

Appendix L

Contamination Review

Showground Station Precinct



Planning &
Environment

Department of Planning and
Environment

Showground Station Precinct

Desktop contamination review

Issue | January 2015

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Job number 239035

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Glossary of terms and abbreviations

Term	Meaning
AEC	Areas of environmental concern
AHD	Australian Height Datum
BTEX	Benzene, toluene, ethylbenzene, xylenes
DP&E / The Department	NSW Department of Planning and Environment
CLM Act	<i>Contaminated Land Management Act 1997</i>
CoPC	Chemical of Potential Concern
The Council	The Hills Shire Council
EIS	Environmental Impact Statement
EPA	Environmental Protection Authority NSW
EPL	Environmental protection licence issued under the POEO Act
The Hills DCP 2012	The Hills Development Control Plan 2012
The Hills LEP 2012	The Hills Local Environmental Plan 2012
The Hills LGA	The Hills Local Government Area
LOR	Limit of Reporting
NWRL	North West Rail Link
NWRL Corridor Strategy	North West Rail Link Corridor Strategy
OCP	Organochlorine Pesticides
OEH	Office of Environment and Heritage NSW
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
SEPP	State Environmental Planning Policy
TfNSW	Transport for NSW
The Precinct	Showground Station Precinct
The Structure Plan	Showground Station Precinct Structure Plan
TPH	Total Petroleum Hydrocarbon
µS/cm	Micro-Siemens per centimetre
VHC	Volatile Halogenated Compounds
VOC	Volatile Organic Compounds

1 Introduction

This report has been prepared by Arup Pty Ltd (Arup) and provides a desktop contamination review relating to the proposed rezoning of the Showground Station Precinct.

The Showground Station Precinct was announced by the NSW Government in August 2014. The precinct is one of number of Priority Precincts which aim to provide for more homes, jobs and improved public spaces close to transport and services. One of the key goals for Priority Precincts is to increase housing choice and affordability by delivering increased housing supply in an environmentally, socially and economically sustainable manner.

The Showground Station Precinct is located in The Hills Shire Local Government Area and covers approximately 271 hectares. The boundary of the precinct is generally based on the road boundary within a radius of 800 metres from the proposed Showground Station, which is normally considered to reflect a 10 minute walk. The boundary also takes in to account predominant land uses, built form and natural features.

The vision for the Showground Station Precinct is for a vibrant, mixed use centre comprising a mixture of offices, shops, community facilities, recreational, cultural and leisure activities, education, and a mix of housing types within walking distance of the new station.

The Showground Station Precinct is a long term project that will be delivered over the next 25 years.

2 Purpose and limitations

2.1 Purpose

This report documents a desktop review of the North West Rail Link (NWRL) environmental impact statement (EIS) reports and other available information related to land contamination for the Showground Station Precinct (the Precinct).

2.2 Limitations to this report

This report has been prepared by Arup for the Department and may only be used and relied on by the Department for the purpose set out in Section 2.1 of this report. Arup otherwise disclaims responsibility to any person other than the Department arising in connection with this report.

It should be noted that the purpose of this report is not intended to make a statement about the suitability of the land for the Precinct end uses nor intended to be a Phase 1 contamination report.

Arup also excludes implied warranties and conditions, to the extent legally permissible. The opinions, conclusions and any recommendations in this report are based on information provided by the Department and reviewed at the date of preparation of the report.

Arup has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared. The opinions, conclusions and any recommendations in this report are based on desktop information made available for this commission.

Not all relevant Precinct features and conditions may have been identified in this report. The information provided by the Department and others (including other Government authorities) has not been independently verified or checked beyond the agreed scope of work.

Arup does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

3 Scope of work

The scope of works completed by Arup was as follows:

- Attendance to project inception meeting and various project progress meetings
- Drive through and visual inspection of the Precinct area
- Review of the following information sources:
 - Published geology, hydrogeology, hydrology and topography records
 - NWRL EIS1 (Major Civil Construction Works), EIS2 (Stations, Rail Infrastructure and Systems) and NWRL Geotechnical Interpretive Reports
 - NWRL Showground precinct activation plans
 - Information provided by the Department of Planning & Environment (the Department) and the Hills Shire Council (the Council) environmental health team.
 - Note Section 149 planning certificates of parcels of land within the precinct were requested but were not available for this report. Council's Environmental Health Team reported Council Section 149 Certificates have no records on contaminated sites within the Precinct
 - *The Hills Local Environmental Plan 2012* (The Hills LEP) maps
 - 1947 and 1961 aerial photographs provided by the Department and aerials from Google Maps and Six Maps
 - Initial subdivision layout and information on the Shire history sourced from Council's website
 - Natural Resource Atlas information
 - Office of Environment and Heritage (Environment Protection Authority division (EPA)) contaminated land register
 - *Protection of the Environment Operations Act 1997* (POEO Act) public register
 - Note that major parcels of land with a change in land use were not identified at the time this report was prepared, hence title deeds records review and WorkCover dangerous goods searches were not undertaken.

4 Showground Station Precinct (the Precinct)

This chapter outlines the location, site history, and existing soils, geology and hydrological conditions of the Precinct. It also documents information received from Council on sites of environmental concern.

4.1 Precinct location

Located in Sydney's North West region, within The Hills Shire Council, the Precinct covers approximately 271 hectares and is bounded by:

- Showground Road and Kathleen Avenue to the north
- Windsor Road to the South
- Fishburn Crescent and Castle Hill residential area to the east
- Windsor Road to the west.

A map showing the location of the Precinct is presented in Figure 1.



Figure 1 Showground Station Precinct

4.2 Precinct history

A timeline of events relevant to the Precinct is presented in Table 1.

Table 1 Showground Station Precinct historical themes (Source: The Hills Shire Council, 2014; GML, 2014)

Year	Commentary
1801	Old Northern Road (outside the Precinct but in proximity to the south eastern end boundary) was built to the new Castle Hill Government Farm.
1802	The first land grants within the Precinct occurred in this period of the development when one of the earliest grants (Portion 126) of 100 acres was granted to Michael Hancey on 31 March 1802.
1810	Windsor Road (west boundary of the Precinct) was constructed.
1891	Castle Hill District Show moved to Showground Road, Castle Hill (located on the north east portion of the Precinct).
1898	The majority of land within the Precinct was subdivided into blocks between 4 and 11 acres and auctioned on separate torrens titles (Figure 2). The torrens title land sale was promoted as: <i>'orchard blocks and residential sites having extensive main frontages, situated on the heights of Baulkham Hills – the best spot for citrus fruit'</i>
1913	Water pipes in Showground Road were connected to the Sydney Water Supply. By 1917 there were water pipes in Baulkham Hills.
1920's	Poultry and egg production becomes the main industry in the Shire.
1926	Electricity came to Baulkham Hills and Castle Hill.
1977	Sewerage connection was available to residents in Castle Hill.
1978	Land in Victoria Avenue and Carrington Road, Castle Hill, was set aside for an industrial area now known as the Castle Hill Trading Zone (within the Precinct).
1982	Council moves in to a new administration building on Showground Road, Castle Hill (within the Precinct).
1988	The Hills Centre for the Performing Arts was opened at Castle Hill (within the Precinct).
2012	NSW Government announces purchase of Showground Road Council Administration Building and surrounds for North West Rail Link Development

	(within the Precinct). Council purchases new building in Norwest Business Park with plans to relocate in 2013.
2013	Council's new administration building, located at 3 Columbia Court, Baulkham Hills is officially opened (outside the Precinct).

