

# **SEPP 33 - Risk Screening Document and Preliminary Hazard Analysis**

**Proposed Service Station**

**Aberdeen Valley Fair  
ABERDEEN NSW**

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**RISK SCREENING and PRELIMINARY HAZARD ANALYSIS**  
**PROPOSED SERVICE STATION**  
**Aberdeen Valley Fair**  
**ABERDEEN 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<sup>1</sup>, (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<sup>2</sup>.

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<sup>3</sup>. 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<sup>4</sup>.

## **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”.

## **SITE DESCRIPTION**

### **LOCATION**

The site is a large development incorporating a proposed service station with an associated fast food outlet located at Aberdeen Valley Fair NSW. The subject site is located on a large block on the south-eastern corner of the Penrith Street and Macqueen Street intersection in Aberdeen. The service station is proposed to be located at the south-west corner of the larger block. This assessment is for the hazardous chemical storage associated with the service station only.

Proposed car parks associated with the overall development will be located to the north and east of the proposed service station. Residential properties are located across Macqueen Street to the west and also to the south of the site.

### **PROPOSAL**

This site incorporates a proposed service station supplying retail sales of Motor Spirit and Combustible Liquids for automotive use to the general public. The service station site is approx. 9011 square meters in size with a proposed 98.8 square meter sales building. It is proposed that this site installs new double walled fuel tanks on site as per the list detailed below.

### **HAZARDOUS MATERIALS**

This proposal allows for a total of 135 kl of flammable liquid and 30 kl of combustible liquid in underground tanks. The site is estimated to have approximately three deliveries of fuel per week. The frequency of site deliveries is well within the SEPP 33 requirements and does not add any potential issues for this site.

## **SEPP 33 RISK SCREENING**

### **FUEL STORAGE**

#### **Proposal:**

#### **Tank storage area 1:**

<b>Product</b>	<b>Quantity</b>	<b>Tank/Compartment No.</b>	<b>Class and PG</b>
ULP	55,000 litres	1	3 PG II
E10 Petrol	25,000 litres	2	3 PG II
95 Petrol	30,000 litres	3	3 PG II
98 Petrol	25,000 litres	4	3 PG II
Diesel	30,000 litres	5	C1*

Note: \* As the diesel (combustible liquid C1) is stored within the same tank storage area as petrol (flammable liquid class 3), it will be considered as a flammable for the purposes of this report.

#### **Tank storage area 2:**

<b>Product</b>	<b>Quantity</b>	<b>Tank/Compartment No.</b>	<b>Class and PG</b>
Diesel	55,000 litres	1	C1**
Diesel	55,000 litres	2	C1**
Diesel	55,000 litres	3	C1**

Note: \*\* As the diesel (combustible liquid C1) is stored within a storage area where there are no flammable materials stored, they are not considered potentially hazardous and no further analysis is required.

As 'Tank storage area 2' contains only diesel (combustible liquid C1) and is not considered potentially hazardous, this analysis will assess the storage and system associated with 'Tank storage area 1' only.

