Remedial Action Plan

49 and 57 Annie Street, Wickham, NSW

Prepared for:
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Distribution

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49 and 57 Annie Street, Wickham, NSW

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List of Acronyms

Acronym	Definition
AASS	Actual Acid Sulphate Soils
ACM	Asbestos Containing Material
AHD	Australian Height Datum
AMG	Approximate Geographical Coordinates
AMP	Asbestos Management Plan
ANZECC	Australian and New Zealand Environment and Conservation Council
ARCP	Asbestos Removal Control Plan
ASC	Assessment of Site Contamination
ASS	Acid Sulphate Soils
BTEXN	Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene
CEMP	Construction, Environment Management Plan
CoPC	Contaminant of Potential Concern
CSM	Conceptual Site Model
DA	Development Application
DSI	Detailed Site Investigation
EIL	Ecological Investigation Level
EMP	Environmental Management Plan
EPA	NSW Environment Protection Authority
ESL	Ecological Screening Level
GME	Groundwater Monitoring Event
HESP	Health, Environment and Safety Plan
HIL	Health-Based Investigation Level
HSL	Health Screening Level
LNAPL	Light non-aqueous phase liquid

Acronym	Definition
LOR	Limit of Reporting
M	Metre
m AHD	Metres Australian Height Datum
m bgl	Metres Below Ground Level
MPE	Multi-phase extraction
NATA	National Association of Testing Authorities
NCC	Newcastle City Council
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NOHSC	National Occupational Health and Safety Commission
OEH	Office of Environment and Heritage
PAH	Polycyclic Aromatic Hydrocarbons
PASS	Potential Acid Sulfate Soils
PID	Photo-Ionisation Detector
PPE	Personal protective equipment
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RAP	Remedial Action Plan
RVR	Remedial Validation Report
SAQP	Sampling and Analysis Quality Plan
SAR	Site Audit Report
SAS	Site Audit Statement
SEPP	State Environmental Planning Policies
SWMS	Safe Work Method Statement

Acronym	Definition
TBC	To be confirmed
TEQ	Toxicity Equivalent Quotient
TRH	Total Recoverable Hydrocarbons
UFP	Unexpected Finds Protocol
VENM	Virgin Excavated Natural Material
VMP	Voluntary Management Proposal

1.0 Introduction and Objectives

Senversa Pty Ltd (Senversa) was engaged by Investec Australia Finance Pty Ltd (Investec) to prepare a Remedial Action Plan (RAP) for the property identified as Lot 1 and Lot 2 in DP 346352, located at 49 and 57 Annie Street, Wickham, NSW (the site).

The site location and layout are shown on **Figure 1**.

1.1 Background

Investec is planning to redevelop the site for mixed residential, open space and commercial uses. The residential development is proposed to comprise refurbishment of the existing wool stores and a new building to be constructed in the north-western corner of the site as medium to high density residential dwellings, with a small commercial retail occupancy in the south of the new building. The residential and commercial developments will be fully and permanently paved with minimal opportunities for soil access. The open space area (public park) will be located in the north-eastern corner of the site, and also provide temporary stormwater detention (which will require this area to be lowered by approximately 0.5 m relative the current ground surface elevations). The development is proposed to be staged, with the wool store in the southwestern portion of the site and the open space in the northeast to be developed first. Copies of the proposed development and staging plans are presented in **Appendix A**.

A number of Preliminary Site Investigations (PSIs) and a Detailed Site Investigation (DSI) (Senversa, 2017) have identified soil and / or groundwater on and under the site. Contamination is also known to exist to the east of the site at Lot 3 in DP 346352 (lot 3), Lot 13 in DP 830026 (Lot 13) and the Caltex Newcastle Fuel Terminal (Caltex Terminal) (refer to **Figure 1** for location of these land parcels). The soil, groundwater and soil vapour contamination east of the site is associated with a leak of jet fuel from the Caltex Terminal. There is no evidence that contamination associated with this leak has impacted on the site.

The DSI report concluded that an RAP was required to be prepared and implemented to:

- Address soil contamination, asbestos containing material (ACM) in soil and aesthetic issues (in soil) on and under the site; and
- Include a program of monitoring to assess whether contamination from off-site areas (east and up hydraulic gradient) is migrating onto site (and potentially impacting on the suitability of the site for the proposed future uses).

Investec has prepared a draft Development Application (DA) Masterplan Report for the site and adjoining Lot 3 and Lot 13, and understands that as part of the development process, a Site Audit Statement (SAS) is required to be prepared by a site auditor (Auditor) accredited by the NSW EPA under the *Contaminated Land Management Act 1997.* Investec has engaged NSW EPA accredited site auditor Mr Lange Jorstad of Geosyntec to complete a site audit for the site. This RAP relates only to the site (Lots 1 and 2). Assessment and remediation of Lots 3 and 13 is ongoing, and is being completed by Caltex.

1.2 Objective

The objectives of the RAP are as follows:

- Define the nature and extent of soil contamination, ACM and aesthetic issues in soil on and under the site requiring remediation (to make the site suitable for the proposed future land use);
- Describe the remediation objectives and strategy to be adopted, and roles and responsibilities for completing the remediation tasks;
- Document the remediation validation requirements;

- Detail a procedure to manage unexpected contamination which may be encountered during the proposed remediation and development works.
- Outline requirements to mitigate potential risks to human health and the environment during remediation;
- Detail a monitoring plan for the eastern boundary of the site - to assess whether contamination east of the site (on and under Lot 3, Lot 13 and the Caltex Terminal) is moving under the site; and
- Provide contingent actions – should the preferred remedial strategies prove unsuccessful, or should there be evidence of off-site contamination (to the east) migrating under the site and posing a potential risk to the users and occupants of the future development.

Acid sulfate soils (ASS) are also known to exist in natural soils under the site (Senversa, 2017). The extent to which these will or may be disturbed is currently not known. Once established, an ASS management plan will be prepared for review and approval by the Auditor.

1.3 Guidelines

The following guidelines were considered when developing the remediation and validation strategy described in this RAP:

- NEPC, 1999 (as amended 2013). *National Environment Protection (Assessment of Site Contamination) Measure* (ASC NEPM).
- NSW DEC, 2006. *Guidelines for the NSW Site Auditor Scheme (2nd edition).*
- NSW EPA, 2000. *Guidelines for Consultants Reporting on Contaminated Sites*.
- NSW WorkCover (now SafeWork NSW), 2014. *Managing asbestos in or on soil*.
- NSW EPA, 2014. *Waste Classification Guidelines*.
- SafeWork Australia, 2011. *How to Manage and Control Asbestos in the Workplace Code of Practice*, December 2011.
- Standards Australia, 2005. *Australian Standard AS 4482.1-2005: Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile Compounds.*
- WA DoH, 2009. *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia*.

1.4 Project Roles

The key stakeholders involved within the remediation project are as follows:

Role	Organisation
Client – entity completing the development.	Investec
Auditor – responsible for undertaking a site audit under the *CLM act 1997.*	GeoSyntec
Remediation Contractor – responsible for construction works and implementation of this RAP.	TBC
Environmental Consultant – responsible for preparation of this RAP, supervision and direction of the remediation contractor and site validation.	Senversa

2.0 Site Background

2.1 Introduction

The following sections provide a summary of the understanding of the site conditions, and the current and historical uses of the site - which are based upon the results of the DSI and other previous investigations conducted at the site and surrounding properties. A list of relevant previous investigation reports is provided in **Section 9.0**.

2.2 Site Identification

The following table summarises site identification details.

Item	Description
Site Address, Lot and Plan Number (approximate area)	The site consists of multiple addresses comprising: • 49 Annie Street, Wickham, NSW - Lot 2 in Deposited Plan 346352 (10,200 m^2). • 57 Annie Street, Wickham, NSW - Lot 1 in Deposited Plan 346352 (10,000 m^2).
Site Area	Approximately 2 hectares (ha).
Local Government Area	Newcastle City Council.
Approximate Geographical Coordinates (AMG)	North-eastern Corner: 32^{0} 54'52" S 1510 45' 18" E. North-western Corner: 32^{0} 54'51" S 1510 45' 14" E. South-eastern Corner: 32^{0} 54'59" S 1510 45' 17" E. South Western Corner: 32^{0} 54'57" S 1510 45' 13" E.

2.3 Site Environmental Setting

The environmental setting of the site is summarised in the table below.

Item	Detail
Current Land Use	The site currently consists of: • Two multi-storey former wool stores – one of which is currently used for storage and office space. The western-most wool store is vacant. The wool stores have an approximately 1 m high crawl space. • An open area to the north of the wool stores – most recently used for storage of boats, shipping containers and concrete casting. • A corrugated iron shed is located in the very north-western corner of the site. The site is fenced along the southern, northern and western boundaries, and part of the eastern boundary. The remainder of the eastern boundary is formed by concrete bund walls which form part of the Caltex Terminal infrastructure.

Item	Detail
Surrounding Land Use	The land uses surrounding the site consist of the following: • North – light commercial and low density residential beyond. • South – mixture of light industrial and residential. • East – Lot 3 and 13 that comprise a former wool store used for general storage (41 Annie Street) and a smaller building (Building 33) used for mixed light industrial use (33 Annie Street). As part of the future development by Investec, Lot 13 will be incorporated into Lot 3. • The Caltex Terminal is located east of Lot 3 and 13, beyond which is mixed commercial and light industrial use and residential properties (Honeysuckle development - east of Hannell Street). • West – light commercial/industrial and residential.
Topography and Surface Cover	The topography of the site is generally flat and low lying, with ground surface elevations varying between approximately 0 to 5 m relative to the Australian Height Datum (AHD). The NSW Natural Resource Atlas website indicated the regional surface elevations decline to the east/southeast towards Throsby Creek and Throsby Basin. The site is sealed with bitumen or concrete, with the exception of a small area of grass located in the north-western corner of the site.
Surface water and Drainage	The nearest surface water body to the site is Throsby Creek, located approximately 350 m east and 500 m northwest of the site (refer to **Figure 1**). Throsby Creek discharges to the Hunter River, close to its outlet to the Pacific Ocean. The Newcastle Stormwater Management Plan (Newcastle City Council (NCC) 2004) indicates Throsby Creek is tidally influenced in the vicinity of the site and therefore is likely to be generally saline. It also indicates that Throsby Creek is highly modified and impacted by current and historical industrial activities (bordering the creek). Surface water runoff at the site is expected to collect within the existing stormwater drainage network, which feeds into the municipal stormwater system. Stormwater within the municipal network is likely to discharge into Throsby Creek.
Regional Geology	The geology underlying the site and surrounding areas generally consists of Cainozoic and Quaternary gravel, sand, silt and clay alluvium (Newcastle Coalfield Regional 1:100 000 Geology Map). The natural soils encountered under the site during the various investigations are considered to be generally consistent with the regional geological profile. Fill material has been placed on top of natural soils at the site and surrounding areas. The nature and thickness of the fill material is described in **Section 2.5**
Potential Acid Sulfate Soils	The Newcastle Acid Sulfate Soil (ASS) Map (Newcastle City Council, 2014) indicates the site is located within a Class 3 ASS zone. Field peroxide testing completed by Aargus (2004), and laboratory testing of natural clay soils underlying the site and surrounding areas by Parsons Brinckerhoff (PB) (2005), GHD (April 2016) and Senversa (2017) indicated the presence of potential ASS (PASS), and to a lesser extent actual ASS (AASS).
Hydrogeology	The upper-most water bearing unit under the site and surrounding areas is a shallow unconfined aquifer, which is present at between approximately 0.5 m below ground level (bgl) and 1 m bgl. Regionally, groundwater within this aquifer is expected to move north and east, towards the Hunter River (and its tributaries, including Throsby Creek). However, a groundwater mound identified by AECOM (2011), and confirmed by Senversa (2014 and 2017) beneath the Caltex Terminal tank farm indicates localised movement of groundwater from the south-western portion of the Caltex Terminal west and southwest towards the site. The extent and effect of this mounding is likely to vary according to rainfall, and potentially tidal stage, with Douglas Partners (2004) reporting small fluctuations in groundwater levels under the site with changes in the tidal cycle. More information on the site hydrogeology is provided in **Section 2.5**.
Groundwater Utilisation	The Department of Primary Industries (NSW Government, 2017) was accessed on 5 May 2017 to identify registered groundwater bores that are present in the area. No registered bores were listed for the site, however three domestic use bores were identified near to the site - one 700 m to the northwest and two located 400 m and 650 m to the southwest. Each of these wells appears to exploit the shallow aquifer under the site and surrounding areas. Relevant environmental values of groundwater under the site are considered to include irrigation, industrial and recreation.

2.4 Historical Site Uses

The historical use of the site was assessed by HLA (2003), Douglas Partners (2004) and Sevnersa (2017). These assessments indicated the following known and potential historical uses and activities at the site:

Item	Detail
Wool Stores	• Wool stores: ▪ Wool storage from the late 1940s until late 1990s (noting that the wool store on Lot 2 was constructed sometime in the late 1950's or early 1960s). Large scale chemical use or storage during the period of wool storage was unlikely, with only minor quantities of oil and lubricants indicated to have been stored and used within the maintenance workshop (southern portion of the wool store in Lot 2). ▪ Commercial storage (Wickham Self Storage) from the late 1990s.
Site Areas Surrounding Wool Stores	• Lot 1: ▪ Bunded storage of oils and use of oils and lanolin to coat steel formwork north of the wool store. ▪ Steel fabrication in the north-western corner of Lot 1. • Lot 2: ▪ A second-hand clothing outlet was formerly located north of the wool store. There appeared to be drum storage associated with this activity. ▪ Timber pallet manufacture in the north-eastern portion of Lot 2. ▪ General material storage north of the wool store, some of which was on unsealed ground until the 1990s.
Other	Historical filling also occurred across the site, with the thickest accumulations in former low-lying areas located to the north of both wool stores (refer to **Section 2.5** for more information). Manufacturing may have also occurred in Lot 2 during the early 1920s - based on the stated occupation of a former site owner.

2.5 Site Specific Geology and Hydrogeology

Setting	Summary
Geology and ASS	Borelogs for soil bores and monitoring wells drilled at the site and adjacent Lots 3 and 13 and Caltex Terminal indicated that the geology beneath the site and surrounding areas consists of up to 2 m of coarse textured fill materials overlying natural sediments of varying amounts of sand and clays. An approximate divide of natural soil types was identified under the site, with shallow soils under the western portion of the site dominated by grey-brown silts and clay, whereas shallow natural soils under the north-eastern portion of the site were sand dominated sediments containing shells. Fill was observed during the DSI at the majority of investigation locations and was thickest (approximately 2 m thick) north of the wool stores, where low lying ground was observed to exist in historical aerial photographs. The fill material consisted of reworked natural soils with inclusions of anthropogenic material including glass, iron filings, brick, wood, ash and slag. HLA (2003) reported tar seeping from the ground in the north-western part of the site. A large lump of tarry material was observed during the DSI in a similar part of the site. PASS were reported at high concentrations (and above the relevant Action Criteria) in a number of clay-rich samples collected under the site. AASS were also reported greater than the Action Criteria in one sample.

Setting	Summary
Hydrogeology	The DSI indicated the aquifer beneath the site is shallow and unconfined, consistent with the results of previous investigation reports (HLA 2003, Douglas Partners 2004, AECOM 2011, Senversa 2014, ES 2015, GHD (2015 and 2016c)). During the recent DSI, groundwater was found to have the following characteristics: • Depths to groundwater ranged between 1.3 m bgl and 0.3 m bgl. • Groundwater had low dissolved oxygen (DO) concentrations and redox potential values, and frequently sulfurous odours, which is consistent with the presence of ASS, and is indicative of sulfate reducing conditions. • Regionally, groundwater will discharge as baseflow into Throsby Creek. Under the site, groundwater moves to the southwest and south under the site. Potential groundwater discharge to a mains sewer exists near the south-eastern portion of the site, where a significant increase in hydraulic gradients occurs (in close vicinity to a local Hunter Water sewer main).

3.0 Nature and Extent of Contamination

3.1 Site

The following table summarises the nature and extent of soil and groundwater contamination on and under the site. The assessment of soil contamination is made in the context of the following ASC NEPM health and ecological investigation and screening levels (HILs, HSLs, EILs and ESLs) adopted in the DSI for the most conservative proposed future uses of the site:

- HIL B and HSL A/B – proposed medium to high density residential use of wool stores and new building in the northern portion of Lot 1.
- HIL C and HSL C – public open space in the northern portion of Lot 2.

The EILs and ESLs for urban and residential areas and public open space have been applied to the entire site – noting that only the public open space areas will be unsealed.

Assessment of groundwater contamination under the site was made in the context of the relevant environmental values of water (irrigation, primary contact recreation and marine aquatic ecosystems), with criteria adopted from the following guidelines. Drinking water guidelines were adopted for volatile organic compounds (VOCs) to assess the potential for vapour intrusion risks – given the ASC NEPM Health Screening Levels (HSLs) are not applicable where groundwater is less than 2 mbgl.

- ANZECC/ARMCANZ, 2000. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.
- NHMRC, 2008. *Guidelines for Managing Risks in Recreational Water (*2008).
- NHMRC, 2011 (as updated 2016) - *Australian Drinking Water Guidelines*.
- International guidelines – where the criteria were not provided in the above listed documents.

The soil sample results are displayed on **Figure 2** and **Figure 3**, and provided in **Table 1** and **Table 2**. **Table 1** and **Table 2** also provide the relevant ASC NEPM human and ecological investigation and screening levels adopted for the DSI. Groundwater sample results are provided in the DSI.

Media	Summary
Soil	• **Human Health** - the following chemicals of potential concern (CoPCs) were reported greater than the adopted HILs / HSLs: ▪ Total polycyclic aromatic hydrocarbons (PAHs), benzo(a)pyrene (BaP) TEQ and non-volatile total recoverable hydrocarbon (TRH) fractions – present under the majority of the site at concentrations greater than the relevant residential (HIL/HSL-B) and open space (HIL/HSL-C) criteria. It is noted that none of the samples collected from under the wool store on Lot 2 reported these chemicals greater than the assessment criteria. ▪ Volatile hydrocarbons including TRH (F1, F2), benzene and naphthalene were reported at concentrations greater than the HSLA/B criteria (and where future residential land use is proposed on site) at three locations in the north-western portion of Lot 1, at two locations under the wool store on Lot 1 (one in the centre and the other in the south), and at one location under the southern portion of the wool store in Lot 2. • **Terrestrial ecology** - concentrations of the CoPC were greater than the adopted EIL/ESL criteria for metals (including arsenic, chromium (III+VI), copper, lead, nickel, zinc), TRH (F1, F2 and F3) and BaP and were reported across the majority of the site (predominantly in fill soils). It is noted that for the portion of the site where residential dwellings and fully and permanently paved land uses are proposed, the ecological criteria do not apply. • **Aesthetics** - fill material within the upper soil profile of the of the site contains aesthetically unsuitable material – based on: ▪ The presence of anthropogenic inclusions in the majority of fill material. ▪ TRH concentrations greater than the ASC NEPM Management Limits in the north of Lot 1 (three locations) and under the southern portion of the wool store in Lot 1 (one location). • **Tar** – tar material was visible on the surface in the north-western portion of the site – near to where tar seeps were reported by HLA (2003). Concentrations of PAHs and TRH greater than the human health and ecological assessment criteria were also reported in this part of the site.

Media	Summary
	• **ACM** - fragments ACM sheeting were identified at two locations - one beneath the northern portion of the wool store on Lot 1 (TP03) and one at the northern end of the roadway separating the two wool stores (TP01). Given the extensive fill present on site, ACM may exist in other parts of the site.
Groundwater	• Arsenic, copper, fluoranthene and phenanthrene were reported in groundwater under or immediately downgradient of the site at concentrations slightly greater the marine aquatic ecosystem trigger levels. The detections of these chemicals were isolated, with the exception of arsenic, which may represent a regional condition. • Concentrations of benzene and naphthalene slightly exceeded the drinking water criteria in groundwater samples collected from two monitoring wells located in the north-eastern portion of the site (where the proposed open space redevelopment area will be located). The chemicals are not reported in groundwater greater than the LOR in surrounding and down gradient monitoring wells, and their presence was considered unlikely to present a risk to future occupants of the site (via vapour intrusion) based on: ▪ The localised nature of the impacts. ▪ The marginal exceedance of the guidelines. ▪ The future use of the relevant portion of the site as open space – where vapour intrusion risks are unlikely to be realised. ▪ The propensity for these chemicals to attenuate. None of the samples reported chemical concentrations greater than the primary contact recreation or irrigation criteria.

3.2 Off-Site

Soil, groundwater and soil vapour contamination and light non-aqueous phase liquids (LNAPL) are present up hydraulic gradient of the site on and under Lot 3, Lot 13 and the Caltex Terminal. The contamination in these areas is subject to ongoing assessment and remediation works by Caltex, and is subject to a voluntary management proposal (VMP) (signed 6 June 2017) and Site Audit. There is no evidence of contamination under Lot 3, Lot 13 and the Caltex Terminal impacting on the site, however remediation of the up hydraulic contamination has not been completed.

3.3 Potential Contamination Transport Mechanisms, Receptors and Pathways

The following potential transport mechanisms, receptors and pathways for exposure to identified soil and groundwater contamination on and under the site were identified.

Consideration	Detail
Potential Transport Mechanisms and Exposure Pathways for Contaminants	The potential transport mechanisms include: • Transport of contamination through surface water flows. • Transport of contamination to underlying groundwater aquifers. • Transport of contaminants through airborne dispersion. Potential exposure mechanisms include the following: • Inhalation of vapour (from contaminated soil), contaminated dust and / or asbestos fibres (from soils and / or building materials). • Dermal contact and / or incidental ingestion with contaminated soils and/or groundwater.

Consideration	Detail
Potential Receptors of Contamination	The potential receptors identified include: • Potential future site users (open space and residential). • Commercial workers and other site users during remediation and development works. • On-site terrestrial ecology. • Off-site aquatic ecological in Throsby Creek.

3.4 Qualitative Assessment of Risk and Need for Remediation

The following table represents a qualitative assessment of potential risks posed by site contamination on and under the site. The table also identifies the contamination which is considered to require remediation to protect the relevant human and ecological receptors, and make the site suitable for its proposed future use.