The initial subdivision layout and aerial photographs from 1930, 1947, 1956, 1961 and 1978 were made available for the review of the Precinct history (Figure 2, Figure 3, Figure 4, Figure 5 Figure 6 and Figure 7). The review was complemented with information on the history of the Shire available at Council's website (The Hills Shire Council, 2014).

The initial subdivision layout (Figure 2) suggests that with exception of the Castle Hill Show Ground, prior the early 1900's the land occupied by the Precinct was vacant land. Although some of the aerial photographs do not capture the whole Precinct, the following commentary is provided in relation to historical land uses:

- Land to the north of Showground Road. This land appears to be covered by native vegetation and tree plantation (probably citrus) (Refer to Table 1) between 1930 and 1961, and occupied by a small number of dwellings and shed structures in close proximity to the Showground Road road reserve. Suburban blocks, residential dwellings and sealed roads with kerbs and gutters are observed in the 1978 aerial.
- Showground site. The initial subdivision layout and arials confirms land uses relating to the showground since the 1900's. The arials show additional dwellings and shed structures around the Showground oval were constructed between 1947 and 1961.
- Land west of Victoria Avenue. The 1930 and 1947 arials suggest that the western portion of the Precinct comprised large vacant lots with small pockets of dwellings and building structures located in close proximity to roads. More intensive agricultural activities (probably citrus plantations) (Refer to Table 1) are evident in the 1956, 1961 and 1978 arials with a large number of agricultural crops, rural dwellings and shed structures and the construction of farm dams.
- Land between Victoria Avenue and Cattai Creek riparian vegetation. The 1930 and 1947 aerial shows intensive agricultural uses when compared to the land west of Victoria Avenue. The southern section (1947 aerial) appears to be dominated by native vegetation and plots of land containing planted trees (probably citrus plantations) (Refer to Table 1). The 1947 aerial also shows long shed structures likely to be related to poultry and egg production (Table 1). The 1956 and 1961 aerial suggest that intensive agricultural uses were maintained on the northern and mid sections and were further enhanced with the construction of farm dams, dwellings and shed structures (the southern section is not visible in the 1961 aerial). A large business (probably industrial) development is observed in the visible portion of the 1978 aerial.
- Cattai Creek corridor. Progressive riparian vegetation clearing is evident in the arials. The aerial shows that in 1930 and 1947 the creek's riparian vegetation comprised a greater portion of the Precinct land. Lower amount of riparian vegetation coverage is observed in the 1956 and 1961 aerial when some vegetation clearance occurred on the North West end of the corridor. By 1978,

riparian vegetation clearance was observed on the northern end of the riparian corridor.

- Land to the east of Cattai Creek corridor and south to the Showground site. The visible portion of the 1947 aerial shows more intensive agricultural uses when compared with the western side of the Precinct. Numerous long sheds (likely to be related to poultry and egg production) (Refer to Table 1), planted trees (likely to be citrus plantations. Refer to Table 1), agricultural plots, dwellings and other structures are noted in the aerial. The visible portion of land shown in the 1956 and 1961 aerials suggest land uses and structures remain largely unchanged during this period. The visible portion of the 1978 aerial show suburban blocks, residential dwellings and sealed roads with kerbs and gutters.

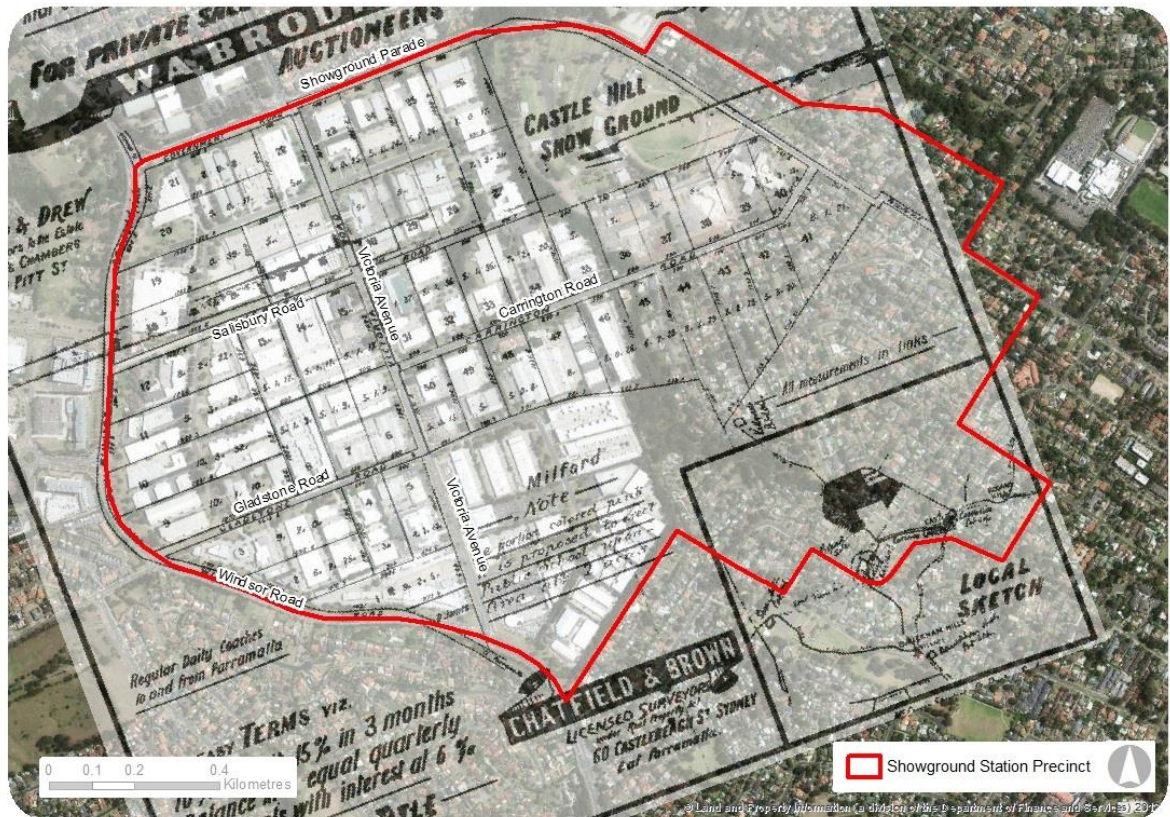


Figure 2 Initial subdivision layout (Source: The Hills Shire, 2014)