### **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 to the site boundaries.

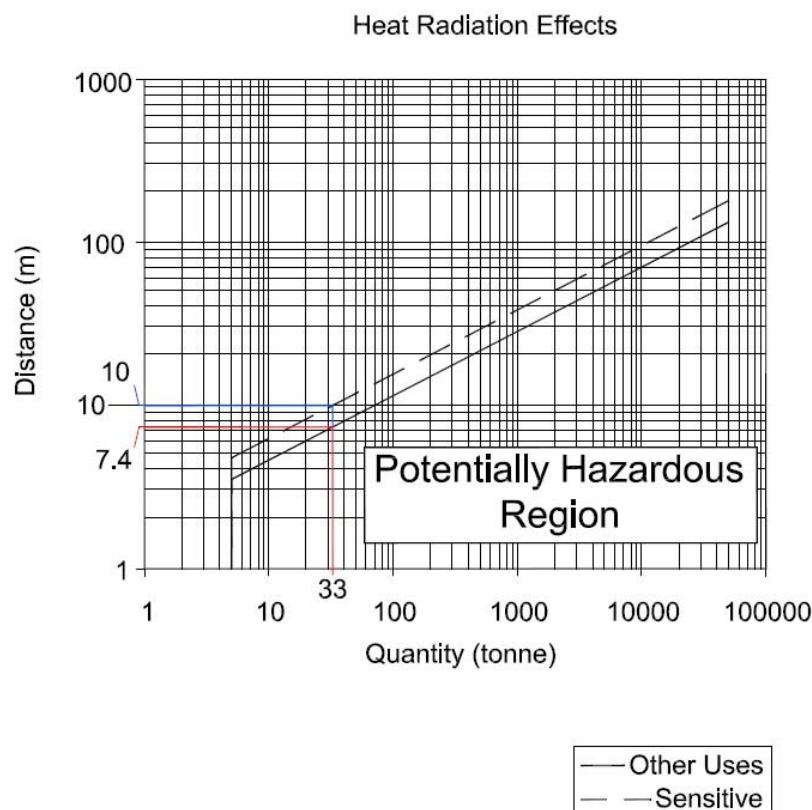
As this assessment is for the storage associated with the service station only, the site will be considered as being separate from the rest of the development and therefore separation distances have been measured to the nominated lease boundaries of the service station site (outlined in Appendix 4).

Boundary	Min Distance – Fill Points	Min Distance - Dispensers
North	3.9	26.4
South	96.8	56.8
East	46.9	37.0
West	20.1	17.0

Total storage capacity is 165,000 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 33,000 litre storage.

**FIGURE 9, SEPP 33**



From Figure 9 we can see that for 33,000 litres, the minimum setback distance from the remote fill and dispensing points is 7.4 meters to site property boundaries.

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

## TRANSPORT SCREENING THRESHOLD

SEPP 33 screening also requires a study of the transporting/delivery frequencies, for the site as outlined in table 2 (below). 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<sup>6</sup>.

In this case, with these numbers, expected deliveries for fuel are well below the threshold and therefore there is no requirement to do a PHA for further analysis due to transport screening thresholds.

Table 2: Transportation Screen Threshold "Applying SEPP 33" (page 18)

**Table 2: Transportation Screening Thresholds**

Class	Vehicle Movements		Minimum quantity*	
	Cumulative Annual	Peak or Weekly	per load (tonne)	
			Bulk	Packages
1	see note	see note	see note	
2.1	>500	>30	2	5
2.3	>100	>6	1	2
3PGI	>500	>30	1	1
3PGII	>750	>45	3	10
3PGIII	>1000	>60	10	no limit
4.1	>200	>12	1	2
4.2	>100	>3	2	5
4.3	>200	>12	5	10
5	>500	>30	2	5
6.1	all	all	1	3
6.2	see note	see note	see note	
7	see note	see note	see note	
8	>500	>30	2	5
9	>1000	>60	no limit	

**Note:** Where proposals include materials of class 1, 6.2 or 7, the Department of Planning should be contacted for advice. Classes used are those referred to in the Dangerous Goods Code and are explained in Appendix 7.

\* If quantities are below this level, the potential risk is unlikely to be significant unless the number of traffic movements is high.

## CONCLUSION

It has been determined via assessment of this proposal under the NSW State Environmental Planning Policy 33 (SEPP 33) that the site is deemed "potentially hazardous". Whilst the transport screening thresholds are complied with the proposed design does not see all setback distances as required under SEPP 33 achieved. As such the site and its current design require further analysis and a PHA is to be completed.

## **PRELIMINARY HAZARD ANALYSIS**

### **Introduction**

As previously detailed, SEPP 33 screening has deemed this proposal to be “Potentially Hazardous or Offensive” and hence a Preliminary Hazard Analysis (PHA) will be required to determine if this proposal is acceptable for this site.

