SEPP 33 - Risk Screening Document and Preliminary Hazard Analysis

Proposed Tank Replacement

7 Eleven Stores Pty Ltd
4 ENDEAVOUR AVENUE
ST CLAIR NSW

Hazkem Pty Ltd
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RISK SCREENING and PRELIMINARY HAZARD ANALYSIS
7-ELEVEN
4 Endeavour Avenue
ST CLAIR NSW

PURPOSE AND SCOPE OF THIS DOCUMENT

For dangerous goods installation designs where there is proposed storages above minor quantities, an investigation process must be followed in order to assess whether or not a proposal is suitable for a particular site or not. Such sites should be deemed "potentially hazardous" until a detailed risk assessment determines otherwise. The process flow chart is detailed in appendix 1.

NSW State Environmental Planning Policy 33[1], (SEPP 33) is a document published by the NSW Department of Planning which provides guidelines for local government and developers for ensuring that the safety and pollution impacts of an industrial proposal are addressed at an early stage of the development application process. Through this document an assessment procedure is followed which links the permissibility of a proposal to its safety performance. SEPP 33 ensures that only those industrial proposals which are suitably located, and able to demonstrate that they can be built and operated with an adequate level of safety, can proceed[2].

As detailed in SEPP 33 a ***"hazardous industry"*** is one which poses a significant risk when all locational, technical, operational and organizational safeguards are included.

A ***"potentially hazardous industry"*** is one which, when all safeguards are operating, imposes a risk level which is significantly lower.

SEPP 33 also incorporates a screening process which will determine whether or not a site is potentially hazardous. If deemed potentially hazardous, a preliminary hazard analysis is required.

Certain activities may involve handling, storing or processing a range of substances which in the absence of locational, technical or operational controls may create an off-site risk or offence to people, property or the environment. Such activities would be defined as potentially hazardous or potentially offensive. SEPP 33 also provides guidelines to assist councils and proponents to establish whether a development proposal would fit into such definitions and hence, come under the provisions of the policy.

The purpose of a PHA is to gain a better understanding of the risks and hazards associated with the site and to provide a reasonable basis for an informed judgment to be made on the acceptability of the site for the proposed development[3]. The PHA will outline in detail possible risks and hazards associated with this site. This will assist council in reaching an informed decision for the proposal.

It is important to note also that this investigation has been carried out by a suitably qualified person who understands the properties of the dangerous goods stored on site and the possible impact they may have on equipment and structures located on and off site. Under state legislation a system must be designed by a suitably qualified person who is experienced in this type of work[4].

State legislation also requires a site such as this to incorporate vapor recovery such that during discharge by a road tanker, all vapors from the storage tank that would normally be discharged to atmosphere are collected by the tanker[5].

REFERENCE AND ASSISTANCE DOCUMENTS

This document has been compiled with guidance from:

- Hazardous Industry Planning Advisory Paper No 4 ' Risk Criteria for Land Use Safety Planning'
- Hazardous Industry Planning Advisory Paper No 6. 'Guidelines for Hazard Analysis"
- Hazardous and Offensive Development Application Guideline 'Applying SEPP 33'
- NSW Dept of Planning assessment guidelines "Multi Level Risk Assessment".
- Liquefied Petroleum Gas Automotive Retail Outlet Department of Planning Hazardous Industry Location Guidelines No1

SITE DESCRIPTION

LOCATION

The site is a proposed re tank of an existing 7 eleven service station located at 4 Endeavour Avenue, St Clair, NSW. The site is on the south side of Endeavour Avenue approximately 50m East of the Endeavour Ave and Botany Lane intersection. The site abuts a shopping centres car park to the south and east with a Red Rooster located to the West.

PROPOSAL

This site is an existing service station supplying Motor Spirit, Combustible Liquids and LPG for automotive use to the general public. The site is approx. 1669 square meters in size with an existing 202 square meter sales building. It is proposed to remove all existing tanks except the LPG vessel and replace with new double wall tanks as per the list detailed below.

HAZARDOUS MATERIALS

There is a maximum, 30kl of LP Gas in bulk stored on site at any one time in an underground vessel, together with a proposed total of 150 kl of flammable liquid and 30 kl of combustible liquid in underground tanks. The site is estimated to have approximately two deliveries of LPG per week and three deliveries of other products per week. The frequency of site deliveries is well within the SEPP 33 requirements and does not add any potential issues for this site.

Note that the LPG and other liquid fuels here are existing.

SEPP 33 RISK SCREENING

FUEL STORAGE

Proposal

Product	Quantity	Tank/Compartment No.	Class and PG
ULP	60,000 litres	1	3 PG II
E10 Petrol	30,000 litres	2	3 PG II
98 Petrol	30,000 litres	3	3 PG II
95 Petrol	30,000 litres	4	3 PG II
Diesel	30,000 litres	5	C1*
LPG	16,000 litres	6	2.1

*Note: As the diesel (combustible C1) is stored on site together with the petrol (class 3), it will be considered as a flammable for the purposes of this report.

CALCULATIONS

The screening method set out in Applying SEPP 33 (Department of Planning, 2011) provides the first step in the analysis. The screening method is based on broad estimates of the possible off-site effects or consequences from hazardous materials present on site, taking into account locational characteristics.

If the quantity/distance is less than the screening threshold, then no further analysis is necessary. The safety management regime in this case relies on observance of the requirements of engineering codes and standards.

If the quantities/distances exceed the screening threshold, further analysis is necessary.

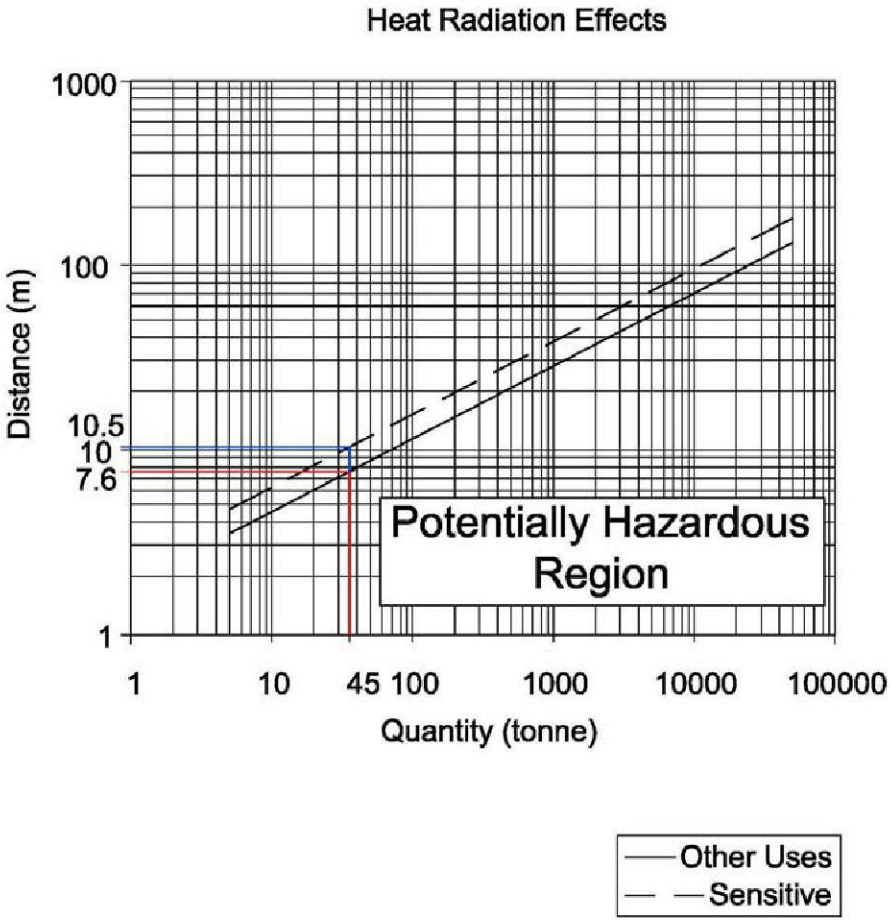
By utilising Figure 9 of SEPP 33 and measuring separation distances, it can be determined whether further analysis is required. The separation distances are measured from both the underground tank fill points and the fuel dispensers themselves.

Boundary	Min Distance – Fill Points	Min Distance - Dispensers
North	29.9	8.4
West	31.2	29.4
East	11.2	13.9
South	6.3	6.3

Total storage capacity is 180,000 litres

So for this quantity, as it is stored underground, we can divide by a factor of five, as it is considered less invasive. So allowance is for 36,000 litre storage.

FIGURE 9, SEPP 33



From Figure 9 we can see that for 36,000 litres, the minimum setback distance from the remote fill and dispensing points is 7.6 meters to site property boundaries.

Since the set back distances are less than this to the southern boundary from the fill points and the dispenser, further analysis will be required to ascertain whether the site is hazardous or not, and a PHA will be required. All other set back distances are met.

TRANSPORT SCREENING THRESHOLD

SEPP 33 screening also requires a study of the transporting/delivery frequencies, for the site. It is envisaged that deliveries to site, for fuels will be about 3 times a week, or 156 times per year. According to the "Transportation Screening Thresholds", up to 45 movements per week or 750 movements per year for fuel are acceptable prior to becoming potentially hazardous[6].

In this case, with these numbers, expected deliveries are well below the threshold.

PRELIMINARY HAZARD ANALYSIS

This preliminary hazard analysis (PHA) covers the following subsections in accordance with established procedures and HIPAP No. 6:

Hazard Identification
Possible outcomes
Estimation of likelihood of hazardous events/consequences*
Control measures

* with respect to risk ranking method detailed in Appendix 2

The following types and quantities of materials are proposed to be stored on site.

Product	Quantity	UN Number	DG Class	Packaging Group	Hazchem code
98 Petrol	30,000 litres	1203	3	II	3(Y)E
E10 Petrol	30,000 litres	1203	3	II	3(Y)E
ULP	60,000 litres	1203	3	II	3(Y)E
Diesel	30,000 litres	NA	C1	-	NA
95 Petrol	30,000 litres	1203	3	II	3(Y)E
LPG	16,000 litres	1075	2.1	-	2(Y)E

This identification process has been examined and each possible event versus possible consequences and proposed safeguards to prevent or minimise these events.

A risk assessment has also been prepared as per NSW Department of Planning "Multi Level Risk Assessment" doc January 2011.

HAZARD IDENTIFICATION

Note. The risk ranking referred to here is as per risk ranking method detailed in appendix 2.

LPG Installation

Specific risks and control measures associated with the LP Gas system:

- Customer drives off with nozzle attached.
  Risk: Yes
  Possible Outcome: Minor Leak
  Ranking: C5/C5/C5
  Control Measure: The dispenser is equipped with a breakaway coupling preventing significant damage from occurring to the dispenser and minimising the amount of product leakage from a substantial portion to a relatively minor amount. Should this situation arise staff are trained to deal with this incident and reassemble the coupling.

- Gas Leak at dispenser.
  Risk: Yes
  Possible Outcome: Leak/Fire
  Ranking: C4/C5/C5
  Control Measure: The LPG system incorporates a remote shutdown system. There are at least two actuator points located on site, one within 10meters of the dispenser and one at the console. This shutdown system will automatically close all tank valves and also valves located underneath the LPG dispenser. The system is designed to close all valves within 10 seconds.

- Gas Leak at tank
  Risk: Yes
  Possible Outcome: Leak/Fire
  Ranking: C4/C5/C5
  Control Measure: The LPG system incorporates a remote shutdown system. There are at least two actuator points located on site, one within 10meters of the dispenser and one at the console. Staff are also trained and equipped with appropriate fire protection equipment to deal with this situation.

- Gas Leak during customer fill.
  Risk: Yes
  Possible Outcome: Leak/Fire
  Ranking: C4/C4/C4
  Control Measure: LPG system incorporates a remote shutdown system. There are at least two actuator points located on site, one within 10meters of the dispenser and one at the console. Staff are also trained and equipped with appropriate fire protection equipment to deal with this situation.

- Gas Leak during bulk (tanker) fill
  Risk: Yes
  Possible Outcome: Leak/Fire
  Ranking: C4/C4/C4
  Control Measure: LPG system incorporates a remote shutdown system. There are at least two actuator points located on site, one within 10meters of the fill point and one at the console. Staff and tanker drivers are also trained to deal with this situation.

- Collision between vehicle and dispenser
  Risk: Yes
  Possible Outcome: Leak/Fire
  Ranking: C3/C4/C4
  Control Measure: The dispenser is surrounded by bollards to protect against any collision. However should the impact be extensive and the dispenser is dislodged, there is an automatic shutdown system installed to minimise the extent of any leak.

- Equipment wear and tear
  Risk: Yes
  Possible Outcome: Leak/Fire
  Ranking: C4/C4/C4
  Control Measure: Regular on site maintenance checks are undertaken to remove the chance of general wear and tear to result in a leak. Staff are trained to deal with any potential incident that may result.

- Leaking cylinder valve on vehicle
  Risk: Yes
  Possible Outcome: Leak/Fire
  Ranking: D4/D5/D5
  Control Measure: Should this situation arise staff are appropriately trained to handle the event. Two brass caps that can be used to seal the connection point are stored on site for this occurrence.

- Customer misuse of equipment
  Risk: Yes
  Possible Outcome: Leak/Fire
  Ranking: D4/D5/D5
  Control Measure: This site displays various instruction and warning signs to prevent customers misusing equipment. Customers are monitored by staff at all times.

- Vandalism of equipment
  Risk: Yes
  Possible Outcome: Leak/Fire
  Ranking: D3/D4/D4
  Control Measure: Staff carry out regular checks of equipment for vandalism and tampering. A service contract is in place which ensures prompt equipment replacement. The dispenser can be shut down if required.

- Fire on adjoining property
  Risk: Yes
  Possible Outcome: Fire
  Ranking: D3/D4/D4
  Control Measure: The LPG system has been designed with a shut down mechanism at the tank to seal all gas in the tank. Staff are trained and aware of emergency evacuation procedures and provided with adequate fire protection in the case of any minor incident. In the event of a major fire, the local fire brigade would be called.

Flammable and Combustible Liquid

The flammable and combustible system at this site has been designed with the intention of minimising all unnecessary risks associated with the storage and handling of these types of dangerous goods. It has been designed in full compliance with AS1940-2004 'The storage and handling of flammable and combustible liquids'. The tanks have been chosen to be located underground and are double walled fibreglass tanks. By installing tanks underground nearly all issues associated with storage are eliminated.

Risks and control measures associated with the Flammable and Combustible Liquid system:

- Customer over fill.
  Risk: Yes
  Possible Outcome: Spill/Fire
  Ranking: C4/C5/C5
  Control Measure: Dispensers are equipped with nozzles that incorporate a mechanism that automatically shuts down fuel flow when the level of liquid reaches the end of the nozzle. Should a spill occur, staff are adequately trained to clean up any minor spill. The site is supplied with fire protection equipment as an added precaution.

- Customer drives off with nozzle attached.
  Risk: No
  Possible Outcome: Minor Leak
  Ranking: C5/C5/C5
  Control Measure: Should this situation arise staff are trained and provided with appropriate clean up materials to deal with this incident. Minimal fuel in the hose will be lost.

- Collision between vehicle and dispenser
  Risk: Yes
  Possible Outcome: Spill/Fire
  Ranking: C4/C5/C5
  Control Measure: Protective bollards are to be installed on the approach side of the island. In the event that damage does occur to the dispenser, minimal fuel loss would occur as the units contain small fuel amounts. Staff have been adequately trained to deal with this situation as well as provided with adequate clean up materials and fire protection/fighting equipment.

- Delivery overfill
  Risk: Yes
  Possible Outcome: Spill/Fire
  Ranking: C4/C5/C5
  Control Measure: Drivers are trained to ensure that there is enough ullage in a tank prior to delivery, and also stay in attendance at the fill area during delivery. Spill kits are on site.

- Use of mobile phone/transmitting devices
  Risk: Yes
  Possible Outcome: Spill/Fire
  Ranking: D3/D4/D4
  Control Measure: Appropriate warning signs are installed at all dispensers. Customers are monitored by appropriately trained staff at all times.

- Spill of product onto customer
  Risk: Yes
  Possible Outcome: Spill/Fire
  Ranking: D3/D4/D4
  Control Measure: Appropriate safe use instructions are installed at all dispenser however should this incident occur staff are trained and supplied with First Aid equipment for a minor situation and are able to contact emergency services for serious incidents.

- Equipment wear and tear
  Risk: Yes
  Possible Outcome: Spill/Fire
  Ranking: C4/C4/C4
  Control Measure: Regular on site maintenance checks are undertaken to remove the chance of general wear and tear which may result in a leak. Staff are trained to deal with any potential incident that may result.

- Customer misuse of equipment
  Risk: Yes
  Possible Outcome: Leak/Fire
  Ranking: D4/D5/D5
  Control Measure: This site displays various instruction and warning signs to prevent customers misusing equipment. Customers are monitored by staff at all times.

- Vandalism of equipment
  Risk: Yes
  Possible Outcome: Leak/Fire
  Ranking: D3/D4/D4
  Control Measure: Staff carry out regular checks of equipment for vandalism and tampering. A service contract is in place which ensures prompt equipment replacement. The dispenser can be shut down if required.

- Fire on adjoining property
  Risk: Yes
  Possible Outcome: Fire
  Ranking: D3/D4/D4
  Control Measure: The entire fuel system can be shut down in the event of a fire. Staff are trained and aware of emergency evacuation procedures and are provided with adequate fire protection in the case of a minor incident. Storage tanks underground protect any product from fire.

CONCLUSIONS

As with any Preliminary Hazard Analysis, the main aims are:

1. Identify all potential hazards and accidental events that may lead to an accident
2. Rank the identified accidental events according to their severity
3. Identify required hazard controls and follow-up actions

In this case, there is nothing that leads to any conclusion other than the fact that this design is acceptable for this site.

MULTI-LEVEL RISK ASSESSMENT APPROACH

This section highlights the key features of the multi-level risk assessment framework. There are three levels of assessment, depending on the outcome of preliminary analysis, which in this case

level 1 - qualitative analysis, primarily based on the hazard identification techniques

level 2 - partially quantitative analysis, using hazard identification and the focused quantification of key potential off-site risk contributors

level 3 - quantitative risk analysis (QRA), based on the full and detailed quantification of risks, consistent with *HIPAP No. 6 -Hazard Analysis*.

The method nominated below is based on the ***Manual for the classification and prioritisation of risks due to major accidents in the process and related industries*** (IAEA, rev. ed. 1996). This method is risk-based and relies on broad estimations of consequences and likelihood of accidents. The outputs may be expressed in terms of individual and societal fatality risk which can be compared against criteria for determining the appropriate level of further assessment.

FLAMMABLE LIQUID STORAGE

Calculations

Classification of Substances by Effect Categories

From IAEA Table II(a) we get Ref No. 6 and Category BII.

Maximum Distance and Area of Effect

From IAEA table III, we get the following:

Maximum distance = 25-50 meters
Area A for Effect Area Category II = 0.4 Ha

Population distribution

The total number of people in the above region at any one time. From IAEA Table IV, population density this area is 40 persons being a residential area.

Total Population density: d = 40 persons/ha.

Total Population density: d = 40 persons /ha.