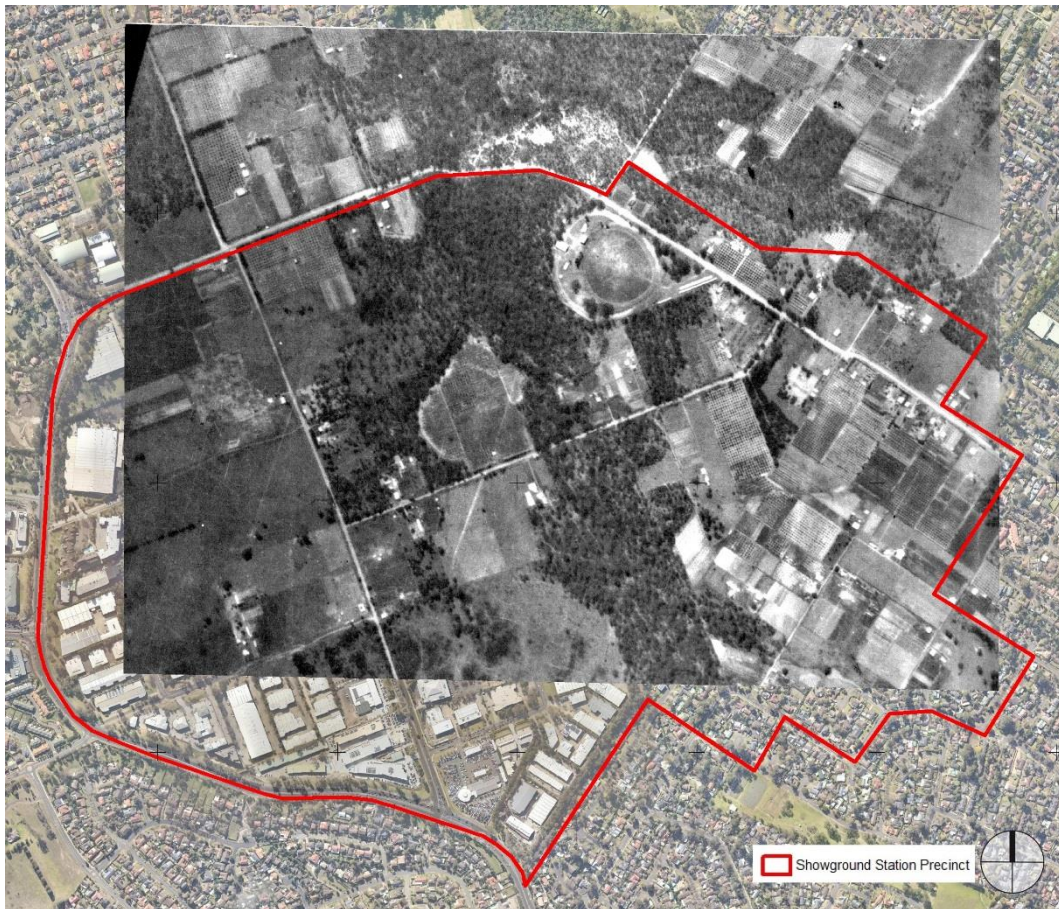


Figure 3 1930 aerial photograph (Source: GML, 2014)

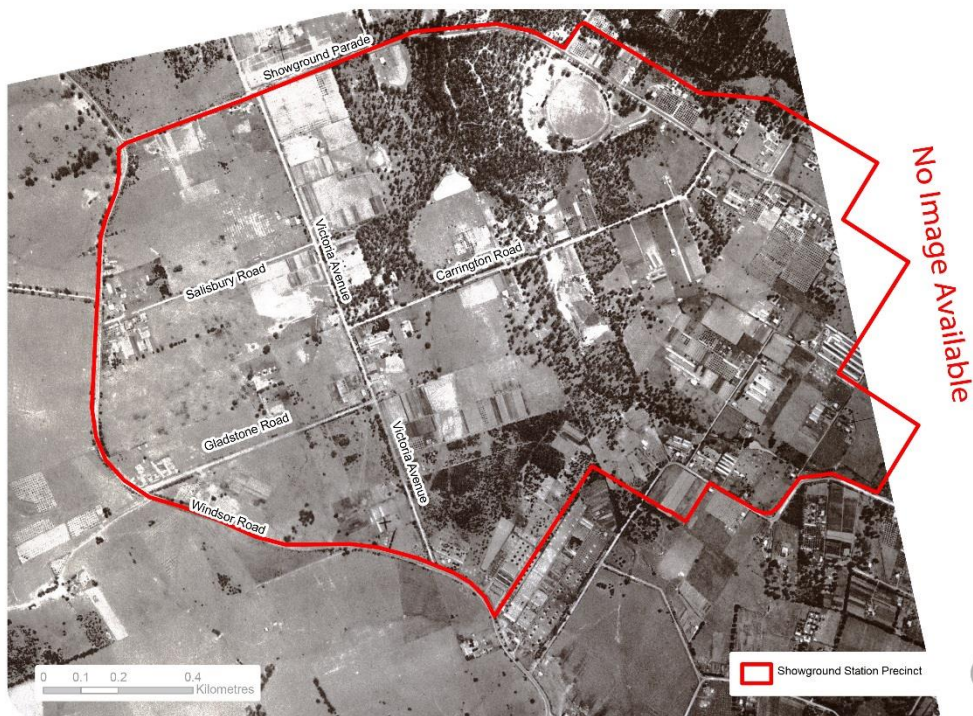


Figure 4 1947 aerial photograph (Source: DP&E, 2014)

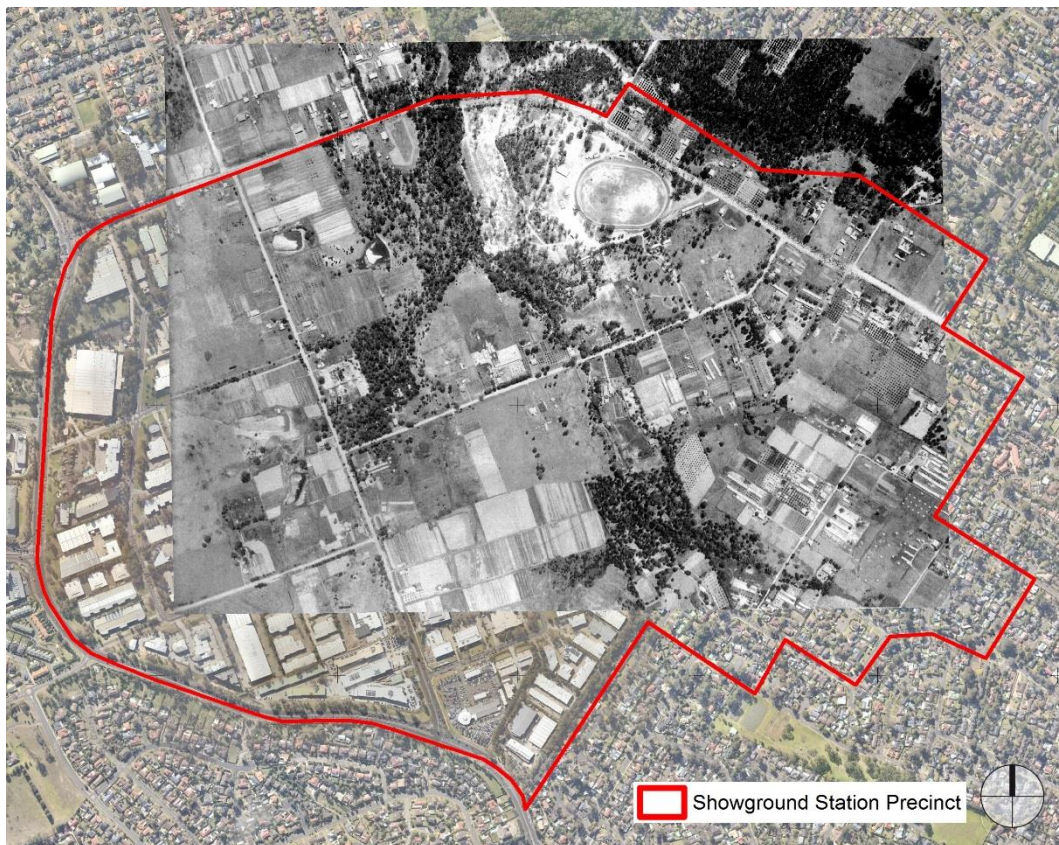


Figure 5 1956 aerial photograph (Source: DP&E, 2014)