Receptors	Qualitative Assessment of Risk and Comments	Remediation Required
Future site residents (medium to high density occupancy scenario) – wool store buildings and north-western building.	**Low to Moderate** – the reported soil and groundwater concentrations are not expected to pose a vapour intrusion risk to future residents, with the possible exception of the north-western portion of the site – where elevated concentrations of TRH F1 and F2 and naphthalene were reported in soil, and where tar was previously reported to be present. Above criteria concentrations of TRH and naphthalene in soil under the wool stores are considered unlikely to pose a risk via a vapour intrusion pathway for the following reasons: • The large (approximate 1 m) crawl space which exists under the wool stores and which is likely to attenuate vapours which may arise from the underlying soil profile. • The likely limited extent of impacts, with only three of 26 current or historical samples collected from under or immediately adjacent to the wool stores reporting concentrations greater than the HSL-A/B criterion. There is the potential for exposure and risk to future occupants to non-volatile TRH fractions and PAHs, although the potential is considered to be low based on the fully and permanently paved nature of the proposed development. The fill material under the future residential areas of the site is aesthetically unsuitable ACM has also been identified.	**Yes, for soil direct contact** **Yes, for soil vapour intrusion (northwest only)** **Yes, for aesthetics & ACM** No for groundwater
Future site residents and users (open space scenario) – north-eastern portion of the site	**Moderate** – concentrations of non-volatile CoPCs are greater than the assessment criteria in soil for open space uses. Potential exposure and risks via vapour inhalation from soil and groundwater sources are considered to be low. The fill material under the open space areas of the site is aesthetically unsuitable ACM may also be present.	**Yes, for soil (direct contact)** **Yes, for aesthetics & ACM** No for groundwater
Commercial workers and other site users during development works.	**Moderate –** there is the potential for site workers to come into contact with contaminated soils during construction activities – in particular those that require disturbance of site soils and groundwater.	**Yes, for soil**
Probable future users of groundwater (recreation and irrigation uses).	**Low –** groundwater is currently not used on site, and is unlikely under the future land use scenarios. Regardless, concentrations of the CoPCs are less than the relevant criteria (which are possible uses of groundwater for the site).	No

Receptors	Qualitative Assessment of Risk and Comments	Remediation Required
On-site ecological receptors.	**Low to moderate –** the proposed residential development areas will be fully and permanently paved, and therefore access by terrestrial ecology will not be relevant. Access and potential risk is possible in the proposed future open space areas of the site.	**Yes – open space and terrestrial ecology**
Off-site aquatic ecological receptors including Throsby Creek.	**Low** – the presence of metals and PAHs in groundwater under and immediately downgradient of the site are unlikely to present a risk to the ecosystems of Throsby Creek, given: • Give the marginal exceedances of the assessment criteria, and localised nature of the impacts (except arsenic). • The large distance to the receptor (500 m to Throsby Creek) – across which mechanisms of dilution and advective dispersion alone are likely to attenuate the chemical concentrations to below the relevant assessment criteria. • Arsenic in groundwater being likely to represent a regional condition.	No

4.0 Remediation Strategy

4.1 Remedial Objective

The remedial objectives for the site are as follows:

- Remove the risks posed by identified contamination to ensure the site is suitable for the proposed mixed high density residential, open space and commercial land uses;
- Undertake the remedial works in a manner that mitigates risks to worker health and safety, and the environment;
- Undertake the remedial works in a manner consistent with relevant regulatory provisions and guidance; and
- Implement a monitoring program to assess the potential for contamination at Lot 3, Lot 13 and the Caltex Terminal to migrate under the site.

4.2 Remediation Areas

On the basis of the nature and extent of contamination under the site, and the potential risks posed by that contamination (refer to **Section 3.0**), the following soil remediation areas have been identified. The locations of these area are illustrated in **Figure 4**.

- **Remediation Area A:** The concentrations of TRH and PAHs in this area have the potential to pose a risk to future residential occupants via direct contact and vapour intrusion pathways. Tar impacts have also been reported in this area. The concentrations of benzo(a)pyrene, TRH and metals also require management to be protective of terrestrial ecosystems. The fill soils present aesthetic issues and ACM may also be existing in soil.
- **Remediation Area B:** The concentrations of TRH and PAHs in this area have the potential to pose a risk to future user via direct contact pathways. The concentrations of benzo(a)pyrene, TRH and metals also require management to be protective of terrestrial ecosystems. The fill soils present aesthetic issues and ACM may also exist in soil.
- **Remediation Area C:** The concentrations of TRH and PAHs in this area (the remainder of the site) have the potential to pose a risk to future residential occupants via direct contact pathways. The concentrations of benzo(a)pyrene, TRH and metals also require management to be protective of terrestrial ecosystems. The fill soils present aesthetic issues and ACM has also been encountered in this area at two locations. The soil samples collected under the wool store on Lot 2 did not contain CoPCs at concentrations greater than the human heath criteria relevant to direct contact pathways for exposure (ASC NEPM HILs). However, the nature of the fill material (ash coke, possible clinker) under the Lot 2 wool store, and its similarity to fill material in other parts of the site (where the CoPCs exceed the ASC NEPM HILs) indicates soil contamination posing a potential risk to the health of future residential occupants may also exist in this area.

Remediation of groundwater or for potential soil vapour contamination is not considered to be required.

4.3 Preferred Remedial/Management Strategy

4.3.1 NSW EPA Guidance

The NSW DEC, 2006. *Guidelines for the NSW Site Auditor Scheme (2nd edition)* lists the following order of preference for soil remediation and management:

- On-site treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level;
- Off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site;

- Removal of contaminated soil to an approved site or facility, followed where necessary by replacement with clean fill; and
- Consolidation and isolation of the soil on-site by containment within a properly designed barrier.

In addition, DEC (2006) also a requirement that remediation should not proceed in the event that it is likely to cause a greater adverse effect than leaving the site undisturbed.

4.3.2 Remediation Options Assessment

Potential remedial options identified for soil contamination under the site are provided below:

Remedial Option	Application	Feasibility
1. On-site treatment so that the contaminants are either destroyed or the associated hazards are reduced to an acceptable level.	Treatment methods exist for the primary contaminants of concern (PAHs and TRH) including chemical stabilisation and thermal treatment. These options are costly, may require specific consent and licencing, impact on surrounding residents (odour/dust) and in the case of stabilisation, will provide limited benefit in reducing the risk profile.	Low – due to cost, approvals and potential for impacts to surrounding residents. This option also does not address ACM.
2. Off-site treatment so that the contaminants are either destroyed or the associated hazards are reduced to an acceptable level, after which the soil is returned to the site.	As above, noting that whilst licencing and approvals may not apply to this option, other amenity impacts to surrounding residents may include increased noise and dust associated with additional truck movements, as well as an increased carbon footprint.	Low – due to cost, potential for impacts to surrounding residents and increased carbon footprint. This option also does not address ACM.
3. Excavation and off-site disposal of the impacted material.	Excavation of fill materials (and possibly underlying natural materials) will be required as part of the development works – to remove: • Possible tar impacted material and soils presenting potential vapour intrusion and direct contact risks in Area A. • Direct contact human and ecological risks and aesthetic issues posed by soils in Area B. Area B must also be lowered by approximately 0.5 m to provide temporary stormwater detention. The soils excavated from Area B may be suitable to remain on site (and placed under sealed areas – refer below). However, the potential for adopting this approach is likely to be limited – based on the existing site levels being likely to be maintained for the future development. Off-site disposal of contaminated soils will remove the potential risks associated with the identified site contamination in Areas A and B. Off-site disposal will also address potential ACM and aesthetic issues which may exist in fill soils in these areas.	This option is considered the preferred strategy for contaminated soils in Area A and possibly Area B.

Remedial Option	Application	Feasibility
4. Retention and Isolation by capping.	The proposed future residential portions of the site will be fully and permanently paved – which will effectively mitigate human and ecological risks associated with direct contact with contaminated soils. Capping will also address potential ACM and aesthetic issues associated with fill soils. The existing wool store floors are considered to represent an effective capping medium, since access to this area will be limited by the low height of the crawl space and confined space conditions. The greatest potential for contact with contaminated soils under the wool store (and broader site) will be during construction works or incidental utilities maintenance – which will be completed and managed under health, safety and environment protocols (Environment/Site Management Plans). Further, due to the limited and difficult access below the wool store (within the crawl space), excavation and off-site disposal of contaminated soils in these areas is considered impracticable. The lowering of the future open space area (Area B) is likely to remove the majority of contaminated soils from this part of the site. However, where deeper soil contamination exists, the material will be over-excavated and uncontaminated soil used to cap the residual contamination. Contaminated soil excavated from Area B may be placed under future sealed areas of the site (e.g. roadways, common paved areas) if increases in the ground surface are required or able to be incorporated into the final development plan. A capping remediation option has the benefit of minimising potential impacts to surrounding receptors and is considered a more sustainable approach. Application of this approach requires preparation and implementation of an environmental management plan (EMP) to manage retained soil contamination into the future.	This option is considered the preferred strategy Area C and possible parts of Area B.

4.3.3 Preferred Remediation Strategy

On the basis of the remediation options assessment (**Section 4.3.2**), the preferred remediation strategy consists of a combination of:

- Excavation and off-site disposal (to a suitably licenced landfill).
- On-site retention and capping.

4.4 Overview of Remediation Works

The proposed remediation works will be undertaken in a generally staged manner and will comprise:

- Preliminaries and site establishment;
- Further characterisation of contaminated fill/soil in Area A and Area B (to support waste classification and off-disposal);
- Removal of contaminated fill materials from Areas A and B, and disposal off-site (and re-use on site if practicable)
- Re-use on site;
- Validation of excavations;
- Capping of contaminated soils in Area C (and Area B, if required), including a warning / marker layer (geotextile, plastic or the like) placed between the retained contaminated soils and overlying uncontaminated soil cap/paving systems;
- Assessment of imported materials to site;
- Material tracking;
- Site demobilisation;
- Groundwater monitoring – eastern site boundary; and

- Post-remediation and construction EMP.

These are described in more detail below.

4.4.1 Preliminaries and Site Establishment

Prior to the commencement of remedial works the following will be completed:

- The boundaries of remediation excavation Areas A and B will be surveyed as shown in **Figure 4**.
- Worker safety, environment and asbestos management controls are to be implemented. These are further described in **Section 5.0**.
- Categorisation and notification of remediation works as required by development consent conditions and SEPP 55 (if required).

4.4.2 Further Characterisation

Further characterisation of soil contamination in Area A and B shall be conducted after removal of surface concrete slabs. This will consist of collection and analysis of supplementary samples (via test pits or soils bores) for total and leachable chemical concentrations analysis -vto support waste classification and off-site disposal. Classification materials designated for off-site disposal will be undertaken by Senversa in accordance with the *NSW EPA (2014) Waste Classification Guidelines: Part 1: Classifying Waste*.

4.4.3 Removal of Impacted Materials

Contaminated soils will be removed from site (Area A and Area B) via excavation and off-site disposal to an appropriately licenced landfill. Suitably licenced trucks will be used to convey the contaminated soils to the landfill. The following principles will be applied during excavation and handling of impacted materials:

- Carefully excavate contaminated soils from Area A and Area B, avoiding potential over-excavation and removal of uncontaminated materials. Works are to be conducted in accordance with the health and safety, and environmental procedures and controls described in **Section 5.0**;
- Senversa will observe the excavation process and excavated materials for indicators of potential contamination conditions that are inconsistent with that identified in the DSI. If the soil conditions are different, these soils shall be managed via the protocol described in **Section 6.1**;
- The number and size of the excavation areas will be kept to a minimum to avoid potential dust or odour issues;
- The contaminated soils will be placed directly into a truck for transport to the landfill; and
- Material tracking and waste transport shall be in accordance with relevant waste regulations, including those specific to asbestos; and

The Remediation Contractor shall obtain disposal dockets from the disposal facility, which shall be provided to Senversa and Investec for validation purposes

4.4.4 Re-use of soil on-site

Contaminated soils excavated from Area B may be suitable for reuse under future sealed parts of the development – including roadways and footpaths. If possible, these materials will be stockpiled and then placed in these areas to bring the ground surface to the required levels. The temporary stockpiles will be managed in accordance with the requirements set out in **Section 5.0.**

Materials shall be tracked in accordance with provisions in **Section 4.4.7**.

4.4.5 Validation of excavations

The walls and base of the excavations completed in Area A and Area B will be validated via collection, field screening and analysis of soils samples – to demonstrate that the contaminated soils have been successfully removed from these areas. The approach to validation is described in **Section 4.6**.

4.4.6 On-site containment and isolation

The contaminated soils in Area C will retained on site, with access and exposure to these soils mitigated by capping with:

- Impermeable surfaces including bitumen and concrete roads and footpaths.
- Concrete slab in the future building in the northern portion of Lot 1.
- The existing wool store flooring.

For the common areas and new building in the northern part of Lot 1, the thickness of capping is proposed to be between 0.3 m to 0.5 m, but will be refined based on final road and building designs. Capping may also be required in Area B – where contaminated soils extend beyond the 0.5 m of material required to be removed to support stormwater detention. Capping in these areas will consist of placement of 0.5 m of uncontaminated soils (over the remaining contaminated material).

Wherever capping is applied to manage retained soil contamination, a warning / marker layer (geotextile, plastic or the like) will placed between the contaminated soils and overlying uncontaminated soil cap/paving systems

Validation of site capping is described in **Section 4.6.**

4.4.7 Imported Materials

Only material that does not represent a health or environmental risk may be imported to Site. The imported material will be assessed for suitability and in accordance with the following:

- Virgin Excavated Natural Material (VENM) as defined in the Protection of the Environment Operations Act (1997) and NSW EPA (2014) Waste Classification Guidelines: Part 1: Classifying Waste; or
- NSW EPA (2014) *Excavated Natural Material Order 2014*; or
- Any other suitable material granted an EPA Exemption under the *Protection of the Environment Operations (Waste) Regulation 2005* and which is also considered suitable for the site-specific conditions and development.

The suitability of soil material for importation on site will be verified by visual inspection and by applying the sampling and analysis requirements outlined in the above listed guidelines.

4.4.8 Material Tracking

During proposed remediation works, contaminated and uncontaminated soil will be excavated, temporarily stockpiled and either used on-site or disposed off-site.

A Material Tracking Register will be maintained on-site which will provide information regarding the source, characteristics, destination and quantities of material temporarily stockpiled, used and disposed off-site.

4.4.9 Demobilisation

Following completion of remediation and excavation works, plant, machinery and amenities that were constructed for the purposes of the remediation works will be removed. Environmental controls such as silt fencing and any other general rubbish will also be removed from the site - noting that demobilisation of plant and environmental controls may be at the end of the development project, since the some of the features of the remediation strategy (e.g. capping under roads and footpaths) will be completed as part of the general civil works for the project.

4.4.10 Groundwater monitoring

Six-monthly monitoring of groundwater quality will be completed at the existing monitoring wells located along the eastern boundary of the site until:

- Remediation of Lot 3 and Lot 13 is completed, and/or
- The risk of contamination from Lot 3 and Lot 13 moving under the site is determined to be low.

All site monitoring wells will be gauged (to confirm directions of groundwater movement) and the following wells sampled:

- MW08.
- Well 8.
- MW103.
- Well 7.
- Well 11.
- Well 3.
- Well 12.
- Well 2.

The locations of these monitoring wells are shown on **Figure 4.** Samples from these wells will be analysed for TRH, benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN), which represent the key CoPCs for the contamination on and under Lot 3 and Lot 13.

4.4.11 Post remediation and construction EMP

An EMP will be prepared to provide the following to future site owners, occupiers and workers:

- Site setting and background.
- The nature and extent of retained contamination under the site.
- Health, safety and environmental controls if disturbance of contaminated soils is required.
- Waste management requirements in case contaminated materials require off-site disposal.
- Roles and responsibilities.
- Environmental incident reporting and legislative notification requirements.

The EMP will be provided to the Auditor for review and approval as part of the site validation process.

4.5 Remediation Validation

4.5.1 General

Validation information is required to verify the effectiveness of the remedial works and document the final site condition as being suitable for the proposed land use. Validation assessment shall be required for the following:

- That contaminated soils have been removed from Area A and Area B;
- That capping layers of suitable type and thickness have been applied across Area C (and Area B, if required); and
- That imported fill materials are suitable for use at the site.

4.5.2 Validation Approach and Criteria

The validation approaches and methods in the table below will be adopted. All sampling and analytical methods shall be consistent with requirements in ASC NEPM and Senversa standard operating procedures.

Area / Material	Remediation/ Management Approach	Validation / Characterisation Approach	Validation Criteria
Area A & B	Excavation of contaminated soils	Initial visual assessment and field screening of the excavation base and walls via screening with a photoionisation detector (PID) for potential presence of VOCs, ACM and unexpected materials. This assessment will be completed by suitably experienced and trained environmental professional / Competent Person and undertaken by walking 10 m transects in overlapping perpendicular directions. Validation soil samples will then be collected from the excavation base and walls at a frequency of one sample per 25 m^2, with a minimum of one sample per wall/floor. The final excavation extent will be surveyed.	• No visible ACM present at the excavation surface. • No other visual or olfactory indicators, or surface soil screening results using a photoionisation detector (PID) of contamination at the excavation surface. • Concentrations of CoPCs* in the soil validation samples meet the validation criteria (refer to **Table 3,** which represent the relevant ASC NEPM HILs, HSLs, EILs and ESLs).
Remediation Area B & C	Capping of Contaminated Soils	Capping of contaminated soils will be validated through: • Inspecting and verifying a geotextile has been placed over the contaminated soils, and that the capping material is impermeable (Area C) or represents visually uncontaminated and aesthetically suitable soils (Area B). • Survey (by a registered surveyor) to verify the thickness of the cap. This will require pre- and post-capping surveys.	• Geotextile documented as being placed on top of retained soil contamination. • Cap is impermeable and covers entire portion of Areas C (except wool stores – where the cap is provided by the existing floors). • Thickness of the capping layer is verified by survey as being between 0.3 m and 0.5 m for impermeable materials and 0.5 m for soil caps (Area B). • Imported soils used for capping in Area B are verified as meeting the requirements described in **Section 4.4.7**
Contaminated material stockpile footprints	Stockpiles of contaminated materials shall not be placed on unsealed ground.	Visual inspection of stockpile footprint for the presence of visible indicators of contamination, including ACM.	No visual indicators of contamination.

*CoPCs consist of those reported at concentrations greater than the assessment criteria, and which might be present given the heterogenous nature of the fill material and site history. These include: TRH, BTEX, PAHs, arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc, asbestos and phenols.

4.5.3 Validation Reporting

A remediation validation report (RVR) will be compiled by Senversa on completion of the remediation and validation works. The RVR will be prepared in a manner consistent with guidance provided NSW EPA (2000). The RVR will include:

- Present an overview of remedial works conducted;
- Present the methods and results, including field notes, photographs and analytical data, of remediation and validation works;
- Present material tracking and waste disposal documentation recorded by the Remediation Contractor;
- An assessment of validation data quality assurance and quality control (QA/QC); and
- Conclusions on the implementation of the RAP and site suitability.

4.5.4 Groundwater Monitoring Reporting

A factual letter report detailing the findings of the groundwater monitoring detailed in **Section 4.4.10** will be prepared following each groundwater monitoring round and provide the following information:

- Direction of groundwater movement (and any changes from previous assessments).
- Sample results and comparison against the adopted guidelines within the DSI;
- Data quality assessment; and
- Conclusions in relation to:
  - Any evidence of contamination from Lot 3 and Lot 13 moving under the site.
  - The need for contingent actions to be implemented – should contamination migrate under the site from Lot 3 and Lot 13.

5.0 Site Management Provisions

This section presents the occupational health, safety and environment management provisions to be implemented during remediation and validation works. A person or persons who has/have management or control of the site shall prepare the following plans prior to commencement of the remediation and validation works, and be responsible for their implementation. The remediation works at the site must be undertaken in accordance with the requirements specified within these plans. All personnel undertaking work on the site will have undergone training relevant to the handling and management of contaminated materials including asbestos.

5.1 Environmental Management

A Construction Environmental Management Plan (CEMP) shall be prepared by the appointed Remediation Contractor or by Senversa prior to commencement of remediation. The CEMP will document the environmental monitoring and management measures required to be implemented during the remediation and construction related activities associated with contaminated soils present on and under the site.

The CEMP will identify human and environmental hazards, mitigation measures and monitoring protocols (to assess the effectiveness of the mitigation measures). The content of the CEMP will include, but not necessarily be limited to, the following:

- Roles, responsibilities and training requirements
- Site control and access, including fencing, signage and aesthetics;
- Measures to prevent dust generation from excavations and stockpiles, including asbestos management controls and monitoring (**Section 5.2.2**), minimising the number of stockpiles and covering/wetting surfaces, installation of dust screens;
- Measures to prevent erosion of stockpiles and sediment runoff from the site and into the stormwater system;
- Odour controls from vehicles and soils encountered in excavations/stockpiles (e.g. possible tar impacted soils);
- Traffic control, including ingress/egress routes, prevention of soil and other contamination materials leaving site and impacting offsite roads/driveways, covering loads;
- Measures to minimise surface runoff into excavations;
- Requirements for management of waste and handling potentially contaminated materials (e.g. excavation water, waste disposal);
- Vehicle and equipment decontamination (e.g. following completion of excavation/handling of impacted fill materials);
- Environmental monitoring (e.g. dust, airborne asbestos fibres, noise, odour) and inspection requirements;
- Emergency response procedures.

Remediation works shall be completed in accordance with the permissible hours of work and noise limits nominated in of the Development Consent.

The Remediation Contractor shall also consider protection of adjoining structures.

5.2 Occupational Health, Safety and Environment

5.2.1 Site-Specific Health Environment Safety Plan (HESP)

A HESP shall be prepared by the Remediation Contractor or the supervising consultant (Senversa) prior to commencement of remediation works. The HESP shall contain procedures that are to be implemented to mitigate potential risks to site workers, surrounding residents/workers and the environment associated with remediation of the contaminated soils. The HESP shall include:

- Assignment of responsibilities;
- An evaluation of hazards;
- Establishment of personal protection standards, safety practices and procedures;
- Monitoring requirements, instruments and trigger values (which may prompt a higher level of management); and
- Provision for contingencies.

The HESP shall consider normal construction related hazards and controls, and those specific to proposed remediation works, including:

- Potential exposure to contaminated soil, groundwater and vapour. This should include provisions to mitigate contaminant exposure of workers via ingestion, dermal or inhalation pathways in the case of unexpected finds;
- Personal Protective Equipment (PPE);
- Under/aboveground services, including former petroleum infrastructure (if encountered); and
- Excavation safety and operation of machinery in restricted spaces like excavations.

5.2.2 Asbestos Management

ACM has been identified at two locations within fill materials at the site. Controls and procedures are required to prevent generation of asbestos fibres during handling of ACM and exposure to workers. Asbestos management controls are required in an area until the area has been verified as not containing asbestos.

An Asbestos Management Plan (AMP) / or Asbestos Removal Control Plan (ARCP) shall be prepared for asbestos related works that meets requirements of SafeWork NSW/Australia codes of practice for working with and removing asbestos. The AMP/ARCP should be developed in consideration of site specific risks and proposed development works, but should consider the following:

- The location and extent of asbestos within the site (currently limited).
- The potential for asbestos to be encountered in fill soils in other parts of the site.
- Roles and responsibilities.
- Training requirements.
- Asbestos register.
- Site specific hazards and mitigation/controls.
- Procedures for stockpiling, transport, handling and disposal of asbestos impacted materials.
- Monitoring requirements.
- Emergency response procedures.

