DEPTH TO WATER (m)	DISSOLVED OXYGEN (mg/l)		ELECTRICAL CONDUCTIVITY (mS or µS/cm)		pH (pH units)		REDOX POTENTIAL (mV)		TEMPERATURE (°C)		CLARITY – tick one					COMMENTS
				READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE	Clear	Slightly Cloudy	Cloudy	Very Cloudy	Turbid	ODOUR, COLOUR, SEDIMENTS, PSH COLLECTED, etc
11.15am		3		0.48		168.4 us		5.47		-166		18.4				X			
		10		0.54		547 us		6.20		-157		18.9						✓	
		18		0.80		546us		6.42		-114		18.9							Manure odour.
		23		0.61		692us		6.50		-89		19.0							Grey thick
		29		0.52		796us		6.48		-97		18.9							M gr Sd sed.
		34		0.69		726		6.55		-42		18.4							*possible leaching
		40		1.25		770		6.60		-34		18.5							from pit.
		42		1.10		773		6.57		-32		18.8							
STABILISATION CRITERIA (3 readings within following ranges)				± 10%		± 3%		± 0.1 unit		± 10mV		± 0.2°C							

DUPLICATE COLLECTED: Y ☒ N ☐ DUPLICATE ID: QC11 **TRIPLICATE COLLECTED:** Y ☒ N ☐ TRIPLICATE ID: QC12

WERE METALS FIELD FILTERED? Y ☒ N ☐ Unfiltered samples must not be put into a preserved container (i.e. 'metals' bottle) **HAS THIS FORM BEEN COMPLETED IN FULL?** Y ☐ N ☐

coffey

Internal Service Report: PhoCheck Tiger PID

Calibrated By	Patricia Halpin
Calibration Date	8 June 2015
Equipment Serial Number	T-107202
Lamp Type	

Description of known problems
none

- ❑ Sensor assembly, housing and metal filter cleaned
- ❑ Lamp and housing cleaned and checked
- ❑ Pump disassembled and cleaned
- ❑ Battery condition checked

Calibration has been performed to manufacturer's specifications, using the standards shown below.

Isobutylene Standard (ppm)	Traceability Lot No.	Pre Calibration Reading (ppm)	Post Calibration Reading (ppm)
100 ppm	-	101 ppm	100 ppm

Comments about the services performed
good working condition

Signature of calibrator	[signature]

coffey

Internal Service Report: 90 FLMV

Calibrated By	Patricia Halpin
Calibration Date	8 June 2015
Equipment Serial Number	V9368

Description of known problems

None

Calibration has been performed to manufacturer's specifications, using the standards shown below.

Parameter	Standard	Traceability Lot No.	Pre Calibration Reading	Post Calibration Reading
Temperature	°C	22.3 -	22.0 °C	22.2 °C
pH	~~6.88~~ 7.0		6.93	6.99
	4.01		4.01	4.01
Conductivity	0 µS/cm	-	0.1 µS/cm	0.0 µS/cm
	~~2.76~~ 58 mS/cm		57 mS/cm	58 mS/cm
TDS	Old design unit, does not support dual calibration of Conductivity & TDS. Conductivity calibrated. Requires re-calibration when switching between these 2 modes.			
Dissolved Oxygen	0 % SAT		0 % SAT	0 % SAT
	100 % SAT	-	101 % SAT	99.9% SAT
ORP	240 mV		236 mV	Check only: pass

Comments about the services performed

Signature of calibrator	Patricia Halpin

Appendix F - Results Summary

Chem_Group	ChemName	Units	EQL	HSL-D Commercial / Industrial Direct Contact	NEPM 2013 EIL	NEPM 2013 ESLs Commercial and industrial, Fine Soil	NEPM 2013 HILs Commercial/ industrial D Soil	GS_1	GS_4	Composite GS_1+GS_4	Composite GS_11+GS_12	Composite GS_13+GS_17	Composite GS_14+GS_15	Composite GS_16+GS_19	Composite GS_18+GS_22	Composite GS_2+GS_3	Composite GS_20+GS_23	Composite GS_21+GS_24	Composite GS_25+GS_26	Composite GS_27+GS_28	Composite GS_29+GS_30	Composite GS_5+GS_6	Composite GS_7+GS_8	Composite GS_9+GS_10
							SAMPLE DATE	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015	9/06/2015
							LAB REPORT	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017
Herbicides	2,4,5-Trichlorophenoxy acetic acid	mg/kg	0.02				**2,500***	-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	2,4,5-TP (Silvex)	mg/kg	0.02					-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	2,4-Dichlorophenoxy acetic acid	mg/kg	0.02				**4,500***	-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	2,4-dichlorophenoxybutanoic acid	mg/kg	0.02					-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	2,4-Dichlorprop	mg/kg	0.02					-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	4-Chlorophenoxy acetic acid	mg/kg	0.02					-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	Clopyralid	mg/kg	0.02					-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	Dicamba	mg/kg	0.02					-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	Fluroxypyr	mg/kg	0.02					-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	2-Methyl-4-chlorophenoxy acetic acid	mg/kg	0.02				**2,500***	-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	2-Methyl-4-Chlorophenoxy butanoic acid	mg/kg	0.02				**2,500***	-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	Mecoprop	mg/kg	0.02				**2,500***	-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	Triclopyr	mg/kg	0.02					-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Inorganics	Asbestos	%	0.004					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	CEC	meq/100g	0.1					9.1	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	pH ($CaCl_2$)	pH unit	0.1					6.3	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Moisture	%	1					-	-	16.1	22.2	19.4	17.5	17	13.9	16	14	18.5	12.9	16.9	16.4	16.9	18.7	19.6
Metals	Arsenic	mg/kg	5		**80***		**1,500***	-	-	6	7	6	<5	5	5	7	5	6	<5	<5	7	6	7	7
	Cadmium	mg/kg	1				**450***	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chromium	mg/kg	2					-	-	22	21	22	20	21	21	24	21	23	19	27	23	23	24	26
	Copper	mg/kg	5		**140***		**120,000***	-	-	25	68	77	65	80	45	49	42	72	64	30	23	97	98	77
	Lead	mg/kg	5		**900***		***750**	-	-	16	15	15	13	14	15	18	13	15	12	16	20	16	17	18
	Mercury	mg/kg	0.1				**365***	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	2		**145***		**3,000***	-	-	14	12	13	12	12	12	13	12	14	10	15	13	12	13	14
	Zinc	mg/kg	5		**310***		**200,000***	-	-	65	61	66	73	72	70	75	66	71	57	63	65	69	73	74
OCP	4,4-DDE	mg/kg	0.05					-	-	**0.08**	<0.05	**0.08**	**0.08**	<0.05	<0.05	**0.19**	**0.16**	**0.12**	<0.05	<0.05	<0.05	<0.05	**0.13**	**0.06**
	a-BHC	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin + Dieldrin	mg/kg	0.05				**45***	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	b-BHC	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Chlordane	mg/kg	0.05				**530***	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	cis-Chlordane	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	d-BHC	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDD	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDT	mg/kg	0.2		**170***			-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	DDT+DDE+DDD	mg/kg	0.05				**1,800***	-	-	**0.08**	<0.05	**0.08**	**0.08**	<0.05	<0.05	**0.19**	**0.16**	**0.12**	<0.05	<0.05	<0.05	<0.05	**0.13**	**0.06**
	Dieldrin	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan	mg/kg	0.05				**1,000***	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan I	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan II	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan sulphate	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin	mg/kg	0.05				**50***	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin aldehyde	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin ketone	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	g-BHC (Lindane)	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor	mg/kg	0.05				**25***	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor epoxide	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Hexachlorobenzene	mg/kg	0.05				**40***	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Methoxychlor	mg/kg	0.2				**1,250***	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	trans-chlordane	mg/kg	0.05					-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PAH	Picloram	mg/kg	0.02				**17,500***	-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04

*Adopted criteria based on a composite of two samples

							FIELD ID	HA1_0.0-0.1	HA1_0.5-0.7	HA2_0.0-0.1	HA2_1.0-1.1	HA3_0.0-0.1	HA3_0.5-0.7	HA4_0.0-0.1	HA4_1.0-1.1	HA5_0.0-0.1	HA5_0.5-0.7	HA6_0.0-0.1	HA6_1.0-1.1	HA7_0.0-0.1	HA7_0.5-0.7	HA8_0.0-0.1	HA8_1.0-1.1
							SAMPLE DATE	11/06/2015	11/06/2015	11/06/2015	11/06/2015	11/06/2015	11/06/2015	11/06/2015	11/06/2015	11/06/2015	11/06/2015	11/06/2015	11/06/2015	11/06/2015	11/06/2015	11/06/2015	11/06/2015
							LAB REPORT	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017
Chem_Group	**ChemName**	**Units**	**EQL**	HSL-D Commercial / Industrial Direct Contact	NEPM 2013 EIL	NEPM 2013 ESLs Commercial and industrial, Fine Soil	NEPM 2013 HILs Commercial/ industrial D Soil																
Inorganics	Moisture	%	1					20.6	17.2	18.6	16.1	30.2	17.7	31	13.7	12.8	7.5	17	10.7	11.1	8	13.8	6.2
Metals	Arsenic	mg/kg	5		**40**		**3000**	<5	8	7	9	8	9	8	11	6	7	6	9	6	8	7	6
	Cadmium	mg/kg	1				**900**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chromium	mg/kg	2					14	29	23	30	24	30	25	34	20	23	21	29	25	25	26	21
	Copper	mg/kg	5		**280**		**240,000**	24	18	24	19	25	17	27	20	21	13	40	19	22	19	23	15
	Lead	mg/kg	5		**470**		**1500**	18	15	16	16	15	16	16	18	129	11	85	16	15	21	16	15
	Mercury	mg/kg	0.1				**730**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	2		**290**		**6000**	8	15	12	17	13	14	14	17	11	15	13	18	15	13	15	12
	Zinc	mg/kg	5		**620**		**400,000**	70	60	79	55	72	55	83	54	152	62	142	63	69	65	68	60
OCP	4,4-DDE	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	a-BHC	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin + Dieldrin	mg/kg	0.05				**45**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	b-BHC	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Chlordane	mg/kg	0.05				**530**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	cis-Chlordane	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	d-BHC	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDD	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDT	mg/kg	0.2		**3**			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	DDT+DDE+DDD	mg/kg	0.05				**3600**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Dieldrin	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan	mg/kg	0.05				**2000**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan I	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan II	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan sulphate	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin	mg/kg	0.05				**100**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin aldehyde	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin ketone	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	g-BHC (Lindane)	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor	mg/kg	0.05				**50**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor epoxide	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Hexachlorobenzene	mg/kg	0.05				**80**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Methoxychlor	mg/kg	0.2				**2500**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	trans-chlordane	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Asbestos		%	0.004					Not detected	-	Not detected	-	Not detected	-	Not detected	-	Not detected	-	Not detected	-	Not detected	-	Not detected	-