Figure 6 1961 aerial photograph (Source: DP&E, 2014)

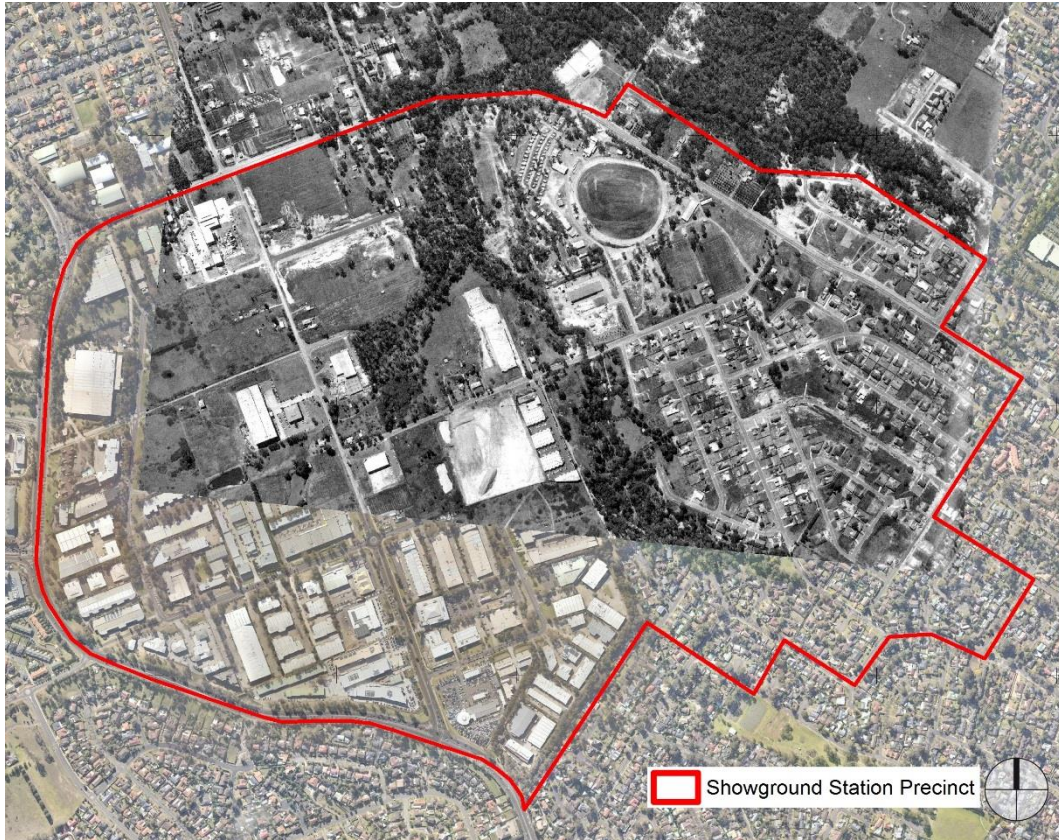


Figure 7 1978 aerial photograph (Source: DP&E, 2014)

4.3 Existing land uses and land use zones

Existing land uses within the Precinct and land use zones as prescribed by The Hills LEP 2012 are presented in Table 2. Existing land use zones within the Precinct are presented in Figure 8.

Table 2 Land uses and land use zones

Existing land use	The Hills LEP 2012 land use zone
Bulky goods, retail and commercial land uses predominantly along the Victoria Avenue corridor.	B5 Business development
Light industrial and commercial land uses concentrated along the eastern side of Windsor Road and along the western side of the Showground site and Cattai Creek.	IN2 Light industrial
Riparian vegetation along Cattai Creek and other open space areas including the Showground.	E4 Environmental living RE1 Public Recreation
The Castle Hill Showground	RE1 Public Recreation

Existing land use	The Hills LEP 2012 land use zone
Council Depot and administrative area adjacent to the southern end of the Showground.	B2 Local centre B4 Mixed use
Residential land uses on the eastern portion of the Precinct.	R1 General Residential R2 Low Density Residential
Infrastructure land uses comprising of roads, pedestrian and cycle paths and other public infrastructure.	SP Infrastructure

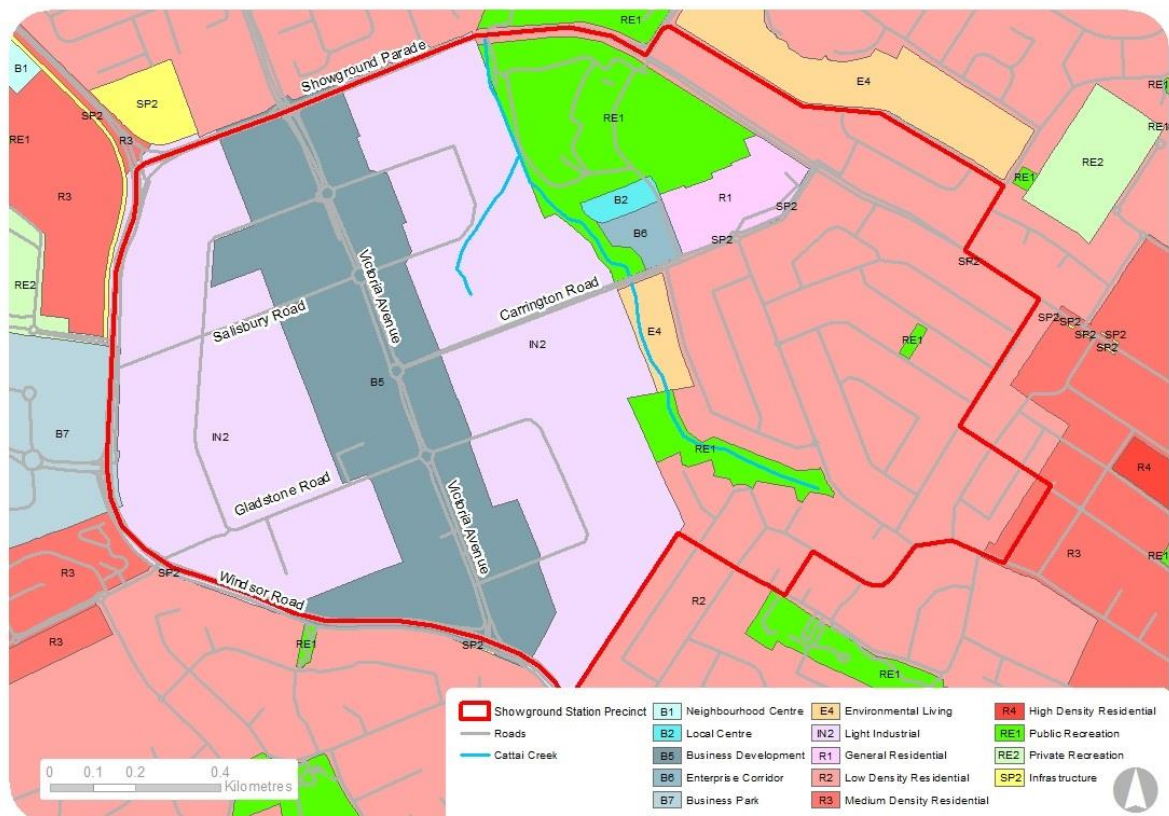


Figure 8 Existing land uses zones within the Showground Station Precinct

Surrounding land uses

The Precinct boundary is surrounded by (Figure 8):

- Low density residential land uses, the TAFE NSW (Western Sydney Institute) and the Powerhouse discovery centre to the north
- Low density residential and public open space (sport grounds and parks) land uses to the south and east

- Low and medium density residential land uses, Council offices and business park related uses to the west.