Population correction factor

The population correction factor is to determine what percentage of the area within a 50 m radius from the site is populated.
Therefore: Total Area = $\pi \times r^2 = \pi \times 50^2 = 7857\ m^2$

Site Area = 1669 M^2 Population correction factor, f_A from IAEA table V = 1 (50%)

Mitigation Correction Factor

From IAEA Table VI, Correction factor for mitigation, fm = 1

Estimation of External Consequences

$Ca,s = A \times d \times f_A \times f_m$ = 0.4Ha x 40(persons per Ha) x 1 x 1 = **16** fatalities per accident

Estimation of Probability of Major Accidents

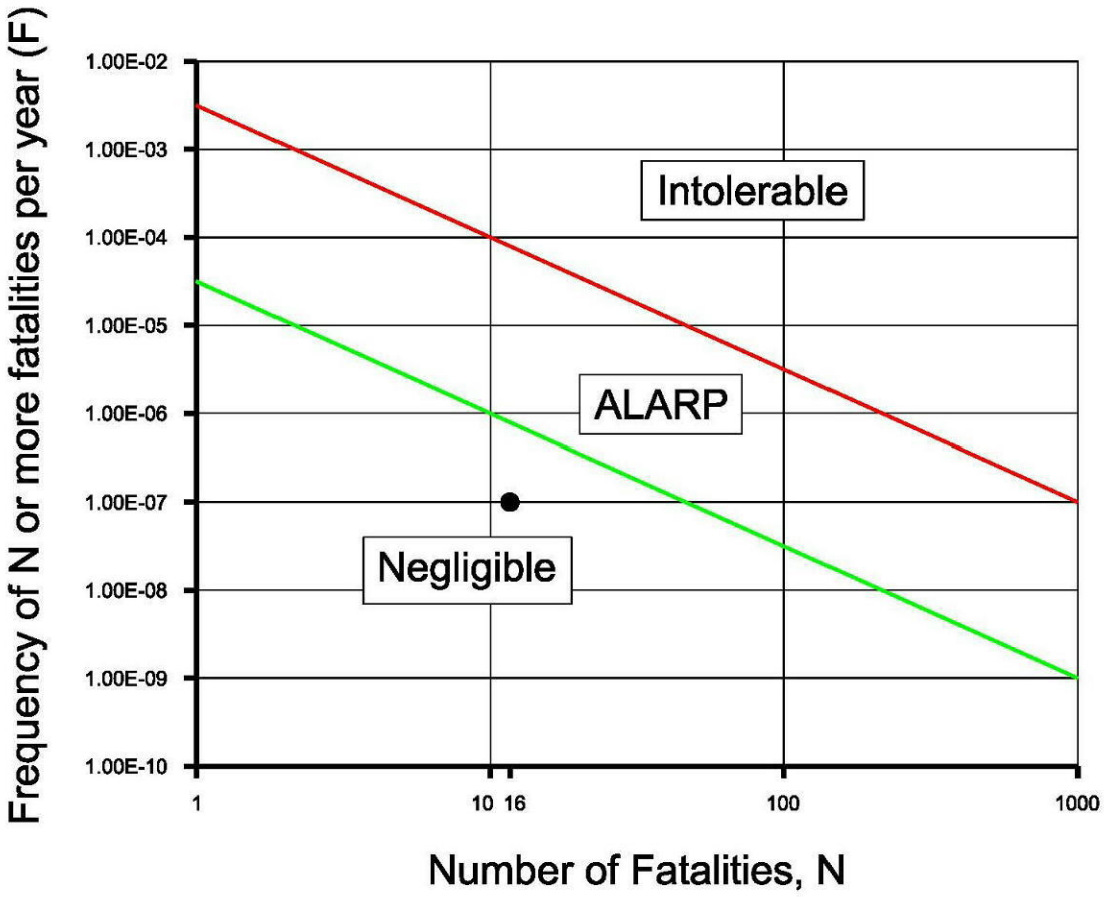
The probability number is given by the formula: $Ni,s = N^*i,s + n_l + n_f + n_o + n_p$

Where average probability number $N^*i,s = 7$ for Ref No. 6
Correction factor for:
Loading, n_l = -1 (for 3 deliveries per week)
Flammables n_f = 0 (not a flammable gas)
Organisational safety no = 0
Wind direction n_p = 0.5

Therefore probability number = 7 -1 + 0 + 0 + 0.5 = 6.5

And converting probability numbers into frequency of events per year (IAEA Table XII)
$P = 1 \times 10^{-7}$

Level of risk



By intersecting the frequency (P = 1 x 10^{-7}) with the consequences (**16** fatalities per accident) in the graph above, we can see that the risk to society from the proposed development falls within the negligible area below the green line.

All possible measures should still be taken to ensure that the level of risk is kept as low as possible.

Conclusion

Plotting the frequency against consequence, it can be clearly seen that the societal risk is negligible. Therefore, only a level one qualitative Risk Analysis is required. This analysis is referred to in Applying SEPP 33 as a Preliminary Hazard Analysis (PHA), which has been included as detailed elsewhere in this document. All equipment must be installed to manufacturer's recommendations and must comply with all the relevant standards listed within. Specific safety features of the site have been included in the PHA, including all monitoring procedures.

LPG STORAGE

General Application of Guidelines and Regulation

In NSW, LPG storage is controlled by state legislation via the "Work Health and Safety Regulations 2011". The code of practice attached to these regulations reference AS/NZS 1596 "The storage and handling of LP Gas". The "Liquefied Petroleum Gas Automotive Retail Outlet Department of Planning Hazardous Industry Location

Guidelines No1" (Locational Guidelines) details provisions for the use of control zones surrounding the LPG equipment and the service station. Two types of zones are used – exclusion zones and population limit zones.

Exclusion zones are circular areas around nominated LPG equipment, Controls apply to the activities which are permitted within these zones.
Population limit zones are circular areas around the service station. An upper limit is placed on the number of people within these zones.
The guidelines also detail technical controls on the LPG installation which are complementary to those applied to AS/NZS 1596.

The current print of AS/NZS1596:2014 includes similar land use separations requirements. As the current edition of AS/NZS 1596:2014 includes provision for a submersible LPG pumping system, which was not available when the locational guidelines were printed in 1993, we are showing compliance with Table 10.1 of AS/NZS 1596:2014 which differs slightly from Table 1 of the guidelines.

The following zones are applicable to this site: -

- A sensitive use exclusion zone of 55 metres centred on the fill point and tanker standing area
- A sensitive use exclusion zone of 15 metres centred on the LPG dispenser
- A residential exclusion zone of 15 metres on the LPG dispenser, fill point and tanker standing area
- A commercial and recreational exclusion zone of 15 metres from the centre of the dispenser
- A commercial and recreational exclusion zone of 10 metres from the centre of the fill point and tanker standing area.

Note. As the LPG vessel is located underground and contains an "in tank" pump with no exposed pipework, separation distances from the tank itself do not apply.

Exclusion Zones

There are three types of exclusion zones.

- **A sensitive uses exclusion zone.** Schools, hospitals, aged persons accommodation and other uses where vulnerable people are concentrated, should not be permitted in this zone.
- **A residential exclusion zone.** No dwellings or places of regular occupancy on residential properties or sensitive uses are permitted within this zone.
- **A recreational /commercial uses exclusion zone.** No recreational uses, commercial developments or places of regular occupancy on commercial properties, residential or sensitive uses are permitted within the zone.

Population Limit Zones

These zones specify an equivalent population which should not be exceeded within the circle of the specified radius. The population figure is based on societal risk considerations. The calculation of equivalent population (see section 1.2.5) takes account of the presence of people, and their vulnerability, in various facilities.

Calculation of the equivalent population

To calculate the equivalent population within the population limit zone and to make allowances for permanent and transient occupancy, the following factors are to be used.

For dwellings = 1 times the number of residents
For shops, offices and factories operating for normal hours = 0.3 times the average number of occupants
For restaurants, taverns, bars etc = 0.3 times the peak usage. (In the case of relatively infrequently used premises this could be reduced to 0.2)
For active open spaces, sports centres, entertainment centres and the like = 0.2 times the peak usage.
For 24 hour shops, factories on 3 shifts and the like = 1 times the average occupancy

For this site, the following chart totals the population count for the areas applicable. Note that figures for the site itself are not assessed as part of the population count.

No	Land Use	Average No of People	% of Use	Factor	Total
This table references Drawing No – HAZ-1901-G02 Rev 0 Hazkem Pty Ltd					
A	St Clair Shopping Centre	200	25	0.3	15
B	Sporting Grounds	50	5	0.3	0.75
				TOTAL	**15.75**

As per AS/NZS 1596-2014 Clause 10.7.3, a maximum of 110 person's occupancy is allowed within 55 meters of both the pump casing and the fill point.

Equivalent population of **15.75** < 110, therefore OK.

These figures are based on a conservative estimate of the population count for the area. Figures could vary in the future and this should be reviewed on a regular basis.

LPG technical controls

The hazard analysis for these guidelines (Appendix 1) is based on facilities which comply with AS/NZS 1596, as well as a number of technical controls as detailed in the "Locational Guidelines". Listed below is the method of complying with each of the technical controls detailed in these guidelines.

Dispenser Location

To minimise the possibility of an LPG leak and subsequent fire at the dispenser contributing to an incident at the storage tank, the 15 metre exclusion zone for the dispenser should not encroach on an above ground storage tank as required by AS/NZS 1596-2014 Clause 10.5.6.
As this design is for an underground tank, this requirement is not applicable.
There are no places of regular occupancy on any commercial development that is within 15 meters of any LPG dispenser.

Unloading Position for LPG Tanker

While unloading, the LPG tanker should be positioned so that it is not vulnerable to accidental damage from vehicles entering or leaving the service station or to impact from vehicles accidentally leaving the roadway.
The LPG tanker unloading position is ideal in this instance. The in ground fill point is immediately adjacent to the tanker standing area, behind the curb line, such that other vehicles entering the site will not drive over the hose.
The LPG tanker position on the site is well into the site and each ingress/egress has substantial clearance for entry/exit.

Tanker Access and Egress

Road tankers should have ready access to the site and in this case they do. Tankers should be able to access and service the site without reversing. In an emergency, it is essential that the road tanker is able to immediately leave the unloading position and exit the site by driving forward. Parking or vehicle standing should be prohibited in areas where it would impede tanker egress.
Tanker access on this site is via the ingress and egress to Bestic Street. Both access and egress are easily achieved by 19 metre articulated tankers.

Impact Protection

The LPG vessel is not vulnerable to impact as it is installed completely below ground.
The LPG dispensers will be protected from impact by bollards

Safety Management System

A comprehensive Safety Management System (SMS) will be put in place prior to operation of the system. This SMS will need to be developed between the site occupier and the LPG supplier, utilising emergency response procedures already in place.

Drain Valve

The drain valve on this installation is located within the LPG access pit. It is plugged and maintenance personnel only have access to this valve, utilising specialist tools via the access pit cover.

Remote Shut Down System

There is a remote shutdown system utilising an electrical/pneumatic design which shuts down the system with a response time of less than 10 seconds. There will be an actuation point adjacent to the LPG dispenser, on the front of sales building and at the console. Another point will be located at the fill point accessible by the delivery driver whilst delivering only.
Each actuation point will be prominently marked and readily accessible. The system will be tested regularly as detailed in the Safety Management System.

Brake Interlocks

Only tankers fitted with brake interlocks will deliver to site. Most, if not all LPG tankers are fitted with these interlocks these days.

Fill Point

The fill point is fitted with a positive manual shut off valve together with a back check valve.

Tanker Parking

Tankers will not be parked on site for extended periods. They will be on site whilst unloading only.

Delivery Frequency

It is not anticipated for deliveries to exceed 2-3 per week or .43 deliveries per day.

Whilst the technical controls also refer to tank connections, as this in an underground installation this technical control is not applicable. Reference is also made to the preference for not having pump pits. When these guidelines were first written this was the case due to lack of ventilation etc. Current engineering practice is to install these pump pits with submersible pumps but with ventilation provisions.

CONCLUSION

Flammable Liquid

Plotting the frequency against consequence, it can be clearly seen that the societal risk is negligible. Therefore, only a level one qualitative Risk Analysis is required.
This analysis is referred to in Applying SEPP 33 as a Preliminary Hazard Analysis (PHA), which has been included elsewhere in this report.
All equipment must be installed to manufacturer's recommendations and must comply with all the relevant standards listed within.
Specific safety features of the site have been included in the PHA, including all monitoring procedures.

LP Gas

The LPG design for this site takes into account the fact that this site is located in a combined residential and commercial area. Documentation here shows compliance with the relevant guidelines. The equipment on site has an acceptable risk provided all relevant design factors as detailed here and in the relevant standard are implemented.

DOCUMENT REFERENCES

1 State Environmental Planning Policy 33, Hazardous & Offensive Development Application Guidelines. – Department of Planning NSW, January 2011.
2 State Environmental Planning Policy 33, Hazardous & Offensive Development Application Guidelines. – Department of Planning NSW. Page 1, 1.2 the policy, last para
3 State Environmental Planning Policy 33, Hazardous & Offensive Development Application Guidelines. – Department of Planning NSW. Page 9, 4.2
4 Protection of the Environment Operations(Underground Petroleum Storage Systems) regulation 2008 division 1, clause 5 and 6
5 Protection of the Environment Operations(Clean Air) Amendment (Vapour Recovery) regulation 2008
6 State Environmental Planning Policy 33, Hazardous & Offensive Development Application Guidelines. – Department of Planning NSW. Page 18, table 2

OTHER REFERENCES

Australian Standards:

AS1940 -2004	"The Storage & Handling of Flammable & Combustible Liquids"
AS/NZS 1596-2014	"Storage and Handling of LPG Gas"
AS 4897-2008	"The Design, Installation and Operation of Underground Petroleum Storage Tanks"
AS 3000-2000	"Electrical Wiring Rules".
AS/NZS 60079.10.1:2009	"Classification of Areas. Explosive gas atmospheres". Annex ZA "Examples of Hazardous Area Classification".
AS 2832.2-2003	"Cathodic Protection of Metals – Compact buried structures".
AS 2239 – 2003	"Galvanic (sacrificial) Anodes for Cathodic Protection".
AS/NZS 3788:2006	"Pressure Equipment – In-service inspection".
AS 4037 – 1999	"Pressure Equipment – Examination & testing".
AS/NZS 1841.5:2007	"Portable Fire Extinguishers".
AS 2444 – 2001	"Portable Fire Extinguishers and Fire Blankets". Select. & location.
AS 1692 – 2006	"Tanks for Flammable and Combustible liquids".

Codes of Practices:

Australian Code for the Transportation of Dangerous Goods by Road and Rail, Seventh edition.
NSW Code of Practice 2005 for Storage & Handling of Dangerous Goods.
NSW Work Health and Safety Act and Regs 2011.

Planning NSW Guidelines:

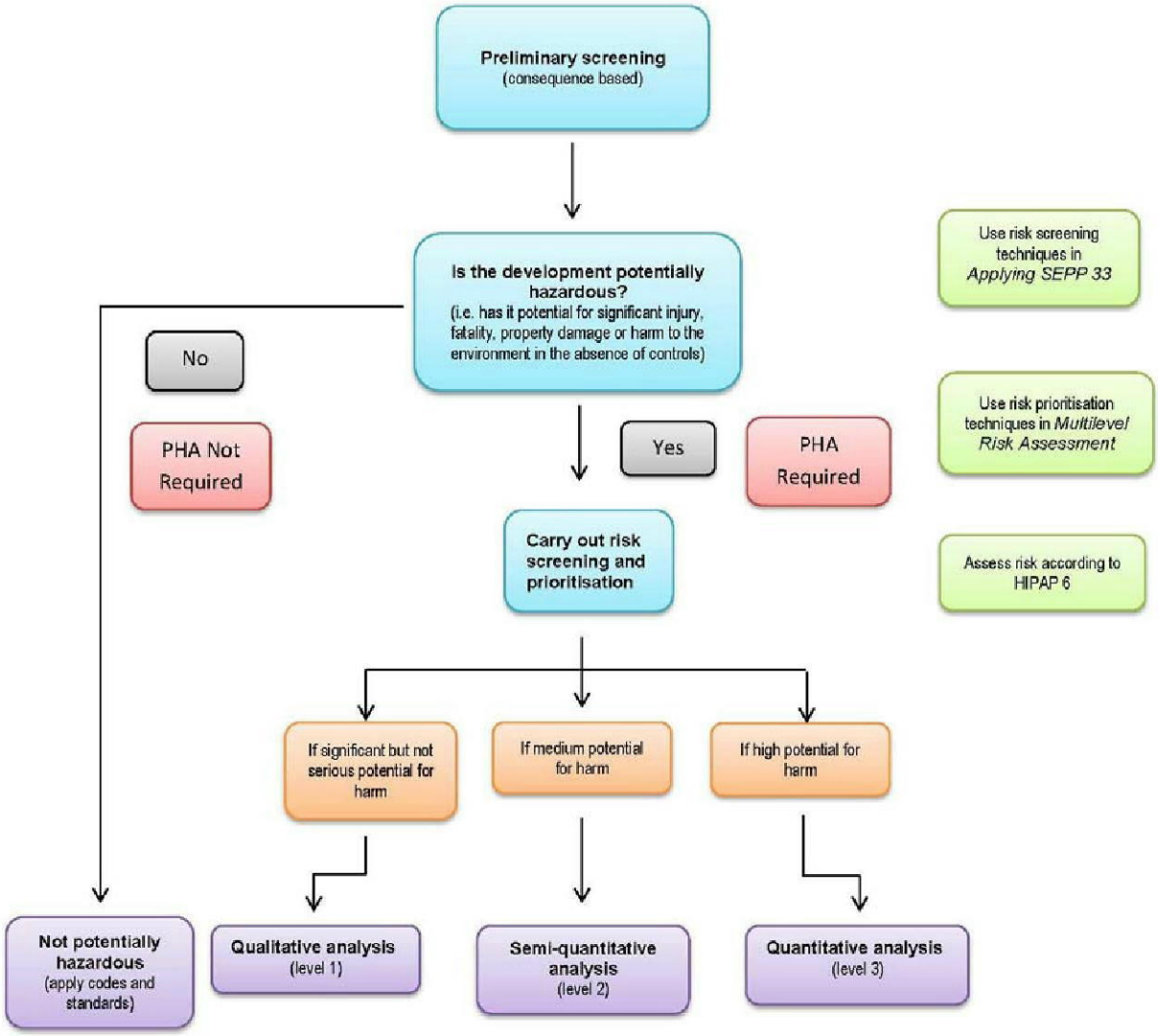
Hazardous and Offensive Development Application Guidelines - Applying SEPP 33.
Hazardous and Offensive Development Application Guidelines - Multi-Level risk Assessment.
Hazardous Industry Planning Advisory Paper No. 4 - Risk Criteria for Land Use Safety Planning
Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis
Hazardous Industry Planning Advisory Paper No. 8 - Hazard and Operability Studies
Hazardous Industry Locational Guidelines No. 1 Liquefied Petroleum Gas, Automotive Retail Outlets.

Other Documentation:

Local Authorities requirements, NSW WorkCover and EPA Acts and Regulations.
Equipment Suppliers Specifications, Requirements and Instructions.
Fuel System Specifications and Drawings.
Site Specific drawings and suppliers specifications.

APPENDIX 1

MULTI LEVEL RISK ASSESSMENT FLOW CHART



APPENDIX 2

RISK RANK METHOD

RISK RANKING METHOD

Risk is the combination of the likelihood of a specific unwanted event and the potential consequences if it should occur.

Probabilities

A - common or repeating occurrence
B - known to occur, or "it has happened"
C - could occur, or "I've heard of it happening"
D - not likely to occur
E - practically impossible

Consequences

People
1 - fatality or permanent disability
2 - serious lost time injury or illness
3 - moderate lost time injury or illness
4 - minor lost time injury or illness
5 - no lost time

Equipment, assets or environment
1 - more than $500K damage
2 - $100K to $500K damage
3 - $50K to $100K damage
4 - $5k to $50K damage
5 - less than $5K damage

Production
1 - more than $500K production delay
2 - $100K to $500K delay
3 - $50K to $100K delay
4 - $5k to $ 50K delay
5 - less than $5K delay

Risk Ranking Method (above)
For each event, the appropriate probability (a letter A to E) and consequence (a number 1 to 5) is selected. If an event affects more than one area of consequence (eg. Affects people and production), the highest rank number, i.e.1, is always selected.

Risk Ranking Table (below)
The consequences (loss outcomes) are combined with the probability (of those outcomes) in the risk ranking table to identify the risk rank of each loss event (eg a consequence 3 with a probability B yields a risk rank 9).
The table yields a risk rank from 1 to 25 for each set of probabilities and consequences.
A rank of 1 is the highest magnitude of risk, i.e. a highly likely, very serious event.
A rank of 25 represents the lowest magnitude of risk, an almost impossible, very low consequence event.
Events represented on the risk ranking table by ranks between 16 and 25 inclusive are considered acceptable risks.