Senversa consider it prudent to conduct air monitoring during any excavation or handling impacted soil and asbestos removal works at the site to verify that implementation of control measures has been successful at managing the risk of air borne fibre generation. Air monitoring should be undertaken in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC) Asbestos Code of Practice and Guidance Notes, in particular the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC 3002:2005].

5.3 Reporting

Non-conformances, complaints, corrective actions and incident management should be recorded and maintained by the Remediation Contractor or supervising consultant (Senversa).

6.0 Contingency Plan and Unexpected Finds

6.1 Contingency Plan

The purpose of the contingency plan is to:

- Identify unexpected situations that could occur;
- Specify procedures that can be implemented to manage such situations; and
- Prevent adverse impacts to the environment and human health should these situations occur.

The contingency plan also addresses:

- Instances where the adopted remediation measures are unsuccessful / ultimately impracticable.
- Potential risks posed by site contamination from upgradient areas migrating under the site.

Potential issues that may arise during the remediation works, and the contingent actions which would be implemented to address the issues, are summarised below:

Anticipated Potential Problems	Contingent Action
Chemical spill / exposure	Stop work, refer to HESP and immediately contact the site supervisor (and EPA and other relevant authorities, as required).
Excessive rain	Cover or stabilise stockpile and unsealed areas not located under cover where possible. Inspect and maintain sediment controls.
Excessive generation of contaminated surface water	Minimise active soil remediation areas and/or improve diversion of clean run-on. Maintain sufficient on-site wastewater storage capacity, or mobilise additional storage and/or treatment systems as needed.
Excessive dust and odour	Use water sprays, biodegradable dust sprays, cease dust-generating activity until better dust control is achieved, or apply interim capping systems. Minimise potential dust generating activities on windy days.
Excessively wet materials	Cover stockpiled material and / or dewater on-site or add absorbents.
Equipment failures	Maintain spare equipment or parts, maintain alternative rental options; or shut down affected operations until repairs are made.
Excessive noise	Identify source and review noise attenuation equipment. As necessary provide silencers on noisy equipment and schedule noisy work when receptors least likely to be affected.
Groundwater extraction and treatment	Maintain on site water tanks to temporarily store groundwater - extracted to allow excavation of contaminated soils below the water table (if required) and/or to intercept contaminated water that may migrate under the site from upgradient areas (Lot 3 and Lot 13). The groundwater is likely to require treatment on-site, or off-site disposal to a licenced liquid waste treatment facility. Managing potentially contaminated groundwater moving under the site from upgradient areas is also likely to involve the following: • Installation of groundwater extraction wells, pumps and piping to convey extracted groundwater to temporary storage tanks, the Caltex groundwater remediation system located on Lot 3 (capacity dependent), or a newly constructed remediation system. • Installation of observation wells to assess whether the extraction wells are successfully remediating contaminated groundwater which may move under the site. • Development and implement a monitoring program to assess the effectiveness of the groundwater extraction systems.

Anticipated Potential Problems	Contingent Action
Release of fuel/oil from machinery	Remove source, use absorbent booms to remove oil and make any repairs and clean-up as required. If necessary, implement temporary measures until booms can be deployed; (e.g. earth embankments) to prevent movement of spill into water courses or stormwater drains.
Silt fence fails	Stop work and repair fence to mitigate potential for movement of sediment and soil off-site.
Tar Impacts	Tarry material and tar impacted soils may exist in the north-western portion of the site, and possibly off-site. Should tar continue off-site, measures must be implemented to ensure this material does not migrate back under the site following remediation. Should tar impacts extend deep in the soil profile under the site (to a depth which is impracticable to remove), the residual tar impacts must be demonstrated as not having a potential to pose a risk to future site occupants and the environment.
Waste Disposal	If excavated soils from Areas A and B are not able to be disposed to landfill, this material may require pre-treatment (on or off-site) prior to disposal, or containment/encapsulation on site.

6.2 Unexpected Finds

The general unexpected finds protocol shall comprise:

- Works in the affected area will cease, the work foreman and Senversa notified;
- The Remediation Contractor and/or Senversa shall then notify the Investec and the Auditor.
- The area will be barricaded and covered (if safe and practicable to do so);
- Senversa shall inspect and assess (including field screening, sampling and analysis) the nature of the find in accordance with guidelines made or approved by EPA;
- Senversa shall assess whether additional remediation/management is required in accordance with provisions in this RAP;
- Senversa shall notify the Site Auditor informing him of the nature and extent of previously unidentified contamination
- The Remediation Contractor shall implement additional works as required and then remove controls; and
- Records will be kept in relation to the nature, location and management of the find.

In addition to the provisions listed above, the following steps may need to be undertaken should unexpected finds such as buried drums or tanks, or suspected impacted materials (other than identified impacts) be discovered during the remediation works:

<u>Increased presence of Asbestos</u>

If significant amounts of ACM are encountered, additional airborne fibre monitoring, upgrades of PPE and revision of asbestos management controls should be conducted. Adjustments to the remediation strategies and amendment of the RAP (to detail the approach for managing greater amounts of ACM) will also be completed.

<u>Identification of odorous, stained or oily materials</u>

In the event that contaminated materials or items not previously identified at the site (e.g. LNAPL, odorous and stained materials, oily materials) are encountered, the above protocol shall be followed. Inspection, field screening, sampling and analysis may be required to assess the nature and extent of the find. If requiring removal, the validation protocols for Area A and Area B will apply (refer to **Section 4.5.2**).

Additional environmental and occupational safety controls may also apply and include:

- Upgrade of PPE for workers within the active work zone, in accordance with the HESP;
- Segregation of discovered material;
- Use of odour suppressants (where appropriate);
- Cover the discovered material with plastic sheeting (where appropriate/possible);
- Appropriate sampling and analysis to assess potential contaminants; and
- Appropriate treatment and/or disposal of the materials following receipt of analytical results and any associated regulatory approvals required.

Identification of Drums, Pits, Underground Storage Tank

Though considered unlikely, there is the potential that drums, pits or underground storage tank(s) may be encountered during removal of the site pavements. In the event of such an occurrence, the above protocol will be implemented and appropriate remedial actions applied.

Other management/remediation measures may also be required, including: pumping out and disposal of residual fuels and oils; and purging tanks of petroleum vapours prior to removal and off-site disposal.

6.3 Groundwater Contamination Migrating Under the Site

Contingent actions to be implemented where groundwater contamination from upgradient areas is found to be migrating under the site are summarised in **Section 6.1.** The need for contingent action will be based on comparing the concentrations of the CoPCs in groundwater with the criteria adopted for the DSI and the Site-Specific Trigger Levels developed by GHD (2016a) for Lot 3 and Lot 13.

Apart from the actions described in **Section 6.1**, the following will also be conducted by Senversa:

- Notify Investec and the Auditor as soon as contamination from upgradient areas is confirmed as migrating under the site. Notification of Caltex and EPA may also be necessary;
- Oversee the development, implementation and monitoring of the groundwater remediation system (refer to **Section 6.1**); and
- Reporting on the performance of the remediation systems, including and monitoring data used to assess the system performance.

7.0 Conclusion

This RAP was developed to provide a conceptual working plan detailing the remediation actions, validation, and occupational health and safety and environment management strategies associated with identified contaminated fill materials at the site.

Subject to the successful implementation of the measures described in this RAP, it is concluded that the site can be made suitable for the intended use and that the risks associated with identified contamination can be managed such that human health and the environment are adequately protected.

8.0 Principles and Limitations of Investigation

The following principles are an integral part of site contamination assessment practices and are intended to be referred to in resolving any ambiguity or exercising such discretion as is accorded the user or site assessor.

Area	Field Observations and Analytical Results
Elimination of Uncertainty	Some uncertainty is inherent in all site investigations. Furthermore, any sample, either surface or subsurface, taken for chemical testing may or may not be representative of a larger population or area. Professional judgment and interpretation are inherent in the process, and even when exercised in accordance with objective scientific principles, uncertainty is inevitable. Additional assessment beyond that which was reasonably undertaken may reduce the uncertainty.
Failure to Detect	Even when site investigation work is executed competently and in accordance with the appropriate Australian guidance, such as the National Environmental Protection (Assessment of Site Contamination) Amendment Measure ('the NEPM'), it must be recognised that certain conditions present especially difficult target analyte detection problems. Such conditions may include, but are not limited to, complex geological settings, unusual or generally poorly understood behaviour and fate characteristics of certain substances, complex, discontinuous, random, or heterogeneous distributions of existing target analytes, physical impediments to investigation imposed by the location of services, structures and other man-made objects, and the inherent limitations of assessment technologies.
Limitations of Information	The effectiveness of any site investigation may be compromised by limitations or defects in the information used to define the objectives and scope of the investigation, including inability to obtain information concerning historic site uses or prior site assessment activities despite the efforts of the user and assessor to obtain such information.
Chemical Analysis Error	Chemical testing methods have inherent uncertainties and limitations. Senversa routinely seeks to require the laboratory to report any potential or actual problems experienced, or non-routine events which may have occurred during the testing, so that such problems can be considered in evaluating the data.
Level of Assessment	The investigation herein should not be considered to be an exhaustive assessment of environmental conditions on a property. There is a point at which the effort of information obtained and the time required to obtain it outweigh the benefit of the information gained and, in the context of private transactions and contractual responsibilities, may become a material detriment to the orderly conduct of business. If the presence of target analytes is confirmed on a property, the extent of further assessment is a function of the degree of confidence required and the degree of uncertainty acceptable in relation to the objectives of the assessment.
Comparison with Subsequent Inquiry	The justification and adequacy of the investigation findings in light of the findings of a subsequent inquiry should be evaluated based on the reasonableness of judgments made at the time and under the circumstances in which they were made.
Data Useability	Investigation data generally only represent the site conditions at the time the data were generated. Therefore, the usability of data collected as part of this investigation may have a finite lifetime depending on the application and use being made of the data. In all respects, a future reader of this report should evaluate whether previously generated data are appropriate for any subsequent use beyond the original purpose for which they were collected, or are otherwise subject to lifetime limits imposed by other laws, regulations or regulatory policies.
Nature of Advice	The investigation works herein are intended to develop and present sound, scientifically valid data concerning actual site conditions. Senversa does not seek or purport to provide legal or business advice.

9.0 References

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Figures

Figure 1: Site Location and Layout

Figure 2: Sample Locations and Soil Exceedances – Human Health

Figure 3: Sample Locations and Soil Exceedances – Terrestrial Ecology

Figure 4: Remediation Areas and Approaches

Path: Y:\16_GIS\01_Jobs\1.NSW_Jobs\S14013_ALLENS_WICKHAM NSW_BOUNDARY INVESTIGATION\MXDs\1. Working MXDs\RAP\S14013_10_F001_Site Location and Layout.mxd

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Phone: (02) 8252 0000
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Legend

- Approximate Location of Observed Surface Tar
- Site Boundary
- Lot Boundary
- Boundary of Declared Land (Area Number 3392)
- Caltex Terminal
- Lot 3 and 13

Notes:
Aerial imagery sourced from Nearmap Pty Ltd

Designed:	L. Trickey	Date:	26/06/2017
Drawn:	S. Koroblitsas	Revision:	0
Checked:	G. Miller	Scale:	1:1,250 (A3)
File:	S14013_10_F001_Site Location and Layout		

0 5 10 20 30 40 Metres
Datum GDA 1994, Projection MGA Zone 56

Figure No:	**1**
Title:	**Site Location and Layout**
Project:	Remediation Action Plan
Location:	49 and 57 Annie Street, Wickham, NSW
Client:	Investec Australia Finance Pty Limited

Path: Y:\16_GIS\01_Jobs\1_NSW_Jobs\S14013_ALLENS_WICKHAM NSW_BOUNDARY INVESTIGATION\MXDs\1. Working MXDs\RAP\S14013_10_F002_Soil Exceedances -HH.mxd

Legend

- Soil Bore
- Test Pit
- Groundwater Well - HLA, Nov 2003
- Approximate Borehole - HLA, Nov 2003
- Approximate Borehole - Aargus, 2004
- Groundwater Well - Douglas, Feb 2004
- Groundwater Well - Senversa, 2014
- Groundwater Well - Other
- Groundwater Well - Senversa, 2017
- Site Boundary
- Lot Boundary
- Approximate Location of Observed Surface Tar

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Notes:
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Designed:	J. Irving	Date:	27/06/2017
Drawn:	S. Koroblitsas	Revision:	0
Checked:	G. Miller	Scale:	1:1,250 (A3)
File:	S14013_10_F002_Soil Exceedances -HH		

0 5 10 20 30 40 Metres

Datum GDA 1994, Projection MGA Zone 56

Figure No:	**2**
Title:	**Sample Locations and Soil Exceedences - Human Health**
Project:	Remediation Action Plan
Location:	49 and 57 Annie Street, Wickham, NSW
Client:	Investec Australia Finance Pty Limited

Path: Y:\16_GIS\01_Jobs\1_NSW_Jobs\S14013_ALLENS_WICKHAM NSW_BOUNDARY INVESTIGATION\MXDs\1. Working MXDS\RAP\S14013_10_F003_Soil Exceedances -EC.mxd

Legend

- Soil Bore
- Test Pit
- Groundwater Well - HLA, Nov 2003
- Approximate Borehole - HLA, Nov 2003
- Approximate Borehole - Aargus, 2004
- Groundwater Well - Douglas, Feb 2004
- Groundwater Well - Senversa, 2014
- Groundwater Well - Other
- Groundwater Well - Senversa, 2017
- Approximate Location of Observed Surface Tar
- Site Boundary
- Lot Boundary

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Phone: (02) 8252 0000

Website: www.senversa.com.au

Notes:
Aerial imagery sourced from Nearmap Pty Ltd

Designed:	J. Irving	Date:	27/06/2017
Drawn:	S. Koroblitsas	Revision:	0
Checked:	G. Miller	Scale:	1:1,250 (A3)
File:	S14013_10_F003_Soil Exceedances -EC		

0 5 10 20 30 40 Metres

Datum GDA 1994, Projection MGA Zone 56

Figure No:	**3**
Title:	**Sample Locations and Soil Exceedances – Terrestrial Ecology**
Project:	Remediation Action Plan
Location:	49 and 57 Annie Street, Wickham, NSW
Client:	Investec Australia Finance Pty Limited

Path: Y:\16_GIS\01_Jobs\1_NSW_Jobs\S14013_ALLENS_WICKHAM NSW_BOUNDARY INVESTIGATION\MXDs\1. Working MXDs\RAP\S14013_10_F004_Remediation Areas and Approaches.mxd

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Address: Level 5, 201 Kent Street, Sydney NSW 2000

Phone: (02) 8252 0000

Website: www.senversa.com.au

Legend

- Soil Bore
- Test Pit
- Groundwater Well - HLA, Nov 2003
- Approximate Borehole - HLA, Nov 2003
- Approximate Borehole - Aargus, 2004
- Groundwater Well - Douglas, Feb 2004
- Groundwater Well - Senversa, 2014
- Groundwater Well - Other
- Groundwater Well - Senversa, 2017
- Approximate Location of Observed Surface Tar
- Site Boundary
- Lot Boundary
- Remediation Area A (excavation and possible capping)
- Remediation Area B (excavation)
- Remediation Area C (capping)
- Remediation Area C (capping provided by Wool Store floor)

Notes:
Aerial imagery sourced from Nearmap Pty Ltd

Designed:	J. Irving	Date:	27/06/2017
Drawn:	S. Koroblitsas	Revision:	0
Checked:	G. Miller	Scale:	1:1,250 (A3)
File:	S14013_10_F004_Remediation Areas and Approaches		

0 5 10 20 30 40 Metres

Datum GDA 1994, Projection MGA Zone 56

Figure No:	**4**
Title:	**Remediation Areas and Approaches**
Project:	Remediation Action Plan
Location:	49 and 57 Annie Street, Wickham, NSW
Client:	Investec Australia Finance Pty Limited

Tables

Table 1: Historical Soil Analytical Results

Table 2: Soil Analytical Results

Table 3: Validation Criteria

Table 1: Historical Soil Sample Analytical Results

Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

Chemical Group	Chemical Name	Units	EQL	NEPC 2013 - MoE-Urban Residential / Public Open Space	NEPC 2013 - Human Health Setting 'B' - Residential with minimal soil access	NEPC 2013 - Human Health Setting 'C' - Public open space	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m	NEPC 2013 -Management Limits in Res / Parkland, Coarse Soil	BH1_0.1	BH1_2	BH2_0.5	BH2_3	BH3_0.5	BH3_1.1	BH4_1.2	BH4_2	BH5_1	BH5_1.3	BH6_1.3	BH6_2	1_0.4	1_0.8
								Report	HLA (2003)													
								Location	BH1		BH2		BH3		BH4		BH5		BH6		1	
								Sampled Depth	0.1	2	0.5	3	0.5	1.1	1.2	2	1	1.3	1.3	2	0.4	0.8
								Sample Date	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	19/01/2004	19/01/2004
								Material	Fill	Natural	Natural	Natural	Fill	Natural	Fill	Natural	Fill	Natural	Fill	Natural	Fill	Natural
Inorganics	Moisture Content (dried @ 103°C)	%	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	2	100[#1]	500[#2]	**300[#3]**			<1	11	3	14	4	10	4	21	9	2	19	15	6	-
	Cadmium	mg/kg	0.4		150[#2]	**90[#3]**			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.1	-
	Chromium (III+VI)	mg/kg	2	200[#37]	500[#5]	**300[#6]**			2	38	4	30	143	19	25	26	269	4	40	32	12	-
	Cobalt	mg/kg			600[#2]	**300[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Copper	mg/kg	5	220[#37]	30000[#2]	**17000[#3]**			5	103	13	37	37	176	40	219	55	2	50	37	25	-
	Lead	mg/kg	5	1100[#37]	1200[#8]	**600[#9]**			<1	66	37	33	90	57	8	240	22	22	66	17	83	<2
	Manganese	mg/kg			14000[#2]	**19000[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mercury	mg/kg	0.05		120[#2]	**80[#3]**			<0.1	<0.1	0.1	0.1	0.4	0.1	<0.1	0.2	1	<0.1	<0.1	<0.1	0.19	-
	Nickel	mg/kg	2	170[#37]	1200[#2]	**1200[#3]**			<1	16	9	7	19	21	8	15	127	3	26	19	5	-
	Selenium	mg/kg	5		1400[#2]	**700[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tin	mg/kg			47000[#10]	**47000[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	5	520[#37]	60000[#2]	**30000[#3]**			7	192	37	34	153	223	45	117	47	3	497	62	90	-
TRH - Australian Fractio	C6-C9	mg/kg	10	180[#11]	45[#12]	**5100[#13]**			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	4	<2	<10	<10
	C10-C14	mg/kg	20	120[#14]	110[#15]	**3800[#16]**			<50	<50	<50	<50	<50	<50	<50	<50	1450	<50	403	<50	<50	<50
	C15-C28	mg/kg	50						<100	113	187	324	605	271	275	335	5490	<100	28,600	1410	<100	<100
	C29-C36	mg/kg	50						<100	162	200	379	1730	298	212	299	3400	<100	29,400	1400	110	<100
	C10-C36	mg/kg	50						<250	300	412	728	2360	594	512	659	10,340	<250	58,400	2835	185	<250
TRH - HSL Fractions*	C6-C10	mg/kg	10					800[#20]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	4	<2	<10	<10
	F1: C6-C10 minus BTEX	mg/kg	10	180[#24]	45[#25]	**5100[#26]**	*45 [#29]*		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	1.4	<2	<10	<10
	>C10-C16	mg/kg	50					1000[#20]	<50	<50	<50	<50	<50	<50	<50	<50	1450	<50	403	<50	<50	<50
	F2: >C10-C16 minus naphthalene	mg/kg	50	120[#24]	110[#25]	**3800[#26]**	*110 [#27]*		<50	<50	<50	<50	<50	<50	<50	<50	1450	<50	*403*	<50	<50	<50
	F3: >C16-C34	mg/kg	100	300[#30]	5800[#25]	**5300[#26]**		3500	<100	113	187	324	605	271	275	335	5490	<100	28600	1410	<100	<100
	>C34-C40	mg/kg	100	2800[#30]	8100[#25]	**7400[#26]**		10000	<100	162	200	379	1730	298	212	299	3400	<100	29400	1400	110	<100
	>C10-C40	mg/kg	50						<250	300	412	728	2360	594	512	659	10340	<250	58400	2835	185	<250
BTEX	Benzene	mg/kg	0.1	50[#30]	0.5[#31]	**120[#32]**	*0.5*		<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
	Ethylbenzene	mg/kg	0.1	70[#30]	55[#31]	**5300[#32]**	*55*		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.5	<0.5
	Toluene	mg/kg	0.1	85[#30]	160[#31]	**18000[#32]**	*160*		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.8	<0.2	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total BTEX	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Xylene (o)	mg/kg	0.1		690[#10]	**690[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Xylenes	mg/kg	0.3	45[#33]	40[#31]	**15000[#32]**	*40*		<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	1.5	<0.2	<0.5	<0.5
PAHs	Acenaphthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Acenaphthylene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Anthracene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	B(a)P TEQ (Zero)	mg/kg	0.5		4[#2]	**3[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	1.5	-
	Benz(a)anthracene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	0.6	-
	Benzo(a)pyrene	mg/kg	0.5	0.7[#24]					-	-	-	-	-	-	-	-	-	-	-	-	1	-
	Benzo(b)&(k)fluoranthene	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	1	-
	Benzo(b)fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	0.5	-
	Benzo(k)fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo[b+j]fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	0.6	-
	Dibenz(a,h)anthracene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	2	-
	Fluorene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	0.6	-
	Naphthalene	mg/kg	0.5	170[#34]	3[#31]	**1900[#32]**	*3*		-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Phenanthrene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	0.8	-
	Pyrene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	1.8	-
	Total polycyclic aromatic hydrocarbons	mg/kg	0.5		400[#2]	**300[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	8.9	-
OCPs	Total Organochlorine pesticides	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	DDE	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	a-BHC	mg/kg	0.05		0.077[#10]	**0.077[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	Aldrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	Aldrin + Dieldrin	mg/kg	0.05		10[#2]	**10[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	b-BHC	mg/kg	0.05		0.27[#10]	**0.27[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	Chlordane	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	cis-Chlordane	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	trans-Chlordane	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	d-BHC	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	DDD	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	DDT	mg/kg	0.2	180[#34]					-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-
	DDT+DDE+DDD	mg/kg	0.05		600[#2]	**400[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.3	-
	Dieldrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	Endosulfan	mg/kg	0.05		400[#2]	**340[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	Endosulfan II	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	Endosulfan sulphate	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	Endrin	mg/kg	0.05		20[#2]	**20[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-

Table 1: Historical Soil Sample Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