4.4 Public database searches

This section documents the results of the searches undertaken in various public databases and registers.

4.4.1 EPA contaminated land register

A search of the contaminated land record of notices maintained by the NSW Office of Environment and Heritage (EPA) was undertaken on 4 December 2014 for the following:

- Orders made under Part 3 of the *Contaminated Land Management Act 1997* (CLM Act)
- Approved voluntary management proposals under the CLM Act that have not been fully carried out and where the approval of the EPA has not been revoked
- Site audit statements provided to the EPA under section 53B of the CLM Act that relate to significantly contaminated land and where practicable, copies of anything formerly required to be part of the public record
- Actions taken by EPA under section 35 or 36 of the *Environmentally Hazardous Chemicals Act 1985*.

No records of notice were found within the Precinct.

4.4.2 POEO Act public register

A search of the register was conducted on 4 December 2014 for Environment Protection Licences, applications, notices, audits or pollution studies and reduction programs. Records relevant to the Precinct are listed in Table 3.

Table 3 POEO search results relevant to the Showground Station Precinct (Source: OEH, 2014)

No	Name	Location	Type	Status
11895	Crc Industries (Aust) Pty Limited	9 Gladstone Road	POEO licence	Issued
1050943	Crc Industries (Aust) Pty Limited	9 Gladstone Road	s.58 Licence Variation	Issued
1095155	Crc Industries (Aust) Pty Limited	9 Gladstone Road	s.58 Licence Variation	Issued
6735	Ecolab Pty Ltd	6 Hudson Avenue	POEO licence	No longer in force
1002798	Ecolab Pty Ltd	6 Hudson Avenue	s.91 Clean Up Notice	Issued
1002799	Ecolab Pty Ltd	6 Hudson Avenue	s.58 Licence Variation	Issued

No	Name	Location	Type	Status
1002832	Ecolab Pty Ltd	6 Hudson Avenue	s.91 Clean Up Notice	Issued
1027226	Ecolab Pty Ltd	6 Hudson Avenue	s.58 Licence Variation	Issued
1051833	Ecolab Pty Ltd	6 Hudson Avenue	s.58 Licence Variation	Issued
1076458	Ecolab Pty Ltd	6 Hudson Avenue	s.58 Licence Variation	Issued
5968	Hobson Engineering Co Pty Ltd	14 Victoria Ave	POEO licence	No longer in force
1044241	Hobson Engineering Co Pty Ltd	14 Victoria Ave	s.58 Licence Variation	Issued
2872	Holt Lloyd Australasia Pty Ltd	15 Hudson Ave	POEO licence	Surrendered
2847	Parker Hannifin (Australia) Pty. Limited	9 Carrington Road	POEO licence	Surrendered
1044239	Parker Hannifin (Australia) Pty. Limited	9 Carrington Road	s.58 Licence Variation	Issued
12202	Sigma-Aldrich Pty. Limited	12 Anella Avenue	POEO licence	Surrendered
1074288	Sigma-Aldrich Pty. Limited	12 Anella Avenue	s.58 Licence Variation	Issued
6701	Smc Pneumatics (Australia) Pty Ltd	18 Hudson Avenue	POEO licence	Issued
1046359	Smc Pneumatics (Australia) Pty Ltd	18 Hudson Avenue	s.58 Licence Variation	Issued
1096759	Smc Pneumatics (Australia) Pty Ltd	18 Hudson Avenue	s.58 Licence Variation	Issued
1097956	Smc Pneumatics (Australia) Pty Ltd	18 Hudson Avenue	s.58 Licence Variation	Issued
1109342	Smc Pneumatics (Australia) Pty Ltd	18 Hudson Avenue	s.58 Licence Variation	Issued
11782	Walter Schellander	40/5 Anella Avenue	POEO licence	No longer in force
1048341	Walter Schellander	40/5 Anella Avenue	s.58 Licence Variation	Issued

4.5 Soils, local geology and hydrogeology

4.5.1 Soils

The published *1:100,000 series Soil Landscape maps* indicate the Precinct is underlain by the following soil landscape categories, defined by the former Department of Land and Water Conservation:

- **Glenorie Soil Landscape.** The soils are typically shallow to moderately deep (<1.0 m) on crests, moderately deep (>1.75 m) brown podsoils (leached soil in a temperate climate) on upper slopes, deep (>2.0 m) yellow podsoils on lower slopes and humic gleyed (waterlogged) soil along drainage lines. Natural slopes are typically less than 20°. These soils are typically highly erosive and moderately reactive. Localised impermeable layers may create perched water tables.
- **Luddenham Landscape.** This landscape occurs on rolling hills on the Wianamatta Group shales. Soils are generally moderately deep (<1.5 m) red podsoils. These soils form low hills (5°-20°), have high soil erosion hazard, are highly plastic and moderately reactive.
- **Hawkesbury Landscape.** Soils in the Hawkesbury Landscape occur on slopes developed on Hawkesbury Sandstone. These soils tend to be shallow (<0.5 m) lithosols and siliceous sands. Natural slopes of up to 25° occur and soils are prone to extreme soil erosion and are highly permeable.

The soils landscape in the Precinct are presented in Figure 9.