RISK RANKING TABLE

PROBABILITY / CONSEQUENCE	A	B	C	D	E
1	1	2	4	7	11
2	3	5	8	12	16
3	6	9	13	17	20
4	10	14	18	21	23
5	15	19	22	24	25

Hazard Analysis

Project: 7 Eleven at 4 Endeavour Ave, St Clair
Description/Activity: Service Station

Assessment Ref No: 7E54
Date: 24/11/2014

Likelihood (L)		Consequences (C)	
Rare	5	Insignificant	5
Unlikely	4	Minor	4
Moderate	3	Moderate	3
Likely	2	Major	2
Almost Certain	1	Extreme	1

Overall Risk Rating (L) x (C)

Score	Response Required
1 to 6	Immediate Action Required
7 to 14	Review Action Required ASAP
15 to 25	Acceptable risk - no need for action

Certification against AS1940 for Flammable and Combustible Liquids Storage

Sheet 1 of 4

No.	Hazard		(L) 1-->5	(C) 1-->5	(L)x(C)	Action Required (Y/N)
1	Overfill of tank	The flammable and combustible liquids tanks are located underground and are remote filled with a remote contents gauges are located at the fill points. A spill kit and fire fighting equipment are within close proximity to the delivery driver whilst filling the tanks.	4	4	16	N
2	Hose trip hazard	The tanker parking area is adjacent to the fill points in a nominated tanker parking area. The hose used is a small diameter pressure hose and is generally able to lie flat on the ground. The tanker driver uses warning signage during deliveries.	5	4	20	N
3	Fire at fill point	All delivery tankers carry at least a single powder type extinguisher which is available near the fill points during product delivery. As a Service Station site additional fire protection equipment is available within a close proximity. The fill points are fitted with back check valves as well as manual valves to stop any outward flow. The tanker is fitted with an emergency stop system in order to cease pumping quickly.	5	3	15	N
4	Fire on site	As a service station storing and dispensing flammable and combustible liquids fire protection in the form of fire extinguishers are located on site in strategic places in full compliance with AS 1940. An emergency shut down system installed onsite to enable the dispensing system to be shut down in an emergency.	5	3	15	N
5	Leak in pipework	All pipework is located underground and are protected from impact. Regular pressure tests are performed to ensure tightness. Stock reconciliation is carried out weekly and would highlight any leaks immediately.	5	4	20	N
6	Ruptured fill hose	Extremely unlikely event. The tank hoses are pressure tested and/or replaced regularly. The tanker is fitted with an emergency stop system. The tank standing area is specifically set up for containment of spills.	4	4	16	N
7	Equipment wear and tear	Regular maintenance checks are carried out on the tank and its equipment to maintain that everything is in a safe and working condition. This occurs at least annually. Delivery drivers report anything that requires rectification.	4	4	16	N
8	Vandalism of equipment	The tank is installed underground. All valves and fittings located in a underground turret which is secured from tampering.	4	4	16	N
9	Fire on adjoining property	Should a fire on an adjoining property impact the site the dispensing system will be shut down ensuring the all product remains in the underground tanks.	5	3	15	N

10	Customer overfill during dispensing	The dispensers installed at this site are equipped with a sensing device that's shuts down the flow of product when it reaches the lip of the nozzle. Clean up materials are located within close proximity of the dispensing area.	4	4	16	N
11	Customer drives off with nozzle inserted	Clean up materials are located within close proximity to the dispensing area.	5	5	25	N
12	Collision between vehicle and dispenser	All dispensers on this site are protected from vehicular impact by with the assistance of bollards.	4	4	16	N
13	Use of mobile phone/transmitting devices	The site is fitted with warning signs advising customers of the risk of mobile phone and transmitting devices. The console is fitted with a public address system should the console operator be required to advise customers of the use of this type of equipment on a service station site.	5	4	20	N
14	Spill of product onto customer	The console operator has been trained in how to administer first aid should a customer be injured by coming into contact with any flammable or dangerous goods on this site.	4	4	16	N
15	Customer misuse of equipment	The site is fitted with instructions indicating procedures for safe use of the dispensing equipment. The console operator is in clear view of all dispensers on site and capable of shutting down any dispenser system that is not being used in a safe manner. The console operator also has access to a public address system should they need to verbally communicate with customers on the forecourt.	5	4	20	N
	Certification against AS/NZS1596 for Flammable Gas Storage					
No.	Hazard		(L) 1-->5	(C) 1-->5	(L)x(C)	Action Required (Y/N)
1	Overfill of tank	Tank installation is located outdoors in a well ventilated area. The tank is remote fill with the fixed liquid level gauge readily accessible at the fill point. The contents gauge is visible by inspection through two access covers over the tank. Fire fighting equipment is within close proximity to the delivery driver whilst filling the tank.	4	4	16	N
2	Hose trip hazard	As a remote filled tank, the tanker will park adjacent to the fill point in a nominated tanker parking area. The hose used is a small diameter pressure hose and is generally able to lie flat on the ground. The tanker driver uses warning signage during deliveries.	5	4	20	N
3	Fire at fill point	At least a single powder type extinguisher is available near the fill points during product delivery (normally carried by the tanker). The fill point is fitted with a manual shutoff valve and a back check fill valve to stop any outward flow. The tanker is fitted with an emergency stop system in	5	3	15	N
4	Fire on site	As a service station storing and dispensing flammable gas fire protection in the form of a minimum of fire extinguishers are located on site in strategic places in full compliance with AS/NZS 1596. An emergency shut down system is installed on site to enable the LP Gas installation and dispensing system to be shut down in an emergency.	5	3	15	N
5	Leak/rupture in pipework	All pipework is located underground and are protected from impact. Regular pressure tests are performed to ensure tightness. Stock reconciliation is carried out weekly and would highlight any leaks immediately. The pipework run through the site is a continuous copper or polypropylene line.	5	4	20	N
6	Ruptured fill hose	Extremely unlikely event. The tank hoses are pressure tested and/or replaced regularly. The tanker is fitted with an emergency stop system.	4	4	16	N
7	Equipment wear and tear	Regular maintenance checks are carried out on the tank and its equipment to maintain that everything is in a safe and working condition. This occurs at least annually. Delivery drivers report anything that requires rectification.	4	4	16	N

8	Vandalism of equipment	As an underground installation all fitting are located within the tank pit and is secured from unauthorised access and tampering. Regular maintenance checks are carried out on all equipment.	4	4	16	N
9	Fire on adjoining property	Should a fire on an adjoining property impact the site the dispensing system will be shut down ensuring the all product remain in the tanks.	5	3	15	N
10	Customer overfill during dispensing	The site is fitted with Style A type dispenser in compliance with AS/NZS 1596 which automatically shuts off when the tank reaches capacity.	4	4	16	N
11	Customer drives off with nozzle inserted	The dispenser is fitted with a break-away coupling which will detach and prevent any significant damage to the dispenser.	5	5	25	N
12	Collision between vehicle and dispenser	All dispensers on this site are protected from vehicular impact by with the assistance of bollards.	4	4	16	N
13	Use of mobile phone/transmitting devices	The site is fitted with warning signs advising customers of the risk of mobile phone and transmitting devices. The console is fitted with a public address system should the console operator be required to advise customers of the use of this type of equipment on a service station site.	5	4	20	N
14	Spill of product onto customer	The console operator has been trained in how to administer first aid should a customer be injured by coming into contact with any flammable gas on this site.	4	4	16	N
15	Customer misuse of equipment	The site is fitted with instructions indicating procedures for safe use of the dispensing equipment. The console operator is in clear view of all dispensers on site and capable of shutting down any dispenser system that is not being used in a safe manner. The console operator also has access to a public address system should they need to verbally communicate with customers on the forecourt.	5	4	20	N
16	Leaking valve	Experience shows that this is a rare occurrence. Any leaking valve can be shut down manually.	5	4	20	N

Hazard Analysis Summary

Project/Site: 7 Eleven at 4 Endeavour Ave, St Clair
Description/Activity: Service Station

Assessment Ref No: 7E54
Date: 24/11/2014
Last Updated:

Note. This section of the hazard analysis is for the design of the installation only and does not take into account any site issues regarding alternative locations.

CONTROL MEASURES		IMPLEMENTATION		MONITOR & REVIEW	
Item Ref	Possible Control Measures	Responsibility and Action Required	Control Implemented Sign-off & Date	Planned Review Date	Review Sign-off & Date
	NA	NA			

CONCLUSION/COMMENTS:

POST IMPLEMENTATION CHECKLIST REVIEW:

APPENDIX 4

PROPOSED SITE DRAWINGS

HAZ-1905-A01 Rev 0 "Existing Conditions Plan"
HAZ-1905-G01 Rev 1 "LPG System Layout"
HAZ-1905-G02 Rev 1 "Population and Exclusion Zones"
HAZ-1905-T01 Rev 1 "Fuel System Layout"

7-Eleven Stores Pty Ltd

Remediation Action Plan for UPSS Replacement 7-Eleven St Clair Service Station (Site ID:2277) 4 Endeavour Avenue, St Clair, NSW

17 November 2014

PARSONS BRINCKERHOFF

Document information
Client: 7-Eleven Stores Pty Ltd Title: Remediation Action Plan for UPSS Replacement 7-Eleven St Clair Service Station (Site ID:2277) 4 Endeavour Avenue, St Clair, NSW Document No: 2201541B-CLM-RPT-1637 Date: 17 November 2014

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Reviewed by:	Andrew Hill	Date: 17/11/2014	Signature: 
Approved by:	Andrew Hill	Date: 17/11/2014	Signature: 

Distribution
7-Eleven Stores Pty Ltd, Parsons Brinckerhoff file, Parsons Brinckerhoff Library

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Abbreviations

BTEXN	Benzene, toluene, ethylbenzene, xylene and naphthalene
HSL	Health screening level
HIL	Health-based investigation levels
LEL	Lower explosion limit. The lower limit (of vapour and oxygen) that explosive vapours occur for a particular compound
LOQ	Limit of quantitation (also see LOR or PQL) – of chemical concentrations attainable from laboratory analysis
LOR	Limit of Reporting
LPG	Liquefied petroleum gas
mAHD	Metres Australian Height Datum
mBGL	Metres below ground level
mg/kg	Milligram per kilogram (or part per million)
mg/L	Milligram per litre (or part per million)
PAH	Polycyclic Aromatic Hydrocarbon
%RPD	Relative per cent difference
PID	Photoionisation detector
ppm	Part per million
PQL	Practical Quantitation Limit (of chemical concentration)
PSH	Phase Separated Hydrocarbons, liquid petroleum products usually detected on the groundwater table, also known as free product or separate phase.
RAP	Remedial Action Plan
UST	Underground storage tank
TPH	Total Petroleum Hydrocarbons (also known as total recoverable hydrocarbons)
μg/L	Microgram per litre (or part per billion)

Executive summary

7-Eleven Stores Pty Ltd (7-Eleven) commissioned Parsons Brinckerhoff Australia Pty Ltd (Parsons Brinckerhoff) to prepare a Remediation Action Plan (RAP) for the service station located at 4 Endeavour Avenue, St Clair NSW (Store ID: 2277). The service station is referred hereafter as the site.

7-Eleven is planning to replace the underground petroleum storage system (UPSS) at the site. A RAP is therefore required to demonstrate that the UPSS removal works will be conducted in an appropriate manner. This RAP describes the methodologies for the remediation of contaminated soil after the fuel infrastructure is removed and a framework to manage hydrocarbon contamination that may be encountered in soil and groundwater at the site during the work. The objective of this RAP is to document the remediation actions required and to provide a framework for the work practices and environmental management techniques to be implemented whilst undertaking fuel infrastructure replacement works. This RAP will be provided to Penrith City Council in conjunction with the submission of a Development Application.

The UPSS replacement program comprises removal of four underground storage tanks (USTs), fuel bowsers and their associated fuel lines. The four USTs are housed in a tank farm in the eastern portion of the site. A liquefied petroleum gas (LPG) tank which is located south of the other tanks will remain in-situ. After the fuel infrastructure is removed, the soils around the infrastructure shall be excavated. Validation soil samples will be collected from the walls and the floor of the excavations. The samples will be tested for total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN) and polycyclic aromatic hydrocarbons (PAHs). As the site will continue to be used as a service station after the UPSS is replaced, the potential risks relating to the remnant contaminants in soil and groundwater are intrusion of hydrocarbon vapours into the buildings and shallow excavations at the site, direct contact of contaminated soil by intrusive maintenance workers at and in the vicinity of the site. Therefore, the soil results will be compared to the soil health screening levels (HSLs) for vapour intrusion risk and health investigation levels (HILs) for direct contact or ingestion risks. When the soil in the excavations is validated, i.e. less than the HSLs and/or HILs and/or not considered to pose risks to potential receptors, the new fuel infrastructure will then be installed in the excavations; otherwise, additional excavations may be necessary to remove any significant contamination.

It is estimated the excavations will result in approximately 300 m^3 of waste soils. The estimation was based on the size of the tanks to be removed and some allowance for excavation of fuel lines but did not include additional excavation volumes required if significant contamination (i.e. concentrations greater than nominated site assessment criteria) is to be encountered. The excavated soil will be assessed against the nominated site assessment criteria for its suitability to be re-used on-site. If the excavated soil is contaminated, i.e. concentrations greater than remediation criteria, it will be classified and disposed to a licensed landfill facility. After the installation of the new fuel infrastructure, the excavation will be reinstated with either re-used excavated soils or certified clean fill.

This RAP also provides a conceptual working plan for work health and safety (WHS) and environmental management in order to minimise the potential impacts on human health and/or the environment resulting from the UPSS replacement works.

Following the fieldwork, a UPSS validation report should be prepared for submission to the Council. The purpose of the validation report is to document the procedures and results of the UPSS removal, the soil excavation and validation activities in accordance to the *Protection of Environment Operation – Underground Petroleum Storage System (2014) regulation* and to illustrate that the site is suitable for continued use as a service station. The validation report will also include documentation of all soil disposed off-site and material imported to the site.

1. Introduction

1.1 Purpose

7-Eleven Stores Pty Ltd (7-Eleven) commissioned Parsons Brinckerhoff Australia Pty Ltd (Parsons Brinckerhoff) to prepare a Remediation Action Plan (RAP) for the St Clair Service Station (Store ID: 2277) which is located at 4 Endeavour Avenue, St Clair, NSW (the 'site'). A site location plan is provided in Figure 1.

7-Eleven is planning to replace the underground petroleum storage system (UPSS) at the site. A RAP is therefore required to document the proposed remediation works associated with the tank replacement works and to provide a framework for the remediation and/or management of the hydrocarbon impacted soil, or backfill material in the vicinity of the fuel infrastructure to be removed. This RAP will be provided to Penrith City Council (Council) in conjunction with a Development Application (DA).

1.2 Objectives

The objective of this RAP is to document the remediation actions required and provide a framework for the work practices and environmental management techniques to be implemented while undertaking removal and replacement of the UPSS at the site.

1.3 Scope of the RAP

The RAP includes:

- a summary of the site conditions and surrounding environment
- a summary of the contamination status at the site and its surroundings
- assessment of data gaps that may require further investigation
- identification of remediation goals
- outline the validation requirements
- timing and schedule of the remedial work
- site management issues
- contingency management issues
- work, health and safety (WHS) issues.

1.4 Technical framework

The RAP was prepared in accordance with the following guidelines:

- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC, 1992)
- *Contaminated Land Management Act* (1997)
- *Exposure Standards for Atmospheric Contaminants in the Occupational Environment* (NOHSC, 1995)
- *Technical Note: Investigation of Service Station Sites* (NSW EPA, 2014)

- *Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 1997)
- *Guidelines for implementing the Protection of the Environment Operations (Underground Petroleum Storage systems) Regulation* (NSW DECCW, 2008)
- *Guidelines on the duty to report contamination under the Contaminated Land Management Act 1997* (NSW DECC, 2009)
- *Managing Land Contamination Planning Guidelines: State Environmental Planning Policy No. 55 – Remediation of Land* (DUAP, 1998)
- *National Environment Protection (Assessment of Site Contamination) Measures* (1999)
- *National Environment Protection (Assessment of Site Contamination) Amended Measure No. 1* (2013)
- *Waste Classification Guidelines – Part 1: Classifying Waste* (NSW DECCW, 2009)
- *Work Health and Safety Act* (2011).

2. Site background information

2.1 . Site identification and description

The site identification details are provided in Table 2.1.

Table 2.1 Site identification details

Site name and ID	St Clair Service Station (Store ID: 2277)
Address	4 Endeavour Avenue, St Clair, NSW.
Title identification	Lot 4021 on Deposited Plan (DP) 851358. 4 Endeavour Avenue comprises a total of three lots; the service station is located entirely on Lot 4021 DP 851358.
Area	1,650 m^2
Local government	Penrith City Council
Zoning	2(d) Residential Medium Density (Interim Development Order No. 75 – City of Penrith)
Current site use	Service station
Proposed site use	Service station

The site, which is rectangular, is bounded by Endeavour Avenue on the northern boundary. The car park of the adjacent St Clair Shopping Centre adjoins the site to the east and south. A fast food restaurant (Red Rooster) adjoins the site to the west. The site is sealed with concrete; it is accessible by driveways located along Endeavour Avenue.

The retail building is located in the western portion of the site. A canopy in the centre of the site covers six bowsers. Five underground storage tanks (USTs) are contained in a tank farm in the eastern portion of the site.

Information regarding UPSS at the service station is summarised in Table 2.2. The approximate location of the fuel infrastructure is shown in Figure 2. This information was derived from the records kept by the NSW WorkCover (Appendix C) and details provided in the historical reports.

Table 2.2 Fuel storage details

Tank ID	Product	Capacity (L)
1	Ethanol-blend petrol (E10)	54,800
2	Diesel	54,800
3	Premium unleaded petrol 98 (PULP98)	20,900
4	Unleaded petrol (ULP)	54,800
5	Liquefied petroleum gas (LPG)	30,000

2.2 Site zoning

The site is zoned 2(d) Residential Medium Density within the Interim Development Order No. 75 – City of Penrith (IDO 75). Service stations are not listed as a permitted use in this zone, however, the site can continue to be used as a service station in accordance with the "existing use rights" provisions within The Act.

The site is zoned B2 Local Centre in the current proposed Penrith City-wide Local Environmental Plan. Service stations are permitted in this draft zone.

2.3 Surrounding land use

The land uses surrounding the site are as follows:

- **North** – Endeavour Avenue with the Mark Leece Sporting Complex beyond;
- **East** – St Clair Shopping Centre car park;
- **South** – St Clair Shopping Centre car park; and
- **West** – Red Rooster restaurant with St Clair High School beyond.

2.4 Physical settings

2.4.1 Topography, geology and hydrogeology

The site's elevation is approximately 50 metres Australian Height Datum (mAHD). The landscape at the site slopes to the north towards Byrnes Creek, which at 70 m away is the nearest surface water body to the site.

The regional map of the area (Department of Mineral Resources, 1991, Geological Series Sheet 9130, Edition 1, Penrith, Scale 1:100,000) indicates that the regional geology in the area consists of Bringelly Shale, which consists of shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff. The geology at the site was described as fill above sandy clay and shale (URS, 2010). Fill consisting of sandy gravel and gravelly sand was present beneath the concrete to 2 m below ground level (mBGL). Sandy clay was present between 2 and 4 mBGL. Shale was encountered from 4 mBGL to the maximum explored depth of 13 mBGL. Groundwater was encountered in the sandy clay layer at around 3 mBGL while drilling (Parsons Brinckerhoff, 2012).

The 2013 groundwater monitoring event (7-Eleven, 2013) showed that standing water levels (SWLs) were encountered between depths of 2.0 and 3.0 mBGL. Gauging results have indicated a groundwater flow to the north-west (URS, 2010; Parsons Brinckerhoff, 2012).

2.4.2 Acid sulfate soils

The acid sulfate soils map for the area prepared by *Commonwealth Scientific and Industrial Research Organisation* (CSIRO) indicates that the site is located within an area where there is extremely low probability of acid sulfate soils. IDO 75 doesn't contain any acid sulfate soils maps.

2.5 Registered groundwater bores search

A review of the registered groundwater bore database (http://www.nratlas.nsw.gov.au) was conducted on 3 July 2014. The review did not identify any registered groundwater bores within 1 km radius of the site. The nearest groundwater bores are located over 2 km away to the north-west.

3. Summary of contamination and potential health risks

3.1 Summary of previous site investigations

The findings of the previous environmental investigations were summarised in the following reports:

- Phase 1 Environmental Site Assessment - St Clair Service Station, 4 Endeavour Avenue, St Clair, November 2009 (Parsons Brinckerhoff, 2009)
- Final Report, Phase 2 Environmental Site Assessment, Mobil Service Station St Clair, 4 Endeavour Avenue, St Clair, August 2010. (URS, 2010)
- Groundwater Monitoring Event Report, September 2011 (Parsons Brinckerhoff, 2011)
- Environmental Site Assessment – 7-Eleven Service Station – 4 Endeavour Avenue & Bennett Road, St Clair, NSW, May 2012 (Parsons Brinckerhoff, 2012)
- Groundwater Monitoring Event Report, November 2012 (OTEK, 2012)
- Groundwater Monitoring Event Report, May 2013 (7-Eleven, 2013).

These investigations have not detected any widespread soil or groundwater contamination at the site. Soil investigations were carried out at 2010 during well installation (URS, 2010), and with additional well installation and soil bores in 2012 (Parsons Brinckerhoff, 2012). The only TPH, BTEX or PAH concentrations detected in soil samples were from surficial layers (<0.5 mBGL), which would be associated with the use of fill or minor surface spills. Lead was detected to a maximum of 97 mg/kg in fill material.