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Chemical Group	Chemical Name	Units	EQL	NEPC 2013 - MoE-Urban Residential / Public Open Space	NEPC 2013 - Human Health Setting 'B' - Residential with minimal soil access	NEPC 2013 - Human Health Setting 'C' - Public open space	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m	NEPC 2013 -Management Limits in Res / Parkland, Coarse Soil	2_0.4	2_0.8	3_0.4	3_0.8	A_BH1_0.3	A_BH1_1	A_BH2_0.3	A_BH2_1	A_BH3_0.7	A_BH4_0.2	A_BH5_0.3	A_BH5_1	A_BH6_0.4	A_BH7_0.25
								Report	Douglas (2004)													
								Location	2		3		A_BH1	A_BH1	A_BH2		A_BH3	A_BH4	A_BH5		A_BH6	A_[illegible]
								Sampled Depth	0.4	0.8	0.4	0.8	0.3	1	0.3	1	0.7	0.2	0.3	1	0.4	0.25
								Sample Date	19/01/2004	19/01/2004	19/01/2004	19/01/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004
								Material	Fill	Natural	Fill	Natural	Fill	Natural	Fill	Natural	Fill	Fill	Fill	Natural	Fill	Natural
Inorganics	Moisture Content (dried @ 103°C)	%	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	2	100[#1]	500[#2]	300[#3]			-	4	23	-	6	<5	10	<5	<5	6	<5	<5	<5	<25
	Cadmium	mg/kg	0.4		150[#2]	90[#3]			-	<0.1	0.3	-	2	<0.5	0.8	<0.5	0.7	0.6	<0.5	<0.5	1.8	<25
	Chromium (III+VI)	mg/kg	2	200[#37]	500[#5]	300[#6]			-	15	8	-	<5	<5	7	9	130	5	6	6	<5	<25
	Cobalt	mg/kg			600[#2]	300[#3]			-	-	-	-	5	-	<5	-	<5	<5	<5	-	7	<25
	Copper	mg/kg	5	220[#37]	30000[#2]	17000[#3]			-	4	14	-	170	58	320	12	<5	37	36	190	820	<25
	Lead	mg/kg	5	1100[#37]	1200[#8]	600[#9]			130	18	62	6	410	310	410	23	26	110	18	210	160	<25
	Manganese	mg/kg			14000[#2]	19000[#3]			-	-	-	-	190	-	170	-	60	300	220	-	470	<25
	Mercury	mg/kg	0.05		120[#2]	80[#3]			-	<0.05	<0.05	-	0.22	0.41	8.62	<0.05	0.21	0.25	0.06	0.17	5.67	<0.05
	Nickel	mg/kg	2	170[#37]	1200[#2]	1200[#3]			-	64	13	-	15	29	27	4	20	14	7	17	54	<10
	Selenium	mg/kg	5		1400[#2]	700[#3]			-	-	-	-	5	-	<5	-	6	<5	<5	-	7	<25
	Tin	mg/kg			47000[#10]	47000[#10]			-	-	-	-	21	-	120	-	<5	<5	<5	-	75	<25
	Zinc	mg/kg	5	520[#37]	60000[#2]	30000[#3]			-	49	63	-	1800	430	600	42	50	220	30	260	350	44
TRH - Australian Fractio	C6-C9	mg/kg	10	180[#11]	45[#12]	5100[#13]			60	1390	<10	<10	<5	-	-	-	<5	-	-	-	<5	-
	C10-C14	mg/kg	20	120[#14]	110[#15]	3800[#16]			<50	**4450**	<50	<50	10	-	-	-	700	-	-	-	70	-
	C15-C28	mg/kg	50						340	910	<100	<100	2000	-	-	-	3100	-	-	-	1000	-
	C29-C36	mg/kg	50						500	300	<100	<100	2300	-	-	-	1000	-	-	-	1300	-
	C10-C36	mg/kg	50						865	5660	<250	<250	4310	-	-	-	4800	-	-	-	2370	-
TRH - HSL Fractions*	C6-C10	mg/kg	10					800[#20]	60	1390	<10	<10	<5	-	-	-	<5	-	-	-	<5	-
	F1: C6-C10 minus BTEX	mg/kg	10	180[#24]	45[#25]	5100[#26]	*45*[#29]		*60*	1381	<10	<10	<5	-	-	-	<5	-	-	-	<5	-
	>C10-C16	mg/kg	50					1000[#20]	<50	4450	<50	<50	10	-	-	-	700	-	-	-	70	-
	F2: >C10-C16 minus naphthalene	mg/kg	50	120[#24]	110[#25]	3800[#26]	*110*[#27]		<50	***4440***	<50	<50	10	-	-	-	*697*	-	-	-	70	-
	F3: >C16-C34	mg/kg	100	300[#30]	5800[#25]	5300[#26]		3500	340	910	<100	<100	2000	-	-	-	3100	-	-	-	1000	-
	>C34-C40	mg/kg	100	2800[#30]	8100[#25]	7400[#26]		10000	500	300	<100	<100	2300	-	-	-	1000	-	-	-	1300	-
	>C10-C40	mg/kg	50						865	5660	<250	<250	4310	-	-	-	4800	-	-	-	2370	-
BTEX	Benzene	mg/kg	0.1	50[#30]	0.5[#31]	120[#32]	*0.5*		*2.9*	0.4	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	<0.2	-
	Ethylbenzene	mg/kg	0.1	70[#30]	55[#31]	5300[#32]	*55*		5.8	3.2	<0.5	<0.5	<1	-	-	-	-	-	-	-	<1	-
	Toluene	mg/kg	0.1	85[#30]	160[#31]	18000[#32]	*160*		1.6	<0.5	<0.5	<0.5	<1	-	-	-	-	-	-	-	<1	-
	Xylene (m & p)	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total BTEX	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Xylene (o)	mg/kg	0.1		690[#10]	690[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Xylenes	mg/kg	0.3	45[#33]	40[#31]	15000[#32]	*40*		19.3	6.2	<0.5	<0.5	<1	-	-	-	-	-	-	-	<1	-
PAHs	Acenaphthene	mg/kg	0.5						-	1.5	<0.5	-	<0.5	<0.5	-	-	<0.5	-	<0.5	<0.5	-	-
	Acenaphthylene	mg/kg	0.5						-	<0.5	<0.5	-	<0.5	<0.5	-	-	15	-	1.6	<0.5	-	-
	Anthracene	mg/kg	0.5						-	2.8	<0.5	-	1	<0.5	-	-	2.4	-	2.4	<0.5	-	-
	B(a)P TEQ (Zero)	mg/kg	0.5		4[#2]	3[#3]			-	**36.9**	0.9	-	13.9	3.2	-	-	16.2	-	12.73	<1.2	-	-
	Benz(a)anthracene	mg/kg	0.5						-	24	0.5	-	7.8	1.8	-	-	10	-	10	<0.5	-	-
	Benzo(a)pyrene	mg/kg	0.5	0.7[#24]					-	27	0.5	-	9.4	2.2	-	-	6.4	-	8.6	<0.5	-	-
	Benzo(b)&(k)fluoranthene	mg/kg							-	46	<1	-	15	4	-	-	38	-	13	<0.5	-	-
	Benzo(b)fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.5						-	16	<0.5	-	6	1.4	-	-	10	-	4.4	<0.5	-	-
	Benzo(k)fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo[b+j]fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.5						-	22	<0.5	-	7.6	1.4	-	-	12	-	8.8	<0.5	-	-
	Dibenz(a,h)anthracene	mg/kg	0.5						-	0.6	<0.5	-	1.4	<0.5	-	-	3.2	-	1.2	<0.5	-	-
	Fluoranthene	mg/kg	0.5						-	43	<0.5	-	11	2.4	-	-	7.2	-	12	0.6	-	-
	Fluorene	mg/kg	0.5						-	1.1	<0.5	-	<0.5	<0.5	-	-	1.6	-	<0.5	<0.5	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						-	19	<0.5	-	6.4	1.6	-	-	16	-	5	<0.5	-	-
	Naphthalene	mg/kg	0.5	170[#34]	3[#31]	1900[#32]	*3*		-	10	<0.5	-	<0.5	<0.5	-	-	*3.2*	-	<0.5	<0.5	-	-
	Phenanthrene	mg/kg	0.5						-	11	<0.5	-	3.8	1.2	-	-	2.6	-	3.2	<0.5	-	-
	Pyrene	mg/kg	0.5						-	43	<0.5	-	11	2.4	-	-	7.2	-	16	0.6	-	-
	Total polycyclic aromatic hydrocarbons	mg/kg	0.5		400[#2]	300[#3]			-	267	1	-	80	18	-	-	130	-	87	1.2	-	-
OCPs	Total Organochlorine pesticides	mg/kg							-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	DDE	mg/kg	0.05						-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	a-BHC	mg/kg	0.05		0.077[#10]	0.077[#10]			-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	Aldrin	mg/kg	0.05						-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	Aldrin + Dieldrin	mg/kg	0.05		10[#2]	10[#3]			-	<0.05	<0.05	-	<0.2	-	-	-	-	<0.2	<0.2	-	-	<0.2
	b-BHC	mg/kg	0.05		0.27[#10]	0.27[#10]			-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	Chlordane	mg/kg	0.05						-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	cis-Chlordane	mg/kg	0.05						-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	trans-Chlordane	mg/kg	0.05						-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	d-BHC	mg/kg	0.05						-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	DDD	mg/kg	0.05						-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	DDT	mg/kg	0.2	180[#34]					-	<0.2	<0.2	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	DDT+DDE+DDD	mg/kg	0.05		600[#2]	400[#3]			-	<0.3	<0.3	-	<0.3	-	-	-	-	<0.3	<0.3	-	-	<0.3
	Dieldrin	mg/kg	0.05						-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	Endosulfan	mg/kg	0.05		400[#2]	340[#3]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05						-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	Endosulfan II	mg/kg	0.05						-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	Endosulfan sulphate	mg/kg	0.05						-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	Endrin	mg/kg	0.05		20[#2]	20[#3]			-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1

Table 1: Historical Soil Sample Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

								Report	Aargus (2004)													
								Location	3H7	A_BH8		A_BH9		A_BH10		A_BH11		A_BH12		A_BH13		
								Field ID	A_BH7_0.7	A_BH8_0.7	A_BH8_1.05	A_BH9_0.55	A_BH9_1.5	A_BH10_0.3	A_BH10_0.6	A_BH11_0.6	A_BH11_1.8	A_BH12_0.2	A_BH12_0.8	A_BH13_0.3	A_BH13_0.8	A_BH13_1.2
								Sampled Depth	0.7	0.7	1.05	0.55	1.5	0.3	0.6	0.6	1.8	0.2	0.8	0.3	0.8	1.2
								Sample Date	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004
								Material	Natural	Fill	Fill	Fill	Natural	Fill	Fill	Natural	Natural	Natural	Natural	Natural	Natural	Natural
Chemical Group	**Chemical Name**	**Units**	**EQL**	NEPC 2013 - MoE-Urban Residential / Public Open Space	NEPC 2013 - Human Health Setting 'B' - Residential with minimal soil access	NEPC 2013 - Human Health Setting 'C' - Public open space	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m	NEPC 2013 -Management Limits in Res / Parkland, Coarse Soil														
Inorganics	Moisture Content (dried @ 103°C)	%	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals	Arsenic	mg/kg	2	100[#1]	500[#2]	**300[#3]**			<5	<5	<5	<5	<5	5	<5	<5	14	<5	<5	<5	<5	<5
	Cadmium	mg/kg	0.4		150[#2]	**90[#3]**			0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.6	1	<0.5	<0.5	0.6	<0.5	<0.5
	Chromium (III+VI)	mg/kg	2	200[#37]	500[#5]	**300[#6]**			25	8	49	6	<5	9	<5	38	<5	<5	97	10	9	27
	Cobalt	mg/kg			600[#2]	**300[#3]**			<5	<5	-	<5	-	<5	<5	7	-	<5	6	<5	<5	-
	Copper	mg/kg	5	220[#37]	30000[#2]	**17000[#3]**			150	17	<5	11	6	24	19	310	82	<5	51	12	9	18
	Lead	mg/kg	5	1100[#37]	1200[#8]	**600[#9]**			130	23	71	15	<5	110	190	120	78	10	38	24	52	8
	Manganese	mg/kg			14000[#2]	**19000[#3]**			28	130	-	47	-	170	100	2700	-	15	27	97	63	-
	Mercury	mg/kg	0.05		120[#2]	**80[#3]**			5.53	0.11	0.11	0.06	<0.05	0.24	0.24	1.5	0.24	<0.05	0.33	0.09	0.08	<0.05
	Nickel	mg/kg	2	170[#37]	1200[#2]	**1200[#3]**			40	19	20	4	<2	29	9	75	33	<2	64	4	5	9
	Selenium	mg/kg	5		1400[#2]	**700[#3]**			<5	<5	-	<5	-	<5	<5	<5	-	<5	<5	<5	<5	-
	Tin	mg/kg			47000[#10]	**47000[#10]**			16	<5	-	<5	-	<5	<5	<5	-	<5	<5	<5	<5	-
	Zinc	mg/kg	5	520[#37]	60000[#2]	**30000[#3]**			85	83	49	83	20	110	95	330	150	9	19	69	59	8
TRH - Australian Fractio	C6-C9	mg/kg	10	180[#11]	45[#12]	**5100[#13]**			-	<5	-	-	-	-	-	-	-	<5	<5	<5	<5	-
	C10-C14	mg/kg	20	120[#14]	110[#15]	**3800[#16]**			-	10	-	-	-	-	-	-	-	<10	30	<10	<10	-
	C15-C28	mg/kg	50						-	400	-	-	-	-	-	-	-	<50	2200	140	100	-
	C29-C36	mg/kg	50						-	2400	-	-	-	-	-	-	-	<50	1400	120	<50	-
	C10-C36	mg/kg	50						-	2810	-	-	-	-	-	-	-	<110	3630	265	130	-
TRH - HSL Fractions*	C6-C10	mg/kg	10					800[#20]	-	<5	-	-	-	-	-	-	-	<5	<5	<5	<5	-
	F1: C6-C10 minus BTEX	mg/kg	10	180[#24]	45[#25]	**5100[#26]**	*45[#29]*		-	<5	-	-	-	-	-	-	-	<5	<5	<5	<5	-
	>C10-C16	mg/kg	50					1000[#20]	-	10	-	-	-	-	-	-	-	<10	30	<10	<10	-
	F2: >C10-C16 minus naphthalene	mg/kg	50	120[#24]	110[#25]	**3800[#26]**	*110[#27]*		-	10	-	-	-	-	-	-	-	<10	30	<10	<10	-
	F3: >C16-C34	mg/kg	100	300[#30]	5800[#25]	**5300[#26]**		3500	-	400	-	-	-	-	-	-	-	<50	2200	140	100	-
	>C34-C40	mg/kg	100	2800[#30]	8100[#25]	**7400[#26]**		10000	-	2400	-	-	-	-	-	-	-	<50	1400	120	<50	-
	>C10-C40	mg/kg	50						-	2810	-	-	-	-	-	-	-	<110	3630	265	130	-
BTEX	Benzene	mg/kg	0.1	50[#30]	0.5[#31]	**120[#32]**	*0.5*		-	<0.2	-	-	-	-	-	-	-	-	<0.2	-	<0.2	-
	Ethylbenzene	mg/kg	0.1	70[#30]	55[#31]	**5300[#32]**	*55*		-	<1	-	-	-	-	-	-	-	-	<1	-	<1	-
	Toluene	mg/kg	0.1	85[#30]	160[#31]	**18000[#32]**	*160*		-	<1	-	-	-	-	-	-	-	-	<1	-	<1	-
	Xylene (m & p)	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total BTEX	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Xylene (o)	mg/kg	0.1		690[#10]	**690[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Xylenes	mg/kg	0.3	45[#33]	40[#31]	**15000[#32]**	*40*		-	<1	-	-	-	-	-	-	-	-	<1	-	<1	-
PAHs	Acenaphthene	mg/kg	0.5						-	<0.5	<0.5	<0.5	<0.5	-	<0.5	0.5	-	<0.5	0.7	<0.5	<0.5	-
	Acenaphthylene	mg/kg	0.5						-	<0.5	1.2	<0.5	<0.5	-	3	<0.5	-	<0.5	0.5	<0.5	0.7	-
	Anthracene	mg/kg	0.5						-	<0.5	0.5	<0.5	<0.5	-	4.8	3.4	-	<0.5	4.2	<0.5	0.8	-
	B(a)P TEQ (Zero)	mg/kg	0.5		4[#2]	**3[#3]**			-	3.2	2.5	1.3	<1.2	-	11.5	35.6	-	<1.2	38.5	2.7	3.5	-
	Benz(a)anthracene	mg/kg	0.5						-	2	1.6	0.6	<0.5	-	9.8	21	-	<0.5	26	1.6	2.6	-
	Benzo(a)pyrene	mg/kg	0.5	0.7[#24]					-	2.2	1.2	0.8	<0.5	-	7.8	24	-	<0.5	25	1.8	2.4	-
	Benzo(b)&(k)fluoranthene	mg/kg							-	4	6	1	<0.5	-	13	38	-	<0.5	47	3	4	-
	Benzo(b)fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.5						-	1.4	1.4	0.6	<0.5	-	3.4	16	-	<0.5	16	1.2	1.2	-
	Benzo(k)fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo[b+j]fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.5						-	2	2.2	0.7	<0.5	-	7.2	19	-	<0.5	26	1.6	2.2	-
	Dibenz(a,h)anthracene	mg/kg	0.5						-	<0.5	<0.5	<0.5	<0.5	-	0.9	3.6	-	<0.5	4	<0.5	<0.5	-
	Fluoranthene	mg/kg	0.5						-	3	2	2	<0.5	-	21	36	-	<0.5	45	3.8	5.6	-
	Fluorene	mg/kg	0.5						-	<0.5	<0.5	<0.5	<0.5	-	1.2	0.5	-	<0.5	0.6	<0.5	<0.5	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						-	1.4	2	0.6	<0.5	-	4.4	17	-	<0.5	18	1.4	1.6	-
	Naphthalene	mg/kg	0.5	170[#34]	3[#31]	**1900[#32]**	*3*		-	<0.5	0.8	<0.5	<0.5	-	0.5	<0.5	-	<0.5	0.5	<0.5	<0.5	-
	Phenanthrene	mg/kg	0.5						-	2	1.6	0.9	<0.5	-	17	14	-	<0.5	17	1.6	2.4	-
	Pyrene	mg/kg	0.5						-	3	1.8	1.8	<0.5	-	18	37	-	<0.5	44	3.8	5.2	-
	Total polycyclic aromatic hydrocarbons	mg/kg	0.5		400[#2]	**300[#3]**			-	21	22	9.2	<0.5	-	116	230	-	<0.5	280	20	29	-
OCPs	Total Organochlorine pesticides	mg/kg							-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	DDE	mg/kg	0.05						-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	a-BHC	mg/kg	0.05		0.077[#10]	**0.077[#10]**			-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	Aldrin	mg/kg	0.05						-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	Aldrin + Dieldrin	mg/kg	0.05		10[#2]	**10[#3]**			-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-
	b-BHC	mg/kg	0.05		0.27[#10]	**0.27[#10]**			-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	Chlordane	mg/kg	0.05						-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	cis-Chlordane	mg/kg	0.05						-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	trans-Chlordane	mg/kg	0.05						-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	d-BHC	mg/kg	0.05						-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	DDD	mg/kg	0.05						-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	DDT	mg/kg	0.2	180[#34]					-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	DDT+DDE+DDD	mg/kg	0.05		600[#2]	**400[#3]**			-	-	-	-	-	<0.3	-	-	-	-	-	-	-	-
	Dieldrin	mg/kg	0.05						-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	Endosulfan	mg/kg	0.05		400[#2]	**340[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05						-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	Endosulfan II	mg/kg	0.05						-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	Endosulfan sulphate	mg/kg	0.05						-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	Endrin	mg/kg	0.05		20[#2]	**20[#3]**			-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-

Table 1: Historical Soil Sample Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