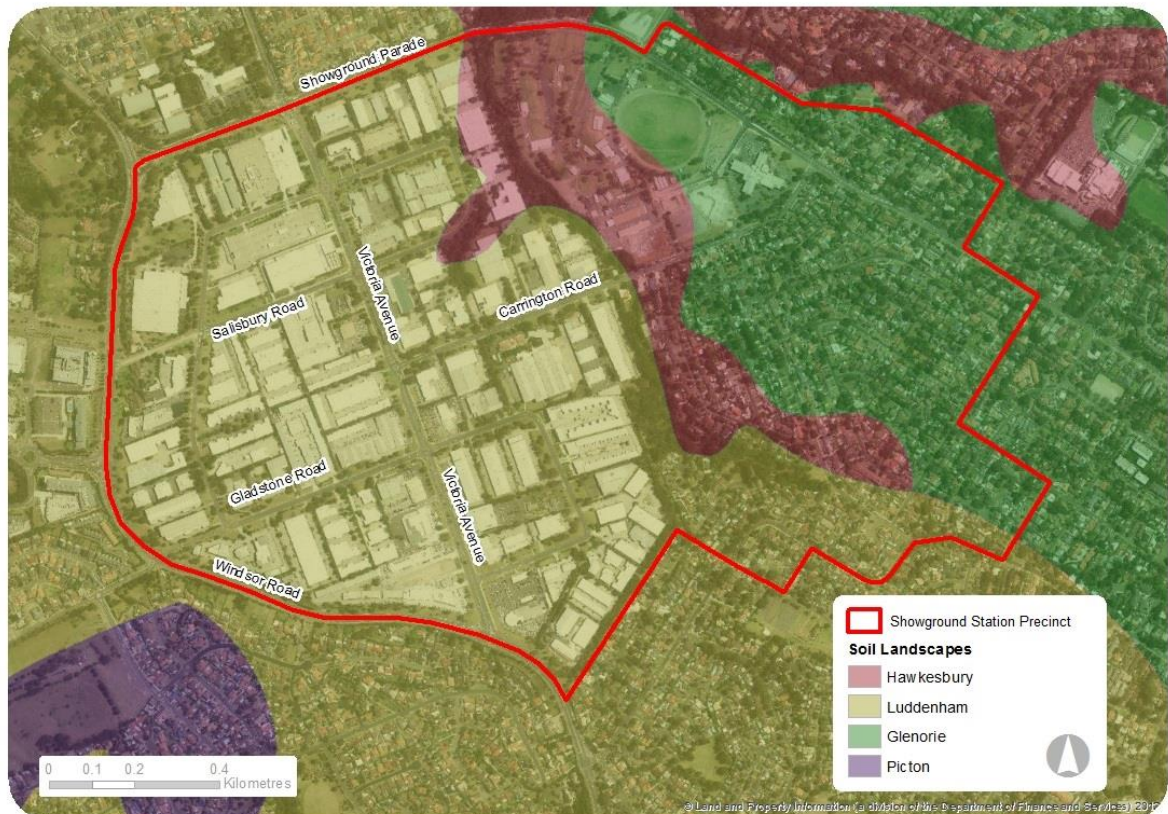


Figure 9 Soil landscapes (Source: Natural Resource Atlas, 2014 (modified))

4.5.2 Salinity

The salinity potential map prepared by the former Department of Infrastructure, Planning and Natural Resources (DIPNR, 2002), now DP&E show that no known areas of high salinity are located within the Precinct. The map indicates that the land within the Precinct is considered to have moderate salinity potential.

4.5.3 Acid sulphate soils occurrence

The Hills LEP 2012 *Acid Sulfate Soils Map* and the OEH *Acid Sulfate Soil Risk Map* show no known occurrence of acid sulphate soils within the Precinct.

4.5.4 Groundwater

The groundwater monitoring network established as part of the NWRL EIS geotechnical program found groundwater levels for early 2012 at the Showground station site varying between 134 and 137m AHD. Seasonal variations in groundwater levels will occur in response to rainfall and may also affect seepage rates. Variations of levels in the order of 10 metres within the Hawkesbury Sandstone may occur.

Groundwater quality within Hawkesbury Sandstone is typically of low to moderate salinity, with electrical conductivity generally between 500 microsiemens per centimetre ($\mu\text{S}/\text{cm}$) and $2000\mu\text{S}/\text{cm}$ and pH generally varying between 4.5 and 6.5. The sandstone tends to have naturally elevated iron concentrations.

Information from the NSW Natural Resource Atlas show one registered borehole within the Precinct (Borehole number GW107601). It is a monitoring borehole to a depth of 35.3m below ground level. No additional data was available for this borehole.

4.6 Information from Council on sites of environmental concern

Council Environmental Health Team reported that any site which contains or contained underground fuel tanks may be potentially contaminated.

Within the Precinct, the Council Environmental Health Team noted there were underground fuel storage tanks at the following locations:

- 3–3A Anella Ave, Castle Hill; and
- Council Depot site.

Council Environmental Health Team also reported there is the potential for one or some of the car sales and services sites on Victoria Ave to have underground fuel storage tanks.

5 NWRL contamination investigations

This section summarises the field work and laboratory testing undertaken as part of the NWRL project that are relevant to the Precinct. These investigations are documented in the *North West Rail Link Geotechnical Interpretive Report* (Coffey Geotechnics, 2012).

5.1 Scope of NWRL field geotechnical investigations

The contamination assessment included a combined site history study, field observations, field sampling and a laboratory testing programme of soils and groundwater.

The site history study involved reviewing available information (walkovers, review of NSW EPA register and review of available reports) to identify potential areas of environmental concern (AEC) and associated chemicals of potential concern (CoPC) which may present a constraint to the project (including construction phase). The field and laboratory testing programme involved sample collection from boreholes and test pits that were drilled/excavated for geotechnical purposes and associated laboratory testing.

Additional site history information was made available to Coffey from Council. In addition, additional site walkovers, review of land titles and review of historical aerial photographs were undertaken at selected properties. The field and laboratory testing programme was adjusted, where practicable, following availability of the above information.

5.2 Investigation findings

NWRL investigation findings relevant to the Precinct mostly focus on two sites: the Castle Hill Showground and Council Depot. Relevant findings of the investigation are summarised below.

Soils

The investigations identified potential contamination sources at the Council Depot site, including three underground storage tanks which have been used for the storage of unleaded petrol and diesel. Two of the underground storage tanks are located immediately to the west of the northerly site buildings and one underground storage tank is located immediately to the south of the southerly site building.

There is a maintenance workshop, a number of storage facilities, a nursery and a dangerous goods shed. Pesticides and herbicides were used in the nursery area.

Minor amounts of asbestos associated with council maintenance operations were identified.

The level topography of the Council Depot site suggests the site has been formed by cut and fill operations. The northeast and eastern parts of the site has been

excavated into soil and weathered rock, while the western and southern parts of the site has been filled partly as a result of Cattai Creek realignment.

Concentrations of chemicals of potential concern (CoPC) in the soil samples analysed were generally detected below the limit of reporting (LOR), typical of background concentrations, or well below the adopted criteria with the exception of nickel, PAH and asbestos.

Low nickel impacts are evident in a number of surface samples and fill samples collected from the Hills Showground (NWR-BH095) and Council Depot (NWR-BH148 and NWR-TP006 to NWR-TP009) with exceedances of the phytotoxicity based criteria and the General Solid Waste threshold, but below the health based criteria. These nickel elevations are considered likely to be attributed to imported fill, and to Council Depot activities. In addition, chrysotile asbestos fibres were reported in a fill sample NWR-TP010 located in the western part of depot and PAH impact (including benzo(a)pyrene) exceeding the health based criteria for commercial/industrial land use was detected in a fill sample NWR-BH0147 located in the western part of the depot. Both samples were located in Council Depot site.

Soil contamination test results exceeding assessment criteria are presented in Table 4.

Table 4 Soil contamination test results exceeding assessment criteria for the Showground station site (Source: Coffey Geotechnics, 2012 (modified))

Contaminants of potential concern	Lowest adopted criteria	Minimum concentration (mg/kg)	Maximum concentration (mg/kg)	Soil samples above assessment criteria	Location of soil samples with concentrations above assessment criteria
Benzo(a)pyrene	1	<0.5	5.6	NWR-BH147 4.0-4.1	Council Depot
Total PAHs	20	<1	80	NWR-BH147 4.0-4.1	Council Depot
Nickel	60	<1	170	NWR-BH095 0.0-0.1 Duplicate of NWR-BH147 0.1-0.2	Castle Hill Showground Council Depot
Asbestos	NE	ND	Chrysotile	NWR-TP010 0.08-1.0	Council Depot

Notes: Values in bold exceed assessment criteria; NE: No established guideline value; ND: Not Detected

Groundwater

Concentrations of CoPC in groundwater samples analysed as part of the NWRL investigations were generally typical of background concentrations with the exception of TPH, benzene, toluene, ethylbenzene, xylenes (BTEX) and phenol elevations in sample NWR-BH033 in the showground area, as well as TPH, BTEX and PAH in samples NWR-BH148 and R18-MW3 within the western and

south-western parts of the depot. It is considered that the TPH, BTEX and phenol impacts in NWR-BH033 are likely related to historical usage/storage of agricultural machinery at the showground pavilion. The TPH and PAH elevations in NWR-BH148 and R18-MW3 within the depot is considered likely associated with fuel storages within the depot. The Coffey Geotechnics report (2012) states detections were considered relatively mild and unlikely to be widespread as part of the NWRL project.