At the two most recent sampling events (November 2012 and May 2013), groundwater from the sampled wells had dissolved TRH, BTEX and PAH concentrations below or below laboratory detection limits, with the exception of BTEX at MW01B in May 2013; a benzene concentration of 248 μg/L was recorded, which is above the guideline for recreational water quality (10 μg/L).

3.2 Contaminants of potential concern

Based on the results of the previous environmental investigation, the contaminants of potential concern for the site were identified as:

- Total petroleum hydrocarbons (TPH)
- Benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN)
- Polycyclic aromatic hydrocarbons (PAH).

For waste classification purposes, analysis of heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc) may also be required.

3.3 Extent of hydrocarbon contamination

3.3.1 Soil

The most recent soil investigation (Parsons Brinckerhoff, 2012) targeted around the fuel dispensers. All samples had concentrations of TPH, BTEX and PAHs below laboratory detection limits, except for a surficial sample (SB101) from near the canopy, which comprised detectable concentrations of TPH C_{15}-C_{28} (210 mg/kg), TPH C_{29}-C_{36} (100 mg/kg) and PAHs (5.6 mg/kg), and a concentration of lead (97 mg/kg) higher than other samples. These concentrations may due to the presence of fill at this location or indicative of a small surface spill.

3.3.2 Groundwater

Groundwater results showed no significant hydrocarbon impacts were detected between 2010 and 2013. At the most recent monitoring event in 2013 dissolved phase TPH and/or BTEX were detected in MW01B, but all other wells had contaminant concentrations below laboratory detection limits, indicating that groundwater impacts are not widespread. Low levels of PAHs have also been previously detected in wells at the site.

3.3.3 Areas of uncertainty

The detection of hydrocarbons in surficial sample locations raises the possibility of the existence of other hotspots of contamination caused by spill surrounding the fuel dispensing infrastructure or the use of impact fill at the site.

Taking into account the close proximity of the soil and groundwater investigation locations to the fuel infrastructure and that the results showed no significant impacts from the activities at the site, Parsons Brinckerhoff considered that extent of hydrocarbon contamination at the site has been defined.

3.4 Conceptual site model

Commercial premises are neighbouring the site to the west, south and east. Playing fields neighbour the site across Endeavour Avenue to the north. The subsurface profile at the site comprises fill underlain by sandy clay and shale. Groundwater is encountered in the sandy clay layer at around 3 mBGL. Groundwater is inferred to flow to the north-west.

The historical soil and groundwater results did not indicate significant hydrocarbon contamination at the site. If there is a leak or spill from the fuel infrastructure at the site, the potential receptors of the soil and groundwater impacts include the on-site commercial workers, on-site excavation and underground utility workers. The receptors may be exposed to contaminants through vapour inhalation (workers in the sales building) and/or direct contact with soil and groundwater (excavation workers and workers in services trenches). Nearby surface water bodies may also be a receptor of groundwater impacts.

4. Remediation goals and strategies

4.1 Remediation objectives

The primary objective of the UPSS replacement is to install new tanks and lines, and at the same time to remove former fuel infrastructure and the significantly contaminated soil around the infrastructure. A further objective is to ensure that the site is suitable for continued use as a service station.

4.2 Remediation category under SEPP55

Based on the requirements of the *State Environmental Planning Policy (SEPP) 55 - Remediation of land*, the proposed remediation works are considered to be classified as 'Category 1 remediation works: work not needing consent'. Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (SREP) applies to the site, therefore development consent is required for remediation works.

4.3 Proposed remediation works

The proposed remedial works comprise excavation and removal of four USTs from the tank farm. The fill points, fuel lines, pumps and dispensers associated with these tanks will also be removed.

After the removal of the tanks and lines, soils around the infrastructure will be excavated. To characterise the contamination status of the site, validation soil samples will be collected from the walls and floors of the excavations. Additional excavations may be considered if the soil contaminant concentrations exceed the adopted investigation levels (see section 4.4) or the hydrocarbon impacted soil are likely to be an ongoing source of contamination to the groundwater. The new fuel infrastructure will only be installed after the excavations have been validated.

If the existing groundwater monitoring wells are destroyed during the excavations, the wells may require replacement.

4.4 Remediation criteria - soil

This RAP is prepared for assessing the hydrocarbon impacts in soil at the site after the removal of the tanks. Therefore, the potential human receptors relevant to this investigation are the site operators and the excavation and maintenance workers at the service station. The exposure pathways identified were vapour intrusion into buildings and shallow trenches, dermal contact and ingestion. Based on the potential receptors identified and the exposure pathways, the applicable remediation criteria are the soil health screening levels (HSLs) for vapour intrusion risks and soil health based investigation levels (HILs) for direct contact and ingestion risks. The HSLs and HILs for commercial users are provided in the *National Environment Protection (Assessment of Contaminated Sites) Amended Measure No. 1* (NEPM, 2013). For the intrusive maintenance workers, the recommended assessment criteria for vapour and direct contact pathways provided in the *CRC CARE Technical Report no. 10* (Friebel and Nadebaum, 2011) have been adopted.

Following the installation of the new tanks, the excavation will be reinstated with imported fill, and then paved with concrete. As the site will be used as a service station, the ecological screening levels (for the protection of plants) for petroleum hydrocarbons have limited relevance and have not been included in the assessment.

The HSLs and HILs for the commercial site users and the intrusive maintenance workers are summarised in Table 4.1 and Table 4.2.

Table 4.1 Soil health screening levels for vapour intrusion into buildings and health investigation levels for human contact with soil – commercial land use

Chemical	Health screening levels[1] (mg/kg)				Health based investigation levels[1] (mg/kg) – commercial/ industrial (HIL-D)
	Commercial/industrial land use (HSL in sand)				
	0 to < 1 m	1 m to < 2 m	2 m to < 4 m	≥ 4 m	
F1[2]	260	370	630	NL	-
F2[2]	NL	NL	NL	NL	-
Benzene	3	3	3	3	-
Toluene	NL	NL	NL	NL	-
Ethylbenzene	NL	NL	NL	NL	-
Xylene	230	NL	NL	NL	-
Naphthalene	NL	NL	NL	NL	-
Carcinogenic PAHs	-	-	-	-	40
Total PAHs	-	-	-	-	4,000

(1) *Schedule B1 Investigation levels for soil and groundwater* (NEPM, 2013)
(2) F1 = TPH C_6-C_{10} less BTEX, F2 = TPH >C_{10}-C_{16} less naphthalene.
(3) NL: not limiting; "-": criteria are not available.

Table 4.2 Soil health screening levels for vapour intrusion into trenches and direct contact – intrusive maintenance workers

Chemical	HSL (mg/kg) for Intrusive maintenance worker (shallow trench)[1]			
	Vapour intrusion			Direct contact
	0 to < 1 m	1 m to < 2 m	≥ 4 m	
F1 (C_6-C_{10} less BTEX)	NL	NL	NL	82,000
TPH >C_{10}-C_{16}	NL	NL	NL	62,000
TPH >C_{16}-C_{34}	-	-	-	85,000
TPH >C_{34}-C_{40}	-	-	-	120,000
Benzene	77	160	NL	1,100
Toluene	NL	NL	NL	120,000
Ethylbenzene	NL	NL	NL	85,000
Xylene	NL	NL	NL	130,000
Naphthalene	NL	NL	NL	29,000

(1) *CRC CARE Technical Report no. 10* (Friebel and Nadebaum, 2011)
(2) NL: not limiting; "-": criteria are not available.

4.5 Groundwater investigation levels

The NEPM (2013) provides groundwater HSLs which are related to potential hydrocarbon vapour emanating from the impacted groundwater and intruding into the site's building. Groundwater at the site is likely to be hosted within the sandy clay at around 3 mBGL. Sandy fill is overlaying the clay. Therefore the relevant HSL is for groundwater in sand with the water level at 2 to <4 m.

For assessing groundwater quality, it is also necessary to assess the potential uses of groundwater down gradient of the site being investigated. The surface water receptor closest to the site is Byrnes Creek, which is located 70 m north of the site, and is down-gradient of the inferred groundwater flow direction from gauging data. This creek is used for recreational purposes.

The threshold concentrations presented in the ANZECC (2000) *Fresh and Marine Waters Quality Guidelines* are considered applicable for the protection of aquatic ecosystems of the receiving waters. As these guidelines apply to receiving waters, it is generally conservative to apply these to groundwater discharging to receiving waters. It is important to note that these are not threshold values at which an environmental problem is likely to occur if exceeded, rather, if the trigger values are exceeded, then further action is required which may include either further site-specific investigations to assess whether or not there is an actual problem or management/remedial action should be undertaken.

It is understood that the NSW EPA policy is that the trigger values for the protection of 95% of aquatic ecosystems should be used except where contaminants are potentially bio-accumulative in which case the trigger values for the protection of 99% of species should be used. Therefore, we have selected trigger values for the protection of 95% of freshwater water species for the majority of contaminants. For these contaminants, low reliability trigger values have been adopted when necessary.

There are no registered groundwater bores within a 1 km radius of the site. Therefore, the Australian Drinking Water Guidelines are not considered to be relevant for assessing groundwater quality at the site.

The groundwater HSLs and investigation levels for the contaminants relevant to the site are summarised in Table 4.3.

Table 4.3 Groundwater health screening levels and groundwater investigation levels

Chemical	HSL-D(1) - in sand, water level at 2 to < 4m (µg/L)	Freshwater ecosystem (1),(2) (µg/L)	Recreational (2) (µg/L)
F1(3)	6,000	-	-
F2(3)	NL	-	-
Benzene	5,000	950	10
Toluene	NL	180	-
Ethylbenzene	NL	80	-
m- & p- xylene	-	275	-
o-xylene	-	350	-
Total xylene	NL	-	-
Naphthalene (volatile)	NL	-	-
Naphthalene	-	16	-
Anthracene	-	0.4	-
Phenanthrene	-	2	-
Fluoranthene	-	1.4	-
Benzo(a)pyrene	-	0.2	0.01

(1) NEPM (2013) Schedule B1 Investigation levels for soil and groundwater
(2) ANZECC (2000) *Fresh and Marine Water Quality Guidelines* – trigger values for 95% protection level of freshwater ecosystem, including low reliability values; and water quality guidelines for recreational purposes
(3) F1 = TPH C_6-C_{10} less BTEX, F2 = TPH >C_{10}-C_{16} less naphthalene.
(4) NL: not limiting; "-": criteria are not available.

4.6 Waste disposal criteria

Prior to the transportation of soils off-site for disposal, the excavated soils shall be tested then classified. The classification of excavated soils will be classified in accordance with the NSW DECCW (2009) *Waste Classification Guidelines – Part 1: Classifying Waste*. A summary of the waste acceptance criteria is included in Table 4.4.

Table 4.4 Waste classification guidelines

Chemicals	CT (without TCLP)[1]		SCC (with TCLP)[2]			
	Maximum value for classification without TCLP		Maximum values for leachable concentration and specific contaminant concentrations when used together			
	General Solid (CT1)	Restricted Solid (CT2)	General solid		Restricted solid	
			TCLP1	SCC1	TCLP2	SCC2
	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)	(mg/kg)
TPH C_6-C_9	650[3]	2,600[3]	na	650	na	2,600
TPH C_{10}-C_{36}	10,000[3]	40,000[3]	na	10,000	na	40,000
Benzene	10	40	2	18	2	72
Toluene	288	1,152	57.6	518	57.6	2,073
Ethylbenzene	600	2,400	120	1080	120	4,320
Total xylene	1,000	4,000	200	1,800	200	7,200
Benzo(a)pyrene	0.8	3.2	0.16	10	0.16	23
Total PAHs	200[3]	800[3]	na	200	na	800
Arsenic	100	400	5	500	20	2,000
Cadmium	20	80	1	100	4	400
Chromium (VI)	100	400	5	1,900	20	7,600
Lead	100	400	5	1,500	20	6,000
Mercury	4	16	0.2	50	0.8	200
Nickel	40	160	2	1,050	8	4,200

(1) Extracted from Table 1 in *Waste Classification Guidelines. Part 1: Classifying Waste* (NSW DECCW, 2009)
(2) Extracted from Table 2 in *Waste Classification Guidelines. Part 1: Classifying Waste* (NSW DECCW, 2009)
(3) These chemicals are assessed using SCC values only.

5. Remediation approach – source removal methodology

5.1 Preliminaries

Prior to commencement of remedial works at the site, the following activities would need to be completed:

- provision of the RAP to Penrith City Council
- obtain all relevant regulatory approvals for the use of the chosen remediation technology
- prepare a Health, Environmental and Safety Plan (HESP) prior to commencement of site works
- ensure that all site personnel are aware of the health, safety and environmental management requirements relating to the excavation of potentially contaminated soils
- ensure that the contractor conducting the tank pit excavation has adequate safety equipment (for example, adequate fencing, barrier boards, barricades and warning signage) to secure the work area and minimise the danger to contractor and the public for the duration of the tank replacement works.

5.2 General

The removal of the UPSS would reduce the possibility of further contamination of soil and groundwater occurring, and residual concentration of hydrocarbons in soil would then decline as a result of natural attenuation. All excavation works should be undertaken by experienced licensed contractors, experienced in the decommissioning and removal of fuel infrastructure and the remediation of contaminated soils.

An environmental scientist should be present during the excavation works, particularly to assess the contamination status of the soil excavated from around the tanks, and to determine whether further excavation of tank pit walls and floor is required to remove heavily contaminated soil.

As a minimum, the following Codes of Practice are applicable to the work and a copy of each should be obtained by the contractor. Standards should be the most recent version available unless otherwise specified:

- AS 4976:200 The removal of underground storage tanks.
- AS 1940 Section 9 The storage and handling of flammable and combustible liquids.

5.3 Primary source removal

The pavement will be broken to allow access to the tanks and fuel lines. ‘Tank Clearance’ consists of draining product from tanks, vapour venting, de-gassing of tanks, proper labelling of tanks and disposal. Once tanks are ‘cleared’ they will be gas tested for vapours and then deemed safe by an appropriately qualified person. The tank atmosphere and the excavation area shall be checked regularly for presence of vapour until the tank is removed from the site.

All applicable permits must be obtained prior to the beginning of any work associated with tank clearance. All product liquid and residue removed from the tank shall be handled in accordance with appropriate standards and local regulations associated with environmentally hazardous materials and dangerous goods. The contractor shall submit written procedures to complete the following activities outlined below:

- draining pipes and pumping out tanks
- removal of pipework
- removal of tank from ground
- labelling of tanks
- transporting of tanks
- tank destruction.

5.4 Soil sampling and characterisation

Following the tank removal and subsequent excavation, soil samples will be collected from the walls and floor of the excavation. All soil samples will be screened in the field using a handheld photo ionisation detector (PID) to measure indicative concentrations of volatile organic compounds (VOC). Samples will be analysed for the contaminants of potential concern, i.e. TPH, BTEXN and PAHs.

The tank pit characterisation will be undertaken in accordance with the NSW EPA (2014) *Technical Note: Investigation of Service Station Sites*. Section 2.6 of these guidelines state that:

> *"Where a UST is removed, as a guide sampling should be: one sample from beneath the centre of the UST if tank length is less than 4 m and at least one sample from each of the four walls. If the tank is 4–10 m long, at least two samples from each of the four walls and under each end. If the tank is longer than 10 m, at least three samples from each of the four walls and under each end are taken. This applies to each tank in the same tank pit"*

Figure 3 shows the proposed validation sampling locations. Quality Assurance / Quality Control (QA/QC) samples would also have to be collected and analysed as described in Section 5.8.

The excavations will be left open while waiting for laboratory results. If validation samples exceed the nominated assessment reference values, further excavation will be undertaken if the impacted soil is deemed to have a potential to adversely impact groundwater.

5.5 Groundwater sampling

Assessment of groundwater is to be undertaken at the completion of the soil remediation works. Groundwater monitoring wells may need replacement if they are destroyed during excavation works. Groundwater samples will be analysed for TPH, BTEXN and PAH. If high levels of dissolved phase hydrocarbons remain, a risk assessment for groundwater for continued petroleum use of the site may be required.

5.6 Reporting

At the completion of the site works, a UPSS validation report will be prepared in general accordance with the NSW DECCW (Sept 2009) *Guidelines for implementing the Protection of the Environment Operation (Underground Petroleum Storage Systems) Regulation (2008).* The UPSS validation report should detail the methodologies and results of the validation works. A checklist of the reporting requirement is provided in the NSW DECCW (2009) *Guidelines for Implementing the Protection of the Environment Operation (Underground Petroleum Storage System) Regulation – Technical note: Site Validation Reporting.*

5.7 Management of excavated soils

Four USTs, the fuel bowsers and the fuel lines will be removed from the service station. Approximately 300 m^3 of waste soils is estimated to require excavation from the tank farm and around the fuel infrastructure. The volume of excavated soils was estimated based on the sizes of the tanks and some allowances for fuel lines, but did not include additional excavation required if significant contamination (i.e. concentrations greater than nominated site assessment criteria) is to be encountered.

The excavated soils shall be segregated into separated stockpiles based on the field observations, such as soil type, field PID readings, olfactory evidence of contamination and depths (i.e. above or below the tanks) where the soils are excavated. The NEPM (2013) *Schedule B2 – Site Characterisation* outlined the minimum number of samples for assessment of stockpiles. For stockpile volume less than 200 m^3, the recommended sampling frequency is 1 per 25 m^3. For stockpiles greater than 200 m^3, lower sampling rates may be derived. All the stockpile soil samples shall be analysed for TPH, BTEX, PAH and lead. Selected soil samples will also be analysed for other heavy metals (arsenic, cadmium, mercury and nickel).

The excavated soils are likely to be disposed at an approved landfill facility. However, some of the excavated soils may be suitable for re-used on-site if the contaminant concentrations are less than the site assessment criteria (see Table 4.1 and 4.2). For disposal, the soils results will be compared guideline values in the *Waste Classification Guidelines* (NSW DECCW, 2009) (see Table 4.4).

The excavated soils will be temporarily stockpiled on-site while awaiting laboratory results. The soils are to be stockpiled on plastic sheets and the stockpile areas are to be securely bunded using silt fencing or hay bales to prevent surface water (and silt laden surface water) from entering or leaving the stockpiles or the site. Plastic sheeting may be required to be placed over the stockpile to minimise wind-blown dust and/or odours.

If the soils are disposed off-site, disposal dockets for tracking of waste will be maintained by the contractor for inclusion in the UPSS validation report.

5.8 Reinstatement of the excavations

Following excavation and validation of the tank pit and the subsequent soil excavations, the new USTs will be installed in the excavation. The voids between the tanks and the pit will be reinstated. The fill used for reinstatement should be certified suitable for the intended use using the following procedures.

Re-use of excavated soil

Excavated soils with contaminant concentrations below the site assessment criteria may be reused on-site. The material should be assessed for its potential to pose risk to human and ecological receptors. The material will not be considered suitable for re-use if contaminant concentrations are shown to exceed assessment criteria or potential risks are identified.

Virgin excavated natural material (VENM)

Where VENM is required for backfilling, it should be certified suitable for the intended use. This procedure would involve:

- reviewing the history of the source of the material
- a visual inspection for foreign material, unusual staining and any odours
- testing of the material at a rate of one per 25 m^3 [as recommended by the *NSW EPA (1994) Guidelines for Assessing Service Station Sites*]. If no suitable certification (including a testing report) can be supplied by the supplier of the material, the analytical suite should include heavy metals (arsenic,

cadmium, chromium, copper, lead, mercury, nickel and zinc), TPH, BTEX, PAHs, organochlorine pesticides (OCPs) and polychlorinated biphenyls (PCBs) (as recommended by the *NSW EPA (1994) Guidelines for Assessing Service Station Sites*).

All analytical results are required to be less than the soil validation criteria reported in Section 4.3 and less than the criteria for sensitive land use as presented in the NSW EPA (1994) *Guidelines for Assessing Service Station Sites*.

Excavated natural material (ENM)

Where ENM is to be imported to the site for use as backfill, the material should be assessed in accordance with the NSW EPA (2012) *Excavated Natural Material Exemption* prior to being imported to the site.

5.9 Quality assurance and quality control (QA/QC)

The data quality indicators (DQIs) for any validation and monitoring events are presented below.