coffey

Table 3
Soil Analytical Results - Mechanical Shed Test pits
Willowbank ESA

							FIELD ID	TP1_0.5-0.7	TP1_1.5-1.6	TP2_0.5-0.7	TP2_1.2	TP3_0.1	TP3_0.5	TP3_1.5	TP4_0.5	TP4_1.5
							SAMPLE DATE	9/06/2015	9/06/2015	9/06/2015	10/06/2015	10/06/2015	10/06/2015	10/06/2015	10/06/2015	10/06/2015
							LAB REPORT	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017	EM1511017
				HSL-D Commercial / Industrial Direct Contact	NEPM 2013 EIL	NEPM 2013 ESLs Commercial and industrial, Fine Soil	NEPM 2013 HILs Commercial/ industrial D Soil									
Chem_Group	**ChemName**	**Units**	**EQL**													
BTEX	Benzene	mg/kg	0.2	**430**		**95**		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toluene	mg/kg	0.5	**99,000**		**135**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Ethylbenzene	mg/kg	0.5	**27,000**		**185**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene (o)	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene Total	mg/kg	0.5	**81,000**		**95**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Naphthalene	mg/kg	1	**11,000**	**10**			<1	<1	<1	<1	<1	<1	<1	<1	<1
	Total BTEX	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TRH	TRH C6-C10 less BTEX (F1)	mg/kg	10	**26,000**				<10	<10	<10	<10	<10	<10	<10	<10	<10
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50
	TRH C6 - C10	mg/kg	10			**215**		<10	<10	<10	<10	<10	<10	<10	<10	<10
	TPH >C10 - C16	mg/kg	50	**20,000**		**170**		<50	<50	<50	<50	<50	<50	<50	<50	<50
	TRH >C16 - C34	mg/kg	100	**27,000**		**2500**		<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH >C34 - C40	mg/kg	100	**38,000**		**6600**		<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH C6 - C9	mg/kg	10					<10	<10	<10	<10	<10	<10	<10	<10	<10
	TRH C10 - C14	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50
	TRH C15 - C28	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH C29 - C36	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH C10 - C36 (Sum of total)	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH	C10 - C40 (Sum of total)	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50
Inorganics	Moisture	%	1					16	15.4	14.9	14.6	7.6	14.5	15.3	13.9	11.7
Metals	Arsenic	mg/kg	5		**40**		**3000**	5	10	6	9	<5	<5	12	8	6
	Cadmium	mg/kg	1				**900**	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chromium	mg/kg	2					22	30	24	31	10	22	35	25	21
	Copper	mg/kg	5		**280**		**240,000**	15	17	13	17	17	17	19	16	13
	Lead	mg/kg	5		**470**		**1500**	16	14	14	16	20	15	18	18	15
	Mercury	mg/kg	0.1				**730**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	2		**290**		**6000**	12	15	13	15	6	12	16	15	12
	Zinc	mg/kg	5		**620**		**400,000**	66	44	55	49	48	66	46	48	58
OCP	4,4-DDE	mg/kg	0.05					0.28	<0.05	<0.05	<0.05	<0.05	0.19	<0.05	0.05	0.19
	a-BHC	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin + Dieldrin	mg/kg	0.05				**45**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	b-BHC	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Chlordane	mg/kg	0.05				**530**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	cis-Chlordane	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	d-BHC	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDD	mg/kg	0.05					0.12	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05
	DDT	mg/kg	0.2		**3**			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	DDT+DDE+DDD	mg/kg	0.05				**3600**	0.4	<0.05	<0.05	<0.05	<0.05	0.27	<0.05	0.05	0.19
	Dieldrin	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan	mg/kg	0.05				**2000**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan I	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan II	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan sulphate	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin	mg/kg	0.05				**100**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin aldehyde	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin ketone	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	g-BHC (Lindane)	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor	mg/kg	0.05				**50**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor epoxide	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Hexachlorobenzene	mg/kg	0.05				**80**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Methoxychlor	mg/kg	0.2				**2500**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	trans-chlordane	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Table 4
Soil Analytical Results - Duplicate Samples
Willowbank ESA

Field Duplicates (SOIL)
Filter: SDG in('08830-3 & 08835-6')

Chem_Group	ChemName	Units	EQL	08830-3 & 08835-6 Composite GS_1+GS_4 9/06/2015 15:00	08830-3 & 08835-6 QC1 9/06/2015 15:00	RPD	08830-3 & 08835-6 TP3_0.5 10/06/2015 15:00	08830-3 & 08835-6 QC6 10/06/2015 15:00	RPD
BTEX	Benzene	mg/kg	0.2				<0.2	<0.2	0
	Toluene	mg/kg	0.5				<0.5	<0.5	0
	Ethylbenzene	mg/kg	0.5				<0.5	<0.5	0
	Xylene (m & p)	mg/kg	0.5				<0.5	<0.5	0
	Xylene (o)	mg/kg	0.5				<0.5	<0.5	0
	Xylene Total	mg/kg	0.5				<0.5	<0.5	0
	Naphthalene	mg/kg	1				<1.0	<1.0	0
	Total BTEX	mg/kg	0.2				<0.2	<0.2	0
Herbicides	2,4,5-Trichlorophenoxy acetic acid	mg/kg	0.02	<0.04	<0.04	0			
	2,4,5-TP (Silvex)	mg/kg	0.02	<0.04	<0.04	0			
	2,4-Dichlorophenoxy acetic acid	mg/kg	0.02	<0.04	<0.04	0			
	2,4-dichlorophenoxybutanoic acid	mg/kg	0.02	<0.04	<0.04	0			
	2,4-Dichlorprop	mg/kg	0.02	<0.04	<0.04	0			
	4-Chlorophenoxy acetic acid	mg/kg	0.02	<0.04	<0.04	0			
	Clopyralid	mg/kg	0.02	<0.04	<0.04	0			
	Dicamba	mg/kg	0.02	<0.04	<0.04	0			
	Fluroxypyr	mg/kg	0.02	<0.04	<0.04	0			
	2-Methyl-4-chlorophenoxy acetic acid	mg/kg	0.02	<0.04	<0.04	0			
	2-Methyl-4-Chlorophenoxy butanoic acid	mg/kg	0.02	<0.04	<0.04	0			
	Mecoprop	mg/kg	0.02	<0.04	<0.04	0			
	Triclopyr	mg/kg	0.02	<0.04	<0.04	0			
Inorganics	Moisture	%	1	16.1	14.2	13	14.5	14.0	4
Metals	Arsenic	mg/kg	5	6.0	5.0	18	<5.0	<5.0	0
	Cadmium	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0
	Chromium	mg/kg	2	22.0	22.0	0	22.0	20.0	10
	Copper	mg/kg	5	25.0	44.0	55	17.0	14.0	19
	Lead	mg/kg	5	16.0	14.0	13	15.0	16.0	6
	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Nickel	mg/kg	2	14.0	13.0	7	12.0	12.0	0
	Zinc	mg/kg	5	65.0	66.0	2	66.0	66.0	0
OCP	4,4-DDE	mg/kg	0.05				0.19	0.19	0
	a-BHC	mg/kg	0.05				<0.05	<0.05	0
	Aldrin	mg/kg	0.05				<0.05	<0.05	0
	b-BHC	mg/kg	0.05				<0.05	<0.05	0
	cis-Chlordane	mg/kg	0.05				<0.05	<0.05	0
	d-BHC	mg/kg	0.05				<0.05	<0.05	0
	DDD	mg/kg	0.05				0.08	0.08	0
	DDT	mg/kg	0.2				<0.2	<0.2	0
	Dieldrin	mg/kg	0.05				<0.05	<0.05	0
	Endosulfan I	mg/kg	0.05				<0.05	<0.05	0
	Endosulfan II	mg/kg	0.05				<0.05	<0.05	0
	Endosulfan sulphate	mg/kg	0.05				<0.05	<0.05	0
	Endrin	mg/kg	0.05				<0.05	<0.05	0
	Endrin aldehyde	mg/kg	0.05				<0.05	<0.05	0
	Endrin ketone	mg/kg	0.05				<0.05	<0.05	0
	g-BHC (Lindane)	mg/kg	0.05				<0.05	<0.05	0
	Heptachlor	mg/kg	0.05				<0.05	<0.05	0
	Heptachlor epoxide	mg/kg	0.05				<0.05	<0.05	0
	Hexachlorobenzene	mg/kg	0.05				<0.05	<0.05	0
	Methoxychlor	mg/kg	0.2				<0.2	<0.2	0
	trans-chlordane	mg/kg	0.05				<0.05	<0.05	0
PAH	Picloram	mg/kg	0.02	<0.04	<0.04	0			
TPH	C10 - C40 (Sum of total)	mg/kg	50				<50.0	<50.0	0
TRH	TRH C6-C10 less BTEX (F1)	mg/kg	10				<10.0	<10.0	0
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50				<50.0	<50.0	0
	TRH C6 - C10	mg/kg	10				<10.0	<10.0	0
	TPH >C10 - C16	mg/kg	50				<50.0	<50.0	0
	TRH >C16 - C34	mg/kg	100				<100.0	<100.0	0
	TRH >C34 - C40	mg/kg	100				<100.0	<100.0	0
	TRH C6 - C9	mg/kg	10				<10.0	<10.0	0
	TRH C10 - C14	mg/kg	50				<50.0	<50.0	0
	TRH C15 - C28	mg/kg	100				<100.0	<100.0	0
	TRH C29 - C36	mg/kg	100				<100.0	<100.0	0
	TRH C10 - C36 (Sum of total)	mg/kg	50				<50.0	<50.0	0

*RPDs have only been considered where a concentration is greater than 0 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (0-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Table 5
Groundwater Gauging Results
Willowbank ESA

Well ID	Date Measured	Time Measured	Event	Top of Well Casing Elevation (mAHD)	Total Well Depth (m)	Depth to Water* (m)	Depth to PSHs* (m)	PSH Thickness (m)	Product Gravity	Hydraulic Equivalent (m)	Corrected Depth to Water (m)	Corrected Water Elevation (mAHD)	PID	Comments
MW1	11/06/2015	11.15am	Pre-purge	-	6.974	2.294	-	-	-	-	-	-	-	Organic odour, grey, high sediment

Notes:

* below top of well casing

ID = identification

mAHD = metres above Australia Height Datum

m = metres

PSH = phase separated hydrocarbons

(grey shading) Calculated using PSH thickness in bailer

Field Equipment Used:

Heron Interface Probe

coffey

Table 6
Groundwater Analytical Results
Willowbank ESA

									FIELD ID	MW1
									SAMPLE DATE	11/06/2015
				ADWG 2015 Aesthetic	ADWG 2015 Health	ANZECC 2000 Freshwater 95%	ANZECC 2000 Primary Industry (Irrigation)	ANZECC 2000 Primary Industry (Livestock)	ANZECC 2000 Recreational Water Quality and Aesthetics	
Chem_Group	ChemName	Units	EQL							
BTEX	Benzene	µg/L	1		1	950			10	<1
	Toluene	µg/L	2	25	800					<2
	Ethylbenzene	µg/L	2	3	300					<2
	Xylene (m & p)	µg/L	2							<2
	Xylene (o)	µg/L	2			350				<2
	Xylene Total	µg/L	2	20	600					<2
	Naphthalene	µg/L	5			16				<5
	Total BTEX	mg/L	0.001							<0.001
TRH	TRH C6-C10 less BTEX (F1)	mg/L	0.02							<0.02
	TRH >C10-C16 less Naphthalene (F2)	mg/L	0.1							<0.1
	TRH C6 - C10	mg/L	0.02							<0.02
	TPH >C10 - C16	mg/L	0.1							<0.1
	TRH >C16 - C34	mg/L	0.1							<0.1
	TRH >C34 - C40	mg/L	0.1							<0.1
	TRH C6 - C9	µg/L	20							<20
	TRH C10 - C14	µg/L	50							<50
	TRH C15 - C28	µg/L	100							<100
	TRH C29 - C36	µg/L	50							<50
	TRH C10 - C36 (Sum of total)	µg/L	50							<50
TPH	C10 - C40 (Sum of total)	µg/L	100							<100
Inorganics	TDS	mg/L	10	600					1000	592
	Hardness as CaCO3	mg/L	1	200					500	103
Metals	Arsenic (Filtered)	mg/L	0.001		0.01		0.1	0.5	0.05	0.004
	Cadmium (Filtered)	mg/L	0.0001		0.002	0.0002	0.01	0.01	0.005	<0.0001
	Chromium (Filtered)	mg/L	0.001					1		<0.001
	Copper (Filtered)	mg/L	0.001	1	2	0.0014	0.2	0.4	1	<0.001
	Lead (Filtered)	mg/L	0.001		0.01	0.0034	2	0.1	0.05	<0.001
	Mercury (Filtered)	mg/L	0.0001		0.001	0.0006	0.002	0.002	0.001	<0.0001
	Nickel (Filtered)	mg/L	0.001		0.02	0.011	0.2	1	0.1	0.001
	Zinc (Filtered)	mg/L	0.005	3		0.008	2	20	0.5	<0.005
OCP	4,4-DDE	µg/L	0.5							<0.5
	a-BHC	µg/L	0.5							<0.5
	Aldrin	µg/L	0.5						1	<0.5
	Aldrin + Dieldrin	µg/L	0.5		0.3					<0.5
	b-BHC	µg/L	0.5							<0.5
	Chlordane	µg/L	0.5		2	0.08			6	<0.5
	cis-Chlordane	µg/L	0.5							<0.5
	d-BHC	µg/L	0.5							<0.5
	DDD	µg/L	0.5							<0.5
	DDT	µg/L	2		9	0.01			3	<2
	DDT+DDE+DDD	µg/L	0.5							<0.5
	Dieldrin	µg/L	0.5						1	<0.5
	Endosulfan I	µg/L	0.5							<0.5
	Endosulfan II	µg/L	0.5							<0.5
	Endosulfan sulphate	µg/L	0.5							<0.5
	Endrin	µg/L	0.5			0.02			1	<0.5
	Endrin aldehyde	µg/L	0.5							<0.5
	Endrin ketone	µg/L	0.5							<0.5
	g-BHC (Lindane)	µg/L	0.5		10	0.2			10	<0.5
	Heptachlor	µg/L	0.5		0.3	0.09			3	<0.5
	Heptachlor epoxide	µg/L	0.5							<0.5
	Hexachlorobenzene	µg/L	0.5							<0.5
	Methoxychlor	µg/L	2							<2
	trans-chlordane	µg/L	0.5							<0.5

Table 7
Groundwater Analytical Results - Duplicate Samples
Willowbank ESA

Field Duplicates (WATER)
Filter: SDG in('08830-3 & 08835-6')

SDG	08830-3 & 08835-6	08830-3 & 08835-6	
Field ID	MW1	QC11	**RPD**
Sampled Date/Time	11/06/2015 15:00	11/06/2015 15:00	

Chem_Gro	ChemName	Units	EQL			
BTEX	Benzene	µg/L	1	<1.0	<1.0	0
	Toluene	µg/L	2	<2.0	<2.0	0
	Ethylbenzene	µg/L	2	<2.0	<2.0	0
	Xylene (m & p)	µg/L	2	<2.0	<2.0	0
	Xylene (o)	µg/L	2	<2.0	<2.0	0
	Xylene Total	µg/L	2	<2.0	<2.0	0
	Naphthalene	µg/L	5	<5.0	<5.0	0
	Total BTEX	mg/l	0.001	<0.001	<0.001	0
Inorganics	TDS	mg/l	10	592.0	596.0	1
	Hardness as CaCO3	mg/l	1	103.0	99.0	4
Metals	Arsenic (Filtered)	mg/l	0.001	0.004	0.004	0
	Cadmium (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
	Chromium (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Copper (Filtered)	mg/l	0.001	<0.001	0.001	0
	Lead (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Mercury (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
	Nickel (Filtered)	mg/l	0.001	0.001	0.002	67
	Zinc (Filtered)	mg/l	0.005	<0.005	0.006	18
OCP	4,4-DDE	µg/L	0.5	<0.5	<0.5	0
	a-BHC	µg/L	0.5	<0.5	<0.5	0
	Aldrin	µg/L	0.5	<0.5	<0.5	0
	Aldrin + Dieldrin	µg/L	0.5	<0.5	<0.5	0
	b-BHC	µg/L	0.5	<0.5	<0.5	0
	Chlordane	µg/L	0.5	<0.5	<0.5	0
	cis-Chlordane	µg/L	0.5	<0.5	<0.5	0
	d-BHC	µg/L	0.5	<0.5	<0.5	0
	DDD	µg/L	0.5	<0.5	<0.5	0
	DDT	µg/L	2	<2.0	<2.0	0
	DDT+DDE+DDD	µg/L	0.5	<0.5	<0.5	0
	Dieldrin	µg/L	0.5	<0.5	<0.5	0
	Endosulfan I	µg/L	0.5	<0.5	<0.5	0
	Endosulfan II	µg/L	0.5	<0.5	<0.5	0
	Endosulfan sulphate	µg/L	0.5	<0.5	<0.5	0
	Endrin	µg/L	0.5	<0.5	<0.5	0
	Endrin aldehyde	µg/L	0.5	<0.5	<0.5	0
	Endrin ketone	µg/L	0.5	<0.5	<0.5	0
	g-BHC (Lindane)	µg/L	0.5	<0.5	<0.5	0
	Heptachlor	µg/L	0.5	<0.5	<0.5	0
	Heptachlor epoxide	µg/L	0.5	<0.5	<0.5	0
	Hexachlorobenzene	µg/L	0.5	<0.5	<0.5	0
	Methoxychlor	µg/L	2	<2.0	<2.0	0
	trans-chlordane	µg/L	0.5	<0.5	<0.5	0
TPH	C10 - C40 (Sum of total)	µg/L	100	<100.0	<100.0	0
TRH	TRH C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02	0
	TRH >C10-C16 less Naphthalene (F2)	mg/l	0.1	<0.1	<0.1	0
	TRH C6 - C10	mg/l	0.02	<0.02	<0.02	0
	TPH >C10 - C16	mg/l	0.1	<0.1	<0.1	0
	TRH >C16 - C34	mg/l	0.1	<0.1	<0.1	0
	TRH >C34 - C40	mg/l	0.1	<0.1	<0.1	0
	TRH C6 - C9	µg/L	20	<20.0	<20.0	0
	TRH C10 - C14	µg/L	50	<50.0	<50.0	0
	TRH C15 - C28	µg/L	100	<100.0	<100.0	0
	TRH C29 - C36	µg/L	50	<50.0	<50.0	0
	TRH C10 - C36 (Sum of total)	µg/L	50	<50.0	<50.0	0

*RPDs have only been considered where a concentration is greater than 0 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (0-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Table 8
Analytical Results - Blanks
Willowbank ESA

Field Blanks (WATER)
Filter: SDG in('08830-3 & 08835-6')

Chem_Group	ChemName	Units	EQL				
			SDG	08830-3 & 08835-6	08830-3 & 08835-6	08830-3 & 08835-6	08830-3 & 08835-6
			Field ID	QC5	QC8	QC13	QC14
			Sampled_Date/Time	9/06/2015 15:00	10/06/2015 15:00	11/06/2015 15:00	11/06/2015 15:00
			Sample Type	Rinsate	Rinsate	Rinsate	Trip_B
BTEX	Benzene	µg/L	1	<1	<1	<1	<1
	Toluene	µg/L	2	<2	<2	<2	<2
	Ethylbenzene	µg/L	2	<2	<2	<2	<2
	Xylene (m & p)	µg/L	2	<2	<2	<2	<2
	Xylene (o)	µg/L	2	<2	<2	<2	<2
	Xylene Total	µg/L	2	<2	<2	<2	<2
	Naphthalene	µg/L	5	<5	<5	<5	<5
	Total BTEX	mg/l	0.001	<0.001	<0.001	<0.001	<0.001
Inorganics	TDS	mg/l	10			<10	
	Hardness as CaCO3	mg/l	1			<1	
Metals	Arsenic (Filtered)	mg/l	0.001	<0.001	<0.001	<0.001	
	Cadmium (Filtered)	mg/l	0.0001	<0.0001	<0.0001	<0.0001	
	Chromium (Filtered)	mg/l	0.001	<0.001	<0.001	<0.001	
	Copper (Filtered)	mg/l	0.001	<0.001	<0.001	<0.001	
	Lead (Filtered)	mg/l	0.001	<0.001	<0.001	<0.001	
	Mercury (Filtered)	mg/l	0.0001	<0.0001	<0.0001	<0.0001	
	Nickel (Filtered)	mg/l	0.001	<0.001	<0.001	<0.001	
	Zinc (Filtered)	mg/l	0.005	<0.005	<0.005	<0.005	
OCP	4,4-DDE	µg/L	0.5	<0.5	<0.5	<0.5	
	a-BHC	µg/L	0.5	<0.5	<0.5	<0.5	
	Aldrin	µg/L	0.5	<0.5	<0.5	<0.5	
	Aldrin + Dieldrin	µg/L	0.5	<0.5	<0.5	<0.5	
	b-BHC	µg/L	0.5	<0.5	<0.5	<0.5	
	Chlordane	µg/L	0.5	<0.5	<0.5	<0.5	
	cis-Chlordane	µg/L	0.5	<0.5	<0.5	<0.5	
	d-BHC	µg/L	0.5	<0.5	<0.5	<0.5	
	DDD	µg/L	0.5	<0.5	<0.5	<0.5	
	DDT	µg/L	2	<2	<2	<2	
	DDT+DDE+DDD	µg/L	0.5	<0.5	<0.5	<0.5	
	Dieldrin	µg/L	0.5	<0.5	<0.5	<0.5	
	Endosulfan I	µg/L	0.5	<0.5	<0.5	<0.5	
	Endosulfan II	µg/L	0.5	<0.5	<0.5	<0.5	
	Endosulfan sulphate	µg/L	0.5	<0.5	<0.5	<0.5	
	Endrin	µg/L	0.5	<0.5	<0.5	<0.5	
	Endrin aldehyde	µg/L	0.5	<0.5	<0.5	<0.5	
	Endrin ketone	µg/L	0.5	<0.5	<0.5	<0.5	
	g-BHC (Lindane)	µg/L	0.5	<0.5	<0.5	<0.5	
	Heptachlor	µg/L	0.5	<0.5	<0.5	<0.5	
	Heptachlor epoxide	µg/L	0.5	<0.5	<0.5	<0.5	
	Hexachlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	
	Methoxychlor	µg/L	2	<2	<2	<2	
	trans-chlordane	µg/L	0.5	<0.5	<0.5	<0.5	
TPH	C10 - C40 (Sum of total)	µg/L	100	<100	<100	<100	
TRH	TRH C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02	<0.02	<0.02
	TRH >C10-C16 less Naphthalene (F2)	mg/l	0.1	<0.1	<0.1	<0.1	
	TRH C6 - C10	mg/l	0.02	<0.02	<0.02	<0.02	<0.02
	TPH >C10 - C16	mg/l	0.1	<0.1	<0.1	<0.1	
	TRH >C16 - C34	mg/l	0.1	<0.1	<0.1	<0.1	
	TRH >C34 - C40	mg/l	0.1	<0.1	<0.1	<0.1	
	TRH C6 - C9	µg/L	20	<20	<20	<20	<20
	TRH C10 - C14	µg/L	50	<50	<50	<50	
	TRH C15 - C28	µg/L	100	<100	<100	<100	
	TRH C29 - C36	µg/L	50	<50	<50	<50	
	TRH C10 - C36 (Sum of total)	µg/L	50	<50	<50	<50	