Groundwater contamination test results exceeding assessment criteria are presented in Table 5.

Table 5 Groundwater contamination test results exceeding assessment criteria for the Showground station site (Source: Coffey Geotechnics, 2012 (modified))

Contaminants of potential concern	Minimum concentration (ug/L)	Maximum concentration (ug/L)	Samples above assessment criteria	Location of soil samples with concentrations above assessment criteria
TPH C6-C9	<20	70	No criteria established	A concentration above the LOR was reported in BH148, located at Council Depot
TPH C10-C36	<100	10,600	No criteria established	Concentrations above LORs were reported in R18-MW3 and BH148, Council Depot
Toluene	<1	3	None	A concentration above the LOR was reported in BH033, located at Council Depot
Ethylbenzene	<1	2	None	A concentration above the LOR was reported in BH148, located at Council Depot
Total Xylene	<3	41	BH148	Council Depot
Naphthalene	<1	4	None	A concentration above the LOR was reported in BH148, located at Council Depot
Total PAHs	<1	104	None	Concentrations above LORs were reported in R18-MW3 and BH148, located in Council Depot

Contaminants of potential concern	Minimum concentration (ug/L)	Maximum concentration (ug/L)	Samples above assessment criteria	Location of soil samples with concentrations above assessment criteria
Phenol	<2	25	None	Concentrations above LORs were reported in BH033, at Castle Hill Showground

Areas of potential environmental concern

The *North West Rail Link Geotechnical Interpretive Report* (Coffey Geotechnics, 2012) identified five sites as areas of potential environmental concern. These sites are listed in Table 6 and shown in Figure 10.

Table 6 Areas of potential environmental concern identified by the NWRL Geotechnical Interpretive Report (Source: Coffey Geotechnics, 2012 (modified))

Site name	Potentially contaminating activity	Chemical of potential concern	Commentary
Castle Hill Showground (Since 1891)	Possible filling with contaminated soil	Heavy metals, TPH, BTEX, PAH, OCP, asbestos	Soil and groundwater contamination could be present due to historical miscellaneous usage since 1891.
Council Depot	Workshop with USTs and bowsers Possible incinerator usage in the past; Fill; Weathering of building materials	Heavy metals, TPH, BTEX, PAH, OCP, PCB, VOC, asbestos	Status of potential impact from USTs in unknown. Other contamination, if present, is likely to be localised and near surface.
Castle Hill trading zone on Salisbury Road	Smash repairs and other commercial and light industrial usage	TPH, PAH, BTEX, heavy metals	Contamination, if present, is likely to be in localised areas limited to the near surface soil.
Integral Energy West Castle Hill Zone Electrical Substation. Corner of Salisbury Road and Victoria Avenue	Transformer oil usage	PCB	Contamination, if present, is likely to be in localised areas limited to the near surface soil.
Hills Lodge Hotel, Castle Hill	Possible backup generator and fuel supply	TPH, BTEX, Lead	Contamination, if present, is likely to be in localised areas limited to the near surface soil.

6 Areas of interest for contamination

The desktop review identified sites within the Precinct where former or existing land uses or known environmental concerns have the potential for encountering contaminated land. These sites are shown in Figure 10 and listed in Table 7.

If any of these sites is to be rezoned to a sensitive land use (eg residential, recreation, educational, child care, etc) as part of the Precinct plan implementation, future investigations will need to be undertaken in conjunction with specific development proposals, which will confirm whether such sites can be made suitable for the proposed development.

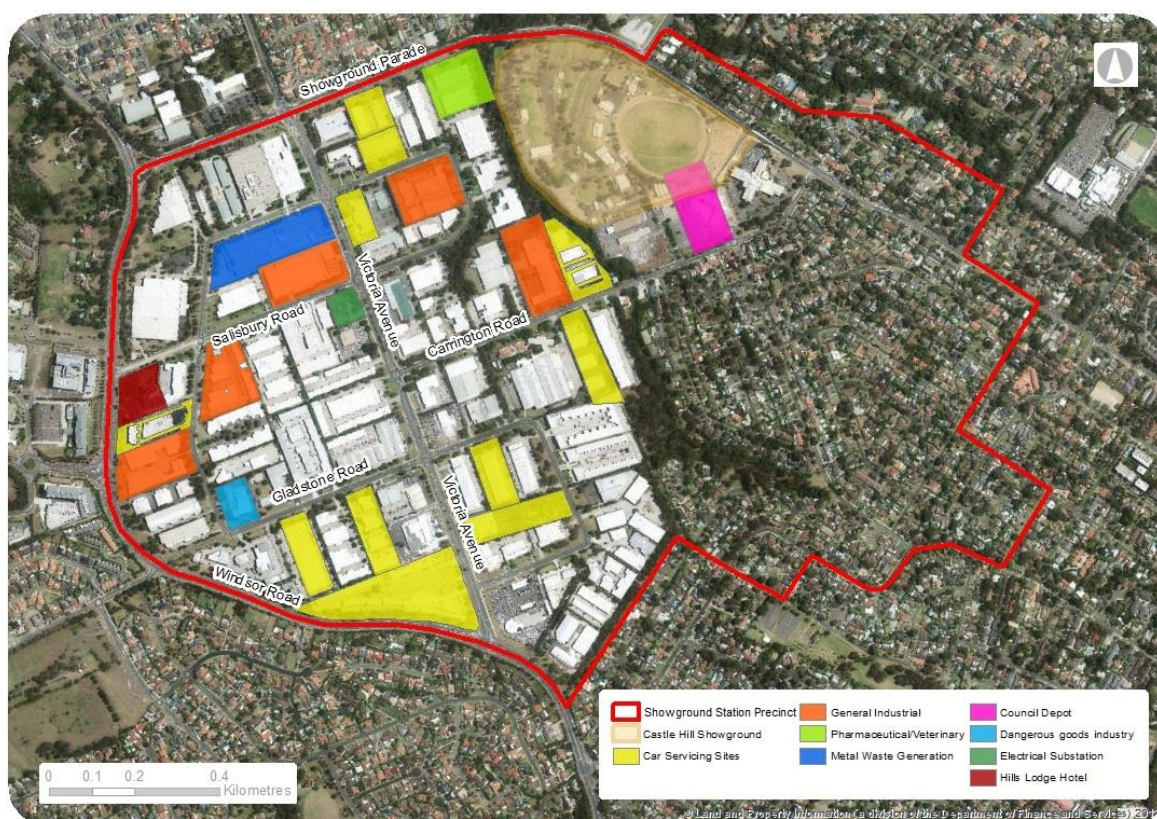


Figure 10 Areas of interest for contamination

Table 7 Areas of interest for contamination

Legal name ¹	Address	Business name	Commentary
Car servicing and repairs			
Lot 3 DP227136	3/44 Carrington Rd Castle Hill	Castle Service Centre	Contaminants of concern include Total Petroleum Hydrocarbons, Benzene, Toluene, Ethyl benzene, Xylenes.
SP19470	23/ 7 Carrington Rd, Castle Hill	ProStreet Auto	