Table 5.1 Data quality indicators

Indicators	Description
Procedures	All approvals and licences required must be obtained prior to work commencing. All field work will be carried out in accordance with relevant guidelines and stand operation procedures. Sign site register (and induction, if required), inspection of remediation equipment. All field work information to be recorded on field day sheets. All works to be undertaken by experienced staff.
Storage and Transport	Samples collected placed directly into laboratory prepared containers and stored in a secure chilled container. Chain of Custody to be used to ensure the integrity of the samples from collection to receipt by the analytical laboratory.
Laboratory	All laboratories used should comply with AS/NZS ISO 9001:2001 quality assurance programs, be NATA registered and perform their own internal QA/QC programs.
QA/QC - Field	The field QA/QC procedures, at the minimum, should comprise: ▪ Duplicate samples 1 in 20 blind duplicates (intra-laboratory) to the primary laboratory and 1 in 20 split duplicates (inter-laboratory) to the secondary laboratory. NEPM (2013) indicated that for soil samples if the relative percentage difference (RPD) for the primary and duplicate is greater than 30%, a review should be conducted of the cause (e.g. instrument calibration, extraction efficiency, appropriateness of the method used, etc.). The RPD variation can be expected to be higher for organic analysis than for inorganics, and for low concentrations analytes (AS4482.1, 2005). ▪ Sample blanks Sample blanks were collected to verify that cross contamination had not occurred during sampling or during transportation of the samples. Equipment rinsate samples were collected for each sampling day and analysed for the contaminant of concern. Trip blanks (prepared by the laboratory) were analysed for each batch of soil and groundwater samples submitted to the laboratory. The trip blanks were analysed for volatile contaminants. ▪ Trip spike The purpose of a trip spike is to confirm the adequacy of sample preservation in the field and during sample transportation to the laboratory by measuring the amount of volatile losses. Trip spikes were prepared by the laboratory using the following procedures. Non-compliance is to be documented in the report and the sample to be re-analysed or higher level to be conservatively adopted.

Indicators	Description
QA/QC – Laboratory	Vary between analytes and between laboratories. If duplicate results are not satisfactory, non-compliance is to be documented in laboratory reports. Primary laboratory QA/QC acceptance limits are as follows: ■ Surrogates: 70 – 130% recovery; ■ Matrix spikes: 70 – 140% recover (organics) and 80-120% (inorganics); ■ Control samples: 70 – 139% recovery (soil) and 80-120% (water); ■ Duplicate samples: RPD less than 30%; ■ Method blanks: 0 to < PQL.

6. Health, Environment and Safety Plan

A Health, Environment and Safety and Plan (HESP) will be prepared prior to performing on-site works associated with this RAP. The HESP will address the health and safety of residents and workers in the surrounding area. As a minimum, it will consider:

- site security
- potential exposure to contamination
- excavation safety
- vibration
- noise
- odour
- dust.

Work associated with the remediation of the site will conform, at a minimum, to the requirements of the NSW WorkCover requirements and associated Regulations.

Typically the HESP will address the following issues:

- regulatory requirements
- responsibilities
- hazard identification and control
- chemical hazard control
- sample and chemical handling procedures
- personal protective equipment
- work zones
- decontamination procedures
- emergency response plans
- contingency plans
- incident reporting.

7. Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) should be developed as industry best practice for the site remediation works to ensure that the on-site and off-site environment is not adversely impacted during the remediation works. The CEMP should address and take into consideration the issues discussed in the following sections. The CEMP should be prepared by the civil contractor.

7.1 Vehicle traffic

The remediation works may slightly increase vehicle traffic in the vicinity of the site. Where necessary, details of Traffic Management will be incorporated into the CEMP to control traffic movement associated with the works and mitigate any disruption to local residents and road users.

7.2 Odour and vapour

The remediation works may result in significant vapours and odours being released into the atmosphere, particularly when excavation of potentially contaminated soil is carried out. At these times, consideration should be given to prevailing weather conditions and if distinct odours are detected, site works should cease work until the odours can be reduced or controlled.

The site supervisor shall monitor all open excavations and remediated soils with a PID to ensure ambient air concentrations are within the acceptable work safe limits. Concentrations of PID monitoring shall be recorded by field staff and submitted for review on a daily basis. If ambient air concentrations of volatile organic compounds (VOCs) exceed 15 ppm for over 30 minutes based on short term exposure limit of 15 ppm for benzene (NOHSC, 1995), work should cease until levels drop.

Alternative control measures could be implemented, including the following:

- workers should be fitted with vapour masks or respirators for continuation of site works in the area.
- wetting down the excavated soil with the use of water sprays containing odour suppressant.
- all contaminated soil loaded onto trucks for off-site disposal are to be securely covered.

7.3 Dust

During the earthworks, dust will be visually monitored. If excessive dust is being generated, areas of earthworks will be sprayed with water to reduce dust levels. Soil to be stockpiled should be covered or wetted down to minimise dust generation.

During excavation and transport of any soil off-site, truck wheels should be cleaned or driven through a constructed wash bay or similar control (e.g. rumble grid) to prevent potentially contaminated soil from being transported onto local roads.

7.4 Plant and machinery

It is the responsibility of the remediation contractor to ensure that all plant and machinery used on the site is properly maintained and in good working condition.

7.5 Noise

Increased noise levels may result from the use of on-site and off-site mechanical equipment during the course of the remediation works. To mitigate any noise which may arise as a result of site works, all works should be carried out during normal working hours and in accordance with NSW regulations on this matter.

Noise control measures to be implemented during the remediation works may include:

- specified entry controls for construction vehicles entering and leaving the site
- suitable construction techniques and methodologies
- use of quieter equipment
- restricted use of reversing alarms and all equipment should be fitted with alarm types that adjust output sound levels according to the prevailing ambient noise level.

All practical measures will be taken to minimise generation of noise, and contact information for enquires or complaints will be posted on the site entrance gate.

7.6 Water and Sediment management

7.6.1 Surface water

Soil stockpiled during excavation works should be suitably contained to prevent run-off of any potentially contaminated water or soil to the surrounding environment, including the stormwater system. Control measures should be established to prevent surface water run-off entering and leaving excavation and stockpile areas. Control measures may include:

- temporary bunding or diversion drains
- HDPE sheeting placed under stockpiles
- silt fences/hay bales to surround stockpiles
- protection of existing drains with silt fencing/hay bales/sand bags.

These mitigation measures should be regularly inspected to ensure that they are in good condition and if necessary upgraded where their performance is deteriorating.

7.6.2 Subsurface seepage and accumulated excavation water

Excavated surfaces are expected to be left open for short durations to minimise the potential of any surface waters entering work areas. If water does accumulate (e.g. rainfall or groundwater ingress), then it will require removal prior to validation and reinstatement.

Any water accumulated in excavations will be sampled and analysed for TPH and BTEX compounds. Upon receipt of the analytical results, management and/or disposal options will be formulated.

7.6.3 Sediment

Drains, gutters, roads and access ways shall be maintained free of sediment in accordance with regulatory requirements. Where required, gutters and roadways shall be swept regularly to keep them free from sediment. As for surface water, control measures should be implemented.

7.7 Equipment and cleaning operations

Throughout the site remediation project, controls will be placed on the operation and movement of equipment. General procedures that will be implemented include:

- excavation equipment will be washed in an environmentally sound manner prior to leaving the site.
- effective truck wheel-washing facilities will be provided to ensure that contaminated soil is not tracked off-site.
- no trucks or equipment carrying contaminated soils should be allowed to move across unsealed ground surfaces, except across designated transport corridors.

All contaminated soil/fill requiring off-site disposal will be transported to an appropriate landfill facility. All transport trucks loaded with contaminated soil for off-site disposal should be sealed and the load completely/securely covered to prevent wind-blown emissions or spillages and covers should be maintained until unloading. All truck tailgates should be securely fixed prior to loading and immediately after unloading soils and all vehicles are to be operated in a manner so as to prevent loss of soils during loading, transport and unloading activities.

As part of the CEMP, a preferred transport route to the nominated facility is required to be identified.

7.8 Site security

During construction works, work areas will be barricaded or secured by a chain-wire fence, which will remain in place over the duration of the remediation works to exclude public visitors. Appropriate safety/warning signs will be posted in accordance with the NSW WorkCover requirements. If an excavation is to be left open while the environmental project manager and contractor are not on-site for a substantial period of time (such as overnight) a temporary fence will additionally be erected around the excavation. Should the excavation be deeper than 1.5 m, the edges of the excavation should be battered to a 45 degree slope or benched into 1 m steps based on industry best practices.

7.9 Working hours

Working hours should be undertaken in accordance with the conditions of development consent. Any works to be conducted outside the normal working hours, needs to have prior agreement with 7-Eleven and have the Council's consent.

7.10 Contact information

Contact details of the appropriate civil contractors and the 7-Eleven Project Manager should be displayed in a prominent location at the site (such as the entrance or site office). Any incidents should be initially reported to the site manager, who will prepare an incident report for the 7-Eleven's Project Manager.

7.11 Community consultation

Community notification will be carried out in accordance with the *State Environmental Planning Policy No.55 – Remediation of Land* (SEPP 55). It is understood that 7-Eleven will manage and coordinate the SEPP 55 notification 30 days prior to re-tanking for this project. Council will also publically advertise/notify the adjoining land owners during the DA process in accordance with Council's Notification Policies.

The notice will include:

- indication that UPSS replacement work is to be undertaken, and the nature of these works
- the time and date such work is to commence
- the phone number of a person present on the premises whilst remediation works are being undertaken
- the 7-Eleven contact information and processes required for registering any complaints.

7.12 Incident response

Response to an incident occurring on-site will be in accordance with 7-Eleven's Emergency and Evacuation Procedures and Incident Reporting Procedures. A health and safety plan and incident contact numbers are to be maintained in an on-site register. All other relevant emergency contact numbers such as police, fire brigade and hospital will be listed in the Health, Environmental and Safety Plan and posted on site for easy access.

Local contractors (including a plumber and electrician) should be on call should an incident be reported by the site workers or local residents.

7.13 Contingency management

Contingency plans for anticipated environmental problems that may arise during the course of the remediation work are summarized in Table 7.1.

Table 7.1 Contingency management plans

Anticipated problems	Corrective actions
Chemical/fuel spill	Stop work, notify above mentioned personnel. Use accessible soil or appropriate absorbent material on site to absorb the spill (if practicable). Stockpile the impacted soil in a secure location, sample and determine the appropriate disposal/treatment option.
Excessive dust	Use water sprays to suppress the dust or stop site activities generating the dust until it abates.
Excessive noise	Identify the source, isolate the source if possible, and modify the actions of the source.
Excessive odours/vapours	If excessive organic odours/vapours are being generated, stop works and monitor ambient air across the site for organic vapours with a PID and odours at site boundaries. Implement control measures including respirators for site workers, use of odour suppressants, wetting down of excavated soil.
Excessive rainfall	Ensure sediment and surface water controls are operating correctly. If possible divert surface water away from active work areas or excavations.
Water in excavations	Collect samples and assess against relevant assessment criteria, to enable disposal options to be formulated.
Leaking machinery or equipment	Stop the identified leak (if possible). Clean up the spill with absorbent material. Stockpile the impacted soil in a secure location, sample and determine the appropriate disposal/treatment option.

Anticipated problems	Corrective actions
Failure of erosion or sedimentation control measures	Stop work, repair the failed control measure.
Unearthing unexpected fill or waste	Stop activities, contact the above mentioned personnel. Prepare a management plan to address the issue.
Equipment failures	Ensure that spare equipment is on hand at the site, or ensure that the failed equipment can be serviced by site personnel or a local contractor.
Complaint Management	Notify 7-Eleven following the complaint. Report the complaint in accordance with management procedures. Implement control measures to address reason for complaint (if possible).
Asbestos	Should asbestos be noted in soil, notify 7-Eleven and the consultant Project Managers. Asbestos monitoring may be required to continue works.
Acid sulfate soils	If acid sulfate soils are suspected, stop works and assess the material. If actual or potential acid sulfate soils are present, prepare an Acid Sulfate Soils Management Plan then work according to the plan.

8. Remediation Action Plan Summary

The purpose of this RAP is to provide a framework to validate the removal of UPSS infrastructure and hydrocarbon impacted soils to levels suitable for continued petroleum use. The following is a summary of the actions required to carry out the RAP.

- perform an underground services check to locate the position of any services prior to any excavation works
- remove concrete and excavate to expose USTs
- drain pumps and pipework
- degas the USTs to make safe for removal and transport off-site for destruction
- removal of the residual product in the USTs and disposal off-site by a licensed waste contractor
- removal of the UPSS and associated infrastructure
- provide tank destruction certificates
- collect soil samples from the excavations for USTs and fuel lines for analyses
- removal of any impacted soils which are to be classified and disposed off-site to an EPA approved landfill
- provide waste disposal certificates
- groundwater at the site to be assessed at completion of the removal of UPSS infrastructure
- the resulting excavations backfilled with approved clean imported virgin excavated natural material
- reporting on work completed
- if high levels of dissolved phase hydrocarbons remain after validation and groundwater assessment, carry out risk assessment for groundwater for continued petroleum use of the site.

9. References

7-Eleven (2013) *Groundwater Monitoring Event Report, May 2013*

ANZECC (1992) *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*

ANZECC (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*

Australian Standard 4976 – *The Removal and Disposal of Underground Petroleum Storage*

CSIRO Acid Sulfate Soil Risk Map, http://www.asris.csiro.au (accessed 3 July 2014)

Department of Natural Resources – NSW Natural Resources Atlas, http://www.nratlas.nsw.gov.au (accessed 3 July 2014)

Friebel, E. and Nadebaum, P. (2011) *Health screening levels for petroleum hydrocarbons in soil and groundwater. Part 1: Technical development document,* CRC CARE Technical Report no. 10, CRC for Contamination Assessment and Remediation for the Environment, Adelaide, Australia

Geological Survey of NSW Department of Mineral Resources (1991) Penrith 1:100 000 Geological Sheet 9130, 1st edition.

NEPC (1999) *National Environmental Protection (Assessment of Site Contamination) Measure*

NEPC (2013) *National Environmental Protection (Assessment of Site Contamination) Amendment Measure No. 1*

NOHSC (1995) *Exposure Standards for Atmospheric Contaminants in the Occupational Environment*

NSW DEC (2006) *Guidelines for the NSW Site Auditors Scheme (2nd edition)*

NSW DECCW (2008) *Guidelines for implementing the Protection of the Environment Operations (Underground Storage Systems) Regulation*

NSW DECCW (2009) *Guidelines on the duty to report contamination under the Contaminated Land Management Act 1997*

NSW DECCW (2009) *Waste Classification Guidelines; Part 1: Classifying waste*

NSW DUAP (1998) *Managing Land Contamination: Planning Guidelines SEPP55 Remediation of Land*

NSW EPA (1995) *Sampling Design Guidelines*

NSW EPA (2000) *Guidelines for Consultants Reporting on Contaminated Sites*

NSW EPA (2014) *Technical Note: Investigation of Service Station Sites*

OTEK (2012) *Groundwater Monitoring Event Report, November 2012*

Parsons Brinckerhoff (2009) *Phase 1 Environmental Site Assessment - St Clair Service Station, 4 Endeavour Avenue, St Clair, November 2009*

Parsons Brinckerhoff (2011) *Groundwater Monitoring Event Report, September 2011*

Parsons Brinckerhoff (2012) *Environmental Site Assessment – 7-Eleven Service Station – 4 Endeavour Avenue & Bennett Road, St Clair, NSW, May 2012*

URS(2010) *Final Report, Phase 2 Environmental Site Assessment, Mobil Service Station St Clair, 4 Endeavour Avenue, St Clair, August 2010*

10. Limitations

Scope of services

This Remediation Action Plan (the report) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and Parsons Brinckerhoff (scope of services). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

Reliance on data

In preparing the report, Parsons Brinckerhoff has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report (the data). Except as otherwise stated in the report, Parsons Brinckerhoff has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (conclusions) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Parsons Brinckerhoff will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Parsons Brinckerhoff.

Environmental conclusions

In accordance with the scope of services, Parsons Brinckerhoff has relied upon the data and has not conducted any environmental field monitoring or testing in the preparation of the report. The conclusions are based upon the data and visual observations and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions.

Within the limitations imposed by the scope of services, the assessment of the site and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

Report for benefit of client

The report has been prepared for the benefit of the client and no other party. Parsons Brinckerhoff assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of Parsons Brinckerhoff or for any loss or damage suffered by any other party in relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

Other limitations

Parsons Brinckerhoff will not be liable to update or revise the report to take into account any events, emergent circumstances or facts occurring or becoming apparent after the date of the report.

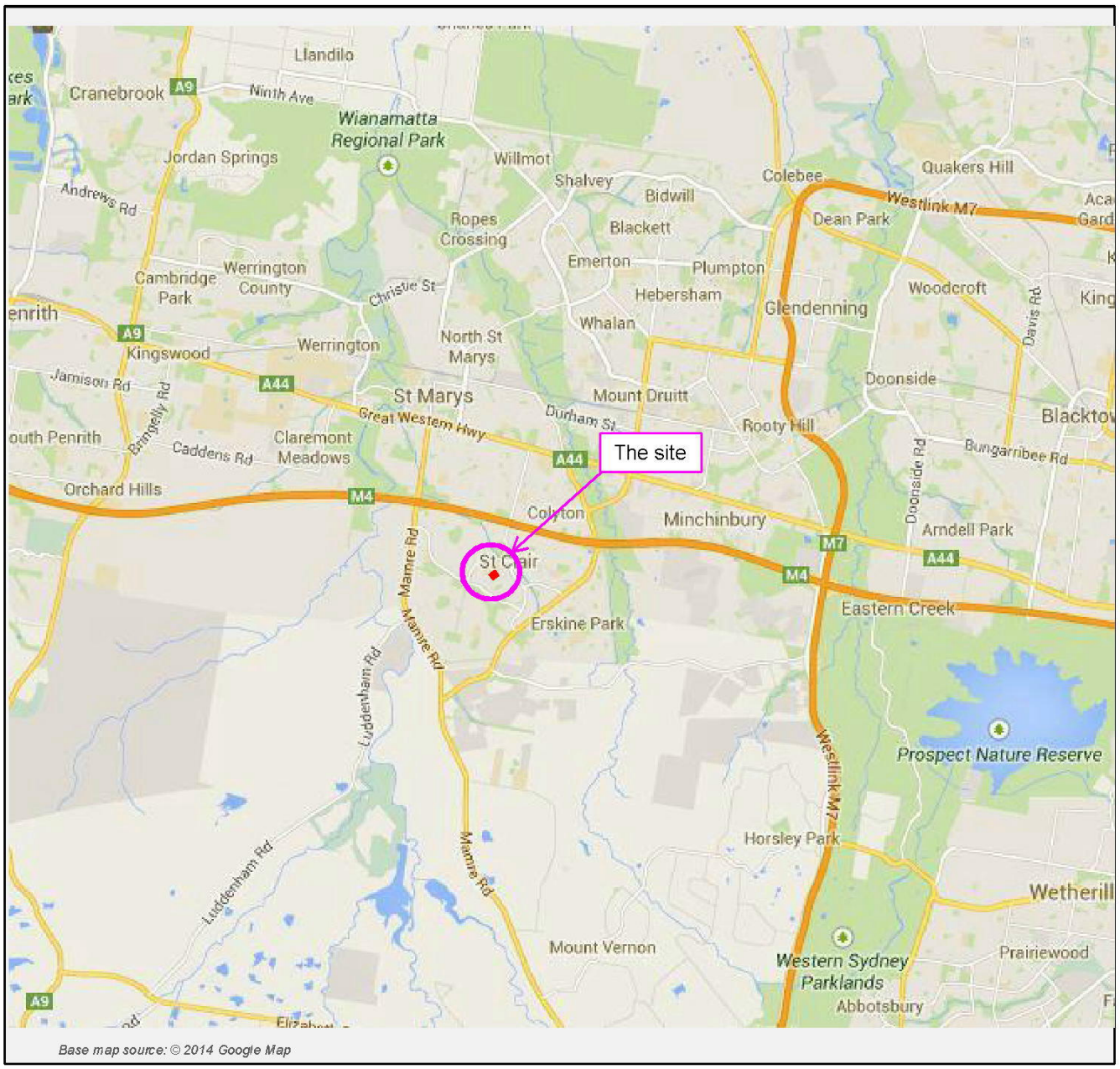
The scope of services did not include any assessment of the title to nor ownership of the properties, buildings and structures referred to in the report, nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

Appendix A

Figures

PROJECT: REMEDIATION ACTION PLAN – UPSS REPLACEMENT
SITE: 7-ELEVEN ST CLAIR (STORE ID: 2277)
ADDRESS: 4 ENDEAVOUR AVENUE, ST CLAIR, NSW