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Chemical Group	Chemical Name	Units	EQL	NEPC 2013 - MoE-Urban Residential / Public Open Space	NEPC 2013 - Human Health Setting 'B' - Residential with minimal soil access	NEPC 2013 - Human Health Setting 'C' - Public open space	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m	NEPC 2013 -Management Limits in Res / Parkland, Coarse Soil														
								Report														**Senvers**
								Location	A_BH14	A_BH15			A_BH16			A_BH17	A_BH18		A_BH19	11		
								Field ID	A_BH14_1.1	A_BH15_0.35	A_BH15_1	A_BH15_1.4	A_BH16_0.4	A_BH16_1.8	A_BH16_2.5	A_BH17_0.5	A_BH18_0.4	A_BH18_0.9	A_BH19_0.2	11_0.4-0.5	11_1.9-2.0	12_0.6-0.7
								Sampled Depth	1.1	0.35	1	1.4	0.4	1.8	2.5	0.5	0.4	0.9	0.2	0.4-0.5	1.9-2	0.6-0.7
								Sample Date	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	14/07/2014	14/07/2014	15/07/2014
								Material	Natural	Fill	Fill	Natural	Fill	Natural	Natural	Fill	Fill	Fill	Fill	Fill	Natural	Fill
Inorganics	Moisture Content (dried @ 103°C)	%	0.1						-	-	-	-	-	-	-	-	-	-	-	9.3	36.8	7.8
Metals	Arsenic	mg/kg	2	100[#1]	500[#2]	300[#3]			<5	1	<5	8	11	<5	<5	21	140	7	<5	10	8	<5
	Cadmium	mg/kg	0.4		150[#2]	90[#3]			<0.5	1.8	2.4	1.6	2	<0.5	<0.5	<0.5	2.4	0.6	1.4	<1	<1	<1
	Chromium (III+VI)	mg/kg	2	200[#37]	500[#5]	300[#6]			<5	19	<5	17	11	30	30	8	37	7	11	11	17	4
	Cobalt	mg/kg			600[#2]	300[#3]			-	<5	<5	-	<5	-	<5	<5	<5	<5	<5	-	-	-
	Copper	mg/kg	5	220[#37]	30000[#2]	17000[#3]			10	17	800	180	36	20	20	17	58	24	52	16	6	<5
	Lead	mg/kg	5	1100[#37]	1200[#8]	600[#9]			15	120	630	63	110	11	15	130	840	190	120	15	<5	<5
	Manganese	mg/kg			14000[#2]	19000[#3]			-	190	94	-	960	-	35	90	170	210	1100	-	-	-
	Mercury	mg/kg	0.05		120[#2]	80[#3]			<0.05	0.18	15.8	0.69	0.19	<0.05	<0.05	0.1	<0.05	0.12	0.12	<0.1	<0.1	<0.1
	Nickel	mg/kg	2	170[#37]	1200[#2]	1200[#3]			14	8	71	29	11	9	12	7	12	5	6	8	13	<2
	Selenium	mg/kg	5		1400[#2]	700[#3]			-	<5	<5	-	<5	-	<5	<5	<5	<5	<5	-	-	-
	Tin	mg/kg			47000[#10]	47000[#10]			-	<5	<5	-	<5	-	<5	6	11	10	5	-	-	-
	Zinc	mg/kg	5	520[#37]	60000[#2]	30000[#3]			50	600	240	160	450	64	75	210	690	230	610	63	25	7
TRH - Australian Fractio	C6-C9	mg/kg	10	180[#11]	45[#12]	5100[#13]			-	<5	<5	-	<5	-	<5	<5	<5	<5	<5	<10	<10	<10
	C10-C14	mg/kg	20	120[#14]	110[#15]	3800[#16]			-	<10	20	-	20	-	60	20	30	40	<10	<50	<50	<50
	C15-C28	mg/kg	50						-	<50	1100	-	320	-	1900	2100	4600	5400	50	140	<100	<100
	C29-C36	mg/kg	50						-	<50	540	-	320	-	940	1100	6300	6300	50	200	<100	<100
	C10-C36	mg/kg	50						-	<110	1660	-	660	-	2900	3220	10,930	11,740	105	340	<50	<50
TRH - HSL Fractions*	C6-C10	mg/kg	10					800[#20]	-	<5	<5	-	<5	-	<5	<5	<5	<5	<5	<10	<10	<10
	F1: C6-C10 minus BTEX	mg/kg	10	180[#24]	45[#25]	5100[#26]	45[#29]		-	<5	<5	-	<5	-	<5	<5	<5	<5	<5	<10	<10	<10
	>C10-C16	mg/kg	50					1000[#20]	-	<10	20	-	20	-	60	20	30	40	<10	<50	<50	<50
	F2: >C10-C16 minus naphthalene	mg/kg	50	120[#24]	110[#25]	3800[#26]	110[#27]		-	<10	20	-	20	-	60	20	30	40	<10	<50	<50	<50
	F3: >C16-C34	mg/kg	100	300[#30]	5800[#25]	5300[#26]		3500	-	<50	1100	-	320	-	1900	2100	4600	5400	50	230	<100	<100
	>C34-C40	mg/kg	100	2800[#30]	8100[#25]	7400[#26]		10000	-	<50	540	-	320	-	940	1100	6300	6300	50	340	<100	<100
	>C10-C40	mg/kg	50						-	<110	1660	-	660	-	2900	3220	10930	11740	105	570	<50	<50
BTEX	Benzene	mg/kg	0.1	50[#30]	0.5[#31]	120[#32]	0.5		-	<0.2	-	-	<0.2	-	-	-	-	<0.2	-	<0.2	<0.2	<0.2
	Ethylbenzene	mg/kg	0.1	70[#30]	55[#31]	5300[#32]	55		-	<1	-	-	<1	-	-	-	-	<1	-	<0.5	<0.5	<0.5
	Toluene	mg/kg	0.1	85[#30]	160[#31]	18000[#32]	160		-	<1	-	-	<1	-	-	-	-	<1	-	<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5
	Total BTEX	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2
	Xylene (o)	mg/kg	0.1		690[#10]	690[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5
	Total Xylenes	mg/kg	0.3	45[#33]	40[#31]	15000[#32]	40		-	<1	-	-	<1	-	-	-	-	<1	-	<0.5	<0.5	<0.5
PAHs	Acenaphthene	mg/kg	0.5						<0.5	<0.5	-	<0.5	<0.5	3	-	1.2	<0.5	0.8	<0.5	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5						<0.5	<0.5	-	<0.5	<0.5	0.5	-	0.6	<0.5	1.6	<0.5	<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5						<0.5	<0.5	-	<0.5	<0.5	8.6	-	5.6	2	4.6	<0.5	<0.5	<0.5	<0.5
	B(a)P TEQ (Zero)	mg/kg	0.5		4[#2]	3[#3]			1.9	<1.2	-	1	5.3	32	-	36.6	8.9	21.9	<1.2	<0.5	<0.5	<0.5
	Benz(a)anthracene	mg/kg	0.5						1.2	<0.5	-	<0.5	2	25	-	26	6.2	16	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene	mg/kg	0.5	0.7[#24]					1.2	<0.5	-	0.6	3.6	22	-	25	6.2	15	<0.5	<0.5	<0.5	<0.5
	Benzo(b)&(k)fluoranthene	mg/kg							2	<0.5	-	1	6	34	-	39	10	24	<0.5	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5
	Benzo(g,h,i)perylene	mg/kg	0.5						0.7	<0.5	-	<0.5	3.2	11	-	13	3.8	7.8	<0.5	<0.5	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.5						1	<0.5	-	0.5	2	22	-	23	5.6	13	<0.5	<0.5	<0.5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5						<0.5	<0.5	-	<0.5	0.5	2.6	-	3.2	0.6	1.8	<0.5	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5						2.2	<0.5	-	1.2	2.8	49	-	49	13	34	<0.5	0.6	<0.5	<0.5
	Fluorene	mg/kg	0.5						<0.5	<0.5	-	<0.5	<0.5	3.8	-	1	<0.5	2	<0.5	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						0.8	<0.5	-	<0.5	3.2	12	-	15	3.8	9	<0.5	<0.5	<0.5	<0.5
	Naphthalene	mg/kg	0.5	170[#34]	3[#31]	1900[#32]	3		<0.5	<0.5	-	<0.5	<0.5	29	-	2.2	<0.5	0.7	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5						0.6	<0.5	-	<0.5	0.7	32	-	23	7.6	17	<0.5	<0.5	<0.5	<0.5
	Pyrene	mg/kg	0.5						2	<0.5	-	1.2	3.2	49	-	49	13	32	<0.5	0.6	<0.5	<0.5
	Total polycyclic aromatic hydrocarbons	mg/kg	0.5		400[#2]	300[#3]			12	<0.5	-	4.8	27	**300**	-	280	72	180	<0.5	1.2	<0.5	<0.5
OCPs	Total Organochlorine pesticides	mg/kg							-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	DDE	mg/kg	0.05						-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	a-BHC	mg/kg	0.05		0.077[#10]	0.077[#10]			-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Aldrin	mg/kg	0.05						-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Aldrin + Dieldrin	mg/kg	0.05		10[#2]	10[#3]			-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
	b-BHC	mg/kg	0.05		0.27[#10]	0.27[#10]			-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Chlordane	mg/kg	0.05						-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	cis-Chlordane	mg/kg	0.05						-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	trans-Chlordane	mg/kg	0.05						-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	d-BHC	mg/kg	0.05						-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	DDD	mg/kg	0.05						-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	DDT	mg/kg	0.2	180[#34]					-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	DDT+DDE+DDD	mg/kg	0.05		600[#2]	400[#3]			-	<0.3	-	-	-	-	-	-	-	-	-	-	-	-
	Dieldrin	mg/kg	0.05						-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan	mg/kg	0.05		400[#2]	340[#3]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05						-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan II	mg/kg	0.05						-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan sulphate	mg/kg	0.05						-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin	mg/kg	0.05		20[#2]	20[#3]			-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-

Table 1: Historical Soil Sample Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

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Chemical Group	Chemical Name	Units	EQL	NEPC 2013 - MoE-Urban Residential / Public Open Space	NEPC 2013 - Human Health Setting 'B' - Residential with minimal soil access	NEPC 2013 - Human Health Setting 'C' - Public open space	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m	NEPC 2013 -Management Limits in Res / Parkland, Coarse Soil	Report a (2014)		
								Location	12		
								Field ID	12_3-3.2	QC01	QC02
								Sampled Depth	3-3.2	3-3.2	3-3.2
								Sample Date	15/07/2014	15/07/2014	15/07/2014
								Material	Natural	Natural	Natural
Inorganics	Moisture Content (dried @ 103°C)	%	0.1						21.9	24.9	21
Metals	Arsenic	mg/kg	2	100[#1]	500[#2]	**300[#3]**			6	6	7.1
	Cadmium	mg/kg	0.4		150[#2]	**90[#3]**			<1	<1	<0.4
	Chromium (III+VI)	mg/kg	2	200[#37]	500[#5]	**300[#6]**			8	9	11
	Cobalt	mg/kg			600[#2]	**300[#3]**			-	-	-
	Copper	mg/kg	5	220[#37]	30000[#2]	**17000[#3]**			7	6	14
	Lead	mg/kg	5	1100[#37]	1200[#8]	**600[#9]**			7	6	13
	Manganese	mg/kg			14000[#2]	**19000[#3]**			-	-	-
	Mercury	mg/kg	0.05		120[#2]	**80[#3]**			<0.1	<0.1	<0.05
	Nickel	mg/kg	2	170[#37]	1200[#2]	**1200[#3]**			4	4	<5
	Selenium	mg/kg	5		1400[#2]	**700[#3]**			-	-	-
	Tin	mg/kg			47000[#10]	**47000[#10]**			-	-	-
	Zinc	mg/kg	5	520[#37]	60000[#2]	**30000[#3]**			15	12	15
TRH - Australian Fractio	C6-C9	mg/kg	10	180[#11]	45[#12]	**5100[#13]**			<10	<10	<20
	C10-C14	mg/kg	20	120[#14]	110[#15]	**3800[#16]**			<50	<50	<20
	C15-C28	mg/kg	50						<100	<100	<50
	C29-C36	mg/kg	50						<100	<100	<50
	C10-C36	mg/kg	50						<50	<50	<50
TRH - HSL Fractions*	C6-C10	mg/kg	10					800[#20]	<10	<10	<20
	F1: C6-C10 minus BTEX	mg/kg	10	180[#24]	45[#25]	**5100[#26]**	*45[#29]*		<10	<10	<20
	>C10-C16	mg/kg	50					1000[#20]	<50	<50	<50
	F2: >C10-C16 minus naphthalene	mg/kg	50	120[#24]	110[#25]	**3800[#26]**	*110[#27]*		<50	<50	<50
	F3: >C16-C34	mg/kg	100	300[#30]	5800[#25]	**5300[#26]**		3500	<100	<100	<100
	>C34-C40	mg/kg	100	2800[#30]	8100[#25]	**7400[#26]**		10000	<100	<100	<100
	>C10-C40	mg/kg	50						<50	<50	-
BTEX	Benzene	mg/kg	0.1	50[#30]	0.5[#31]	**120[#32]**	*0.5*		<0.2	<0.2	<0.1
	Ethylbenzene	mg/kg	0.1	70[#30]	55[#31]	**5300[#32]**	*55*		<0.5	<0.5	<0.1
	Toluene	mg/kg	0.1	85[#30]	160[#31]	**18000[#32]**	*160*		<0.5	<0.5	<0.1
	Xylene (m & p)	mg/kg	0.2						<0.5	<0.5	<0.2
	Total BTEX	mg/kg	0.2						<0.2	<0.2	-
	Xylene (o)	mg/kg	0.1		690[#10]	**690[#10]**			<0.5	<0.5	<0.1
	Total Xylenes	mg/kg	0.3	45[#33]	40[#31]	**15000[#32]**	*40*		<0.5	<0.5	<0.3
PAHs	Acenaphthene	mg/kg	0.5						<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5						<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5						<0.5	<0.5	<0.5
	B(a)P TEQ (Zero)	mg/kg	0.5		4[#2]	**3[#3]**			<0.5	<0.5	<0.5
	Benz(a)anthracene	mg/kg	0.5						<0.5	<0.5	<0.5
	Benzo(a)pyrene	mg/kg	0.5	0.7[#24]					<0.5	<0.5	<0.5
	Benzo(b)&(k)fluoranthene	mg/kg							-	-	-
	Benzo(b)fluoranthene	mg/kg	0.5						<0.5	<0.5	-
	Benzo(g,h,i)perylene	mg/kg	0.5						<0.5	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5						<0.5	<0.5	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5						-	-	<0.5
	Chrysene	mg/kg	0.5						<0.5	<0.5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5						<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5						<0.5	<0.5	<0.5
	Fluorene	mg/kg	0.5						<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						<0.5	<0.5	<0.5
	Naphthalene	mg/kg	0.5	170[#34]	3[#31]	**1900[#32]**	*3*		<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5						<0.5	<0.5	<0.5
	Pyrene	mg/kg	0.5						<0.5	<0.5	<0.5
	Total polycyclic aromatic hydrocarbons	mg/kg	0.5		400[#2]	**300[#3]**			<0.5	<0.5	<0.5
OCPs	Total Organochlorine pesticides	mg/kg							-	-	-
	DDE	mg/kg	0.05						-	-	-
	a-BHC	mg/kg	0.05		0.077[#10]	**0.077[#10]**			-	-	-
	Aldrin	mg/kg	0.05						-	-	-
	Aldrin + Dieldrin	mg/kg	0.05		10[#2]	**10[#3]**			-	-	-
	b-BHC	mg/kg	0.05		0.27[#10]	**0.27[#10]**			-	-	-
	Chlordane	mg/kg	0.05						-	-	-
	cis-Chlordane	mg/kg	0.05						-	-	-
	trans-Chlordane	mg/kg	0.05						-	-	-
	d-BHC	mg/kg	0.05						-	-	-
	DDD	mg/kg	0.05						-	-	-
	DDT	mg/kg	0.2	180[#34]					-	-	-
	DDT+DDE+DDD	mg/kg	0.05		600[#2]	**400[#3]**			-	-	-
	Dieldrin	mg/kg	0.05						-	-	-
	Endosulfan	mg/kg	0.05		400[#2]	**340[#3]**			-	-	-
	Endosulfan I	mg/kg	0.05						-	-	-
	Endosulfan II	mg/kg	0.05						-	-	-
	Endosulfan sulphate	mg/kg	0.05						-	-	-
	Endrin	mg/kg	0.05		20[#2]	**20[#3]**			-	-	-

Table 1: Historical Soil Sample Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

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								Location	BH1		BH2		BH3		BH4		BH5		BH6		1	
								Field ID	BH1_0.1	BH1_2	BH2_0.5	BH2_3	BH3_0.5	BH3_1.1	BH4_1.2	BH4_2	BH5_1	BH5_1.3	BH6_1.3	BH6_2	1_0.4	1_0.8
								Sampled Depth	0.1	2	0.5	3	0.5	1.1	1.2	2	1	1.3	1.3	2	0.4	0.8
								Sample Date	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	1/10/2003	19/01/2004	19/01/2004
								Material	Fill	Natural	Natural	Natural	Fill	Natural	Fill	Natural	Fill	Natural	Fill	Natural	Fill	Natural
Chemical Group	**Chemical Name**	**Units**	**EQL**	NEPC 2013 - MoE-Urban Residential / Public Open Space	NEPC 2013 - Human Health Setting 'B' - Residential with minimal soil access	NEPC 2013 - Human Health Setting 'C' - Public open space	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m	NEPC 2013 -Management Limits in Res / Parkland, Coarse Soil														
	Endrin aldehyde	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.05		0.52[#10]	**0.52[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	Heptachlor	mg/kg	0.05		10[#2]	**10[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	Heptachlor epoxide	mg/kg	0.05		0.053[#10]	**0.053[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	Hexachlorobenzene	mg/kg	0.05		15[#2]	**10[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-
	Methoxychlor	mg/kg	0.2		500[#2]	**400[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-
OPPs	Azinophos methyl	mg/kg	0.05		180[#10]	**180[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Bolstar (Sulprofos)	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromophos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbophenothion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorfenvinphos	mg/kg	0.05		43[#10]	**43[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos	mg/kg	0.05		340[#2]	**250[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Chlorpyrifos-methyl	mg/kg	0.05		610[#10]	**610[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coumaphos	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Diazinon	mg/kg	0.05		43[#10]	**43[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Dichlorvos	mg/kg	0.05		1.7[#10]	**1.7[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Dimethoate	mg/kg	0.05		12[#10]	**12[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Disulfoton	mg/kg			2.4[#10]	**2.4[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Ethion	mg/kg	0.05		31[#10]	**31[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ethoprop	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Fenamiphos	mg/kg	0.05		15[#10]	**15[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenitrothion	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Fensulfothion	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenthion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Malathion	mg/kg	0.05		1200[#10]	**1200[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Merphos	mg/kg			1.8[#10]	**1.8[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Methyl parathion	mg/kg	0.2		15[#10]	**15[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Mevinphos (Phosdrin)	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Monocrotophos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Parathion	mg/kg	0.2		370[#10]	**370[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Phorate	mg/kg			12[#10]	**12[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Prothiofos	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Ronnel	mg/kg			3100[#10]	**3100[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
	Stirophos	mg/kg			20[#10]	**20[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biocides	Demeton (total)	mg/kg			2.4[#10]	**2.4[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	<1	-
	Demeton-S-methyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pirimphos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trichlorfon	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOCs	Sum of Volatile Organic Compounds	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs	PCBs (total)	mg/kg			1[#35]	**1[#36]**			-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-

Comments

* For historcial comparison purposes TRH HSL fractions have been derived using historical TPH Fractions (i.e C6-C9 = C6-C10, C10-C14 = >C10-C16, C10-C14 = >C10-C16) and should is used for comparison purposes only.
#1:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to aged arsenic (contamination present in soil for at least two years). For fresh contamination refer Schedule B7 of the NEPM.
#2:NEPC (2013) - HIL 'B'.
#3:NEPC (2013) - HIL 'C'.
#4:NEPC (2013) EIL - Urban Residential and Public Open Space. Value is for chromium III; no value has been published for chromium VI. Initial screening value applicable to all aged soils (see text).
#5:NEPC (2013) - HIL 'B'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#6:NEPC (2013) - HIL 'C'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#7:NEPC (2013) EIL - Urban Residential and Public Open Space. Initial screening value applicable to all aged soils. Derive site-specific value if contamination is fresh (<2 years) or if EIL exceeded.
#8:NEPC (2013) - HIL 'B'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#9:NEPC (2013) - HIL 'C'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#10:USEPA RSLs (May 2013 update) - Residential.
#11:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C6-C10 (F1) adopted for this fraction.
#12:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#13:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#14:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C10-C16 (F2) adopted for this fraction.
#15:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#16:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#17:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F2 (C>10-C16 less naphthalene) but has been applied to full fraction for initial screening.
#18:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for initial screening.
#19:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for initial screening.
#20:Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
#21:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F1 (C6-C10 less BTEX) but has been applied to full fraction for initial screening.
#22:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial screening.
#23:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial screening.
#24:NEPC (2013) ESL - Urban Residential and Public Open Space. Value applies to both coarse and fine soil.

#25:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel.
#26:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel.
#27:To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#28:Derived soil HSL exceeds soil saturation concentraiton
#29:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#30:NEPC (2013) ESL - Urban Residential and Public Open Space. Coarse soil value adopted for initial screening.
#31:Friebel & Nadebaum (2011) - HSL-B.
#32:Friebel & Nadebaum (2011) - HSL-C.
#33:NEPC (2013) ESL - Urban Residential and Public Open Space. Fine soil value (most conservative) adopted for initial screening.
#34:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to both fresh and aged contamination.
#35:NEPC (2013) - HIL 'B'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#36:NEPC (2013) - HIL 'C'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#37:Site derived EIL criteria (see text)

Table 1: Historical Soil Sample Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

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								Location	2		3		A_BH1	A_BH1	A_BH2		A_BH3	A_BH4	A_BH5		A_BH6	A_I
								Field ID	2_0.4	2_0.8	3_0.4	3_0.8	A_BH1_0.3	A_BH1_1	A_BH2_0.3	A_BH2_1	A_BH3_0.7	A_BH4_0.2	A_BH5_0.3	A_BH5_1	A_BH6_0.4	A_BH7_0.25
								Sampled Depth	0.4	0.8	0.4	0.8	0.3	1	0.3	1	0.7	0.2	0.3	1	0.4	0.25
								Sample Date	19/01/2004	19/01/2004	19/01/2004	19/01/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004
								Material	Fill	Natural	Fill	Natural	Fill	Natural	Fill	Natural	Fill	Fill	Fill	Natural	Fill	Natural
Chemical Group	**Chemical Name**	**Units**	**EQL**	NEPC 2013 - MoE-Urban Residential / Public Open Space	NEPC 2013 - Human Health Setting 'B' - Residential with minimal soil access	NEPC 2013 - Human Health Setting 'C' - Public open space	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m	NEPC 2013 -Management Limits in Res / Parkland, Coarse Soil														
	Endrin aldehyde	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.05		0.52[#10]	0.52[#10]			-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	Heptachlor	mg/kg	0.05		10[#2]	10[#3]			-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	Heptachlor epoxide	mg/kg	0.05		0.053[#10]	0.053[#10]			-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	Hexachlorobenzene	mg/kg	0.05		15[#2]	10[#3]			-	<0.05	<0.05	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
	Methoxychlor	mg/kg	0.2		500[#2]	400[#3]			-	<0.2	<0.2	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1
OPPs	Azinophos methyl	mg/kg	0.05		180[#10]	180[#10]			-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Bolstar (Sulprofos)	mg/kg							-	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Bromophos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbophenothion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorfenvinphos	mg/kg	0.05		43[#10]	43[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos	mg/kg	0.05		340[#2]	250[#3]			-	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos-methyl	mg/kg	0.05		610[#10]	610[#10]			-	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Coumaphos	mg/kg							-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Diazinon	mg/kg	0.05		43[#10]	43[#10]			-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Dichlorvos	mg/kg	0.05		1.7[#10]	1.7[#10]			-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Dimethoate	mg/kg	0.05		12[#10]	12[#10]			-	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-
	Disulfoton	mg/kg			2.4[#10]	2.4[#10]			-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Ethion	mg/kg	0.05		31[#10]	31[#10]			-	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Ethoprop	mg/kg							-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Fenamiphos	mg/kg	0.05		15[#10]	15[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenitrothion	mg/kg							-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Fensulfothion	mg/kg							-	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Fenthion	mg/kg	0.05						-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Malathion	mg/kg	0.05		1200[#10]	1200[#10]			-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Merphos	mg/kg			1.8[#10]	1.8[#10]			-	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Methyl parathion	mg/kg	0.2		15[#10]	15[#10]			-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Mevinphos (Phosdrin)	mg/kg							-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Monocrotophos	mg/kg	0.2						-	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-
	Parathion	mg/kg	0.2		370[#10]	370[#10]			-	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-
	Phorate	mg/kg			12[#10]	12[#10]			-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Prothiofos	mg/kg	0.05						-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Ronnel	mg/kg			3100[#10]	3100[#10]			-	<0.5	<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Stirophos	mg/kg			20[#10]	20[#10]			-	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
Biocides	Demeton (total)	mg/kg			2.4[#10]	2.4[#10]			-	<1	<1	-	-	-	-	-	-	-	-	-	-	-
	Demeton-S-methyl	mg/kg	0.05						-	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
	Pirimphos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trichlorfon	mg/kg							-	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5
VOCs	Sum of Volatile Organic Compounds	mg/kg							-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-
PCBs	PCBs (total)	mg/kg			1[#35]	1[#36]			-	<0.5	<0.5	-	-	-	<1	-	-	-	-	-	-	-

Comments

* For historcial comparison purposes TRH HSL fractions have been derived using historical TPH Fractions (i.e C6-C9 = C6-C10, C10-C14 = >C10-C16, C10-C14 = >C10-C16) and should is used for comparison purposes only.
#1:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to aged arsenic (contamination present in soil for at least two years). For fresh contamination refer Schedule B7 of the NEPM.
#2:NEPC (2013) - HIL 'B'.
#3:NEPC (2013) - HIL 'C'.
#4:NEPC (2013) EIL - Urban Residential and Public Open Space. Value is for chromium III; no value has been published for chromium VI. Initial screening value applicable to all aged soils (see text).
#5:NEPC (2013) - HIL 'B'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#6:NEPC (2013) - HIL 'C'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#7:NEPC (2013) EIL - Urban Residential and Public Open Space. Initial screening value applicable to all aged soils. Derive site-specific value if contamination is fresh (<2 years) or if EIL exceeded.
#8:NEPC (2013) - HIL 'B'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#9:NEPC (2013) - HIL 'C'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#10:USEPA RSLs (May 2013 update) - Residential.
#11:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C6-C10 (F1) adopted for this fraction.
#12:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#13:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#14:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C10-C16 (F2) adopted for this fraction.
#15:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#16:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#17:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F2 (C>10-C16 less naphthalene) but has been applied to full fraction for initial screening.
#18:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for initial screening.
#19:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for initial screening.
#20:Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
#21:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F1 (C6-C10 less BTEX) but has been applied to full fraction for initial screening.
#22:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial screening.
#23:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial screening.
#24:NEPC (2013) ESL - Urban Residential and Public Open Space. Value applies to both coarse and fine soil.