Appendix ‘G’

Servicing Strategy

SJE Consulting

SERVICING STRATEGY

FOR

WILLOWBANK ROAD

INDUSTRIAL ESTATE

EAST ALBURY

NEW SOUTH WALES

for DA application

APRIL 2016

REVISION B

1. INTRODUCTION

The aim of this report is to demonstrate that the proposed development can be serviced by the existing services.

The proposed Willowbank Road Industrial Estate covers an area of approximately 9ha. The proposed industrial estate is located off Willowbank Road in East Albury. East Albury is located east of the Hume Highway with access via East Street. Willowbank Road is located approximately 350 meters from the intersection of East Street and Schubach Street.

Appendix B shows the development area of the Willowbank Road industrial estate, which is composed of 21 lots. This development area forms part of the DA application.

The existing services will need to be extended to service the proposed development including the sewer, water, electrical and telecommunications.

All the existing services are able to be extended to service the development area. A further detailed analysis of each service and how they will be designed to service the development is included in this report.

2. RETICULATED SEWERAGE

The 21 lots are to be serviced with the reticulation sewer connected to a proposed pump station, located in the road reserve of Willowbank Road.

An existing manhole is located on East Street SMH No. A2619, the proposed sewer rising main will be constructed from this point for approximately 700m to the proposed pump station on Willowbank Road. Refer **Appendix C, C1** for the servicing plan for the sewer rising main and sewer pump station.

The design flow for the sewer rising main is based on approximately 21 Industrial lots. Refer **Appendix C, C2** for design calculations for the sewer rising main and sewer pump station.

3. RETICULATED WATER SUPPLY

The existing water mains in Willowbank Road, Schubach Street and Doctor Point Road are only 100Dia. It is proposed to construct a water main of 150mm diameter south down Schubach Street from the existing water main on East Street, continuing West on Willowbank Road. The extension will be approximately 550m to service the proposed development. Refer **Appendix C, C1** for servicing plan.

4. STORMWATER DRAINAGE

The stormwater drainage from the proposed development site will drain overland following the natural topography of the land. The stormwater drainage system will require retardation and water quality treatments before the water can be released.

An existing retention basin is located west of the proposed development site. Drainage lines proposed follow the road and run along the southern edge of the development, discharging to the existing retention basin. Refer to **Appendix A** for basin locations.

5. ELECTRICITY, GAS AND TELECOMMUNICATIONS

Electricity, gas and telecommunications services currently exist along Willowbank Road. These services can be extended into the proposed development site via the entrance road into the proposed development.

The electricity, gas and telecommunication services located in Willowbank Road currently have the scope to supply the proposed industrial lots in the Willowbank Road development.

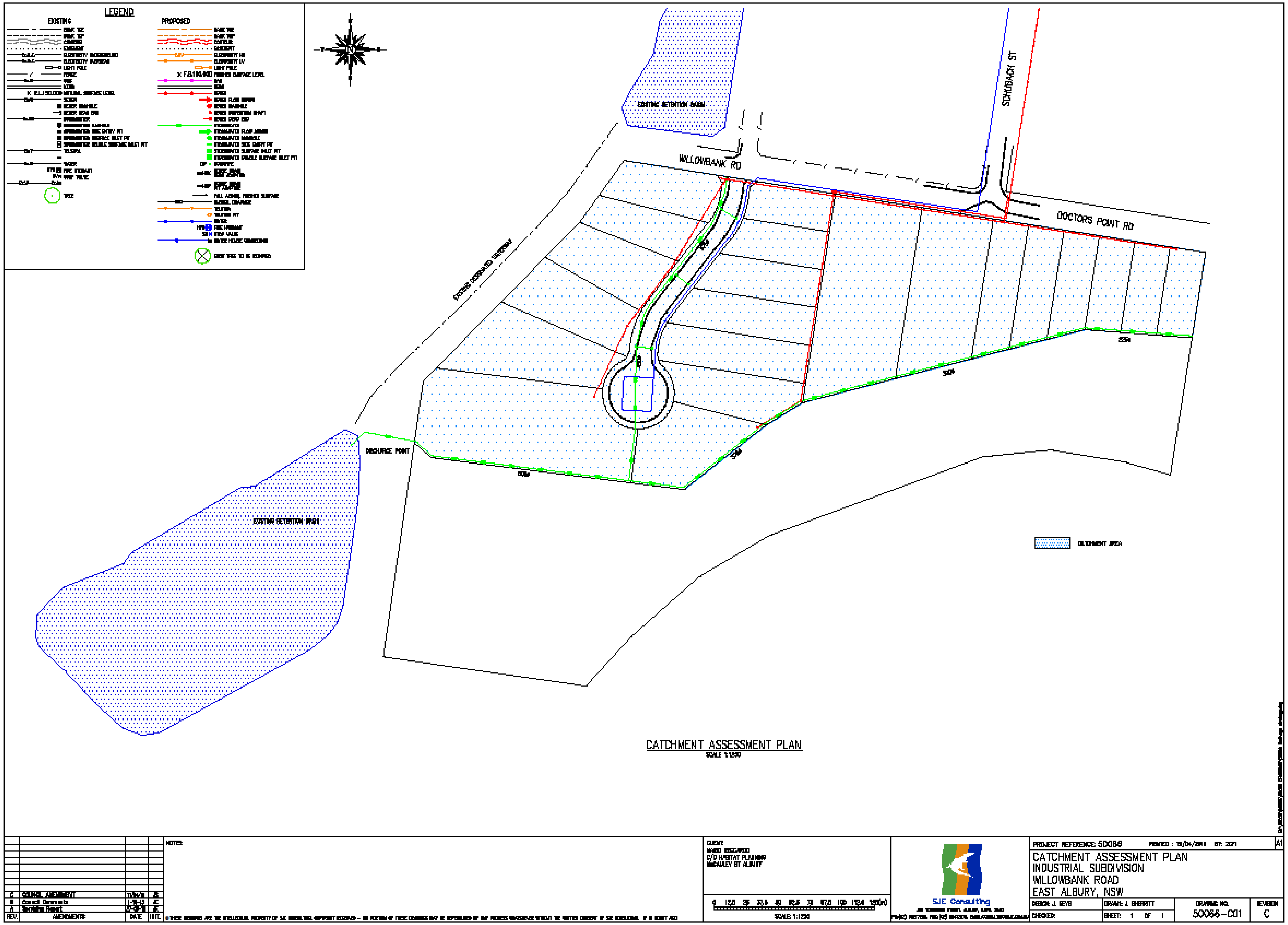
6. CONCLUSION

This report has been prepared for the DA Application for the subject development site, to develop industrial lots that are fully serviced with sewerage, water, stormwater drainage, electricity, gas and telecommunications.

This report has provided a detailed description on each service and concludes that the proposed lots can be fully serviced by the extension of the existing services.