PARSONS BRINCKERHOFF

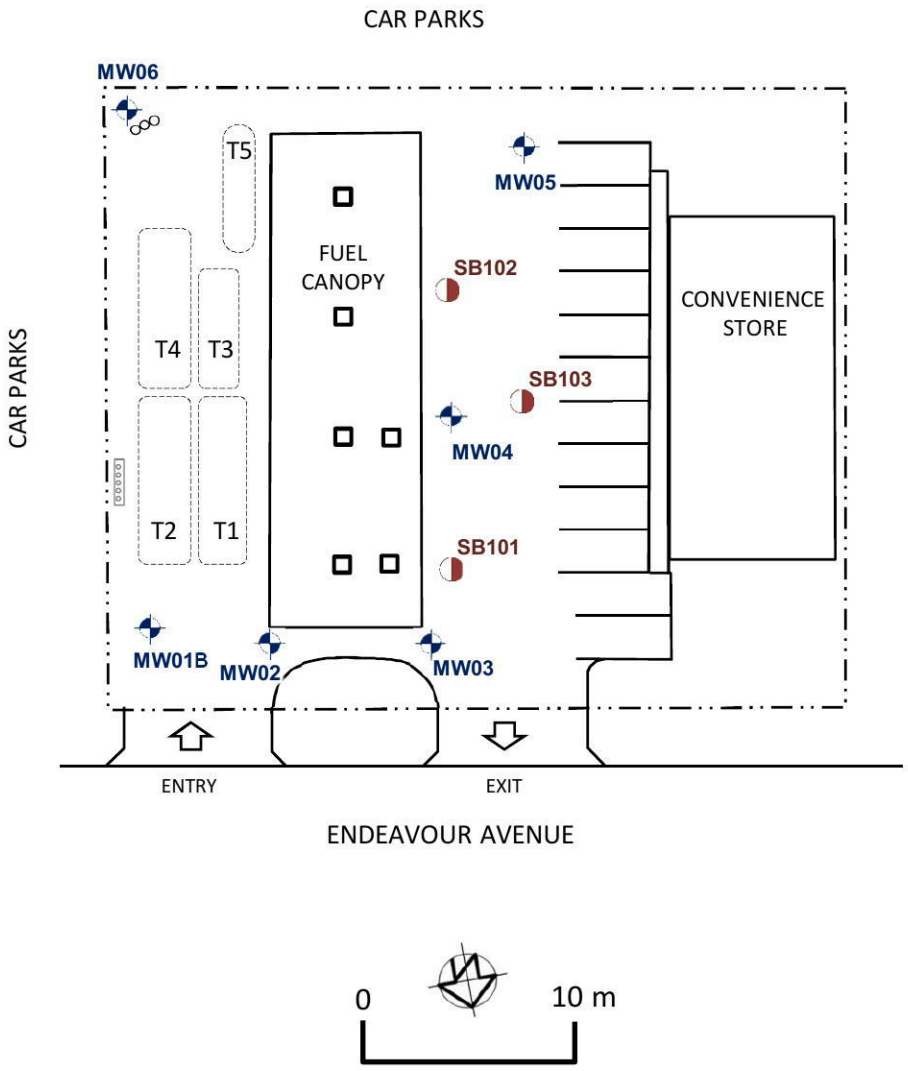


0 1 2
kilometres

Site location plan
Figure 1

PROJECT: REMEDIATION ACTION PLAN – UPSS REPLACEMENT
SITE: 7-ELEVEN ST CLAIR (STORE ID:2277)
ADDRESS: 4 ENDEAVOUR AVENUE, ST CLAIR, NSW

PARSONS BRINCKERHOFF



LEGEND

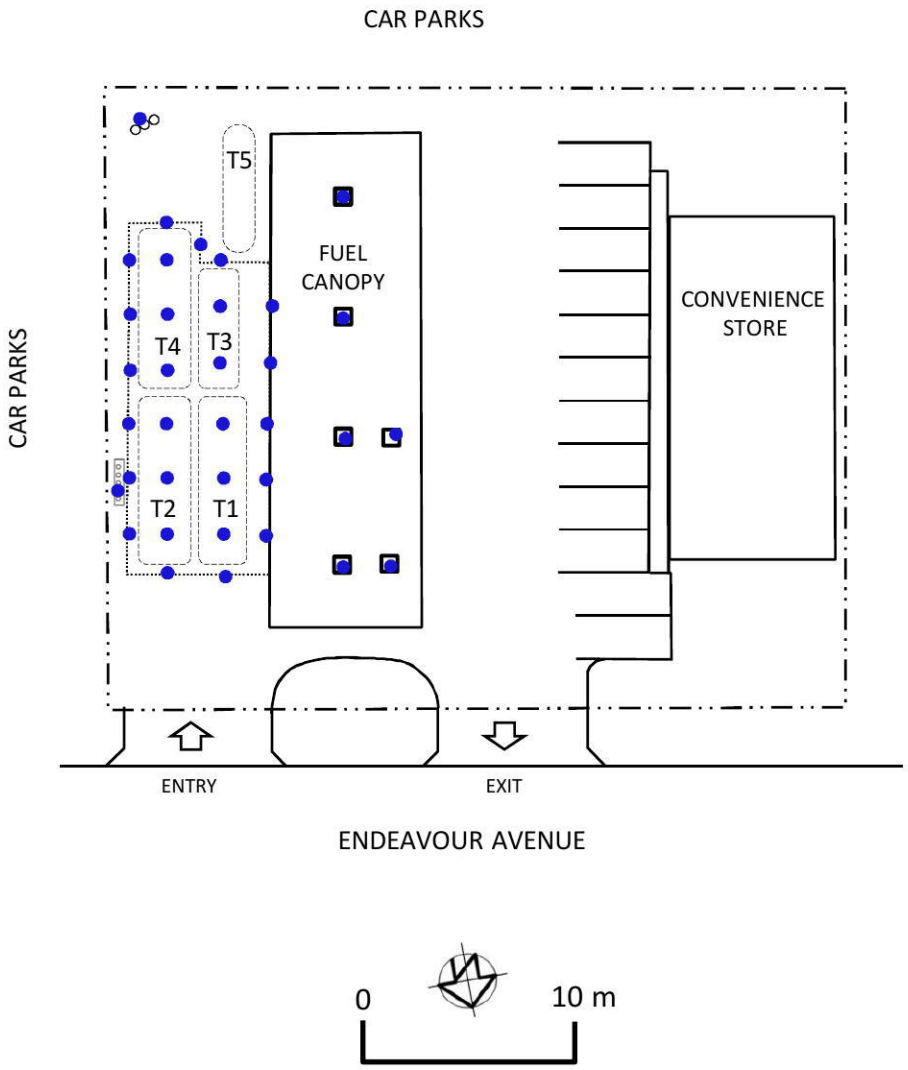
- Site (service station property) boundary
- Underground storage tanks
- Fill points
- Vent
- MW01 — Groundwater monitoring wells
- SB1 — Soil bores

TANK	CAPACITY (kL)	PRODUCT
T1	54.8	E10
T2	54.8	DIESEL
T3	20.9	PULP 98
T4	54.8	ULP
T5	30	LPG

Figure 2
Historical sampling locations

PROJECT: REMEDIATION ACTION PLAN – UPSS REPLACEMENT
SITE: 7-ELEVEN ST CLAIR (STORE ID:2277)
ADDRESS: 4 ENDEAVOUR AVENUE, ST CLAIR, NSW

PARSONS BRINCKERHOFF



LEGEND

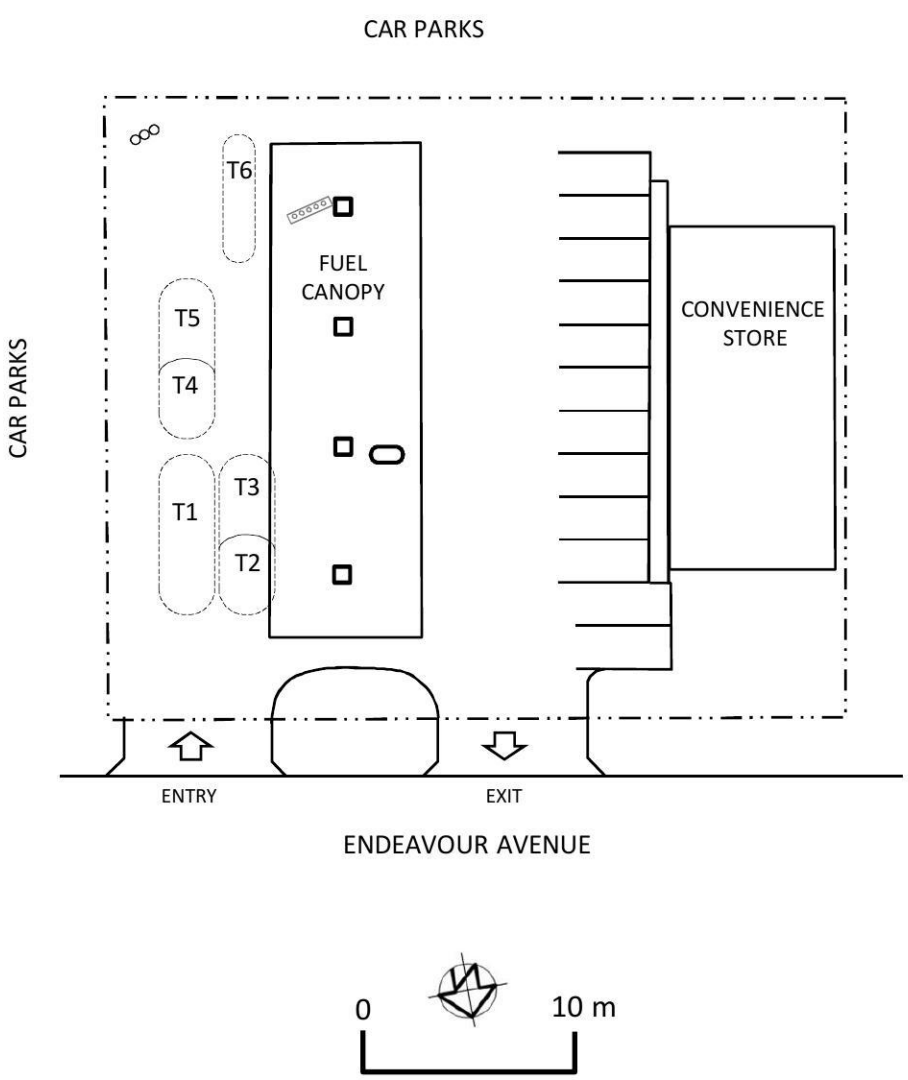
- Site (service station property) boundary
- Underground storage tanks
- Fill points
- Vent
- Proposed sampling locations (note: additional samples may be required for fuel lines)
- Approximate extent of excavation

TANK	CAPACITY (kL)	PRODUCT
T1	54.8	E10
T2	54.8	DIESEL
T3	20.9	PULP 98
T4	54.8	ULP
T5	30	LPG

Figure 3
Proposed soil validation sampling locations

PROJECT: REMEDIATION ACTION PLAN – UPSS REPLACEMENT
SITE: 7-ELEVEN ST CLAIR (STORE ID:2277)
ADDRESS: 4 ENDEAVOUR AVENUE, ST CLAIR, NSW

PARSONS BRINCKERHOFF



LEGEND

- Site (service station property) boundary
- Underground storage tanks
- Fill points
- Vent
- New multi product fuel dispenser
- New LPG dispenser

TANK	CAPACITY (kL)	PRODUCT
T1	60	ULP
T2	30	E10
T3	30	PULP 95
T4	30	PULP 98
T5	30	DIESEL
T6	30	AUTOGAS

Figure 4
Proposed site layout (after UPSS replacement)

Appendix B

Historical soil and groundwater results

Table 1 Historical soil results

7-Eleven St Clair Service Station (Store ID: 2277)

4 Endeavour Avenue, St Clair

Well ID	Depth (mBGL)	Date	TPH C_6-C_9	TPH C_{10}-C_{14}	TPH C_{15}-C_{28}	TPH C_{29}-C_{36}	TPH C10-C_{36}	Benzene	Toluene	Ethylbenzene	Xylene (Total)	Lead	Total PAH
SB101	0.25-0.35	28/03/2012	<10	<50	210	100	310	<0.2	<0.5	<0.5	<0.5	97	5.6
SB102	0.5-0.6	28/03/2012	<10	<50	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	18	<0.5
	1.9-2.0	28/03/2012	<10	<50	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	16	<0.5
SB103	1.0-1.1	28/03/2012	<10	<50	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	16	<0.5
	1.9-2.0	28/03/2012	<10	<50	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	28	<0.5
MW06	2.0-2.1	28/03/2012	<10	<50	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	23	<0.5
	3.8-3.9	28/03/2012	<10	<50	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	19	<0.5
Soil investigation level[1]													
HSL-D in sand at depths of 0 to < 1 m			-	-	-	-	-	3	NL	NL	230	-	-
HSL-D in sand at depths of 1 to < 2 m			-	-	-	-	-	3	NL	NL	NL	-	-
HSL-D in sand at depths of 2 to < 4 m			-	-	-	-	-	3	NL	NL	NL	-	-
Health investigation level			-	-	-	-	-	-	-	-	-	1,500	4,000

Notes:

Concentrations expressed in mg/kg

[1] NEPM (2013) *Schedule B1 - Investigation levels for soil and groundwater*

Table 2 Historical groundwater results

7-Eleven St Clair Service Station (Store ID: 2277)

4 Endeavour Avenue, St Clair

Well ID	Date	Depth to water (mBTOC)	TPH C_6-C_9	TPH C_{10}-C_{14}	TPH C_{15}-C_{28}	TPH $C2_9$-C_{36}	F1 (TPH C_6-C_{10} less BTEX)	F2 (TPH >C_{10}-C_{16} less naphthalene)	F3 (TPH >C_{16} to C_{34})	F4 (TPH >C_{34}-C_{40})	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene (Total)	Naphthalene	Lead	Total PAH
MW01B	10/6/2010	-	<20	<50	<100	<50	-	-	-	-	<1	<5	<2	-	-	<2	-	<1	<0.5
	6/9/2011	2.512	<20	<50	<100	<50	-	-	-	-	<1	<5	<2	-	-	<2	-	<1	<0.5
	4/4/2012	1.941	-	-	-	-	<20	<50	790	660	2	<2	<2	-	-	<2	1.1	<10	3.6
	16/11/2012	2.467	-	-	-	-	<20	<100	<100	<100	<1	<2	<2	-	-	<2	<5	-	-
	22/5/2013	2.311	-	-	-	-	170	250	<100	<100	248	7	2	-	-	13	<5	-	<1
MW02	10/6/2010	-	<20	<50	<100	<50	-	-	-	-	<1	<5	<2	-	-	<2	-	<1	<0.5
	6/9/2011	2.724	<20	<50	<100	<50	-	-	-	-	<1	<5	<2	-	-	<2	-	<1	<0.5
	4/4/2012	2.518	-	-	-	-	<20	<50	<100	<50	<1	<2	<2	-	-	<2	<1	<10	<1
	16/11/2012	2.924	-	-	-	-	<20	<100	<100	<100	<1	<2	<2	-	-	<2	<5	-	-
	22/5/2013	2.573	-	-	-	-	<20	<100	<100	<100	<1	<2	<2	-	-	<2	<5	-	<1
MW03	10/6/2010	-	<20	<50	<100	<50	-	-	-	-	<1	<5	<2	-	-	<2	-	<1	<0.5
	6/9/2011	3.512	<20	<50	<100	<50	-	-	-	-	<1	<5	<2	-	-	<2	-	<1	<0.5
	4/4/2012	2.743	-	-	-	-	<20	<50	<100	<50	<1	<2	<2	-	-	<2	<1	<10	1.1
	16/11/2012	2.373	-	-	-	-	<20	<100	<100	<100	<1	<2	<2	-	-	<2	<5	-	-
	22/5/2013	2.304	-	-	-	-	<20	170	<100	<100	<1	<2	<2	-	-	<2	<5	-	<1
MW04	10/6/2010	-	<20	<50	<100	<50	-	-	-	-	<1	<5	<2	-	-	<2	-	<1	<0.5
	6/9/2011	2.544	<20	<50	<100	<50	-	-	-	-	<1	<5	<2	-	-	<2	-	1	<0.5
	4/4/2012	2.218	-	-	-	-	<20	<50	<100	<50	<1	<2	<2	-	-	<2	1.8	<10	3.3
	16/11/2012	2.534	-	-	-	-	<20	<100	<100	<100	<1	<2	<2	-	-	<2	<5	-	-
	22/5/2013	2.041	-	-	-	-	<20	<100	<100	<100	<1	<2	<2	-	-	<2	<5	-	<1
MW05	10/6/2010	-	<20	<50	<100	<50	-	-	-	-	<1	<5	<2	-	-	<2	-	<1	<0.5
	6/9/2011	-	<20	<50	<100	<50	-	-	-	-	<1	<5	<2	-	-	<2	-	1	<0.5
	4/4/2012	2.269	-	-	-	-	<20	<50	<100	<50	<1	<2	<2	-	-	<2	<1	<10	<1
	16/11/2012	2.626	-	-	-	-	<20	<100	<100	<100	<1	<2	<2	-	-	<2	<5	-	-
	22/5/2013	1.994	-	-	-	-	<20	<100	<100	<100	<1	<2	<2	-	-	<2	<5	-	<1
MW06	4/4/2012	2.753	-	-	-	-	<20	<50	<100	<50	<1	<2	<2	-	-	<2	2.7	<10	4
	16/11/2012	3.333	-	-	-	-	<20	<100	<100	<100	<1	<2	<2	-	-	<2	<5	-	-
	22/5/2013	3.039	-	-	-	-	<20	<100	<100	<100	<1	<2	<2	-	-	<2	<5	-	<1
Groundwater assessment criteria																			
[1] Freshwater ecosystem			-	-	-	-	-	-	-	-	950	180	80	275	300	-	-	3.4	-
[2] Recreational water quality			-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-

Notes:

Concentrations expressed in µg/L

[1] NEPM (2013) S*chedule B1 - Investigation levels for soil and groundwater*

[1] ANZECC (2000) *Fresh and Marine Water Quality Guidelines – trigger values for 95% protection level of freshwater ecosystem*

[2] ANZECC (2000) *Fresh and Marine Water Quality Guidelines – guidelines for recreational water quality and aesthetics*

Appendix C

Dangerous Good Search -

information provided by NSW WorkCover

WorkCover NSW
92–100 Donnison Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
T 02 4321 5000 F 02 4325 4145
Customer Service Centre 13 10 50
DX 731 Sydney workcover.nsw.gov.au

Our Ref: D14/083058
Your Ref: Yung Kho

8 July 2014

Attention: Yung Kho
Parsons Brinckerhoff Australia Pty Ltd
GPO BOX 5394
Sydney NSW 2001

Dear Ms Kho,

RE SITE: 4 Endeavour Ave St Clair NSW

I refer to your site search request received by WorkCover NSW on 26 June 2014 requesting information on licences to keep dangerous goods for the above site.

Enclosed are copies of the documents that WorkCover NSW holds on Dangerous Goods Licence 35/027486 relating to the storage of dangerous goods at the above-mentioned premises, as listed on the Stored Chemical Information Database (SCID).

If you have any further queries please contact the Dangerous Goods Licensing Team on (02) 4321 5500.

Yours Sincerely

Brent Jones
Senior Licensing Officer
Dangerous Goods Notification Team

Notification of dangerous goods on premises DG – 01

1. APPLICATION TYPE (Select only one box)

☐ New site $100 fee applies.

☒ Further notification To be supplied every 12 months – $100 fee applies.

☐ New occupier of an existing dangerous goods notifiable site (where the notification has expired) $100 fee applies.

Please provide the following for a further notification or, if you are a new occupier of an existing dangerous goods notifiable site.

Acknowledgement number for the site (if known)
35/NDG0274856

Expiry date (DD/MM/YYYY)
/ / or the site address

Street number/street name (include Lot or DP number if applicable)
4

Street name
Endeavour Avenue

Suburb
St Clair

State
NSW

Postcode
2759

2. SITE OCCUPIER'S DETAILS (person in control of the site)

Required for a new site or a new occupier of an existing dangerous goods notifiable site (where the notification period has expired). It is only required for a further notification where details have changed.

2.1 Individual occupier

Title

Family/Surname

Given name

Other names

Date of birth (DD/MM/YYYY)
/ /

Daytime contact number

Mobile number

Fax number

Email

Please go to section 2.4

2.2 Corporation occupier

Legal name
7-Eleven Stores Pty Ltd

Registered business (trading name)
7-Eleven #2277 St Clair

ABN
48-005-299-427

Please go to section 2.3

If space is insufficient please provide details on a separate sheet of paper.