#25:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel.
#26:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel.
#27:To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#28:Derived soil HSL exceeds soil saturation concentraiton
#29:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#30:NEPC (2013) ESL - Urban Residential and Public Open Space. Coarse soil value adopted for initial screening.
#31:Friebel & Nadebaum (2011) - HSL-B.
#32:Friebel & Nadebaum (2011) - HSL-C.
#33:NEPC (2013) ESL - Urban Residential and Public Open Space. Fine soil value (most conservative) adopted for initial screening.
#34:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to both fresh and aged contamination.
#35:NEPC (2013) - HIL 'B'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#36:NEPC (2013) - HIL 'C'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#37:Site derived EIL criteria (see text)

Table 1: Historical Soil Sample Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

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Chemical Group	Chemical Name	Units	EQL	NEPC 2013 - MoE-Urban Residential / Public Open Space	NEPC 2013 - Human Health Setting 'B' - Residential with minimal soil access	NEPC 2013 - Human Health Setting 'C' - Public open space	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m	NEPC 2013 -Management Limits in Res / Parkland, Coarse Soil	A_BH7	A_BH8		A_BH9		A_BH10		A_BH11		A_BH12		A_BH13		
								Field ID	A_BH7_0.7	A_BH8_0.7	A_BH8_1.05	A_BH9_0.55	A_BH9_1.5	A_BH10_0.3	A_BH10_0.6	A_BH11_0.6	A_BH11_1.8	A_BH12_0.2	A_BH12_0.8	A_BH13_0.3	A_BH13_0.8	A_BH13_1.2
								Sampled Depth	0.7	0.7	1.05	0.55	1.5	0.3	0.6	0.6	1.8	0.2	0.8	0.3	0.8	1.2
								Sample Date	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004
								Material	Natural	Fill	Fill	Fill	Natural	Fill	Fill	Natural	Natural	Natural	Natural	Natural	Natural	Natural
	Endrin aldehyde	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.05		0.52[#10]	**0.52**[#10]			-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	Heptachlor	mg/kg	0.05		10[#2]	**10**[#3]			-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.05		0.053[#10]	**0.053**[#10]			-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	Hexachlorobenzene	mg/kg	0.05		15[#2]	**10**[#3]			-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2		500[#2]	**400**[#3]			-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
OPPs	Azinophos methyl	mg/kg	0.05		180[#10]	**180**[#10]			-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Bolstar (Sulprofos)	mg/kg							-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Bromophos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbophenothion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorfenvinphos	mg/kg	0.05		43[#10]	**43**[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos	mg/kg	0.05		340[#2]	**250**[#3]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos-methyl	mg/kg	0.05		610[#10]	**610**[#10]			-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Coumaphos	mg/kg							-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Diazinon	mg/kg	0.05		43[#10]	**43**[#10]			-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Dichlorvos	mg/kg	0.05		1.7[#10]	**1.7**[#10]			-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Dimethoate	mg/kg	0.05		12[#10]	**12**[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Disulfoton	mg/kg			2.4[#10]	**2.4**[#10]			-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Ethion	mg/kg	0.05		31[#10]	**31**[#10]			-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Ethoprop	mg/kg							-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Fenamiphos	mg/kg	0.05		15[#10]	**15**[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenitrothion	mg/kg							-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Fensulfothion	mg/kg							-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Fenthion	mg/kg	0.05						-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Malathion	mg/kg	0.05		1200[#10]	**1200**[#10]			-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Merphos	mg/kg			1.8[#10]	**1.8**[#10]			-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Methyl parathion	mg/kg	0.2		15[#10]	**15**[#10]			-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Mevinphos (Phosdrin)	mg/kg							-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Monocrotophos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Parathion	mg/kg	0.2		370[#10]	**370**[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phorate	mg/kg			12[#10]	**12**[#10]			-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Prothiofos	mg/kg	0.05						-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Ronnel	mg/kg			3100[#10]	**3100**[#10]			-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Stirophos	mg/kg			20[#10]	**20**[#10]			-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
Biocides	Demeton (total)	mg/kg			2.4[#10]	**2.4**[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Demeton-S-methyl	mg/kg	0.05						-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
	Pirimphos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trichlorfon	mg/kg							-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
VOCs	Sum of Volatile Organic Compounds	mg/kg							<0.5	-	-	-	-	-	-	-	-	-	-	<0.5	-	-
PCBs	PCBs (total)	mg/kg			1[#35]	**1**[#36]			-	-	-	-	-	-	-	-	-	-	-	-	<1	-

Comments

* For historcial comparison purposes TRH HSL fractions have been derived using historical TPH Fractions (i.e C6-C9 = C6-C10, C10-C14 = >C10-C16, C10-C14 = >C10-C16) and should is used for comparison purposes only.
#1:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to aged arsenic (contamination present in soil for at least two years). For fresh contamination refer Schedule B7 of the NEPM.
#2:NEPC (2013) - HIL 'B'.
#3:NEPC (2013) - HIL 'C'.
#4:NEPC (2013) EIL - Urban Residential and Public Open Space. Value is for chromium III; no value has been published for chromium VI. Initial screening value applicable to all aged soils (see text).
#5:NEPC (2013) - HIL 'B'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#6:NEPC (2013) - HIL 'C'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#7:NEPC (2013) EIL - Urban Residential and Public Open Space. Initial screening value applicable to all aged soils. Derive site-specific value if contamination is fresh (<2 years) or if EIL exceeded.
#8:NEPC (2013) - HIL 'B'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#9:NEPC (2013) - HIL 'C'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#10:USEPA RSLs (May 2013 update) - Residential.
#11:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C6-C10 (F1) adopted for this fraction.
#12:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#13:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#14:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C10-C16 (F2) adopted for this fraction.
#15:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#16:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#17:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F2 (C>10-C16 less naphthalene) but has been applied to full fraction for initial screening.
#18:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for initial screening.
#19:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for initial screening.
#20:Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
#21:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F1 (C6-C10 less BTEX) but has been applied to full fraction for initial screening.
#22:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial screening.
#23:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial screening.
#24:NEPC (2013) ESL - Urban Residential and Public Open Space. Value applies to both coarse and fine soil.

#25:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel.
#26:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel.
#27:To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#28:Derived soil HSL exceeds soil saturation concentraiton
#29:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#30:NEPC (2013) ESL - Urban Residential and Public Open Space. Coarse soil value adopted for initial screening.
#31:Friebel & Nadebaum (2011) - HSL-B.
#32:Friebel & Nadebaum (2011) - HSL-C.
#33:NEPC (2013) ESL - Urban Residential and Public Open Space. Fine soil value (most conservative) adopted for initial screening.
#34:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to both fresh and aged contamination.
#35:NEPC (2013) - HIL 'B'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#36:NEPC (2013) - HIL 'C'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#37:Site derived EIL criteria (see text)

Table 1: Historical Soil Sample Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

senversa

Chemical Group	Chemical Name	Units	EQL	NEPC 2013 - MoE-Urban Residential / Public Open Space	NEPC 2013 - Human Health Setting 'B' - Residential with minimal soil access	NEPC 2013 - Human Health Setting 'C' - Public open space	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m	NEPC 2013 -Management Limits in Res / Parkland, Coarse Soil	A_BH14	A_BH15			A_BH16			A_BH17	A_BH18		A_BH19	11		
								Field ID	A_BH14_1.1	A_BH15_0.35	A_BH15_1	A_BH15_1.4	A_BH16_0.4	A_BH16_1.8	A_BH16_2.5	A_BH17_0.5	A_BH18_0.4	A_BH18_0.9	A_BH19_0.2	11_0.4-0.5	11_1.9-2.0	12_0.6-0.7
								Sampled Depth	1.1	0.35	1	1.4	0.4	1.8	2.5	0.5	0.4	0.9	0.2	0.4-0.5	1.9-2	0.6-0.7
								Sample Date	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	7/10/2004	14/07/2014	14/07/2014	15/07/2014
								Material	Natural	Fill	Fill	Natural	Fill	Natural	Natural	Fill	Fill	Fill	Fill	Fill	Natural	Fill
	Endrin aldehyde	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.05		0.52#10	**0.52#10**			-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Heptachlor	mg/kg	0.05		10#2	**10#3**			-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.05		0.053#10	**0.053#10**			-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorobenzene	mg/kg	0.05		15#2	**10#3**			-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2		500#2	**400#3**			-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
OPPs	Azinophos methyl	mg/kg	0.05		180#10	**180#10**			-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Bolstar (Sulprofos)	mg/kg							-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Bromophos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbophenothion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorfenvinphos	mg/kg	0.05		43#10	**43#10**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos	mg/kg	0.05		340#2	**250#3**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos-methyl	mg/kg	0.05		610#10	**610#10**			-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Coumaphos	mg/kg							-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Diazinon	mg/kg	0.05		43#10	**43#10**			-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Dichlorvos	mg/kg	0.05		1.7#10	**1.7#10**			-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Dimethoate	mg/kg	0.05		12#10	**12#10**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Disulfoton	mg/kg			2.4#10	**2.4#10**			-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Ethion	mg/kg	0.05		31#10	**31#10**			-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Ethoprop	mg/kg							-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Fenamiphos	mg/kg	0.05		15#10	**15#10**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenitrothion	mg/kg							-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Fensulfothion	mg/kg							-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Fenthion	mg/kg	0.05						-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Malathion	mg/kg	0.05		1200#10	**1200#10**			-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Merphos	mg/kg			1.8#10	**1.8#10**			-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Methyl parathion	mg/kg	0.2		15#10	**15#10**			-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Mevinphos (Phosdrin)	mg/kg							-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Monocrotophos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Parathion	mg/kg	0.2		370#10	**370#10**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phorate	mg/kg			12#10	**12#10**			-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Prothiofos	mg/kg	0.05						-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Ronnel	mg/kg			3100#10	**3100#10**			-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Stirophos	mg/kg			20#10	**20#10**			-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
Biocides	Demeton (total)	mg/kg			2.4#10	**2.4#10**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Demeton-S-methyl	mg/kg	0.05						-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
	Pirimphos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trichlorfon	mg/kg							-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
VOCs	Sum of Volatile Organic Compounds	mg/kg							-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-
PCBs	PCBs (total)	mg/kg			1#35	**1#36**			-	-	<1	-	-	-	-	-	<1	-	-	-	-	-

Comments

* For historcial comparison purposes TRH HSL fractions have been derived using historical TPH Fractions (i.e C6-C9 = C6-C10, C10-C14 = >C10-C16, C10-C14 = >C10-C16) and should is used for comparison purposes only.
#1:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to aged arsenic (contamination present in soil for at least two years). For fresh contamination refer Schedule B7 of the NEPM.
#2:NEPC (2013) - HIL 'B'.
#3:NEPC (2013) - HIL 'C'.
#4:NEPC (2013) EIL - Urban Residential and Public Open Space. Value is for chromium III; no value has been published for chromium VI. Initial screening value applicable to all aged soils (see text).
#5:NEPC (2013) - HIL 'B'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#6:NEPC (2013) - HIL 'C'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#7:NEPC (2013) EIL - Urban Residential and Public Open Space. Initial screening value applicable to all aged soils. Derive site-specific value if contamination is fresh (<2 years) or if EIL exceeded.
#8:NEPC (2013) - HIL 'B'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#9:NEPC (2013) - HIL 'C'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#10:USEPA RSLs (May 2013 update) - Residential.
#11:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C6-C10 (F1) adopted for this fraction.
#12:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#13:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#14:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C10-C16 (F2) adopted for this fraction.
#15:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#16:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#17:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F2 (C>10-C16 less naphthalene) but has been applied to full fraction for initial screening.
#18:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for initial screening.
#19:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for initial screening.
#20:Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
#21:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F1 (C6-C10 less BTEX) but has been applied to full fraction for initial screening.
#22:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial screening.
#23:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial screening.
#24:NEPC (2013) ESL - Urban Residential and Public Open Space. Value applies to both coarse and fine soil.

#25:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel.
#26:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel.
#27:To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#28:Derived soil HSL exceeds soil saturation concentraiton
#29:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#30:NEPC (2013) ESL - Urban Residential and Public Open Space. Coarse soil value adopted for initial screening.
#31:Friebel & Nadebaum (2011) - HSL-B.
#32:Friebel & Nadebaum (2011) - HSL-C.
#33:NEPC (2013) ESL - Urban Residential and Public Open Space. Fine soil value (most conservative) adopted for initial screening.
#34:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to both fresh and aged contamination.
#35:NEPC (2013) - HIL 'B'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#36:NEPC (2013) - HIL 'C'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#37:Site derived EIL criteria (see text)

Table 1: Historical Soil Sample Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

Chemical Group	Chemical Name	Units	EQL	NEPC 2013 - MoE-Urban Residential / Public Open Space	NEPC 2013 - Human Health Setting 'B' - Residential with minimal soil access	NEPC 2013 - Human Health Setting 'C' - Public open space	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand 0-1m	NEPC 2013 -Management Limits in Res / Parkland, Coarse Soil	**Location:** 12		
								Field ID	12_3-3.2	QC01	QC02
								Sampled Depth	3-3.2	3-3.2	3-3.2
								Sample Date	15/07/2014	15/07/2014	15/07/2014
								Material	Natural	Natural	Natural
	Endrin aldehyde	mg/kg	0.05						-	-	-
	Endrin ketone	mg/kg	0.05						-	-	-
	g-BHC (Lindane)	mg/kg	0.05		0.52[#10]	**0.52[#10]**			-	-	-
	Heptachlor	mg/kg	0.05		10[#2]	**10[#3]**			-	-	-
	Heptachlor epoxide	mg/kg	0.05		0.053[#10]	**0.053[#10]**			-	-	-
	Hexachlorobenzene	mg/kg	0.05		15[#2]	**10[#3]**			-	-	-
	Methoxychlor	mg/kg	0.2		500[#2]	**400[#3]**			-	-	-
OPPs	Azinophos methyl	mg/kg	0.05		180[#10]	**180[#10]**			-	-	-
	Bolstar (Sulprofos)	mg/kg							-	-	-
	Bromophos-ethyl	mg/kg	0.05						-	-	-
	Carbophenothion	mg/kg	0.05						-	-	-
	Chlorfenvinphos	mg/kg	0.05		43[#10]	**43[#10]**			-	-	-
	Chlorpyrifos	mg/kg	0.05		340[#2]	**250[#3]**			-	-	-
	Chlorpyrifos-methyl	mg/kg	0.05		610[#10]	**610[#10]**			-	-	-
	Coumaphos	mg/kg							-	-	-
	Diazinon	mg/kg	0.05		43[#10]	**43[#10]**			-	-	-
	Dichlorvos	mg/kg	0.05		1.7[#10]	**1.7[#10]**			-	-	-
	Dimethoate	mg/kg	0.05		12[#10]	**12[#10]**			-	-	-
	Disulfoton	mg/kg			2.4[#10]	**2.4[#10]**			-	-	-
	Ethion	mg/kg	0.05		31[#10]	**31[#10]**			-	-	-
	Ethoprop	mg/kg							-	-	-
	Fenamiphos	mg/kg	0.05		15[#10]	**15[#10]**			-	-	-
	Fenitrothion	mg/kg							-	-	-
	Fensulfothion	mg/kg							-	-	-
	Fenthion	mg/kg	0.05						-	-	-
	Malathion	mg/kg	0.05		1200[#10]	**1200[#10]**			-	-	-
	Merphos	mg/kg			1.8[#10]	**1.8[#10]**			-	-	-
	Methyl parathion	mg/kg	0.2		15[#10]	**15[#10]**			-	-	-
	Mevinphos (Phosdrin)	mg/kg							-	-	-
	Monocrotophos	mg/kg	0.2						-	-	-
	Parathion	mg/kg	0.2		370[#10]	**370[#10]**			-	-	-
	Phorate	mg/kg			12[#10]	**12[#10]**			-	-	-
	Prothiofos	mg/kg	0.05						-	-	-
	Ronnel	mg/kg			3100[#10]	**3100[#10]**			-	-	-
	Stirophos	mg/kg			20[#10]	**20[#10]**			-	-	-
Biocides	Demeton (total)	mg/kg			2.4[#10]	**2.4[#10]**			-	-	-
	Demeton-S-methyl	mg/kg	0.05						-	-	-
	Pirimphos-ethyl	mg/kg	0.05						-	-	-
	Trichlorfon	mg/kg							-	-	-
VOCs	Sum of Volatile Organic Compounds	mg/kg							-	-	-
PCBs	PCBs (total)	mg/kg			1[#35]	**1[#36]**			-	-	-

Comments

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#13:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#14:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C10-C16 (F2) adopted for this fraction.
#15:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#16:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
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#27:To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#28:Derived soil HSL exceeds soil saturation concentraiton
#29:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
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#32:Friebel & Nadebaum (2011) - HSL-C.
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#35:NEPC (2013) - HIL 'B'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#36:NEPC (2013) - HIL 'C'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#37:Site derived EIL criteria (see text)

Table 2: Soil Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

senversa

Chemical Group	Chemical Name	Units	EQL	NEPC 2013 - MoE- Urban Residential / Public Open	NEPC 2013 - Human Health Setting 'B' - Residential with	NEPC 2013 - Human Health Setting 'C' - Public open	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand	NEPC 2013 - Management Limits in Res / Parkland, Coarse																	
								Location	MW100			MW101		MW103					SB14		SB15				SB16	
								Field ID	MW100_0.4-0	MW100_1.6-1	MW100_3-3.1	MW101_0.2-0	MW101_1.5-1	MW103_0.1-0	MW103_0.5-0	QC18	QC19	MW103_2-2.2	SB14_0.6-0.7	SB14_1.8-1.9	SB15_0.5-0.6	SB15_2-2.1	QC2	QC3	SB16_0.6-0.7	SB16_0.9-1
								Sampled Depth	0.4-0.5	1.6-1.7	3-3.1	0.2-0.3	1.5-1.95	0.1-0.2	0.5-0.7	0.5-0.7	0.5-0.7	2-2.2	0.6-0.7	1.8-1.9	0.5-0.6	2-2.1	2-2.1	2-2.1	0.6-0.7	0.9-1
								Sample Date	16/03/2017	16/03/2017	16/03/2017	20/03/2017	20/03/2017	5/05/2017	5/05/2017	5/05/2017	5/05/2017	5/05/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017
								Material	Fill	Natural	Natural	Fill	Natural	Fill	Fill	Fill	Fill	Natural	Fill	Natural	Fill	Natural	Natural	Natural	Fill	Natural
Inorganics	Moisture Content (dried @ 103°C)	%	0.1						24	38.6	30.9	14.9	46	5.5	10.1	10.8	13	31.8	14	30.5	16.6	20.4	20.6	22	7.8	10.2
Metals	Arsenic	mg/kg	2	100[#1]	500[#2]	300[#3]			<5	16	14	5	17	10	<5	<5	2.2	14	6	8	16	5	<5	4.8	<5	<5
	Cadmium	mg/kg	0.4		150[#2]	90[#3]			<1	<1	1	1	2	<1	<1	<1	<0.4	<1	1	<1	4	<1	<1	<0.4	1	<1
	Chromium (III+VI)	mg/kg	2	200[#37]	500[#5]	300[#6]			8	33	23	19	33	9	2	5	<5	28	11	15	20	6	6	<5	50	<2
	Copper	mg/kg	5	220[#37]	30000[#2]	17000[#3]			30	23	11	38	17	12	<5	5	<5	10	40	6	17	<5	<5	<5	22	<5
	Lead	mg/kg	5	1100[#37]	1200[#8]	600[#9]			17	20	7	275	10	12	<5	6	<5	7	285	<5	84	<5	<5	<5	29	<5
	Mercury	mg/kg	0.05		120[#2]	80[#3]			0.6	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	2	170[#37]	1200[#2]	1200[#3]			6	10	19	12	26	5	<2	2	<5	18	12	11	5	4	6	5.4	5	<2
	Zinc	mg/kg	5	520[#37]	60000[#2]	30000[#3]			13	33	36	558	34	65	9	24	8.1	37	164	21	42	8	8	8.5	134	6
TRH - HSL Fractions	C6-C10	mg/kg	10					800[#20]	<10	<10	<10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<10	<10	<10	<20	<10	<10
	F1: C6-C10 minus BTEX	mg/kg	10	180[#24]	45[#25]	5100[#26]	45[#29]		<10	<10	<10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<10	<10	<10	<20	<10	<10
	>C10-C16	mg/kg	50					1000[#20]	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	F2: >C10-C16 minus naphthalene	mg/kg	50	120[#24]	110[#25]	3800[#26]	110[#27]		<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	F3: >C16-C34	mg/kg	100	300[#30]	5800[#25]	5300[#26]		3500	300	1570	<100	3200	<100	<100	<100	<100	<100	<100	380	<100	<100	<100	<100	<100	110	<100
	>C34-C40	mg/kg	100	2800[#30]	8100[#25]	7400[#26]		10000	<100	450	<100	1120	<100	<100	<100	<100	<100	<100	130	<100	<100	<100	<100	<100	<100	<100
	>C10-C40	mg/kg	50						300	2020	<50	4320	<50	<50	<50	<50	-	<50	510	<50	<50	<50	<50	-	110	<50
BTEX	Benzene	mg/kg	0.1	50[#30]	0.5[#31]	120[#32]	0.5		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2
	Ethylbenzene	mg/kg	0.1	70[#30]	55[#31]	5300[#32]	55		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
	Toluene	mg/kg	0.1	85[#30]	160[#31]	18000[#32]	160		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.2						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5
	Total BTEX	mg/kg	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	<0.2
	Xylene (o)	mg/kg	0.1		690[#10]	690[#10]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
	Total Xylenes	mg/kg	0.3	45[#33]	40[#31]	15000[#32]	40		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.3	<0.5	<0.5
PAHs	Acenaphthene	mg/kg	0.5						<0.5	0.6	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5						<0.5	<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5						<0.5	4.1	<0.5	12.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	B(a)P TEQ (Zero)	mg/kg	0.5		4[#2]	3[#3]			3.1	25.4	0.9	89.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.9	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5
	Benz(a)anthracene	mg/kg	0.5						2.7	21	0.8	60	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.4	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5
	Benzo(a)pyrene	mg/kg	0.5	0.7[#24]					2.3	18.2	0.7	61.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.4	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5
	Benzo(g,h,i)perylene	mg/kg	0.5						0.8	5.8	<0.5	35.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5						1.2	7.6	<0.5	25.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5						3.2	21.2	0.8	80.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.3	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5
	Chrysene	mg/kg	0.5						2.7	20	0.7	63.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.7	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5						<0.5	1.5	<0.5	7.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5						5.6	32.7	1.3	116	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	10	<0.5	<0.5	<0.5	<0.5	<0.5	2.3	0.6
	Fluorene	mg/kg	0.5						<0.5	<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						0.7	4.7	<0.5	25.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Naphthalene	mg/kg	0.5	170[#34]	3[#31]	1900[#32]	3		<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5						2.3	12.8	<0.5	47.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<0.5
	Pyrene	mg/kg	0.5						5.8	38.4	1.5	124	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	10.4	<0.5	<0.5	<0.5	<0.5	<0.5	2.1	0.7
	Total Polycyclic aromatic hydrocarbons	mg/kg	0.5		400[#2]	300[#3]			27.3	189	5.8	660	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	52.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.8	1.3
OCPs	Total Organochlorine pesticides	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDE	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	a-BHC	mg/kg	0.05		0.077[#10]	0.077[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Aldrin	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Aldrin + Dieldrin	mg/kg	0.05		10[#2]	10[#3]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	b-BHC	mg/kg	0.05		0.27[#10]	0.27[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Chlordane	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	cis-Chlordane	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	trans-Chlordane	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	d-BHC	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	DDD	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	DDT	mg/kg	0.2	180[#34]					-	-	-	<1	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-
	DDT+DDE+DDD	mg/kg	0.05		600[#2]	400[#3]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Dieldrin	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Endosulfan	mg/kg	0.05		400[#2]	340[#3]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Endosulfan II	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Endosulfan sulphate	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Endrin	mg/kg	0.05		20[#2]	20[#3]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Endrin aldehyde	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.05		0.52[#10]	0.52[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Heptachlor	mg/kg	0.05		10[#2]	10[#3]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.05		0.053[#10]	0.053[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Hexachlorobenzene	mg/kg	0.05		15[#2]	10[#3]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2		500[#2]	400[#3]			-	-	-	<1	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-
OPPs	Azinophos methyl	mg/kg	0.05		180[#10]	180[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Bolstar (Sulprofos)	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromophos-ethyl	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Carbophenothion	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Chlorfenvinphos	mg/kg	0.05		43[#10]	43[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Chlorpyrifos	mg/kg	0.05		340[#2]	250[#3]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Chlorpyrifos-methyl	mg/kg	0.05		610[#10]	610[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Coumaphos	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2: Soil Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