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	25,000 litres	1203	3	II	3YE
E10 Petrol	25,000 litres	1203	3	II	3YE
ULP	55,000 litres	1203	3	II	3YE
Diesel	30,000 litres	NA	C1	-	NA
95 Petrol	30,000 litres	1203	3	II	3YE

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.

#### **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:

- Overfill of tank  
Risk: Yes  
Possible Outcome: Spill  
Ranking: C4  
The flammable and combustible liquids tanks are located underground and are remote filled with a remote contents gauge located at the fill points. A spill kit and firefighting equipment are within close proximity to the delivery driver whilst filling the tanks.
- Hose trip hazard  
Risk: Yes  
Possible Outcome: Spill  
Ranking: B5  
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.
- Fire at fill point  
Risk: Yes  
Possible Outcome: Spill/Fire  
Ranking: D4  
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.
- Fire on site  
Risk: Yes  
Possible Outcome: Spill/Fire  
Ranking: C4  
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.
- Leak in pipework  
Risk: Yes  
Possible Outcome: Spill  
Ranking: D4  
All pipework is located underground and is protected from impact. Regular pressure tests are performed to ensure tightness. Stock reconciliation is carried out weekly and would highlight any leaks immediately.

- Ruptured fill hose  
Risk: Yes  
Possible Outcome: Spill  
Ranking: E4  
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.
- Equipment wear and tear  
Risk: Yes  
Possible Outcome: Spill  
Ranking: C4  
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.
- Vandalism of equipment  
Risk: Yes  
Possible Outcome: Spill/Fire  
Ranking: D3  
The tank is installed underground. All valves and fittings located in a underground turret which is secured from tampering.
- Fire on adjoining property  
Risk: Yes  
Possible Outcome: Spill/Fire  
Ranking: D3  
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.
- Customer overfill during dispensing  
Risk: Yes  
Possible Outcome: Spill/Fire  
Ranking: C4  
The dispensers installed at this site are equipped with a sensing device that's shuts down the flow of product when it reaches the tip of the nozzle. Clean up materials are located within close proximity of the dispensing area.
- Customer drives off with nozzle inserted  
Risk: Yes  
Possible Outcome: Spill/Fire  
Ranking: C5  
Clean up materials are located within close proximity to the dispensing area.
- Collision between vehicle and dispenser  
Risk: Yes  
Possible Outcome: Spill/Fire  
Ranking: C4  
All dispensers on this site are protected from vehicular impact by with the assistance of bollards.

- Use of mobile phone/transmitting devices  
 Risk: Yes  
 Possible Outcome: Spill/Fire  
 Ranking: D3  
 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.
  
- Spill of product onto customer  
 Risk: Yes  
 Possible Outcome: Spill/Fire  
 Ranking: D3  
 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.
  
- Customer misuse of equipment  
 Risk: Yes  
 Possible Outcome: Spill/Fire  
 Ranking: D4  
 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.

## 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 are:

**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.

### **MULTI LEVEL RISK ASSESSMENT FRAMEWORK**

The calculations following here are a direct reference to this proposal using the working process detailed in this document.

The technique used is a modified version of the *Manual for the classification of risks due to major accidents in process and related industries* (IAEA, Rev. 1. 1996). It should be noted that the full IAEA method covers fixed installations and transport (including waterways and pipelines).

For simplicity, only the part of the method dealing with fixed installations is covered here. The IAEA method was developed to produce a broad estimate of the risks due to major accidents from the manufacture, storage, handling and transport of hazardous materials. As published, the method covers only off-site risks arising from explosion, fire or release of toxic substances. The results are expressed in terms of societal risk, rather than individual risk. Societal risk of death is defined in the IAEA method as the relationship between the number of people killed in a single accident and the chance or likelihood that this number will be exceeded.

The method uses a number of simplifying assumptions, the most important being:

- Only the most important variables are used in assessing risk (such as population density, frequency of loading/unloading operations)
- Estimates of probability and consequences are rounded to the nearest order of magnitude.
- The entire inventory is initially assumed to be involved in any incident.
- For physical and toxic effects, 100 percent fatality is assumed within an area where 50-100 percent lethality would be expected; outside this range, no fatalities are assumed.