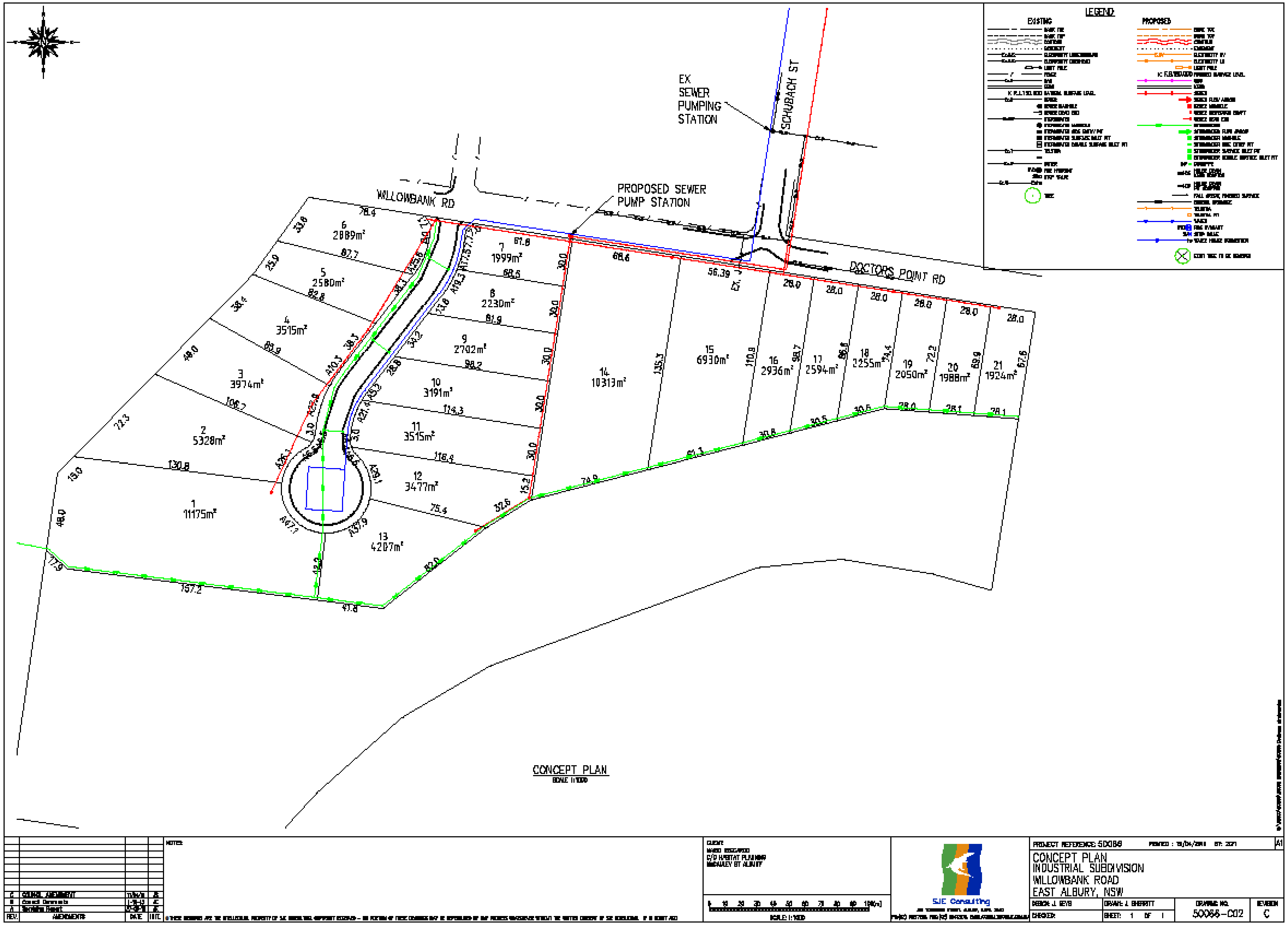
7. APPENDIX A

PDF APPENDIX A - CATCHMENT PLAN



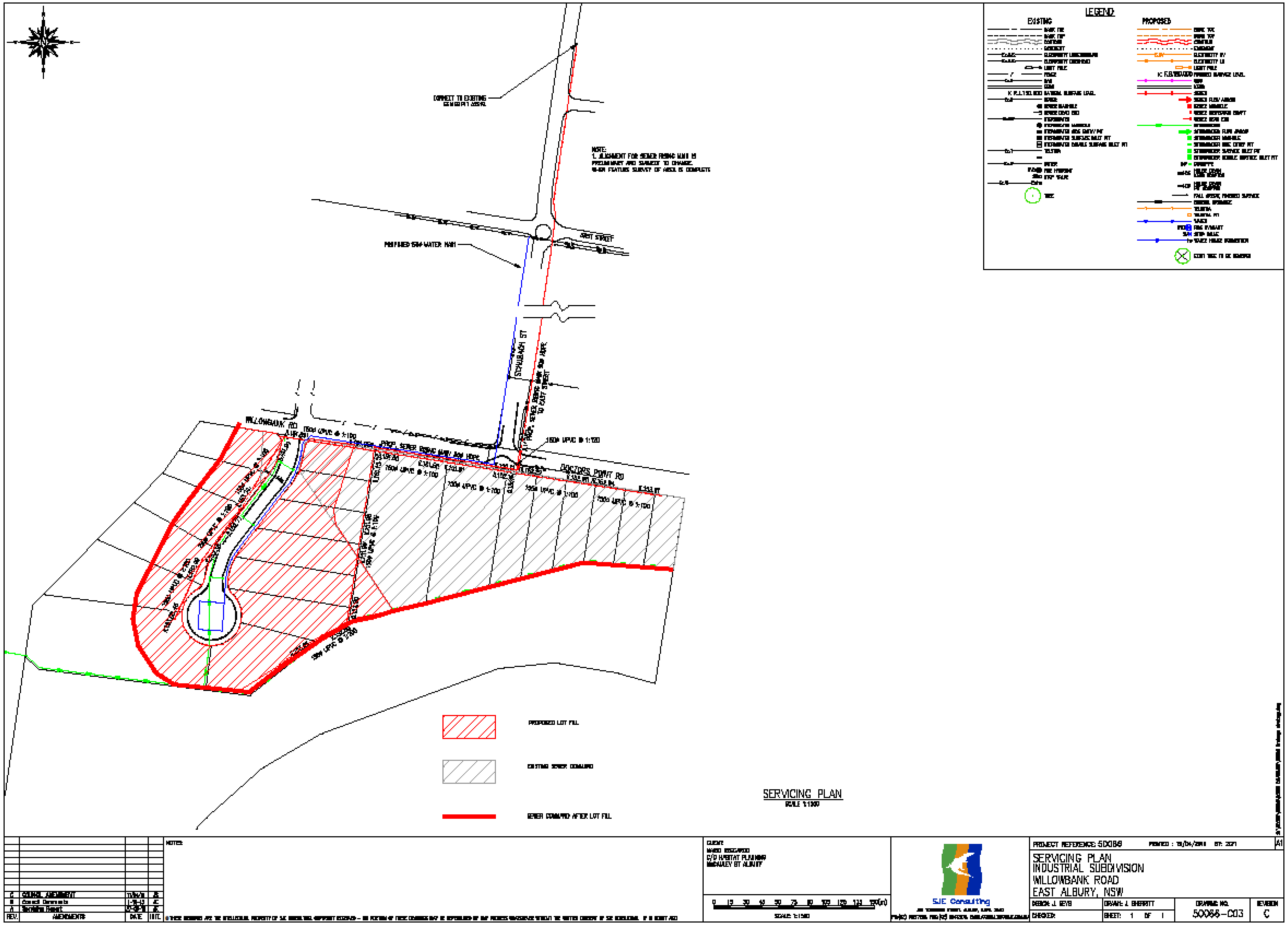
8. APPENDIX B

PDF APPENDIX B - CONCEPT PLAN



9. APPENDIX C

PDF APPENDIX C1 - SERVICING PLAN



WILLOWBANK ROAD, EAST ALBURY.

Sewage Pump Station and Rising Main Design Features

1. Design Flow

Pump Station pump peak flow design based on the Peak Wet Weather Flow (PWWF). After consultation with Albury city council staff this has been calculated as:

-21 Industrial lots, equivalent to approximately 90 residential lots, by an EP of 3.1 by 180L per person per day gives the average dry weather flow (ADWF) by a multiplier for wet weather of 6 gives a total of 301,320L/day or 3.48L/s (PWWF).

2. Pump Station Levels

The Pump Station will be located in the road reserve on the Southern side of Willowbank Road, East Albury.

The levels are approximately:

- RL 154.02m for top of station;
- RL 151.48m for the incoming gravity sewer inlet Invert Level and a depth below this of approximately 0.95m (RL 150.525m) to be deemed the base of the wet well.

3. The Rising Main

The Rising Sewer is to be 90mm HDPE running for approximately 700m from the road reserve on Willowbank Drive to the existing sewer manhole no. A2619 located on Schubach Street.

The Rising Sewer will run from the proposed station site to a ground level high point around RL 163.91m, giving a static head value of around 13.2m.

4. Friction losses

An allowance must be made for losses within the station pipe work based on say 75mm nominal diameter poly pipe. Pipe work assumed to consist of, depending on final layout, equivalent two 90 degree bends (k value ~ 0.6 each), two 45 degree bends (k value ~ 0.4 each), one swing check valve (k value ~ 2.0), one Flow meter, turbine type, (k value ~ 7) one gate check valve (k value ~0.2), one standard tee (flow through branch) (k ~ 1.8), one standard tee (flow through run) (k ~ 0.6), one pipe entry and one pipe exit (K value ~ 1.0).

Therefore total k value equals 15.1, while the velocity of flow in the pipe is around 1.16 m/s, giving a K times V squared divided by 2 times the acceleration due to gravity (g) of 1.04m. (Pump Station fittings friction losses)

The head losses due to friction in the rising main (90mm dia), at approximately 5L per second, are around 10.4m for the entire length of rising sewer.

Pipe head losses in the station based on 80mm diameter poly class at 5.0L/s are 0.087m over an approximate 5m of pipe.

Adding the static heads gives a total working head range of about 24.8m.

5. Sewer Pump

If this is plotted to the required "Flygt" pump range then it becomes clear the most likely pump will be a 2.4 KW CP 3060.390 HT.

In full operation the flow should be around 5.08 L/s with a Rising Main velocity of around 1.1m/s.

As the design proceeds, the sewer pump design can be refined but based on supplied data the 2.4 KW pump and 90mm Diameter Riser combinations should be suitable for this situation with a reasonable degree of safety. Pump station will be detailed as per ACC requirements (including twin pumps on guide rails on pedestals and the usual control systems) and final design will be submitted with the rest of the design plans for Willowbank Road.

Jonathan Keys
SJE Consulting

Design Pumping Flow Rate

Contributory flow	21 Industral lots equivelant to 90 residential lots *180 (units per lot) =	16200	L/d

Peaking Factor Calculation				
Estimated Population per residence=		3.10		(EP)
Peak Factor =	Developmet area	9	(ha)	(WSA 02 -2002-2.3)
		4.241238253		Sewer code of Autralia
	Design Peak Factor =	4.241		

Determine Minimum Pump Rate					
Average Daily Flow =	0.5813	L/s	50,220	L/d	
Peak Dry Weather Flow =	2.465	L/s	212994.99	L/d	(Average daily flow*EP*Design Peaking I
Peak Wet Weather Flow =	3.4875	L/s	301320	L/d	
Design Pumping Rate =	**4.6**	L/s			

Cycle Time & Wet Well Geometry

Target Cycles Per Hour				
ADF	=	0.58125	L/s	
Pumping Rate (	=	4.6	L/s	
Time	=	10.0	min.	Calculated from target Cycles per Hour
Cycles Per Hour =		**6.0**		
Check Cycles Per Hour:		**OK**		
Check Cycles Per Hour:		**OK**		

Determine Wet well Diameter			
Required Volume =	1.40000	m^3	ACC Requirement
Pick Wet Well Diameter =	**1.8**	m	
Cut-in-cut-out depth (h)	**0.550**	m	Based on ACC minimum requirment 1400L of stora
Max Volume in Cycle =	1.4	m^3	

Sewer Inlet lvl		**151.48**
FS lvl		**154.02**

Determine Wet Well Invert & Float Elevations			
Duty cut in level	151.33	m	150mm below inlet level
Duty cut out level	150.8	m	cut in level - cut-in-cut-out depth
Low level Alarm	150.6	m	170mm below duty cut out
Standby cut In	151.93	m	600mm above duty cut in
Highlevel Alarm	152.23	m	300mm above standby cut-in
ı Invert Elev* =	150.525	m	85mm below low level alarm
Total pit depth	3.50	m	
Depth below inlet	0.955	m	

Force Main & Piping Design

Off-Site Force Main Data		
Design Pump Rate (L/s) =	4.6	
Select Force Main Size (m) =	**0.0763**	90m
Velocity (m/s) =	1.01	
Meets Minimum Velocity Requirement?	**OK**	
Meets Maximum Velocity Requirement?	**OK**	
Required Pump?		
Line Length (m) =	**700**	
Account for Minor Losses =	5%	
Equiv Length (m) =	700.350	

Connection Point:	

Pump Station Piping Data	
Design Pump Rate (L/s) =	4.6
Pick Wet Well & Valve Vault Piping Size (m) =	**0.074**
Velocity (m/s) =	1.07
Meets Minimum Velocity Requirement?	**OK > 0.6096 MPS**
Meets Maximum Velocity Requirement?	**OK < 2.4384 MPS**