senversa

Chemical Group	Chemical Name	Units	EQL	NEPC 2013 - MoE- Urban Residential / Public Open	NEPC 2013 - Human Health Setting 'B' - Residential with	NEPC 2013 - Human Health Setting 'C' - Public open	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand	NEPC 2013 - Management Limits in Res / Parkland, Coarse																	
								Location	SB17		SB18		SB19			SB20		SB21		TP01				TP02		TP
								Field ID	SB17_0.5-0.6	SB17_2.8-2.9	SB18_0.2-0.3	SB18_1.5-1.6	SB19_0.5-0.6	SB19_1.5-1.6	SB19_2-2.1	SB20_0.5-0.6	SB20_0.85-0.	SB21_0.1-0.2	SB21_1.5-1.9	TP01_0.2-0.3	TP01_0.3-0.4	TP01_0.5-0.6	QC6	TP02_0.2-0.3	TP02_0.5-0.6	TP03_0.1-0.2
								Sampled Depth	0.5-0.6	2.8-2.9	0.2-0.3	1.5-1.6	0.5-0.6	1.5-1.6	2-2.1	0.5-0.6	0.85-0.95	0.1-0.2	1.5-1.95	0.2-0.3	0.3-0.4	0.5-0.6	0.5-0.6	0.2-0.3	0.5-0.6	0.1-0.2
								Sample Date	15/03/2017	15/03/2017	15/03/2017	15/03/2017	16/03/2017	16/03/2017	16/03/2017	16/03/2017	16/03/2017	21/03/2017	21/03/2017	16/03/2017	16/03/2017	16/03/2017	16/03/2017	17/03/2017	17/03/2017	23/03/2017
								Material	Fill	Natural	Fill	Natural	Fill	Natural	Natural	Fill	Natural	Fill	Natural	Fill	Fill	Natural	Natural	Fill	Natural	Fill
Inorganics	Moisture Content (dried @ 103°C)	%	0.1						9.5	37.1	20.3	38.8	36	29.2	20.8	20.3	12.7	10	20	22.3	-	17.4	21.6	10.4	4.3	-
Metals	Arsenic	mg/kg	2	100[#1]	500[#2]	300[#3]			<5	15	6	24	<5	<5	<5	5	<5	15	6	14	-	<5	<5	11	<5	-
	Cadmium	mg/kg	0.4		150[#2]	90[#3]			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	-
	Chromium (III+VI)	mg/kg	2	200[#37]	500[#5]	300[#6]			4	34	9	59	14	7	4	15	<2	13	5	7	-	<2	<2	8	<2	-
	Copper	mg/kg	5	220[#37]	30000[#2]	17000[#3]			11	16	22	103	9	<5	<5	35	<5	17	<5	13	-	<5	<5	17	<5	-
	Lead	mg/kg	5	1100[#37]	1200[#8]	600[#9]			196	18	12	207	30	<5	<5	57	<5	18	<5	45	-	<5	<5	20	6	-
	Mercury	mg/kg	0.05		120[#2]	80[#3]			0.2	<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	170[#37]	1200[#2]	1200[#3]			6	25	14	52	170	5	3	7	<2	9	<2	5	-	<2	<2	8	<2	-
	Zinc	mg/kg	5	520[#37]	60000[#2]	30000[#3]			112	78	74	518	71	<5	7	236	<5	71	<5	155	-	10	9	134	28	-
TRH - HSL Fractions	C6-C10	mg/kg	10					800[#20]	<10	<10	<10	<10	54	<10	<10	<10	<10	<10	<10	<10	-	<10	<10	<10	<10	-
	F1: C6-C10 minus BTEX	mg/kg	10	180[#24]	45[#25]	5100[#26]	45[#29]		<10	<10	<10	<10	54	<10	<10	<10	<10	<10	<10	<10	-	<10	<10	<10	<10	-
	>C10-C16	mg/kg	50					1000[#20]	<50	<50	<50	<50	390	<50	<50	<50	<50	<50	<50	<50	-	<50	<50	<50	<50	-
	F2: >C10-C16 minus naphthalene	mg/kg	50	120[#24]	110[#25]	3800[#26]	110[#27]		<50	<50	<50	<50	390	<50	<50	<50	<50	<50	<50	<50	-	<50	<50	<50	<50	-
	F3: >C16-C34	mg/kg	100	300[#30]	5800[#25]	5300[#26]		3500	<100	<100	<100	190	1210	<100	<100	220	<100	120	<100	<100	-	<100	<100	<100	<100	-
	>C34-C40	mg/kg	100	2800[#30]	8100[#25]	7400[#26]		10000	<100	<100	<100	<100	280	<100	<100	<100	<100	130	<100	<100	-	<100	<100	<100	<100	-
	>C10-C40	mg/kg	50						<50	<50	<50	190	1880	<50	<50	220	<50	250	<50	<50	-	<50	<50	<50	<50	-
BTEX	Benzene	mg/kg	0.1	50[#30]	0.5[#31]	120[#32]	0.5		<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	-
	Ethylbenzene	mg/kg	0.1	70[#30]	55[#31]	5300[#32]	55		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Toluene	mg/kg	0.1	85[#30]	160[#31]	18000[#32]	160		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Xylene (m & p)	mg/kg	0.2						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Total BTEX	mg/kg	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	<0.2	-
	Xylene (o)	mg/kg	0.1		690[#10]	690[#10]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Total Xylenes	mg/kg	0.3	45[#33]	40[#31]	15000[#32]	40		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
PAHs	Acenaphthene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Acenaphthylene	mg/kg	0.5						0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Anthracene	mg/kg	0.5						0.8	<0.5	<0.5	<0.5	9.9	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	B(a)P TEQ (Zero)	mg/kg	0.5		4[#2]	3[#3]			3.2	<0.5	<0.5	<0.5	78	<0.5	<0.5	4.9	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Benz(a)anthracene	mg/kg	0.5						2.8	<0.5	<0.5	<0.5	51.7	<0.5	<0.5	3.2	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Benzo(a)pyrene	mg/kg	0.5	0.7[#24]					2.4	<0.5	<0.5	<0.5	57.6	<0.5	<0.5	3.8	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Benzo(g,h,i)perylene	mg/kg	0.5						1.3	<0.5	<0.5	<0.5	21.5	<0.5	<0.5	1.9	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Benzo(k)fluoranthene	mg/kg	0.5						1.2	<0.5	<0.5	<0.5	21.7	<0.5	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Benzo[b+j]fluoranthene	mg/kg	0.5						3.1	<0.5	<0.5	<0.5	64.3	<0.5	<0.5	4.4	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Chrysene	mg/kg	0.5						2.4	<0.5	<0.5	<0.5	47	<0.5	<0.5	3.2	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Dibenz(a,h)anthracene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Fluoranthene	mg/kg	0.5						5.3	<0.5	<0.5	0.7	125	<0.5	<0.5	8.4	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	0.9	<0.5	-
	Fluorene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						1.1	<0.5	<0.5	<0.5	19.6	<0.5	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Naphthalene	mg/kg	0.5	170[#34]	3[#31]	1900[#32]	3		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Phenanthrene	mg/kg	0.5						2.6	<0.5	<0.5	<0.5	33.5	<0.5	<0.5	2.8	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	Pyrene	mg/kg	0.5						4.6	<0.5	<0.5	0.7	126	<0.5	<0.5	8.6	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	0.8	<0.5	-
	Total Polycyclic aromatic hydrocarbons	mg/kg	0.5		400[#2]	300[#3]			28.3	<0.5	<0.5	1.4	585	<0.5	<0.5	40	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	1.7	<0.5	-
OCPs	Total Organochlorine pesticides	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDE	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	a-BHC	mg/kg	0.05		0.077[#10]	0.077[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Aldrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Aldrin + Dieldrin	mg/kg	0.05		10[#2]	10[#3]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	b-BHC	mg/kg	0.05		0.27[#10]	0.27[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Chlordane	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	cis-Chlordane	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	trans-Chlordane	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	d-BHC	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	DDD	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	DDT	mg/kg	0.2	180[#34]					-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	<0.2	-	-
	DDT+DDE+DDD	mg/kg	0.05		600[#2]	400[#3]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Dieldrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Endosulfan	mg/kg	0.05		400[#2]	340[#3]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Endosulfan I	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Endosulfan II	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Endosulfan sulphate	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Endrin	mg/kg	0.05		20[#2]	20[#3]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Endrin aldehyde	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Endrin ketone	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	g-BHC (Lindane)	mg/kg	0.05		0.52[#10]	0.52[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Heptachlor	mg/kg	0.05		10[#2]	10[#3]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Heptachlor epoxide	mg/kg	0.05		0.053[#10]	0.053[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Hexachlorobenzene	mg/kg	0.05		15[#2]	10[#3]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Methoxychlor	mg/kg	0.2		500[#2]	400[#3]			-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	<0.2	-	-
OPPs	Azinophos methyl	mg/kg	0.05		180[#10]	180[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Bolstar (Sulprofos)	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromophos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Carbophenothion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Chlorfenvinphos	mg/kg	0.05		43[#10]	43[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Chlorpyrifos	mg/kg	0.05		340[#2]	250[#3]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Chlorpyrifos-methyl	mg/kg	0.05		610[#10]	610[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Coumaphos	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2: Soil Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

								Location	03	TP04		TP05		TP06		TP07				TP08		TP09		TP10	
								Field ID	TP03_0.6-0.7	TP04_0.3-0.4	TP04_0.9-1	TP05_0-0.1	TP05_0.5-0.6	TP06_0-0.1	TP06_0.4-0.5	TP07_0.1-0.2	QC15	QC16	TP07_0.5-0.6	TP08_0-0.1	TP08_0.4-0.5	TP09_0-0.1	TP09_0.4-0.5	TP10_0.1-0.2	TP10_0.3-0.4
								Sampled Depth	0.6-0.7	0.3-0.4	0.9-1	0-0.1	0.5-0.6	0-0.1	0.4-0.5	0.1-0.2	0.1-0.2	0.1-0.2	0.5-0.6	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0.1-0.2	0.3-0.4
								Sample Date	23/03/2017	23/03/2017	23/03/2017	23/03/2017	23/03/2017	23/03/2017	23/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017
								Material	Natural	Fill	Fill	Fill	Natural	Fill	Natural	Fill	Fill	Fill	Natural	Fill	Natural	Fill	Natural	Fill	Natural
Chemical Group	**Chemical Name**	**Units**	**EQL**	NEPC 2013 - MoE- Urban Residential / Public Open	NEPC 2013 - Human Health Setting 'B' - Residential with	NEPC 2013 - Human Health Setting 'C' - Public open	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand	NEPC 2013 - Management Limits in Res / Parkland, Coarse																	
Inorganics	Moisture Content (dried @ 103°C)	%	0.1						45.2	42.1	33.8	24.9	20.5	45.6	10.8	12.2	15	15	19.7	14.8	7.5	20.3	13.4	26.1	11.5
Metals	Arsenic	mg/kg	2	100[#1]	500[#2]	**300[#3]**			<5	<5	6	13	<5	8	<5	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5
	Cadmium	mg/kg	0.4		150[#2]	**90[#3]**			<1	<1	1	<1	<1	1	<1	<1	<1	<0.4	<1	<1	<1	<1	<1	<1	<1
	Chromium (III+VI)	mg/kg	2	200[#37]	500[#5]	**300[#6]**			8	2	324	2	<2	6	<2	7	4	360	<2	3	<2	5	<2	4	<2
	Copper	mg/kg	5	220[#37]	30000[#2]	**17000[#3]**			39	503	139	13	<5	12	<5	19	9	7.5	<5	9	<5	14	<5	15	<5
	Lead	mg/kg	5	1100[#37]	1200[#8]	**600[#9]**			114	7	51	29	<5	22	<5	12	46	11	<5	10	<5	21	<5	10	<5
	Mercury	mg/kg	0.05		120[#2]	**80[#3]**			0.4	<0.1	0.6	0.2	<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	170[#37]	1200[#2]	**1200[#3]**			73	46	193	10	<2	9	<2	6	6	5.7	<2	8	<2	10	<2	18	<2
	Zinc	mg/kg	5	520[#37]	60000[#2]	**30000[#3]**			162	146	40	27	<5	442	55	33	36	33	<5	38	<5	113	<5	46	<5
TRH - HSL Fractions	C6-C10	mg/kg	10					800[#20]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<10	<10	<10	<10
	F1: C6-C10 minus BTEX	mg/kg	10	180[#24]	45[#25]	**5100[#26]**	*45 [#29]*		<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<10	<10	<10	<10
	>C10-C16	mg/kg	50					1000[#20]	<50	<50	1580	180	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	F2: >C10-C16 minus naphthalene	mg/kg	50	120[#24]	110[#25]	**3800[#26]**	*110 [#27]*		<50	<50	*1580*	*180*	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	F3: >C16-C34	mg/kg	100	300[#30]	5800[#25]	**5300[#26]**		3500	320	640	21,200	1120	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	>C34-C40	mg/kg	100	2800[#30]	8100[#25]	**7400[#26]**		10000	<100	150	6770	160	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	>C10-C40	mg/kg	50						320	790	29,600	1460	<50	<50	<50	<50	<50	-	<50	<50	<50	<50	<50	<50	<50
BTEX	Benzene	mg/kg	0.1	50[#30]	0.5[#31]	**120[#32]**	*0.5*		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Ethylbenzene	mg/kg	0.1	70[#30]	55[#31]	**5300[#32]**	*55*		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Toluene	mg/kg	0.1	85[#30]	160[#31]	**18000[#32]**	*160*		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.2						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total BTEX	mg/kg	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	<0.2
	Xylene (o)	mg/kg	0.1		690[#10]	**690[#10]**			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total Xylenes	mg/kg	0.3	45[#33]	40[#31]	**15000[#32]**	*40*		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs	Acenaphthene	mg/kg	0.5						<0.5	<0.5	7.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5						<0.5	1.3	5.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5						<0.5	2.4	39.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	B(a)P TEQ (Zero)	mg/kg	0.5		4[#2]	**3[#3]**			1.1	7.1	303	<0.5	<0.5	2.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benz(a)anthracene	mg/kg	0.5						1.5	4.4	236	0.7	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene	mg/kg	0.5	0.7[#24]					0.7	4.9	204	<0.5	<0.5	2.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(g,h,i)perylene	mg/kg	0.5						<0.5	3.1	121	<0.5	<0.5	1.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5						0.6	1.8	101	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5						1.4	6.5	286	<0.5	<0.5	2.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chrysene	mg/kg	0.5						1.5	3.9	233	0.8	<0.5	1.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5						<0.5	0.6	23.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5						2.4	10.7	371	1.4	<0.5	4.9	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluorene	mg/kg	0.5						<0.5	0.5	12.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						<0.5	2.6	96	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Naphthalene	mg/kg	0.5	170[#34]	3[#31]	**1900[#32]**	*3*		<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5						2	7.4	60.6	1.7	<0.5	2.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Pyrene	mg/kg	0.5						2.1	8.9	390	1.3	<0.5	4.7	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5
	Total Polycyclic aromatic hydrocarbons	mg/kg	0.5		400[#2]	**300[#3]**			12.2	59	**2190**	5.9	<0.5	23.7	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5
OCPs	Total Organochlorine pesticides	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDE	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	a-BHC	mg/kg	0.05		0.077[#10]	**0.077[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aldrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aldrin + Dieldrin	mg/kg	0.05		10[#2]	**10[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	b-BHC	mg/kg	0.05		0.27[#10]	**0.27[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlordane	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	cis-Chlordane	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	trans-Chlordane	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	d-BHC	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDD	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDT	mg/kg	0.2	180[#34]					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDT+DDE+DDD	mg/kg	0.05		600[#2]	**400[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dieldrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan	mg/kg	0.05		400[#2]	**340[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan II	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan sulphate	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin	mg/kg	0.05		20[#2]	**20[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin aldehyde	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.05		0.52[#10]	**0.52[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Heptachlor	mg/kg	0.05		10[#2]	**10[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.05		0.053[#10]	**0.053[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorobenzene	mg/kg	0.05		15[#2]	**10[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2		500[#2]	**400[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OPPs	Azinophos methyl	mg/kg	0.05		180[#10]	**180[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bolstar (Sulprofos)	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromophos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbophenothion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorfenvinphos	mg/kg	0.05		43[#10]	**43[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos	mg/kg	0.05		340[#2]	**250[#3]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos-methyl	mg/kg	0.05		610[#10]	**610[#10]**			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coumaphos	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2: Soil Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

Chemical Group	Chemical Name	Units	EQL	NEPC 2013 - MoE- Urban Residential / Public Open	NEPC 2013 - Human Health Setting 'B' - Residential with	NEPC 2013 - Human Health Setting 'C' - Public open	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand	NEPC 2013 - Management Limits in Res / Parkland, Coarse	MW100			MW101		MW103					SB14		SB15				SB16	
								Field ID	MW100_0.4-0	MW100_1.6-1	MW100_3-3.1	MW101_0.2-0	MW101_1.5-1	MW103_0.1-0	MW103_0.5-0	QC18	QC19	MW103_2-2.2	SB14_0.6-0.7	SB14_1.8-1.9	SB15_0.5-0.6	SB15_2-2.1	QC2	QC3	SB16_0.6-0.7	SB16_0.9-1
								Sampled Depth	0.4-0.5	1.6-1.7	3-3.1	0.2-0.3	1.5-1.95	0.1-0.2	0.5-0.7	0.5-0.7	0.5-0.7	2-2.2	0.6-0.7	1.8-1.9	0.5-0.6	2-2.1	2-2.1	2-2.1	0.6-0.7	0.9-1
								Sample Date	16/03/2017	16/03/2017	16/03/2017	20/03/2017	20/03/2017	5/05/2017	5/05/2017	5/05/2017	5/05/2017	5/05/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017
								Material	Fill	Natural	Natural	Fill	Natural	Fill	Fill	Fill	Fill	Natural	Fill	Natural	Fill	Natural	Natural	Natural	Fill	Natural
	Diazinon	mg/kg	0.05		43[#10]	43[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Dichlorvos	mg/kg	0.05		1.7[#10]	1.7[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Dimethoate	mg/kg	0.05		12[#10]	12[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Disulfoton	mg/kg			2.4[#10]	2.4[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ethion	mg/kg	0.05		31[#10]	31[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Ethoprop	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenamiphos	mg/kg	0.05		15[#10]	15[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Fenitrothion	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fensulfothion	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenthion	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Malathion	mg/kg	0.05		1200[#10]	1200[#10]			-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Merphos	mg/kg			1.8[#10]	1.8[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Methyl parathion	mg/kg	0.2		15[#10]	15[#10]			-	-	-	<1	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-
	Mevinphos (Phosdrin)	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Monocrotophos	mg/kg	0.2						-	-	-	<1	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-
	Parathion	mg/kg	0.2		370[#10]	370[#10]			-	-	-	<1	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-
	Phorate	mg/kg			12[#10]	12[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Prothiofos	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Ronnel	mg/kg			3100[#10]	3100[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Stirophos	mg/kg			20[#10]	20[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biocides	Demeton (total)	mg/kg			2.4[#10]	2.4[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Demeton-S-methyl	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Pirimphos-ethyl	mg/kg	0.05						-	-	-	<0.25	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-
	Trichlorfon	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols	2,4,5-trichlorophenol	mg/kg	0.5		6100[#10]	6100[#10]			<0.5	<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
	2,4,6-trichlorophenol	mg/kg	0.5		44[#10]	44[#10]			<0.5	<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
	2,4-dichlorophenol	mg/kg	0.5		180[#10]	180[#10]			<0.5	<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
	2,4-Dimethylphenol	mg/kg	0.5		1200[#10]	1200[#10]			<0.5	<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
	2,4-Dinitrophenol	mg/kg			120[#10]	120[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,6-Dichlorophenol	mg/kg	0.5						<0.5	<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
	2-chlorophenol	mg/kg	0.5		390[#10]	390[#10]			<0.5	<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
	2-Methylphenol	mg/kg	0.2		3100[#10]	3100[#10]			<0.5	<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
	2-Nitrophenol	mg/kg	0.5						<0.5	<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
	3-&4-Methylphenol	mg/kg	0.4						<1	<1	<1	<8	<1	<1	<1	<1	-	-	<1	<1	<1	<1	<1	-	<1	<1
	4,6-Dinitro-2-methylphenol	mg/kg			4.9[#10]	4.9[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg			120[#10]	120[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-Chloro-3-methylphenol	mg/kg	0.5		6100[#10]	6100[#10]			<0.5	<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
	4-Nitrophenol	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dinoseb	mg/kg			61[#10]	61[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentachlorophenol	mg/kg	1		130[#2]	120[#3]			<2	<2	<2	<8	<2	<2	<2	<2	-	-	<2	<2	<2	<2	<2	-	<2	<2
	Phenol	mg/kg	0.5		45000[#2]	40000[#3]			<0.5	<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	tetrachlorophenols	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos Identificatio	Asbestos Detected	--			Yes	Yes			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	weight of sample	g	0.01						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments
#1:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to aged arsenic (contamination present in soil for at least two years). For fresh contamination refer Schedule B7 of the NEPM.
#2:NEPC (2013) - HIL 'B'.
#3:NEPC (2013) - HIL 'C'.
#4:NEPC (2013) EIL - Urban Residential and Public Open Space. Value is for chromium III; no value has been published for chromium VI. Initial screening value applicable to all aged soils (see text).
#5:NEPC (2013) - HIL 'B'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#6:NEPC (2013) - HIL 'C'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#7:NEPC (2013) EIL - Urban Residential and Public Open Space. Initial screening value applicable to all aged soils. Derive site-specific value if contamination is fresh (<2 years) or if EIL exceeded.
#8:NEPC (2013) - HIL 'B'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#9:NEPC (2013) - HIL 'C'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#10:USEPA RSLs (May 2013 update) - Residential.
#11:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C6-C10 (F1) adopted for this fraction.
#12:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#13:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#14:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C10-C16 (F2) adopted for this fraction.
#15:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#16:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#17:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F2 (C>10-C16 less naphthalene) but has been applied to full fraction for initial screening.
#18:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for initial screening.
#19:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for initial screening.
#20:Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
#21:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F1 (C6-C10 less BTEX) but has been applied to full fraction for initial screening.
#22:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial screening.
#23:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial screening.
#24:NEPC (2013) ESL - Urban Residential and Public Open Space. Value applies to both coarse and fine soil.
#25:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel.
#26:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel.
#27:To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#28:Derived soil HSL exceeds soil saturation concentraiton
#29:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#30:NEPC (2013) ESL - Urban Residential and Public Open Space. Coarse soil value adopted for initial screening.
#31:Friebel & Nadebaum (2011) - HSL-B.
#32:Friebel & Nadebaum (2011) - HSL-C.
#33:NEPC (2013) ESL - Urban Residential and Public Open Space. Fine soil value (most conservative) adopted for initial screening.
#34:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to both fresh and aged contamination.
#35:NEPC (2013) - HIL 'B'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#36:NEPC (2013) - HIL 'C'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#37:Site derived EIL criteria (see text)