6. STORAGE DETAILS (must be completed for both new notifications and further notifications)

Storage facility identifier: 1
Type of storage facility: Underground Storage Tank
Class or division: 3
Maximum storage capacity: 54800
Unit (L or kg or number): L

UN number	Class or division	Typical quantity	Unit (L or kg or number)	Packing group
1203	3	54800	L	II

Proper shipping name: Petrol

Product or common name: E10 Unleaded

Storage facility identifier: 2
Type of storage facility: Underground Storage Tank
Class or division: C1
Maximum storage capacity: 54800
Unit (L or kg or number): L

UN number	Class or division	Typical quantity	Unit (L or kg or number)	Packing group
00C1	C1	52000	L	- -

Proper shipping name: Combustible Liquids

Product or common name: Diesel

Storage facility identifier: 3
Type of storage facility: Underground Storage Tank
Class or division: 3
Maximum storage capacity: 26000
Unit (L or kg or number): L

UN number	Class or division	Typical quantity	Unit (L or kg or number)	Packing group
1203	3	24600	L	II

Proper shipping name: Petrol

Product or common name: Premium Unleaded

Storage facility identifier: 4
Type of storage facility: Underground Storage Tank
Class or division: 3
Maximum storage capacity: 54800
Unit (L or kg or number): L

UN number	Class or division	Typical quantity	Unit (L or kg or number)	Packing group
1203	3	52000	L	II

Proper shipping name: Petrol

Product or common name: Regular Unleaded

Notification of dangerous goods on premises

DG – 01

If space is insufficient please provide details on a separate sheet of paper.

6. STORAGE DETAILS (must be completed for both new notifications and further notifications)

Storage facility identifier: 5

Type of storage facility: Underground Storage Tank

Class or division: 2.1

Maximum storage capacity: 30000

Unit (L or kg or number): L

UN number: 1075

Class or division: 2.1

Typical quantity: 25500

Unit (L or kg or number): L

Packing group: --

Proper shipping name: Petroleum Gases Liquified

Product or common name: Automotive LPG

Storage facility identifier: 6

Type of storage facility: Cylinder Store

Class or division: 2.1

Maximum storage capacity: 920

Unit (L or kg or number): L

UN number: 1075

Class or division: 2.1

Typical quantity: 920

Unit (L or kg or number): L

Packing group: --

Proper shipping name: Petroleum Gas Liquified

Product or common name: Cylinder LPG

Storage facility identifier:

Type of storage facility:

Class or division:

Maximum storage capacity:

Unit (L or kg or number):

UN number:

Class or division:

Typical quantity:

Unit (L or kg or number):

Packing group:

Proper shipping name:

Product or common name:

Storage facility identifier:

Type of storage facility:

Class or division:

Maximum storage capacity:

Unit (L or kg or number):

UN number:

Class or division:

Typical quantity:

Unit (L or kg or number):

Packing group:

Proper shipping name:

Product or common name:

#121

Licence No. 35/027486

APPLICATION FOR RENEWAL

OF LICENCE TO KEEP DANGEROUS GOODS

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE DANGEROUS GOODS ACT, 1975 AND REGULATION THEREUNDER

DECLARATION: Please renew licence number 35/027486 to 2/12/2005 . I confirm that all the licence details shown below are correct (amend if necessary).

Russell Davis ..... Russell Davies 28/10/04

(Signature) *(Please print name)* *(Date signed)*

for: STRASBURGER ENTERPRISES (PROPERTIES) PTY LIMITED

*THIS **SIGNED** DECLARATION SHOULD BE **RETURNED TO:***

WorkCover New South Wales
Dangerous Goods Licensing Section
LOCKED BAG 2906
LISAROW NSW 2252

Enquiries:ph (02) 43215500
fax (02) 92875500

Details of licence on 15 October 2004

Licence Number 35/027486 **Expiry Date** 2/12/2004

Licensee STRASBURGER ENTERPRISES (PROPERTIES) PTY LIMITED ACN 002 913 911
QUIX FOOD STORES

Postal Address: QUIX FOOD STORES P O BOX 1707 COLLINGWOOD VIC 3066

Licensee Contact LICENCE RENEWAL (ACCOUNTING DEPT)

Premises Licensed to Keep Dangerous Goods
STRASBURGER ENTERPRISES (PROPERTIES) PTY LIMITED QUIX FOOD STORES
ENDEAVOUR AVE ST CLAIR 2759

4 20/1/05

Nature of Site AUTOMOTIVE FUEL RETAILING

Major Supplier of Dangerous Goods MOBIL

Emergency Contact for this Site DUTY MANAGER Ph. 9628 4055

Site staffing 24 HRS 7 DAYS

Details of Depots

Depot No.	Depot Type	Goods Stored in Depot	Qty
1	**UNDERGROUND TANK**	**Class 3**	**54800 L**
	UN 1203 PETROL		54800 L
2	**UNDERGROUND TANK**	**Class 3**	**54800 L**
	UN 1203 PETROL		54800 L
3	**UNDERGROUND TANK**	**Class 3**	**20900 L**
	UN 1203 PETROL		20900 L
4	**UNDERGROUND TANK**	**Class 3**	**54800 L**
	UN 1203 PETROL		54800 L
5	**UNDERGROUND TANK**	**Class 2.1**	**30000 L**
	UN 1075 PETROLEUM GASES, LIQUEFIED		30000 L
6	~~DECANTING~~ **CYLINDER(S)** STORE	**Class 2.1**	~~190~~ **KG** 180 KG
	UN 1075 PETROLEUM GASES, LIQUEFIED		~~190~~ KG 180

Application for Licence to Keep Dangerous Goods

WORKCOVER NEW SOUTH WALES

4/2/99

Application for ☐ new licence ☑ amendment ☐ transfer ☐ renewal of expired licence

PART A – Applicant and site information
See page 2 of Guidance Notes.

1 Name of applicant: STRASBURGER ENTERPRISES (PROPERTIES) P/L. — ACN: 000 913 911

2 Postal address of applicant: BAG 19 — Suburb/Town: SEVEN HILLS. — Postcode: 1730

3 Trading name or site occupier's name: QUIX - ST CLAIR

4 Contact for licence inquiries — Phone: 98387499. — Fax: 9624 2878 — Name: REGIONAL MANAGER

5 Previous licence number (if known): 35/ 027486

6 Previous occupier (if known):

7 Site to be licensed — No: 121 — Street: ENDEAVOR AVE.

Suburb / Town: ST CLAIR — Postcode: 2759.

8 Main business of site: SERVICE STATION.

9 Site staffing: Hours per day: 24 — Days per week: 7

10 Site emergency contact — Phone: 96284055 — Name: DUTY MANAGER

11 Major supplier of dangerous goods: MOBIL OIL

12 If a new site or for amendments to depots – see page 4 of Guidance Notes.

Plan stamped by: Name of Accredited Consultant: PHIL KOMM. — Date stamped: 21-9-98.

RECEIVED 8 OCT 1998 SCIENTIFIC SERVICES

DATA ENTERED 23 NOV 1998

I certify that the details in this application (including any accompanying computer disk) are correct and cover all licensable quantities of dangerous goods kept on the premises.

13 Signature of applicant: [signature] — Printed name: CHRISTINE COOK — Date: 16.9.98.

Please send your application, marked *CONFIDENTIAL*, to:

Dangerous Goods Licensing, Level 3, Locked Bag 10, Clarence Street, SYDNEY NSW 2000

What is a depot? See page 5 of the Guidance Notes.

PART C – Dangerous Goods Storage *Complete one section per depot.*

If you have more depots than the space provided, photocopy sufficient sheets first.

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity
1	UNDERGROUND TANK	3	54,800 LITRES

UN Number	Proper Shipping Name	PG Class (I, II, III)		Product or common name	Typical quantity	Unit, e.g. L, kg, m³
1203	PETROL	3	II	PETROL	54,800	L.

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity
2	UNDERGROUND TANK	3.	54,800 LITRES.

UN Number	Proper Shipping Name	PG Class (I, II, III)		Product or common name	Typical quantity	Unit, e.g. L, kg, m³
1203	PETROL	3	II	PETROL	54,800	L

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity
3	UNDERGROUND TANK	3.	20,900 LITRES

UN Number	Proper Shipping Name	PG Class (I, II, III)		Product or common name	Typical quantity	Unit, e.g. L, kg, m³
1203	PETROL	3	II	PETROL	20,900	L

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity
4	UNDERGROUND TANK	3	54,800 LITRES.

UN Number	Proper Shipping Name	PG Class (I, II, III)		Product or common name	Typical quantity	Unit, e.g. L, kg, m³
1203.	PETROL	3	II	PETROL	54,000	L.

P.T.O

What is a depot? See page 5 of the Guidance Notes.

PART C – Dangerous Goods Storage *Complete one section per depot.*

If you have more depots than the space provided, photocopy sufficient sheets first.

Add

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity
5	UNDERGROUND TANK	2.1	30,000 LITRES.

UN Number	Proper Shipping Name	PG Class (I, II, III)		Product or common name	Typical quantity	Unit, e.g. L, kg, m³
1075	LIQUEFIED PETROLEUM GAS	2.1		L.P. GAS.	30,000	L.

Add

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity
6	DECANTING CYLINDER	2.1	190 KG.

UN Number	Proper Shipping Name	PG Class (I, II, III)		Product or common name	Typical quantity	Unit, e L, kg, m
1075	LIQUEFIED PETROLEUM GAS	2.1		L.P. GAS	150	KG

Form 3I

I

LICENCE No.
35 027484

WORKCOVER AUTHORITY
DANGEROUS GOODS ACT, 1975

APPLICATION FOR LICENCE (~~or AMENDMENT or TRANSFER of LICENCE~~)*
FOR THE KEEPING OF DANGEROUS GOODS

31 JUL 1991 ... BRANCH

(* Delete whichever is not required)

Name of Applicant in full (see Item 1 - Explanatory notes - page 4)	Strasburger Enterprises (Properties) Pty Ltd.
Trading name or occupier's name (if any)	Strasburger Enterprises (Properties) Pty Ltd.
Postal Address	Unit 7A 30 Foundry Rd, Seven Hills Postcode 2147.
Address of the premises to be licensed. (Including Street No.)	Endeavour Avenue, St Clair. Postcode 2759.
Nature of premises (See Item 2 - Explanatory notes - page 4)	Service Stations
Telephone number of applicant	STD Code 02 Number 838 7499

Particulars of type of depots and maximum quantities of dangerous goods to be kept at any one time.

Depot number	Type of depot (See item 3 - Explanatory notes - page 4)	Storage capacity	Dangerous goods Product being stored	C & C Office use only
1	Underground tank	55,000	Flammable liquids	
2	Underground tank	55,000	Flammable liquids	
3	Underground tank	55,000	Flammable liquids	
4	Underground tank	25,000	Flammable liquids.	
5				
6		SEEN		
7			Data Entered	
8			03 Dec 91	
9				Metro West
10		G.M.Burt 21/8/91		SEEN
11		SIGNATURE		[signature]
12				Date 15/5/92

Has site plan been approved by the Dangerous Goods Branch? ~~Yes~~ No — If yes, no plans required. If no, please attach site plan, or provide sketch plan overleaf. which has bee checked by an accredited consultant

Have premises previously been licensed? ~~Yes~~ No — If, yes, state name of previous occupier, and licence No. (if known)

Name of oil company supplying flammable liquid (if applicable). MOBIL OIL AUSTRALIA LTD.

Signature of applicant [signature] Date 29-7-91.

For external explosives magazine(s), please fill in page 3.

FOR OFFICE USE ONLY

CERTIFICATE OF INSPECTION

I, ... being an Inspector under the Dangerous Goods Act, 1975, do hereby certify that the premises described above do comply with the requirements of the Dangerous Goods Act, 1975, and the Dangerous Goods Regulation with regard to their situation and construction for the keeping of dangerous goods of the nature and in the quantity specified.

Date ....

STATEMENT OF ENVIRONMENTAL EFFECTS

REPLACEMENT OF EXISTING UNDERGROUND FUEL TANKS, NEW FUEL DISPENSERS AND ASSOCIATED WORKS INCLUDING SITE REMEDIATION AT EXISTING 7-ELEVEN SERVICE STATION

4 ENDEAVOUR AVENUE, ST CLAIR (LOT 1 AND 2 DP 1018519 AND LOT 4021 DP 851358)

NOVEMBER 2014

Prepared by
Milestone (AUST) Pty Limited

Contacts
Lisa Bella Esposito

Development Management
Town Planning

MILESTONE (AUST) PTY LIMITED
ABN 29 123 048 162

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MILESTONE CONSTRUCTION (AUST) PTY LIMITED
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APPENDICES

1. INTRODUCTION

1.1 Introduction

This Statement of Environmental Effects (SEE) has been prepared for Convenience Properties (Operations) Pty Ltd (7-Eleven Stores) by Milestone (AUST) Pty Limited (Milestone) to accompany a Development Application to Penrith City Council (Council) for the replacement of underground fuel storage tanks and fuel dispensers and associated works including site remediation at the 7-Eleven Service Station located at 4 Endeavour Avenue, St Clair (the site).

The replacement of the existing fuel infrastructure with new fuel tanks is essential to the ongoing operation of the site as a 7-Eleven Service Station. Replacement of the underground fuel tanks is a critical and an essential upgrade to ensure the continued safe operation of the site and provides positive environmental outcomes for the site.

The proposal will not alter the existing convenience store building, vehicle access points or any operational aspects of the 7-Eleven Service Station.

This report has been prepared with reference to the following:

- Site Analysis and Development Plans prepared by Hazkem (Appendix A), including:
  - Drawing List, Drawing No. HAZ-1905 dated 7 November 2014;
  - General Notes, Drawing No. HAZ-1905-S01, Revision 0 dated 7 November 2014;
  - Existing Conditions Plan, Drawing No. HAZ-1905-A01, Revision 1 dated 27 November 2014;
  - Demolition Plan, Drawing No. HAZ-1905-A02, Revision 0 dated 7 November 2014;
  - Proposed Site Plan, Drawing No. HAZ-1905-A03, Revision 2 dated 27 November 2014;
  - Tanker Path Layout, Drawing No. HAZ-1905-A04, Revision 2 dated 27 November 2014;
  - Erosion and Sediment Control Plan, Drawing No. HAZ-1905-A05, Revision 2 dated 27 November 2014;
  - LPG System Layout, Drawing No. HAZ-1905-G01, Revision 2 dated 27 November 2014;
  - Population and Exclusion Zones, Drawing No. HAZ-1905-G02, Revision 1 dated 19 November 2014;
  - Fuel System Layout, Drawing No. HAZ-1905-T01, Revision 2 dated 27 November 2014;
  - Electrical Conduit Layout, Drawing No. HAZ-1905-E01, Revision 2 dated 27 November 2014;
  - Forecourt Drainage Layout, Drawing No. HAZ-1905-E02, Revision 1 dated 19 November 2014;
  - Concrete Replacement Plan, Drawing No. HAZ-1905-C01, Revision 2 dated 27 November 2014; and
  - Hazardous Area Layout, Drawing No. HAZ-1905-HZ01, Revision 2 dated 27 November 2014.
- Waste Management Plan for Construction prepared by Milestone dated November 2014 (Appendix B).
- Hazardous and Offensive Development Risk Screening Document and Preliminary Hazard Analysis prepared by Hazkem Pty Ltd, dated November 2014.
- Environmental Site Assessment Report prepared by Parsons Brinckerhoff Australia Pty Limited dated 3 May 2012.
- Remediation Action Plan for UPSS Replacement prepared by Parsons Brinckerhoff Australia Pty Limited, Revision A dated 17 November 2014.

This report provides an overview of the site and its context, a detailed description of the proposed development, the planning framework and an environmental assessment of the development.

2. THE SITE

2.1 Site Description

The land is known as 4 Endeavour Avenue, St Clair, and comprises three lots (Lot 1 and 2 DP 1018519 and Lot 4021 DP 851358) with a total area of 3.2 hectares. The site has a frontage to Endeavour Avenue, Bennett Road and Botany Lane of 204m, 83m and 406m respectively.

Currently existing on the site is the St Clair Shopping Centre, a Red Rooster and a 7-Eleven Service Station (Lot 4021 DP 851358) (the subject site). The 7-Eleven Service station comprises associated convenience store, 6 fuel dispensers and business identification signage. A single canopy structure supported by metal pylons covers the fuel dispensers located in the fuel forecourt area. The 7-Eleven Service Station has separate vehicle entry and exit points to Endeavour Avenue.

The site is not a heritage item nor is it identified within a heritage conservation area within Interim Development Order No. 75 – City of Penrith (IDO 75).

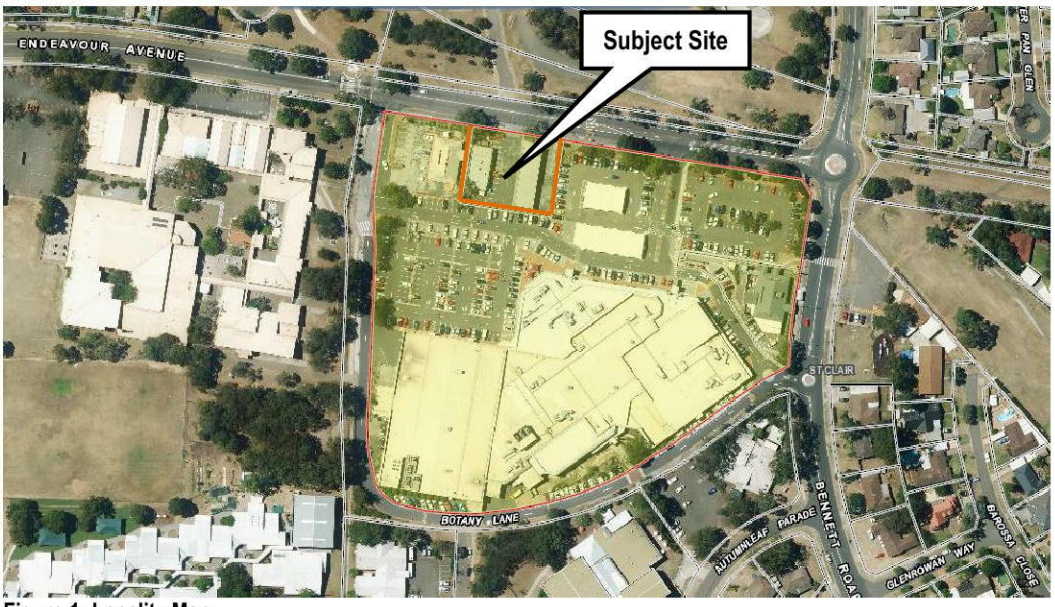

Figure 1: Locality Map
Source: SixMaps 2014

2.2 Site Context

The site is situated within an established commercial precinct to the south of Endeavour Avenue. Endeavour Avenue is a two lane road running in an east west direction.

Endeavour Avenue directly abuts the site's northern boundary with Bynes Creek and Mark Leece Sporting Complex beyond. Bennet Road with the St Clair Out of Hours Care beyond is located to the east of the site.

Botany Lane directly abuts the site's southern and western boundary. The St Clair Leisure Centre is located to the south and St Clair High School and St Clair Primary school located to the west of the site, beyond Botany Lane.

The nearest residential premises are located along Edmund Blackett Close approximately 140m to the west of the site, on the opposite side of Endeavour Avenue.

2.3 Site Development History

Council approved Development Consent No. DA970128 on 15 July 1997 for the use as a Service Station.

3. DESCRIPTION OF THE PROPOSAL

3.1 Overview

The proposed development includes the replacement of existing underground fuel storage tanks with new underground tanks as well as the replacement of the existing fuel dispensers with new fuel dispensers. The proposal results in an overall reduction in the number of tanks at the site from five separate tanks to four tanks comprising six new consolidated chambers.

Following removal of the four existing underground tanks from the east of the site, the site will be cleared of all excavated soil and waste. Three new consolidated tanks have been strategically positioned closely together to ensure any potential future contamination of the site is limited.

The proposal will include:

- Removal of existing six fuel dispensers (comprising of twelve refuelling stations) from under the existing canopy;
- Removal of associated fuel infrastructure including removal of existing fuel fill box and existing fuel vents at the eastern boundary of the site;
- Excavation, decommissioning and removal of four underground fuel storage tanks at the east of the site;
- Removal of excavated soil material from the site and on-site remediation works (refer to Section 4.1.3 of this SEE);
- Installation of three new consolidated underground fuel storage tanks, five new fuel dispensers (comprising ten refuelling stations), fuel fill point and one new grated pits under the existing canopy and new fuel vents to the southern site boundary;
- Installation of one new 2,500L Concrete Collection Pit;
- Installation of new Oil and Water Separator to the north of the existing convenience store building within the existing colourbond enclosure;
- New bunding to fuel forecourt under existing canopy; and
- Associated infrastructure works and commissioning of new fuel tanks and new fuel infrastructure.

All proposed works are illustrated on the Development Plans prepared by Hazkem held at Appendix A.