Calculated Head Loss in Fittings, Valves, Entrances & Exits

	K	Qty	Sub Total K
Angle Valve	5	0	0
Ball Valve, Full Port	0.05	0	0
Butterfly Valve	0.6	0	0
Check Valve, Swing Type	2	1	2
Elbow 45 Degrees	0.4	2	0.8
Elbow 90 Degrees, Long Radius	0.6	0	0
Elbow 90 Degrees, Standard	0.6	2	1.2
Flow Meter, Turbine Type	7	1	7
Foot Valve	0.9	0	0
Gate Valve	0.2	1	0.2
Globe Valve	10	0	0
Pipe Entrance, Inward Projected Pipe	1	0	0
Pipe Entrance, Sharp Edge	0.5	1	0.5
Pipe Exit	1	1	1
Tee, Standard, Flow Through Branch	1.8	1	1.8
Tee, Standard, Flow Through Run	0.6	1	0.6
		Total K	**15.1**

Pump Selection

Force Main Diameter (I.D) (m) =	0.0763
Pick Wet Well & Valve Vault Piping Size (m) =	0.074
Force Main Length (m) =	700
wet well length (approx) (m)=	5
Resistance coeficent k =	15.1
Minimum Required Pump Rate (L/s) =	4.60
Kinematic Viscosity (V) (m^2/s) =	0.0000010
Specific Roughness © (m) =	0.0000015

Design Pumping Rate (L/s) =	4.6

Data for systems curve

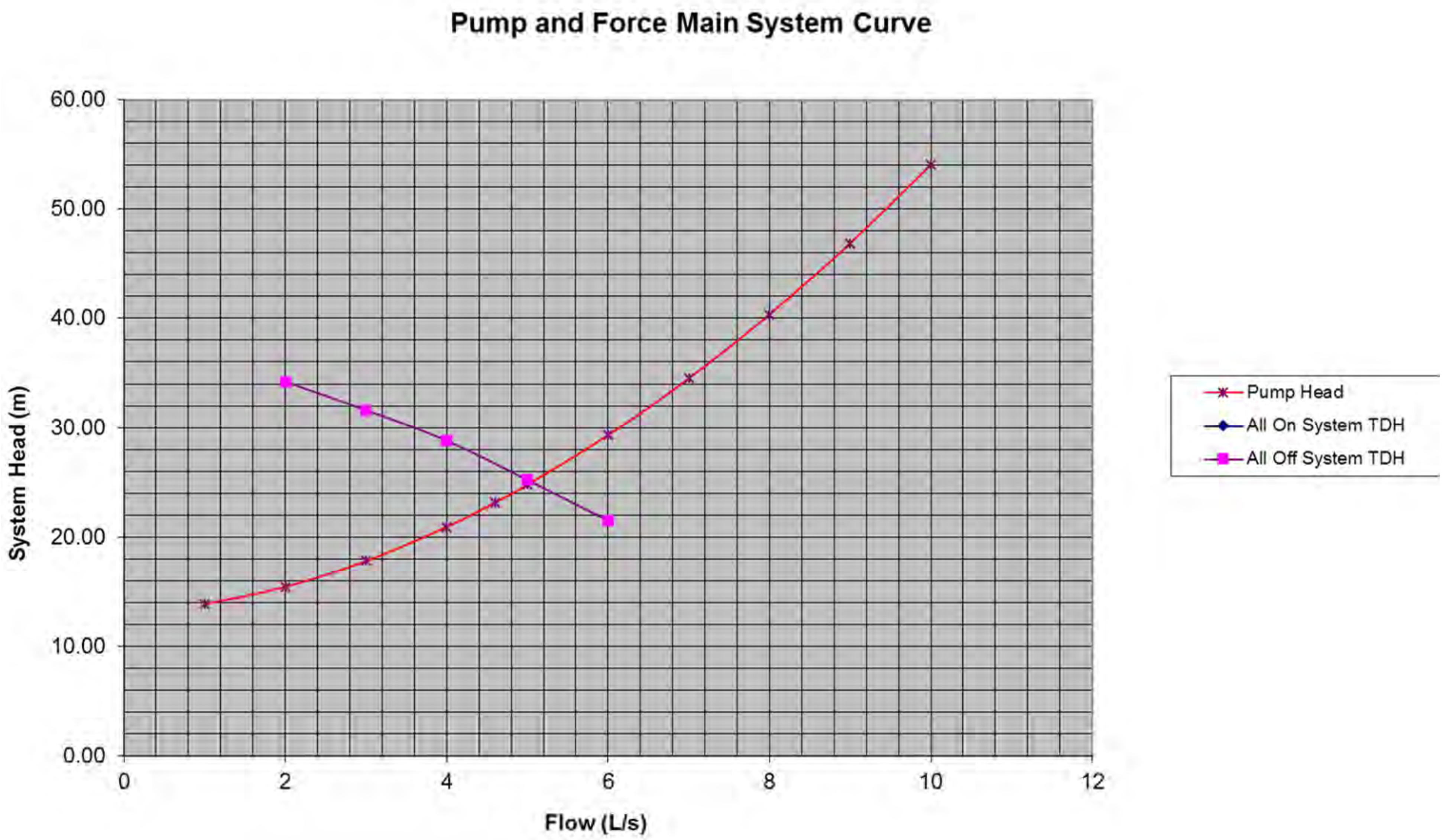
L/S	Static Head	Head caused by siphoning effect in riser main	Velocity in riser main (m/s) = ((L/s)*.001)/area of rising main)	Velocity in Wet well	Velocity head (Station pipe work) (K*v^2)/(2*g)	Reynolds Number	Darcy Friction Factor	Pipe head losses (Riser main)	Pipe head losses (Station)	Total Pump hea (siphonin effect)
1	13.2	0	0.218706174	0.2325127	0.041607469	16687	0.02707465	0.6	0.005	13.9
2	13.2	0	0.437412348	0.4650254	0.166429878	33375	0.02285350	2.0	0.017	15.4
3	13.2	0	0.656118521	0.6975381	0.374467225	50062	0.02083603	4.2	0.035	17.8
4	13.2	0	0.874824695	0.9300508	0.665719511	66749	0.01956806	7.0	0.058	20.9
4.6	13.2	0	1.006048399	1.06955842	0.880414053	76761	0.01899550	9.0	0.075	23.1
5	13.2	0	1.093530869	1.1625635	1.040186735	83436	0.01866652	10.4	0.087	24.8
6	13.2	0	1.312237043	1.395076199	1.497868899	100124	0.01797831	14.5	0.120	29.3
7	13.2	0	1.530943216	1.627588899	2.038766001	116811	0.01742801	19.1	0.159	34.5
8	13.2	0	1.74964939	1.860101599	2.662878042	133498	0.01697336	24.3	0.202	40.4
9	13.2	0	1.968355564	2.092614299	3.370205022	150186	0.01658850	30.1	0.250	46.9
10	13.2	0	2.187061738	2.325126999	4.160746941	166873	0.01625654	36.4	0.303	54.0

Pump Manufacturer:	**Flygt Submersible Pump**
Model Number:	**CP 3060.390 HT 3~250p**
Impeller Diameter:	**160 mm**
KW:	**2.4**
Voltage:	**415v 3phase**

Max synchronous speed of 1500 rpm

System curve provided by pump manufacturer

	Initial Pump Curve	Final Pump Curve
1	36.2	
2	34.2	
3	31.6	
4	28.8	
5	25.2	
6	21.5	


Pump and Force Main System Curve
System Head (m)
60.00
50.00
40.00
30.00
20.00
10.00
0.00
0
2
4
6
8
10
12
Flow (L/s)
Pump Head
All On System TDH
All Off System TDH

Station Operation Check

Proposed Operational Point No.1

5.08	L/s at	**25.3**	System Head	

Check Wet well Cycle Times

Wet well Diameter (m)	Wet well Area (m^2)	Wet well depth (m)	Wet well Volume (m^3)	
1.8	2.5	0.5502	1.4	
Fill =	Wet well Volume / ADF	=	40.143	minutes
Run =	Wet well Volume / Pump Rate - ADF	=	5.18662591	minutes
		Total =	45.32999509	minutes
		Cycle Time =	**1.3**	**Cycles / H**
		Meets Minimum Cycle Time?	**Increase Cycle Time**	
		Meets Maximum Cycle Time?	**OK**	

Station Operation Check

Proposed Operational Point No. 2

5.08	L/s	**25.3**	System head	

Check Wet well Cycle Times

Wet well Diameter (m)	Wet well Area (m^2)	Wet well depth (m)	Wet well Volume (m^3)	
1.8	2.5	0.6	1.39929026	
Fill =	Wet well Volume / PWWF	=	6.68716970	minutes
Run =	Wet well Volume / Pump Rate - PWWF	=	14.64458671	minutes
		Total =	21.331756405	minutes
		Cycle Time =	**2.8**	**Cycles / Hour**
		Meets Minimum Cycle Time?	**OK**	
		Meets Maximum Cycle Time?	**OK**	

Appendix ‘H’

Integrated Land Use & Transport

The Right Place for Business and Services — Planning policy	
Aims	
This policy aims to encourage a network of vibrant, accessible mixed use centres which are closely aligned with and accessible by public transport, walking and cycling.	The proposal is not to create a centre but to add to existing industrial land in the south of East Albury. Public transport is available in nearby East Street. The location of the land and its intended use is such that dedicated pedestrian access is not warranted. Cycle access is available by the local road network.
Objectives	
The planning objectives of the policy are to:	
• locate trip-generating development which provides important services in places that: − help reduce reliance on cars and moderate the demand for car travel − encourage multi-purpose trips − encourage people to travel on public transport, walk or cycle − provide people with equitable and efficient access	The development envisaged by the industrial zoning will generate trips relating to employment and business activities. The combination of the size of the land being rezoned, the low density of development in Albury-Wodonga, the general underutilisation of the local road network and lack of public transport coverage means the proposal will on balance not reduce reliance on car travel. Access to the site is excellent within the context of industrial land use being in close proximity of a full interchange of the Hume Highway and route of vehicles not through residential areas.
• minimise dispersed trip-generating development that can only be accessed by cars	The site, like most employment lands outside of the Albury CBD, will be accessed by cars. Consequently there is a technical non-compliance with this objective.
• ensure that a network of viable, mixed use centres closely aligned with the public transport system accommodates and creates opportunities for business growth and service delivery	The site is not a centre.
• protect and maximise community investment in centres, and in transport infrastructure and facilities	The site is not a centre.
• encourage continuing private and public investment in centres, and ensure that they are well designed, managed and maintained	The site is not a centre.
• foster growth, competition, innovation and investment confidence in centres, especially in the retail and entertainment sectors, through consistent and responsive decision making.	The site is not a centre.
Improving Transport Choice — Guidelines for planning and development	
Principles	
1. CONCENTRATE IN CENTRES Develop concentrated centres containing the highest appropriate densities of housing, employment, services and public facilities within an acceptable walking distance — 400 to 1000 metres — of major public transport nodes, such as railway stations and high frequency bus routes with at least a 15 minute frequency at peak times.	The site is not a centre.