Table 2: Soil Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

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Chemical Group	Chemical Name	Units	EQL	NEPC 2013 - MoE- Urban Residential / Public Open	NEPC 2013 - Human Health Setting 'B' - Residential with	NEPC 2013 - Human Health Setting 'C' - Public open	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand	NEPC 2013 - Management Limits in Res / Parkland, Coarse	SB17		SB18		SB19			SB20		SB21		TP01				TP02		TF
								Field ID	SB17_0.5-0.6	SB17_2.8-2.9	SB18_0.2-0.3	SB18_1.5-1.6	SB19_0.5-0.6	SB19_1.5-1.6	SB19_2-2.1	SB20_0.5-0.6	SB20_0.85-0.	SB21_0.1-0.2	SB21_1.5-1.9	TP01_0.2-0.3	TP01_0.3-0.4	TP01_0.5-0.6	QC6	TP02_0.2-0.3	TP02_0.5-0.6	TP03_0.1-0.2
								Sampled Depth	0.5-0.6	2.8-2.9	0.2-0.3	1.5-1.6	0.5-0.6	1.5-1.6	2-2.1	0.5-0.6	0.85-0.95	0.1-0.2	1.5-1.95	0.2-0.3	0.3-0.4	0.5-0.6	0.5-0.6	0.2-0.3	0.5-0.6	0.1-0.2
								Sample Date	15/03/2017	15/03/2017	15/03/2017	15/03/2017	16/03/2017	16/03/2017	16/03/2017	16/03/2017	16/03/2017	21/03/2017	21/03/2017	16/03/2017	16/03/2017	16/03/2017	16/03/2017	17/03/2017	17/03/2017	23/03/2017
								Material	Fill	Natural	Fill	Natural	Fill	Natural	Natural	Fill	Natural	Fill	Natural	Fill	Fill	Natural	Natural	Fill	Natural	Fill
	Diazinon	mg/kg	0.05		43[#10]	43[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Dichlorvos	mg/kg	0.05		1.7[#10]	1.7[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Dimethoate	mg/kg	0.05		12[#10]	12[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Disulfoton	mg/kg			2.4[#10]	2.4[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ethion	mg/kg	0.05		31[#10]	31[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Ethoprop	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenamiphos	mg/kg	0.05		15[#10]	15[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Fenitrothion	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fensulfothion	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenthion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Malathion	mg/kg	0.05		1200[#10]	1200[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Merphos	mg/kg			1.8[#10]	1.8[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Methyl parathion	mg/kg	0.2		15[#10]	15[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	<0.2	-	-
	Mevinphos (Phosdrin)	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Monocrotophos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	<0.2	-	-
	Parathion	mg/kg	0.2		370[#10]	370[#10]			-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	<0.2	-	-
	Phorate	mg/kg			12[#10]	12[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Prothiofos	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Ronnel	mg/kg			3100[#10]	3100[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Stirophos	mg/kg			20[#10]	20[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biocides	Demeton (total)	mg/kg			2.4[#10]	2.4[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Demeton-S-methyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Pirimphos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-
	Trichlorfon	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols	2,4,5-trichlorophenol	mg/kg	0.5		6100[#10]	6100[#10]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	2,4,6-trichlorophenol	mg/kg	0.5		44[#10]	44[#10]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	2,4-dichlorophenol	mg/kg	0.5		180[#10]	180[#10]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	2,4-Dimethylphenol	mg/kg	0.5		1200[#10]	1200[#10]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	2,4-Dinitrophenol	mg/kg			120[#10]	120[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,6-Dichlorophenol	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	2-chlorophenol	mg/kg	0.5		390[#10]	390[#10]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	2-Methylphenol	mg/kg	0.2		3100[#10]	3100[#10]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	2-Nitrophenol	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	3-&4-Methylphenol	mg/kg	0.4						<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	-
	4,6-Dinitro-2-methylphenol	mg/kg			4.9[#10]	4.9[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg			120[#10]	120[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-Chloro-3-methylphenol	mg/kg	0.5		6100[#10]	6100[#10]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	4-Nitrophenol	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dinoseb	mg/kg			61[#10]	61[#10]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentachlorophenol	mg/kg	1		130[#2]	120[#3]			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	-	<2	<2	<2	<2	-
	Phenol	mg/kg	0.5		45000[#2]	40000[#3]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
	tetrachlorophenols	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos Detected	--			Yes	Yes			-	-	-	-	-	-	-	-	-	-	-	-	Yes	-	-	-	-	Yes
Identificatio	weight of sample	g	0.01						-	-	-	-	-	-	-	-	-	-	-	-	163	-	-	-	-	65.3

Comments

#1:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to aged arsenic (contamination present in soil for at least two years). For fresh contamination refer S
#2:NEPC (2013) - HIL 'B'.
#3:NEPC (2013) - HIL 'C'.
#4:NEPC (2013) EIL - Urban Residential and Public Open Space. Value is for chromium III; no value has been published for chromium VI. Initial screening value applicable to all age
#5:NEPC (2013) - HIL 'B'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#6:NEPC (2013) - HIL 'C'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#7:NEPC (2013) EIL - Urban Residential and Public Open Space. Initial screening value applicable to all aged soils. Derive site-specific value if contamination is fresh (<2 years) or i
#8:NEPC (2013) - HIL 'B'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#9:NEPC (2013) - HIL 'C'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#10:USEPA RSLs (May 2013 update) - Residential.
#11:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C6-C10 (F1) adopted for this fraction.
#12:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#13:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#14:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C10-C16 (F2) adopted for this fraction.
#15:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#16:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#17:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F2 (C>10-C16 less naphthalene) but has been applied to full fraction for initial screening.
#18:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for
#19:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for
#20:Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
#21:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F1 (C6-C10 less BTEX) but has been applied to full fraction for initial screening.
#22:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial scr
#23:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial scr
#24:NEPC (2013) ESL - Urban Residential and Public Open Space. Value applies to both coarse and fine soil.
#25:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel.
#26:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel.
#27:To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#28:Derived soil HSL exceeds soil saturation concentraiton
#29:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#30:NEPC (2013) ESL - Urban Residential and Public Open Space. Coarse soil value adopted for initial screening.
#31:Friebel & Nadebaum (2011) - HSL-B.
#32:Friebel & Nadebaum (2011) - HSL-C.
#33:NEPC (2013) ESL - Urban Residential and Public Open Space. Fine soil value (most conservative) adopted for initial screening.
#34:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to both fresh and aged contamination.
#35:NEPC (2013) - HIL 'B'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#36:NEPC (2013) - HIL 'C'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#37:Site derived EIL criteria (see text)

Table 2: Soil Analytical Results
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401310

senversa

								Location	03	TP04		TP05		TP06		TP07				TP08		TP09		TP10	
								Field ID	TP03_0.6-0.7	TP04_0.3-0.4	TP04_0.9-1	TP05_0-0.1	TP05_0.5-0.6	TP06_0-0.1	TP06_0.4-0.5	TP07_0.1-0.2	QC15	QC16	TP07_0.5-0.6	TP08_0-0.1	TP08_0.4-0.5	TP09_0-0.1	TP09_0.4-0.5	TP10_0.1-0.2	TP10_0.3-0.4
								Sampled Depth	0.6-0.7	0.3-0.4	0.9-1	0-0.1	0.5-0.6	0-0.1	0.4-0.5	0.1-0.2	0.1-0.2	0.1-0.2	0.5-0.6	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0.1-0.2	0.3-0.4
								Sample Date	23/03/2017	23/03/2017	23/03/2017	23/03/2017	23/03/2017	23/03/2017	23/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017	24/03/2017
								Material	Natural	Fill	Fill	Fill	Natural	Fill	Natural	Fill	Fill	Fill	Natural	Fill	Natural	Fill	Natural	Fill	Natural
Chemical Group	**Chemical Name**	**Units**	**EQL**	NEPC 2013 - MoE- Urban Residential / Public Open	NEPC 2013 - Human Health Setting 'B' - Residential with	NEPC 2013 - Human Health Setting 'C' - Public open	NEPC 2013 - Res A/B Soil HSL for Vapour Intrusion, Sand	NEPC 2013 - Management Limits in Res / Parkland, Coarse																	
	Diazinon	mg/kg	0.05		43#10	43#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dichlorvos	mg/kg	0.05		1.7#10	1.7#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dimethoate	mg/kg	0.05		12#10	12#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Disulfoton	mg/kg			2.4#10	2.4#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ethion	mg/kg	0.05		31#10	31#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ethoprop	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenamiphos	mg/kg	0.05		15#10	15#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenitrothion	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fensulfothion	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenthion	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Malathion	mg/kg	0.05		1200#10	1200#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Merphos	mg/kg			1.8#10	1.8#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Methyl parathion	mg/kg	0.2		15#10	15#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mevinphos (Phosdrin)	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Monocrotophos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Parathion	mg/kg	0.2		370#10	370#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phorate	mg/kg			12#10	12#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Prothiofos	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ronnel	mg/kg			3100#10	3100#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Stirophos	mg/kg			20#10	20#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biocides	Demeton (total)	mg/kg			2.4#10	2.4#10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Demeton-S-methyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pirimphos-ethyl	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trichlorfon	mg/kg							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols	2,4,5-trichlorophenol	mg/kg	0.5		6100#10	6100#10			<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4,6-trichlorophenol	mg/kg	0.5		44#10	44#10			<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dichlorophenol	mg/kg	0.5		180#10	180#10			<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-Dimethylphenol	mg/kg	0.5		1200#10	1200#10			<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-Dinitrophenol	mg/kg			120#10	120#10			-	-	-	-	-	-	-	-	-	<5	-	-	-	-	-	-	-
	2,6-Dichlorophenol	mg/kg	0.5						<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-chlorophenol	mg/kg	0.5		390#10	390#10			<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-Methylphenol	mg/kg	0.2		3100#10	3100#10			<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-Nitrophenol	mg/kg	0.5						<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	3-&4-Methylphenol	mg/kg	0.4						<1	<1	<8	<1	<1	<1	<1	<1	<1	<0.4	<1	<1	<1	<1	<1	<1	<1
	4,6-Dinitro-2-methylphenol	mg/kg			4.9#10	4.9#10			-	-	-	-	-	-	-	-	-	<5	-	-	-	-	-	-	-
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg			120#10	120#10			-	-	-	-	-	-	-	-	-	<20	-	-	-	-	-	-	-
	4-Chloro-3-methylphenol	mg/kg	0.5		6100#10	6100#10			<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	4-Nitrophenol	mg/kg							-	-	-	-	-	-	-	-	-	<5	-	-	-	-	-	-	-
	Dinoseb	mg/kg			61#10	61#10			-	-	-	-	-	-	-	-	-	<20	-	-	-	-	-	-	-
	Pentachlorophenol	mg/kg	1		130#2	120#3			<2	<2	<8	<2	<2	<2	<2	<2	<2	<1	<2	<2	<2	<2	<2	<2	<2
	Phenol	mg/kg	0.5		45000#2	40000#3			<0.5	<0.5	<4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	tetrachlorophenols	mg/kg							-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-
Asbestos	Asbestos Detected	--			Yes	Yes			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Identificatio	weight of sample	g	0.01						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments
#1:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to aged arsenic (contamination present in soil for at least two years). For fresh contamination refer S
#2:NEPC (2013) - HIL 'B'.
#3:NEPC (2013) - HIL 'C'.
#4:NEPC (2013) EIL - Urban Residential and Public Open Space. Value is for chromium III; no value has been published for chromium VI. Initial screening value applicable to all age
#5:NEPC (2013) - HIL 'B'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#6:NEPC (2013) - HIL 'C'. Conservatively assumes present as Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
#7:NEPC (2013) EIL - Urban Residential and Public Open Space. Initial screening value applicable to all aged soils. Derive site-specific value if contamination is fresh (<2 years) or i
#8:NEPC (2013) - HIL 'B'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#9:NEPC (2013) - HIL 'C'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
#10:USEPA RSLs (May 2013 update) - Residential.
#11:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C6-C10 (F1) adopted for this fraction.
#12:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#13:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#14:NEPC (2013) ESL - Urban Residential and Public Open Space. Value for C10-C16 (F2) adopted for this fraction.
#15:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#16:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#17:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F2 (C>10-C16 less naphthalene) but has been applied to full fraction for initial screening.
#18:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for
#19:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for
#20:Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2
#21:NEPC (2013) ESL - Urban Residential and Public Open Space. Value is for F1 (C6-C10 less BTEX) but has been applied to full fraction for initial screening.
#22:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial scre
#23:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial scr
#24:NEPC (2013) ESL - Urban Residential and Public Open Space. Value applies to both coarse and fine soil.
#25:Friebel & Nadebaum (2011) - HSL-B. Only to be used where source is petrol or diesel fuel.
#26:Friebel & Nadebaum (2011) - HSL-C. Only to be used where source is petrol or diesel fuel.
#27:To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#28:Derived soil HSL exceeds soil saturation concentraiton
#29:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#30:NEPC (2013) ESL - Urban Residential and Public Open Space. Coarse soil value adopted for initial screening.
#31:Friebel & Nadebaum (2011) - HSL-B.
#32:Friebel & Nadebaum (2011) - HSL-C.
#33:NEPC (2013) ESL - Urban Residential and Public Open Space. Fine soil value (most conservative) adopted for initial screening.
#34:NEPC (2013) EIL - Urban Residential and Public Open Space. Value applies to both fresh and aged contamination.
#35:NEPC (2013) - HIL 'B'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#36:NEPC (2013) - HIL 'C'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
#37:Site derived EIL criteria (see text)

Table 3: Validation Criteria
Remedial Action Plan
49 and 57 Annie Street, Wickham, NSW
1401311

senversa

CoPC	Unit	Investigation/Screening Criteria - Remediation Area A	Investigation/Screening Criteria - Remediation Area B		
		NEPC 2013 - Human Health Setting 'B' - Residential with minimal soil access	NEPC 2013 - Terrestrial Ecology - Urban Residential / Public Open Space	NEPC 2013 - Human Health Setting 'C' - Public open space	NEPC 2013 -Management Limits in Res / Parkland, Coarse Soil
Arsenic	mg/kg	500	100	300	
Cadmium	mg/kg	150		90	
Chromium (III+VI)	mg/kg	500	200	300	
Copper	mg/kg	30000	220	17000	
Lead	mg/kg	1200	1100	600	
Mercury	mg/kg	120		80	
Nickel	mg/kg	1200	170	1200	
Zinc	mg/kg	60000	520	30000	
C6-C10	mg/kg				800
F1: C6-C10 minus BTEX	mg/kg	45	1804	5100	
>C10-C16	mg/kg				1000
F2: >C10-C16 minus naphthalene	mg/kg	110	1204	3800	
F3: >C16-C34	mg/kg	5800	300	5300	3500
>C34-C40	mg/kg	8100	2800	7400	10000
Benzene	mg/kg	0.5	50	120	
Ethylbenzene	mg/kg	55	70	5300	
Toluene	mg/kg	160	85	18000	
Xylene (o)	mg/kg	690		690	
Total Xylenes	mg/kg	40	45	15000	
B(a)P TEQ Zero	mg/kg	4		3	
Benzo(a)pyrene	mg/kg		0.7		
Naphthalene	mg/kg	3	170	1900	
Total Polycyclic aromatic hydrocarbons	mg/kg	400		300	

Appendix A: Proposed Development Plan and Staging

A	02.06.2017	ISSUED FOR DA

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CLIENT:
Investec

PROJECT :
Wickham Wool Stores
PROJECT NO : 15032

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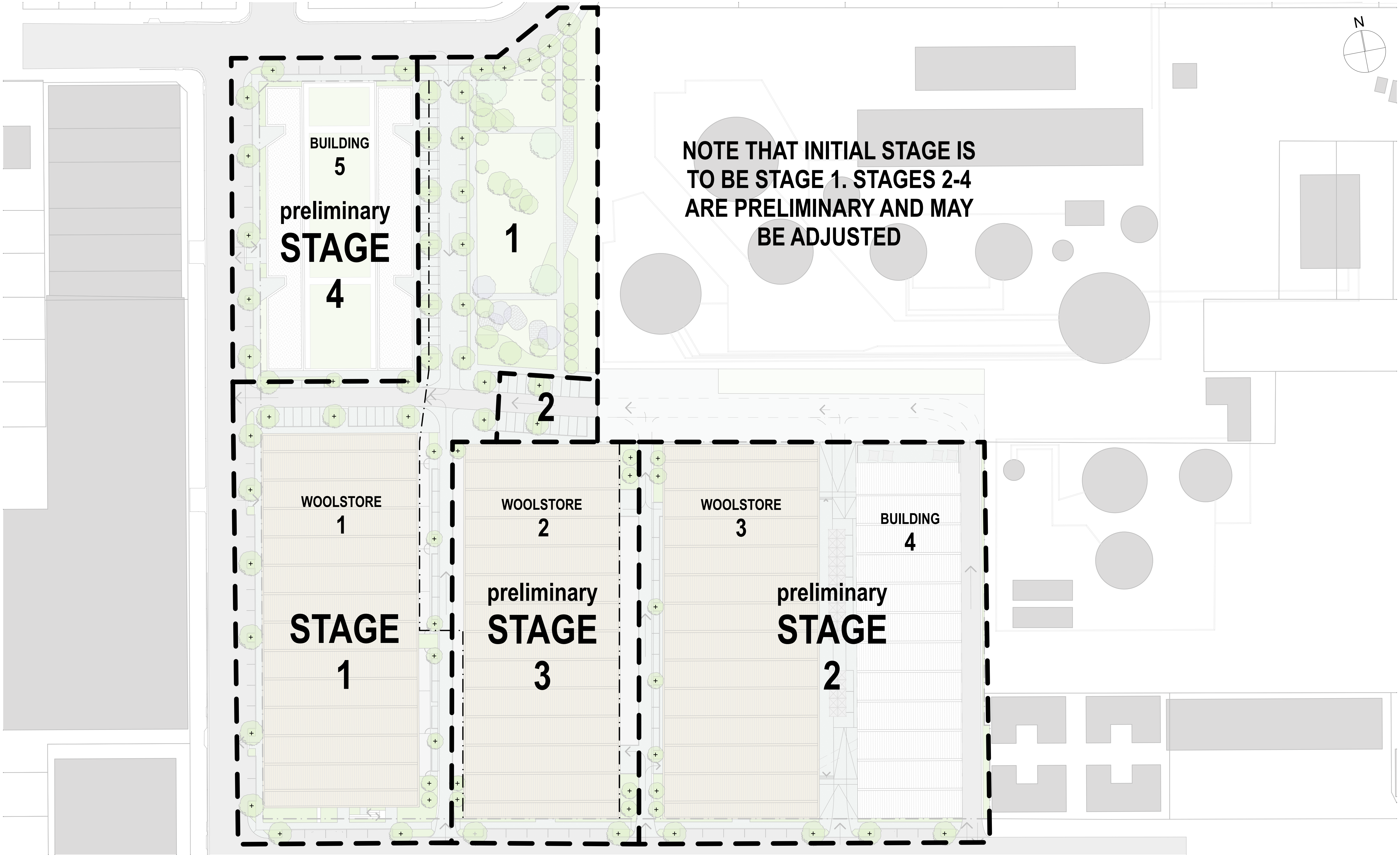
DRAWING TITLE
SITE PLAN

PROJECT - PHASE
DA MASTERPLAN

SCALES
1:500 @ A1
1:400 @ A3

DRAWN	CHECKED
KT	TG

DATE 2/06/2017
DRAWING NO A-002
REV A



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DRAWING TITLE
MASTERPLAN - Staging Plan

PROJECT - PHASE
DA MASTERPLAN REPORT

SCALES
1:1000 @ A3

DRAWN	CHECKED
KT	TG

DATE 25/06/2017
DRAWING NO
REV A

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