Legal name ¹	Address	Business name	Commentary
Lot 5 DP261795	3-3a Anella Ave, Castle Hill	Unknown ¹	
SP33041	4/4 Anella Ave, Castle Hill	McLean Automotive	
SP38117	5/8 Anella Ave, Castle Hill	Marjan Automotives	
SP42317	10 Hudson Ave, Castle Hill	Automotive Professionals	
SP22797	5/2 Gladstone Rd, Castle Hill	Garry's Auto Electrical	
Lot 3 DP270096	29/8 Gladstone Rd, Castle Hill	Ron Stocks Motors	
SP54494	44/2 Hoyle Ave, Castle Hill	Mini Spares & Repairs	
Lot 15 DP1060302	D3/2A Victoria Ave, Castle Hill	A' Class Automotives	
Lot 104 DP802392	21/7 Victoria Ave, Castle Hill	Castle Hill Car Care	
Lot 5 DP261795	27 Victoria Ave, Castle Hill	UltraTune	
Council Depot ^{2, 12}			
Lot 38 DPP3520	Carrington Road, Castle Hill	Council Depot	In the NWRL EIS the Showground Station site was assessed to have nickel and Polycyclic aromatic hydrocarbons impacts and the presence of asbestos fibres. In terms of groundwater contamination, Total petroleum hydrocarbon, Polycyclic aromatic hydrocarbons and phenol impacts were identified. Such contaminates may be related to the previous operation of Council’s Depot.
Castle Hill Showground ^{2, 12}			

Legal name ¹	Address	Business name	Commentary
Lot 199 DP752020	Doran Dr, Castle Hill	Castle Hill Showground	Possible filling with contaminated soil. Contaminants of concern include heavy metals, TPH, BTEX, PAH, OCP and asbestos.
Dangerous goods industry³			
Lot 2 DP572255	9 Gladstone Road, Castle Hill	CRC Industries (Aust) Pty Limited	Contaminants of concern include oil and hydrocarbons related to the production of aerosol and bulk Lubricants, Anti-Corrosion and Chemical Maintenance products ⁴ . Business operates under POEO EPL No <u>1095155</u>
General industrial³			
SP48998	40/5 Anella Avenue, Castle Hill	Walter Schellander	Contaminants of concern include Cyanides – inorganic, Chromium compounds, Copper compounds, Nickel compounds, Selenium and selenium compounds. Waste generated at the premises is originated from bronzing/electroplating all sorts of materials ⁵ . Business operates under POEO EPL No <u>1048341</u>
Lot 1 DP796954	6 Hudson Avenue, Castle Hill	Ecolab Pty Ltd	Facility use for production and handling of detergents, germicides, water treatment products and control equipment ⁶ . Contaminants of concern include surface active agents which may contain metals and inorganic materials, acid solutions or acids in solid form, and clinical and related wastes. Business operates under POEO EPL No <u>1076458</u>
Lot 1 DP796954	14 Victoria Ave, Castle Hill	Hobson Engineering Co Pty Ltd	Contaminants of concern include waste oil/water, hydrocarbons/water mixtures or emulsions from handling of petrochemical materials to the mining, construction, oil, and manufacturing industries ⁷ . Business operates under POEO EPL No <u>1044241</u>
Lot 1 DP625453	15 Hudson Ave, Castle Hill	Holt Lloyd Australasia Pty Ltd	Business operates (or operated) under POEO EPL No <u>2872</u> which has been surrendered. Activities under the

Legal name ¹	Address	Business name	Commentary
			surrendered licence include storage and handling of paints, paint solvents, pigments, dyes, printing inks, polishes, etc ⁸
Lot B DP327274	9 Carrington Road, Castle Hill	Parker Hannifin (Australia) Pty Ltd	Contaminants of concern include waste mineral oils, waste oil/water, hydrocarbons/water mixtures or emulsions. The premises design and deliver components that are required in "Motion & Control" technology and systems ⁹ . Business operates under POEO EPL No <u>1044239</u>
Production of pharmaceutical/veterinary products³			
Lot 10 DP788658	12 Anella Avenue, Castle Hill	Sigma-Aldrich Pty. Limited	The premises undertake genomic and proteomic research, biotechnology, pharmaceutical development, the diagnosis of disease and as key components in pharmaceutical, diagnostics and high technology manufacturing ¹⁰ . Contaminants of concern include: acidic solutions, basic solutions, waste containing peroxides, organic solvents, halogenated organic solvents, waste mineral oils, PCB, PCN, PCT, PBB, phenols, cyanides, surfactants, odorous organic chemicals, waste pharmaceuticals, drugs and medicines, waste arising from R&D or teaching activities. Business operates under POEO EPL No <u>1074288</u>
Metal waste generation³			
Lot 1 DP625453	18 Hudson Avenue, Castle Hill	Smc Pneumatics (Australia) Pty	The site is used for the manufacture, processing and sales of automatic control equipment; and manufacture and sales of sintered filters and various types of filtration equipment ¹¹ . Contaminants of concern include Volatile Organic Compounds (VOCs). Although this is not relevant to soil contamination, VOCs are considered constraint in the

Legal name ¹	Address	Business name	Commentary
			context of land uses proposed adjacent or in vicinity to this site.
Electrical substation¹²			
Lot 1 DP558578	Integral Energy West Castle Hill Zone Electrical Substation	Corner of Salisbury Road and Victoria Avenue, Castle Hill	Contaminant of concern: PCB. Contamination, if present, is likely to be in localised areas limited to the near surface soil.
Accommodation¹²			
Lot 102 DP736768	Hills Lodge Hotel	1 Salisbury Rd, Castle Hill	Contaminants of concern include TPH, BTEX and Lead (Possible backup generator and fuel supply). Contamination, if present, is likely to be in localised areas limited to the near surface soil.

Sources:

1 Google & SIX Maps

2 NWRL EIS

3 POEO Public register (<http://www.epa.nsw.gov.au/licensing/licencePOEO.htm>)4 <http://www.crcindustries.com.au/>5 <http://www.ibisworld.com.au/enterprise/full/default.aspx?entid=7604>6 <http://www.hobson.com.au/>7 <http://www.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=20039&SYSUID=1&LICID=2872>8 <http://www.parker.com/>9 <http://www.sigmaaldrich.com/australia/about-us.html>10 <http://www.smcworld.com/docs/company/en/>11 <http://www.bronzingstudio.com.au/>

12 NWRL Geotechnical Interpretive Report

7 Conclusions and recommendations

Conclusions

- With the exception of the Castle Hill Show ground site which was established in 1891, the land occupied by the Precinct was largely vacant until early 1900s
- Early land uses within the Precinct were predominantly agricultural and included citrus plantations and poultry and egg production
- In the late 1970's land along the Victoria Avenue and Carrington Road corridors was set aside for industrial land uses. This land is known as the Castle Hill Trading Zone and continues to be occupied by industrial related land uses
- Areas of interest for potential contamination identified by this desktop review include:
 - Council Depot
 - Castle Hill Showground
 - Land occupied by car servicing and repairs businesses, light and dangerous goods industries, production of pharmaceutical and veterinary products, industries that generate metal waste, electrical substation and a hotel.

Recommendations

Clause 6 of the *State Environmental Planning Policy No 55 - Remediation of Land* (SEPP 55) requires consideration of contamination issues when rezoning or zoning land or changing its use through a development application process.

If there is likely to be a change in use that may increase the risk to health or the environment from contamination, the relevant planning authority must be satisfied that the land is suitable for the proposed use or can be remediated to make it suitable.

If any of the areas of interest for potential contamination identified by this desktop review is to be rezoned to a sensitive land use (eg residential, recreation, educational, child care, etc), future investigations will need to be undertaken in conjunction with specific development proposals, which will confirm whether such sites can be made suitable for the proposed development.

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