The Right Place for Business and Services — Planning policy	
2. MIX USES IN CENTRES Encourage a mix of housing, employment, services, public facilities and other compatible land uses, in accessible centres.	The site is not a centre.
3. ALIGN CENTRES WITHIN CORRIDORS Concentrate high density, mixed use, accessible centres along major public transport corridors within urban areas.	The site is adjacent to the main road and rail transport corridor in Australia being the Hume Highway and Great Southern Railway that link Melbourne and Sydney. It is within the Albury urban area.
4. LINK PUBLIC TRANSPORT WITH LAND USE STRATEGIES Plan and implement public transport infrastructure and services in conjunction with land use strategies to maximise access along corridors, and to and from centres.	The nature of the proposal is such that the usage resulting from development will not generate a demand for the extension of existing public transport infrastructure or routes in Albury.
5. CONNECT STREETS Provide street networks with multiple and direct connections to public transport services and efficient access for buses.	The proposal will not result in any change to the existing local street network. Access to public transport in East Street is via Schubach Street.
6. IMPROVE PEDESTRIAN ACCESS Provide walkable environments and give greater priority to access for pedestrians, including access for people with disabilities.	The development of the site will not result in a volume of trips that warrants the provision of additional dedicated pedestrian access.
7. IMPROVE CYCLE ACCESS Maximise cyclists' accessibility to centres, services, facilities and employment locations.	The existing local street network provides for cyclists. Local streets are generally underutilised in terms of their design capacity and such provide a safe environment for cyclists.
8. MANAGE PARKING SUPPLY Use the location, supply and availability of parking to discourage car use.	All parking associated with the development of the site will be provided on-site in accordance with Council's requirements.
9. IMPROVE ROAD MANAGEMENT Improve transport choice and promote an integrated transport approach by managing road traffic flow and priority of transport modes.	The Traffic Impact Assessment at Appendix 'E' demonstrates how traffic generated from the development of the land can be managed within the local road network.
10. IMPLEMENT GOOD URBAN DESIGN Design with an emphasis on the needs of pedestrians, cyclists and public transport users.	The proposal is for industrial development of a type that remains to be determined. The site is accessible to public transport and can be accommodated within the existing local road network. The needs of pedestrians, cyclists and public transport users are considered met by the proposal.

Appendix 'I'

AHIMS searches for recorded sites of Aboriginal cultural heritage

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : 1496/1

Client Service ID : 238700

Habitat Planning Environmental Planning and Development

Date: 14 August 2016

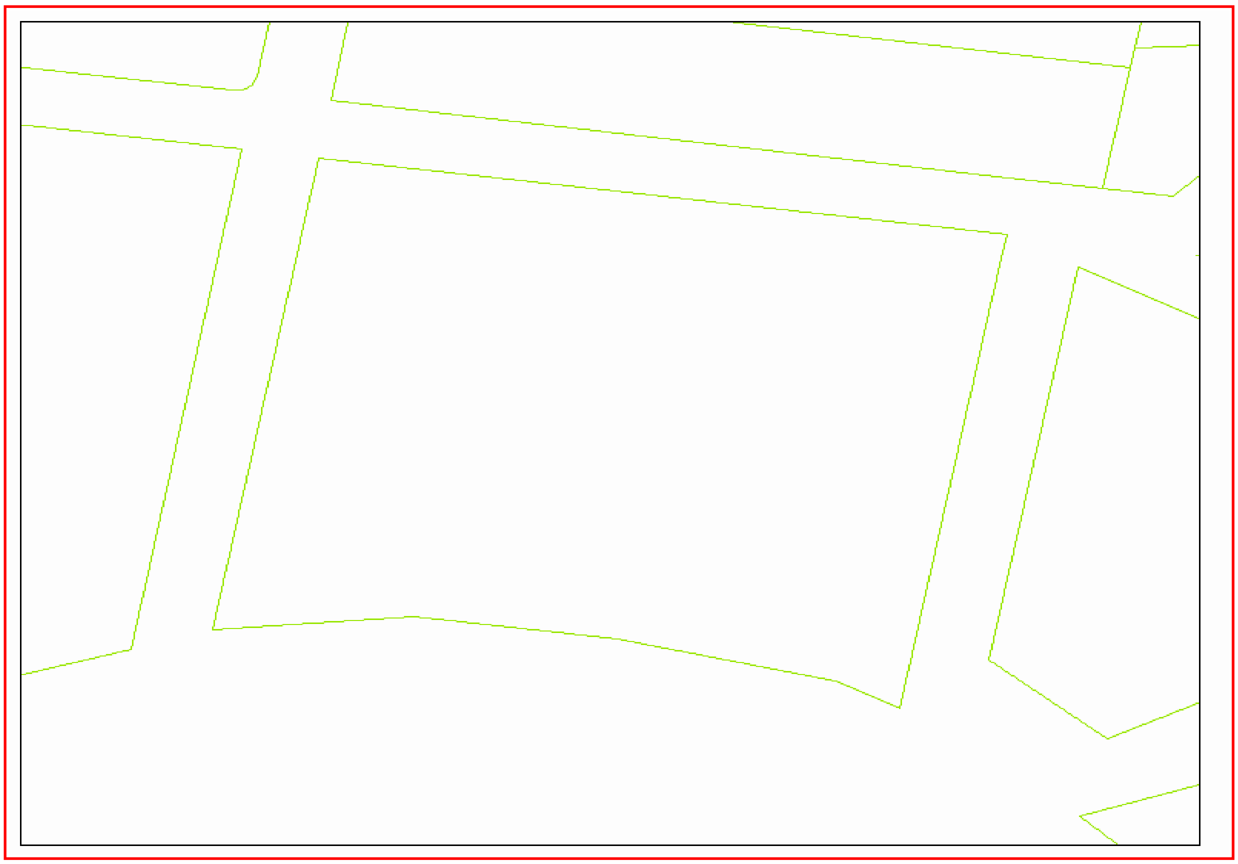
Attention: Warwick Horsfall

Email: habitat@habitatplanning.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 156, DP:DP753326 with a Buffer of 50 meters, conducted by Warwick Horsfall on 14 August 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : 1496/2

Client Service ID : 238701

Habitat Planning Environmental Planning and Development

Date: 14 August 2016

Attention: Warwick Horsfall

Email: habitat@habitatplanning.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 2, DP:DP999814 with a Buffer of 50 meters, conducted by Warwick Horsfall on 14 August 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

AHIMS Web Services (AWS)

Search Result

Purchase Order/Reference : 1496/3

Client Service ID : 238702

Habitat Planning Environmental Planning and Development

Date: 14 August 2016

Attention: Warwick Horsfall

Email: habitat@habitatplanning.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 37, DP:DP1007315 with a Buffer of 50 meters, conducted by Warwick Horsfall on 14 August 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

AHIMS Web Services (AWS)

Search Result

Purchase Order/Reference : 1234

Client Service ID : 250834

Habitat Planning Environmental Planning and Development

Date: 25 October 2016

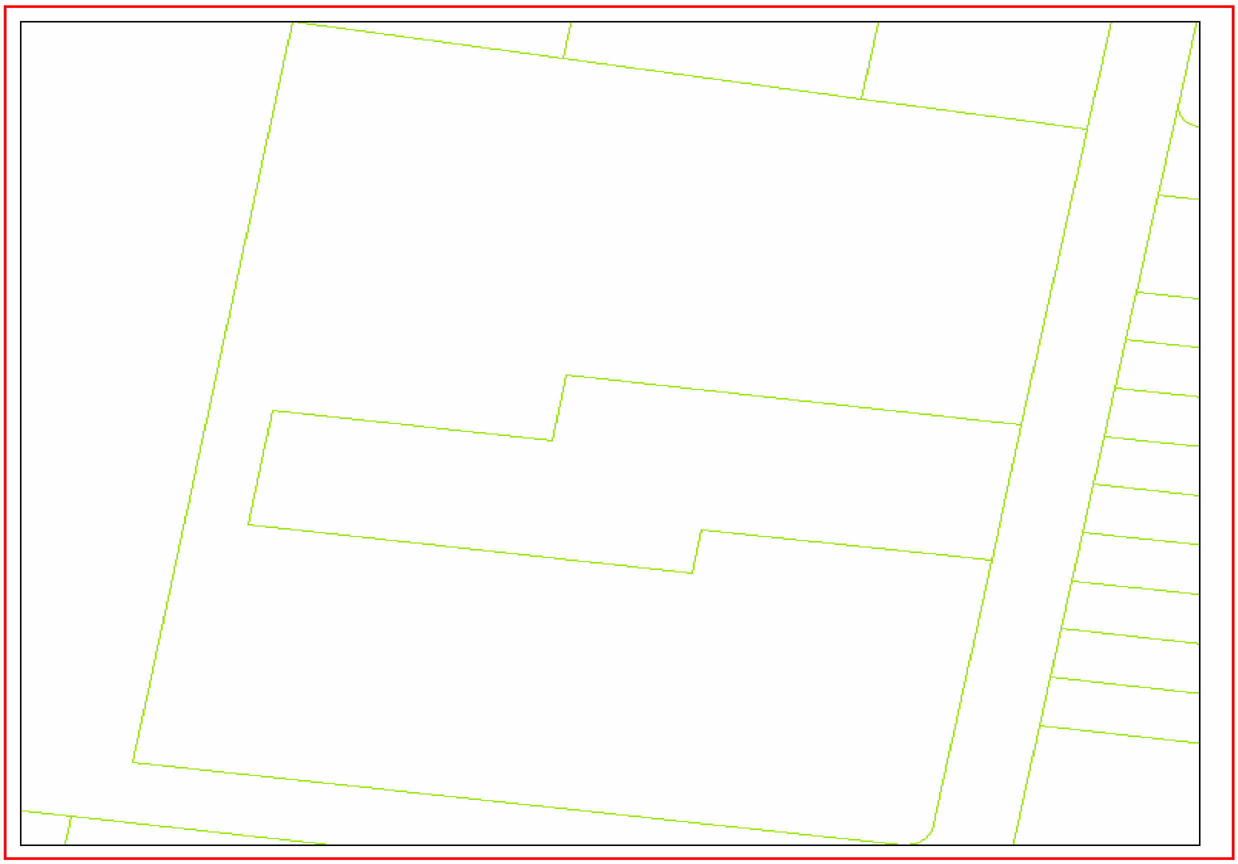
Attention: Warwick Horsfall

Email: habitat@habitatplanning.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 32, DP:DP1139466 with a Buffer of 0 meters, conducted by Warwick Horsfall on 25 October 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : 1234