3.2 Schedule of Underground Fuel Storage Tanks

3.2.1 Existing Tanks

A total of four underground tanks are proposed to be removed. The underground fuel storage tanks proposed to be removed are annotated on the plans as tanks T1, T2, T3 and T4.

Details of the existing tanks are as follows:

Tank No.	Tank Size (litres)	Product	Proposal
T1	54,800	Ethanol 10	Removed
T2	54,800	Diesel	Removed
T3	20, 900	PULP 98	Removed
T4	54,800	ULP	Removed
T5	30,000	LPG	Retained

3.2.2 Proposed Tanks

The four existing underground fuel storage tanks will be replaced by three new tanks, which will consist of five internally separated tank chambers (Tanks T1, T2, T3, T4 and T5). Details of the proposed new tanks are as follows:

Tank No.	Tank Size (litres)	Product
T1	60,000	ULP
T2	30,000	Ethanol10
T3	30,000	PULP 98
T4	30,000	PULP 95
T5	30,000	Diesel

3.3 Fuel Dispensers

The existing six fuel dispensers under the canopy (comprising twelve refuelling stations) will be removed and replaced with five fuel dispensers (comprising ten refuelling stations). The new multiproduct fuel dispensers will provide ULP, E10, Pulp 95/98 and diesel product.

Fuel dispensers currently located on site are located such that refuelling vehicles are oriented in a west facing direction whilst refuelling and the proposed fuel dispensers will be orientated to allow vehicles to continue to face in a west direction.

3.4 Installation

The replacement of the existing underground fuel tanks will require the excavation of the service station fuel forecourt and removal of existing fuel dispensers. The decommissioning and removal of the existing tanks will take approximately 2-3 weeks.

Following removal of the existing tanks, the site will be cleared of all excavated soil and waste as required by the site remediation works. The new underground fuel tanks are pre-fabricated off-site and will be transported to the site prior to their installation. The proposed installation of the new underground fuel tanks will take approximately one week. The ancillary works and commissioning of the new tanks will take approximately 4-5 weeks.

A suitably qualified contractor will be engaged to ensure the decommissioning and removal of the existing tanks and installation of the new underground fuel tanks complies with the relevant requirements of the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2014 (UPSS Regulations 2014).

3.5 Waste Management and Maintenance

The proposal will result in the generation of waste associated with removal of existing fuel dispensers, excavation of the site and laying of new concrete to the 7-Eleven fuel forecourt following installation of the new tanks. All waste generated will be reused, recycled or disposed of. Contaminated soil will be disposed at a relevant NSW OEH licensed waste facility where required. Refer to the Waste Management Plan held at Appendix B.

The proposed new underground fuel storage tanks will not generate any waste during their use. The tank structures will be fabricated from durable and long lasting materials. Maintenance works may be undertaken by relevant contractors from time to time to ensure a high standard of performance and visual presentation will be maintained at all times.

4. STATUTORY PLANNING FRAMEWORK AND ENVIRONMENTAL ASSESSMENT

In accordance with Section 79C(1) of the Environmental Planning and Assessment Act 1979 as amended (the Act) the following section provides an appraisal of the proposed development having regard to the statutory planning instruments that apply to this site.

4.1 Environmental Planning Instruments

4.1.1 Protection of the Environment (Underground Petroleum Storage System) Regulations 2014

The UPSS Regulations 2014 outlines the legislative requirements for the modification and replacement of underground petroleum storage systems.

Clause 13 of UPSS Regulations 2014 outlines the validation report requirements for when underground fuel tanks are removed or replaced and states:

"(1) If the modification involves the removal or replacement of any tank, a modified storage system must not be commissioned unless a validation report for the storage site has been served on the relevant local authority:

(a) Except as provided by paragraph (b), no later than 60 days after the tank is removed or replaced, or

(b) If remediation of the site is required, no later than 60 days after remediation is completed."

A Validation Report will be prepared and issued to Council in accordance with Clause 13 of UPSS Regulations 2014.

4.1.2 State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

State Environmental Planning Policy No. 33 Hazardous and Offensive Development (SEPP 33) provides the guidelines for the development of potentially hazardous and offensive industry or storage.

A Multi-Level Risk Assessment prepared by Hazkem Pty Ltd (Hazkem) states that a minimum separation distance of 7.6m from the remote filling and dispenser points and the site boundaries is required for the proposed works.

Table 1: Fill Point and Dispensers Distances

Boundary	**Minimum Distances (m)**	
	Fill Point	**Dispensers**
North	29.9	8.4
West	31.2	29.4
East	11.2	13.9
South	**6.3**	**6.3**

As Table 1 demonstrates, the proposed fill point and dispensers fall within the minimum separation distance from the southern boundary and do not pass the initial screening test.

Notwithstanding, the proposed new tanks and fuel dispensers are not considered to pose a significant risk to surrounding land uses on the basis of the following key considerations:

- The replacement of the existing underground fuel tanks and fuel dispensers is a significant upgrade to aging site infrastructure and results in environmental and public safety improvements to the site.
- The continued use of the site as a service station will not result in any additional adverse impacts on the adjoining land uses.
- The type of material stored on the site is limited to fuel products for retail to the public.
- All fuel deliveries are strictly observed and controlled by delivery staff. The continued operation and use of the site as a service station will not introduce any potentially dangerous activities.

Further analysis by Hazkem, within the Hazardous and Offensive Development Screening and Preliminary Hazard Analysis, demonstrates that the societal risks of the proposed works are negligible and therefore the site is not classified as a "Potentially Hazardous Industry" within SEPP 33.

4.1.3 State Environmental Planning Policy No. 55 – Remediation of Land

Clause 7(1) of the State Environmental Planning Policy No 55 – Remediation of Land (SEPP 55) states that a Council cannot consent to development on the land unless:

- *"it has considered whether the land is contaminated;*
- *if contaminated, it is satisfied that the land in its contaminated state, or after remediation, is suitable for the proposed purpose; and*
- *if remediation is required, it is satisfied that remediation will be undertaken before the land is used for the proposed purpose."*

The Environmental Site Assessment Report dated 3 May 2012 prepared by Parsons Brinckerhoff has been submitted with the DA. The Environmental Site Assessment concluded that contaminants of potential concern were found below the laboratory limit of reporting. Further details regarding contaminant types and levels are included within the Environmental Site Assessment Report submitted as part of this DA.

Remediation at this site is classified as Category 1 Remediation Work on the basis that the site is subject to Sydney Regional Environmental Plan No. 20 – Hawkesbury Nepean River (now deemed a SEPP). Category 1 Remediation Work requires consent from Council in accordance with Clause 8(2) of SEPP 55.

Remediation work will be undertaken in accordance with the Remediation Action Plan prepared by Parsons Brinckerhoff submitted with this DA, which details the methodology for removal, remediation and disposal of underground petroleum storage system associated infrastructure. The Remediation Action Plan has been prepared to ensure that the excavated soil associated with the replacement of the existing underground fuel tanks will be appropriately managed. Further details regarding the remediation approach is outlined within the Remediation Action Plan that accompanies this DA. Remediation will be undertaken prior to the recommencement of the retail fuel use of the site.

The proposed development is therefore able to achieve compliance with SEPP 55.

4.1.3 Sydney Regional Environmental Plan No. 20 – Hawkesbury Nepean River 1997

The aim of Sydney Regional Environmental Plan No. 20 – Hawkesbury Nepean River (SREP 20) is to protect the environment of the Hawkesbury Nepean River system by ensuring that the impacts of future land uses are considered in a regional context.

Remediation of contaminated land is permitted under SREP 20 with consent. The proposed development and associated remediation works provide an important upgrade to the site which will serve to improve and protect the water quality of the Hawkesbury Nepean River System.

4.1.4 Interim Development Order No. 75 – City of Penrith

The site is subject to IDO 75. Clause 3 and 3A of IDO 75 states the following:

"3. Subject to this Order, interim development may be carried out only with the consent of the Council and the concurrence of the New South Wales Planning and Environment Commission for any purpose other than the following purposes -

Advertising structures; bulk homes; caravan parks; car repair stations; forestry; gas holders; generating works; industries (other than home industries); institutions; junk yards; liquid fuel depots; mines; motels; motor showrooms; roadside stalls; sawmills; stables; stock and sale yards; transport terminals (other than bus stations or bus depots); warehouse.

3A For the purposes of permitting, regulating, restricting or prohibiting, or conferring on the Council, powers, authorities, duties or functions with respect to permitting, regulating restricting or prohibiting interim development the land, the subject of this Order is included within Zone No. 2(d)."

The site is zoned 2(d) Residential Medium Density within IDO 75. Service stations are prohibited in the 2(d) Residential Zone and the site relies on 'existing use rights' provisions within the Act. 'Existing use' is defined in Section 106 of the Act as:

"(a) the use of a building, work or land for a lawful purpose immediately before the coming into force of an environmental planning instrument which would, but for Division 4A of Part 3 or Division 4 of this Part, have the effect of prohibiting that use, and

(b) the use of a building, work or land:

(i) for which development consent was granted before the commencement of a provision of an environmental planning instrument having the effect of prohibiting the use, and

(ii) that has been carried out, within one year after the date on which that provision commenced, in accordance with the terms of the consent and to such an extent as to ensure (apart from that provision) that the development consent would not lapse."

On 15 July 1997 Council approved a DA for the development of the service station (Development Consent No. DA970128) and the use of the site as a service station has remained active since this consent. In this regard, Council can continue to grant development consent to the proposed development as it is classified as an 'existing use' under the Act.

Clause 41 of The Environmental Planning and Assessment Regulation 2000 (the Regulation) outlines the requirements for alterations and additions to an existing use and states:

"(1) An existing use may, subject to this Division:
(a) be enlarged, expanded or intensified, or
(b) be altered or extended, or
(c) be rebuilt."

The proposed replacement of the existing underground fuel tanks and fuel dispensers is ancillary maintenance works to the service station use of the site. Therefore, in accordance with Clause 41 of the Regulations, the proposed removal and replacement of the fuel infrastructure on the site is permissible with Council's development consent.

4.1.5 Planning Proposal for Penrith City-wide Local Environmental Plan

The site is proposed to be zoned B2 Local Centre within the Planning Proposal for the Penrith City-wide Local Environmental Plan. Service stations are permissible in the B2 Local Centre Zone with Council's development consent.

4.2 Penrith Development Control Plan 2006

Part 2.1: Contaminated Land

Part 2.1 of the Penrith Development Control Plan 2006 (DCP 2006) outlines the requirements for contaminated land.

Remediation work will be undertaken in accordance with the Remediation Action Plan prepared by Parsons Brinckerhoff submitted with this DA. The Remediation Action Plan has been prepared to ensure that the excavated soil associated with the replacement of the existing underground fuel tanks will be appropriately managed. Further details regarding the remediation approach is outlined within the Remediation Action Plan that accompanies this DA. Remediation will be undertaken prior to the recommencement of the retail fuel use of the site.

A Validation Report will be prepared and issued to Council during the construction process in accordance with Clause 13 of UPSS Regulations 2014.

Part 2.9: Waste Planning

A Waste Management Plan for construction has been included with this DA (refer to Appendix B). The Waste Management Plan provides details regarding the type of waste generated by the proposal, how any waste is to be stored and/or treated on the site and how any residual waste will be dispersed.

Specific details regarding the waste contractors and disposal facilities will be prepared during the Construction Certificate stage of the project.

4.3 Section 79C(1) of the Environmental Planning and Assessment Act 1979

Section 79C(1) of the Act requires the following matters be considered in the assessment of the proposed development.

4.3.1 Impact of the development including the environmental impact of the development on both the natural and built environment and social and economic impacts on the locality.

The proposal will significantly enhance the environmental quality of the land the replacement of the existing underground fuel tanks. Site remediation works and installation of a new and more compact tank system will improve the condition of the site and will prevent any future underground contaminant soil leaching.

Appropriate runoff and erosion control measures will be implemented during all works undertaken on the site to ensure minimal environmental impacts.

New Fuel Dispensers

The proposed development includes the removal and replacement of six consolidated fuel dispensers (comprising twelve refuelling stations) and replaced with five consolidated fuel dispensers (comprising ten refuelling stations) under the existing canopy. The proposed fuel dispensers will not result in any adverse environmental impacts due to the following:

- The proposed fuel dispensers are appropriate for the continued use of the site as a service station.
- Vehicle access to and from the site will remain as per existing site condition and is not proposed to be modified as part of this Development Application.
- Vehicles will continue to enter and exit the site is a forward direction.

Earthworks

Earthworks required to remove and replace the existing underground fuel tanks will be confined to the existing fuel forecourt area under the existing fuel canopy and to the south of the site. Approximately 300m^3 of waste soil will be removed during the retanking works. The proposed earthworks are confined to areas on the site where soil has previously been disturbed and does not require excavation to any environmentally sensitive area (or the like). Following installation of the new underground tanks, a new concrete forecourt will be provided over the tanks.

Remediation and removal of contaminated soils will benefit the local environment by extracting and removing a source of potentially hazardous contaminants from the soil and groundwater. Remediation of the site and disposal of waste soil will occur in accordance with the Remedial Action Plan prepared by Parsons Brinckerhoff and Waste Management Plan (Appendix B) submitted with this Development Application.

Site Access and Safety during Construction

The proposed development will require the closure of the site during all excavation and installation works. The site will be fenced and signs erected to provide safety warnings to pedestrians and motorists. All installation works will be contained wholly within the site.

On-site safety management will be detailed during the Construction Certificate stage of the development.

BCA Compliance

The proposal is capable of compliance with all of the relevant requirements of the BCA.

Utilities

Adequate utility services are available to the site and are able to meet the needs of the proposed development.

Stormwater Management

The site contractor will be responsible for all on-site erosion and sediment control and removal of any excess excavated material from the site in accordance with the Erosion and Sediment Control Plan and Waste Management Plan.

Traffic Management

The proposed works including decommissioning, excavation and removal of the existing tanks will take approximately 2-3 weeks. The proposed installation of the new underground fuel tanks will take approximately one week and the ancillary works and commissioning of the new underground tanks will take approximately 4-5 weeks.

At no time will any vehicle be parked on the roadway or outside the site's boundaries and all construction and excavation works will occur during normal construction hours.

The truck movements generated by the construction and installation will not result in any significant adverse impacts.

Natural and Cultural Environmental Heritage

The proposed development will not adversely affect any element of the natural or cultural environmental heritage.

No vegetation or trees on the site or on any adjoining properties will be removed or detrimentally affected as a result of the proposal.

4.3.2 Suitability of the Site

The proposed replacement of underground fuel storage tanks will improve the environmental quality of the site and surrounds. Works associated with the proposal will be fully contained within the site and will not interfere with uses on adjoining properties.

The proposal will not alter the existing service station convenience shop building layout or access provisions.

4.3.3 Any submissions made in accordance with the Act or Regulation

The proposed development will be publicly notified and the proponent will respond to any submissions received by Council during the public notification period if required.

4.3.4 The Public Interest

The proposed development is considered to be in the public interest as it facilitates the orderly upgrade of the land and site remediation. The proposed development enhances the quality of the land by removing contamination and allows for the remediation of the site. The proposal will enable the continued use of the site as a service station with positive environmental outcomes.

5. CONCLUSION

The proposed development includes the removal of four underground fuel storage tanks and existing fuel dispensers and the installation of three new consolidated underground fuel storage tanks and installation of new fuel dispensers at the 7-Eleven Service Station at 4 Endeavour Avenue, St Clair.

Replacement of the underground fuel tanks is a critical and essential upgrade to ensure the continued safe operation of the site. In addition, the proposed development ensures that the site can accommodate for future growth and demand for fuel products.

All installation works will be appropriately controlled and managed by on-site contractors to prevent any adverse environmental impacts. The proposal will be managed to minimise environmental impacts on adjoining properties.

The remediation of the land requires Council's development consent and contamination found on the site will be remediated in accordance with the Remedial Action Plan prepared by Parsons Brinckerhoff and in accordance with the provisions of SEPP 55. The replacement of the existing fuel infrastructure with new fuel infrastructure will ensure the site is fit for continued use as a service station and to ensure any potential future contamination of the site is limited.

Environmental assessment pursuant to SEPP 33 demonstrates that the societal risks of the proposed works are negligible.

Overall, the proposed development achieves a high level of compliance with Council's Interim Development Order No. 75 – City of Penrith, Planning Proposal for Penrith City-wide Local Environmental Plan and Penrith Development Control Plan 2006.

The proposed development will be installed and managed during construction to ensure the proposed works do not detract from the amenity of surrounding properties. The site will be closed during all excavation and installation works, fencing and signage will be erected to provide safety warnings to pedestrians and motorists.

In light of the planning and environmental merits of the proposal and in the absence of any significant adverse economic, social or environmental impacts, Council's approval of the development application is sought.

MILESTONE (AUST) PTY LIMITED

Milestone

WASTE MANAGEMENT PLAN
November 2014

Outline of proposal	**Replacement of underground fuel storage tanks, fuel dispensers, fill points and associated works including site remediation at existing 7-Eleven Service Station**
Site Address	4 Endeavour Avenue, St Clair Lots 4021 DP 851358
Site Owner and Operator	7-Eleven Stores Pty Ltd
Applicant	Milestone (AUST) Pty Limited
Telephone	(02) 9518-3666
Fax	(02) 9518-3933
Buildings and other structures currently on site	7-Eleven Service Station with single storey retail shop, fuel canopy over fuel court, fuel dispensers and 7-Eleven business identification signage.
Brief description of proposal	Removal of four existing underground fuel storage tanks and existing fuel dispensers, fuel fill points and replacement with three new consolidated underground fuel storage tanks and fuel dispensers, fuel fill points and associated works.

EXCAVATION AND INSTALLATION PHASES

MATERIALS ON-SITE			**DESTINATION**		
			Reuse & Recycling		**Disposal**
Type of Materials	**Vol (m^3)**	**Wt (t)**	**ON-SITE** **Specific proposed reuse or on-site recycling materials**	**OFF-SITE** **Specify contractor and recycling outlet**	**Specify contractor and landfill site**
Excavation material	300	TBC	Possible reuse of non-contaminated soil for backfilling purposes. Reuse of soil dependent upon preliminary investigation report.	Possible off-site recycling of contaminated excavated material to be confirmed. Local waste recycling facility to be used.	Un-recyclable excavated material to be disposed. Local waste recycling facility to be used.
Garden Waste	-	-	-	-	-
Bricks	-	-	-	-	-
Tiles	-	-	-	-	-
Concrete	TBC	TBC	On-site evaluation of concrete reuse to be	Excavated concrete to be sent off-site for	Un-recyclable concrete to be sent

MATERIALS ON-SITE			DESTINATION		
			Reuse & Recycling		Disposal
Type of Materials	**Vol (m^3)**	**Wt (t)**	**ON-SITE** **Specific proposed reuse or on-site recycling materials**	**OFF-SITE** **Specify contractor and recycling outlet**	**Specify contractor and landfill site**
			undertaken by contractor.	recycling and processing, if suitable.	to local waste facility.
Timber – Pine, particle board	-	-	-	-	-
Plasterboard	-	-	-	-	-
Metal – Copper, Aluminium	TBC	TBC		Metal components of existing underground fuel storage tanks to be recycled where appropriate. Local metal recycling contractor to be used.	Un-recyclable metal products to be disposed off site at local facility.
Asbestos – cement, roof & wall	TBC	TBC			Not applicable. Any asbestos materials to be sent off-site for processing. Local asbestos waste treatment facility to be used.
Other – Including glass doors, fittings, carpets, etc	TBC	TBC			Miscellaneous materials unsuitable for on-site reuse. Local waste facility to be selected.

Notes

1. Details of the exact quantities to be confirmed upon detailed site investigation during Construction Certificate process.

2. Location of recycling and waste facilities to be confirmed upon engagement of site contractor and tendering process.

3. The site contractor, prior to commencement of any works, will erect a suitable 1.8 metre high fence on the site and to encircle the work area.

4. The fence will be covered with shade cloth and warning signs affixed to clearly demarcate the works zone area from the public domain.

5. The site will be closed during the excavation and installation works.

ONGOING MANAGEMENT OF WASTE

TYPE OF WASTE TO BE GENERATED	EXPECTED VOL. PER WEEK	PROPOSED ON-SITE STORAGE & TREATMENT FACILITIES	DESTINATION
Household recyclables (bottles, cans, paper, etc)	Not applicable (see note 1 below).	-	-
Food and garden waste	Not applicable (see note 1 below).	-	-
Paper/Cardboard from office	Not applicable (see note 1 below).	-	-

Notes

1. The proposal does not alter the operation and waste management procedures of the existing 7-Eleven service station and associated convenience store. Existing waste storage and disposal measures will not be altered.

2. The proposed new underground fuel tanks will not generate any waste during their use. The tank structures will be fabricated from durable, long lasting materials.