Client Service ID : 250832

Habitat Planning Environmental Planning and Development

Date: 25 October 2016

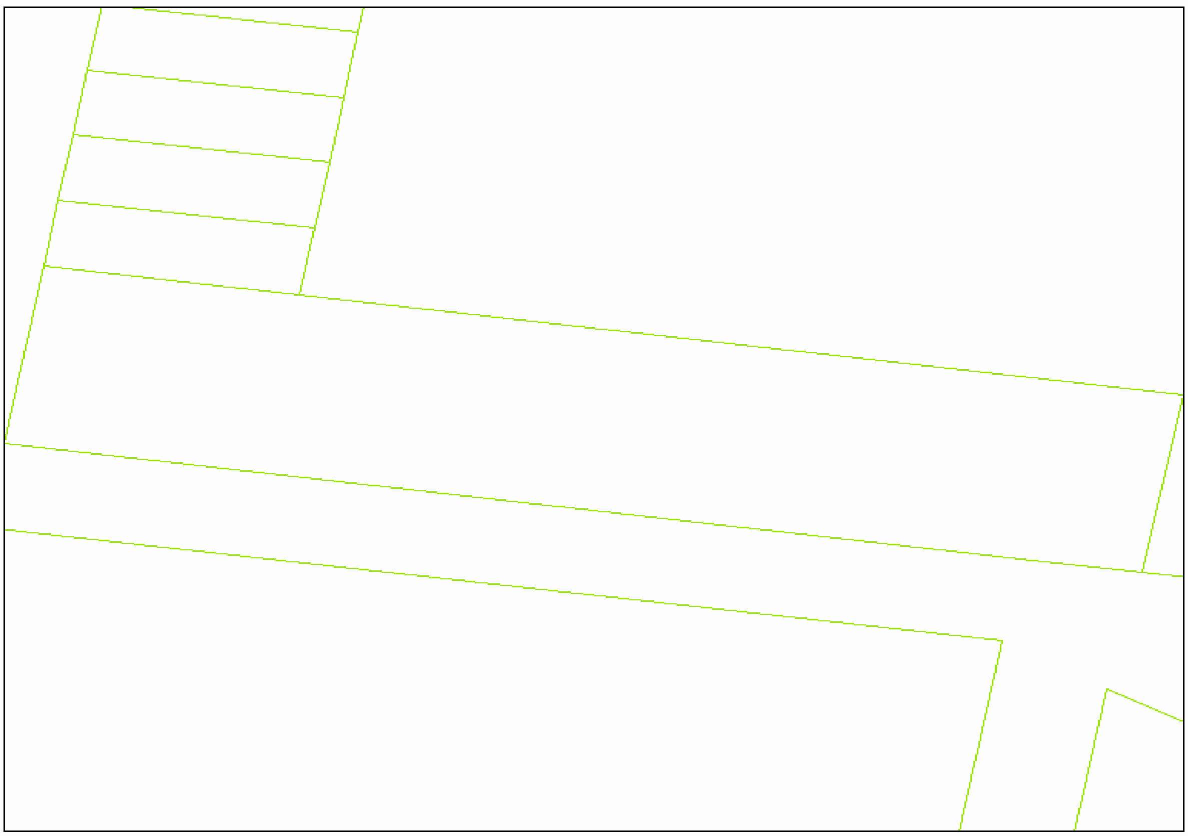
Attention: Warwick Horsfall

Email: habitat@habitatplanning.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 12, DP:DP38412 with a Buffer of 0 meters, conducted by Warwick Horsfall on 25 October 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

AHIMS Web Services (AWS)

Search Result

Purchase Order/Reference : 1234

Client Service ID : 250831

Habitat Planning Environmental Planning and Development

Date: 25 October 2016

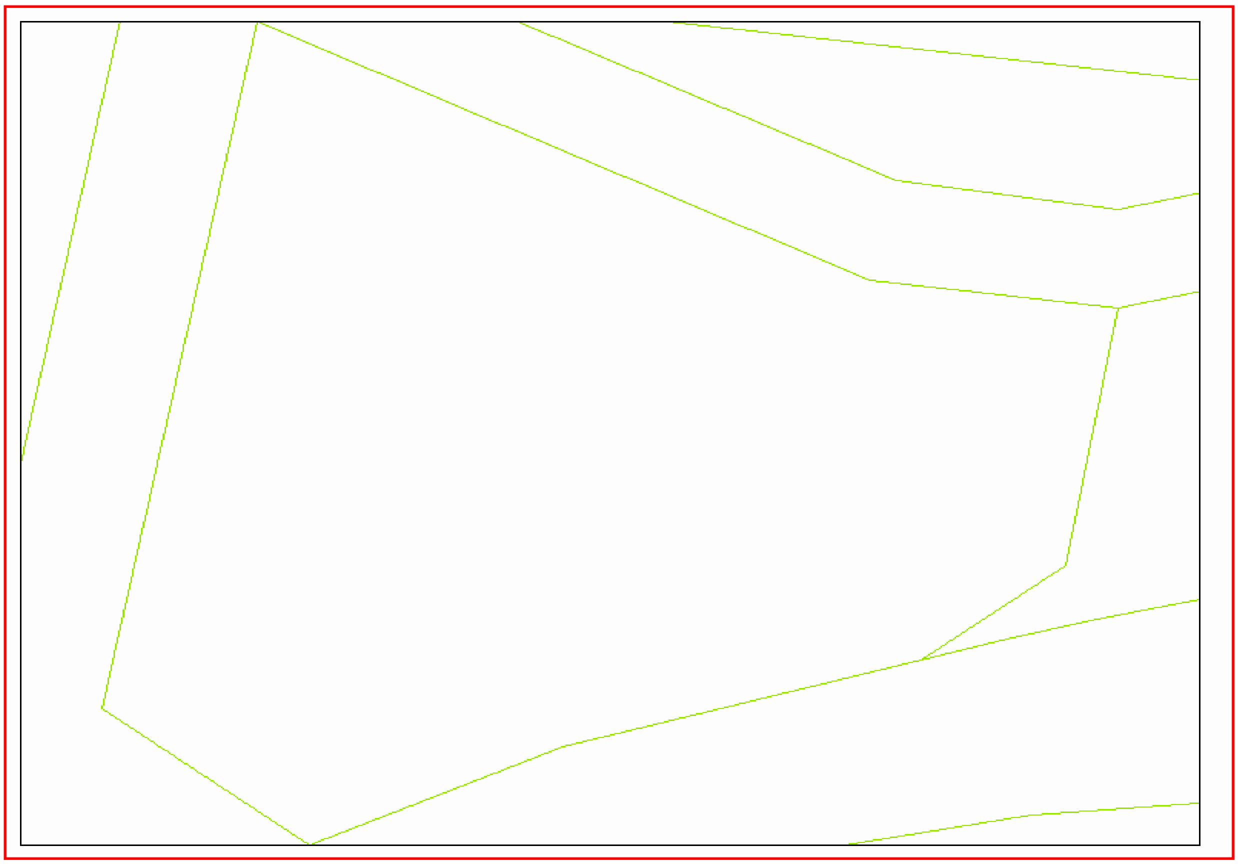
Attention: Warwick Horsfall

Email: habitat@habitatplanning.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 317, DP:DP753326 with a Buffer of 0 meters, conducted by Warwick Horsfall on 25 October 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

AHIMS Web Services (AWS)

Search Result

Purchase Order/Reference : 1234

Client Service ID : 250830

Habitat Planning Environmental Planning and Development

Date: 25 October 2016

Attention: Warwick Horsfall

Email: habitat@habitatplanning.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 101, DP:DP1014941 with a Buffer of 0 meters, conducted by Warwick Horsfall on 25 October 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

AHIMS Web Services (AWS)

Search Result

Purchase Order/Reference : 1234

Client Service ID : 250829

Habitat Planning Environmental Planning and Development

Date: 25 October 2016

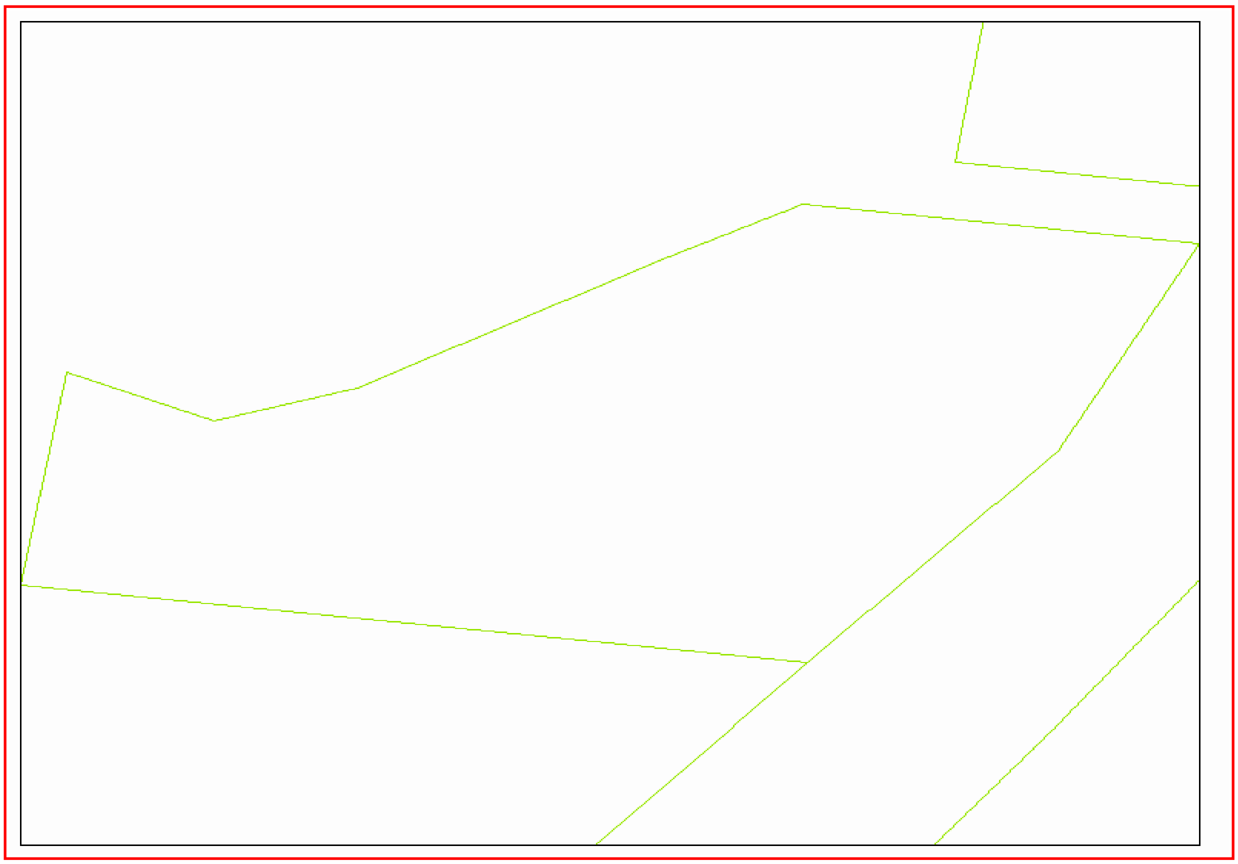
Attention: Warwick Horsfall

Email: habitat@habitatplanning.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 103, DP:DP1014941 with a Buffer of 0 meters, conducted by Warwick Horsfall on 25 October 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***