- No explosion overpressure or heat radiation calculations are carried out - the lethal radius is assumed to be the distance to the lower flammable limit (LFL) in the case of explosion and the actual fire area in the case of flammables.
- Only one weather pattern is used.
- Basic probabilities are generic but are modified later.

The boundaries of the site have been defined and maps and drawings prepared showing the site location in relation to its locality, and the site layout itself. The area chosen is of sufficient size to encompass the consequence distance of the worst credible accident. The site layout is in sufficient detail to allow the locations of all storage and processing areas to be identified to a precision that will allow consequence distances to be clearly represented.

A plan of the area has been produced and estimates of the population in the area have been made. It should be noted that the surrounding area does not include any sensitive uses.

Firstly, IAEA Table 1 (page 39) provides us with reference number 6 for this type of storage being Flammable liquids in underground tanks.

From IAEA Table II(a), (page 42) for the storage of flammable liquids storage such as this as it is underground taking into account Table II(a) note, the storage quantity is to be divided by 5. For this underground storage of a total of 165,000L applying a division of 5 we therefore assess as 33 tonnes (10-50 tonnes). Based on Table II(a) classification of substance by effect category, we get for reference 6 as BII.

Using these classifications, in IAEA table III, (page 43) we obtain **A** for BII a maximum area of effect distance of 25-50 m's radius and an effect area of 0.4ha. ( $A=0.4$ )

As the storage of flammable liquids is located underground, the effect distance will be measured from the location of the fill points. Although the site is of a significant size, as the fill points are located near the site boundary, the maximum effect area will not be contained within the site and therefore population distribution around the site needs to be assessed.

The site itself and the adjacent road (Macqueen Street) and car park take up the majority of the Effect Area however some area also encroaches on neighbouring properties. Utilising the Population Density guidance of Table IV (page 44) with the ability to correct where deemed necessary. As a conservative figure, utilising the guidance provided by Table IV and knowledge of the area we estimate 160 persons per hectare. ( $d = 160$ )

### **Possible number of fatalities**

Considering the population correction factor  $f_a$  of Table V (page 44) this can be utilised if only part of the Effect Area is populated. The effect area for BII is up to a 50m radius. As the site itself, the adjacent road and car park take up the majority of the effect area, less than 10% of the 50m radius will be consistently populated. Based on Table V a population fraction of 10 needs to be applied and therefore a figure of 0.2 is determined. ( $f_a = 0.2$ )

Following on to the mitigation correction factors  $f_m$ , in this case as the substance is flammable and reference number 6, Table VI (page 45) gives a value of 1.

So an estimate of external consequences, given by the formula:  $C_{a,s} = A \cdot d \cdot f_a \cdot f_m$   
or, in this case:

Reference 6  $C_{a,s} = A \cdot d \cdot f_a \cdot f_m$

Reference 6  $C_{a,s} = 0.4 \times 160 \times 0.2 \times 1$

Reference 6  $C_{a,s} = 13 \text{ fatalities}$

### Estimation of Probability of major accident

The method used for estimating probability is based on probability numbers related to the type of installation and substance involved, together with correction factors for:

- average probability of incident based on type of installation/storage
- the frequency of loading/unloading operations ( $n_l$ ) (based on 52 per year)
- safety systems associated with flammable substances ( $n_f$ )
- organisational and management safety ( $n_o$ )
- wind direction towards the populated area ( $n_p$ )

The probability number is given by the formula:

$$N_{i,s} = N_{i,s}^* \cdot n_l \cdot n_f \cdot n_o \cdot n_p$$

Where  $N_{i,s}$  is the average probability number for the installation and the substance.

Table VII states for reference 6 as a storage and not a plant  $N_{i,s}^* = 7$

Table VIII states for the deliver frequency of approximately 3 deliveries per week/156 deliveries per year  $n_l = -1$

Table IX is applicable to flammable gas storages only  $n_f = \text{Not applicable} = 0$

Table X applies Correction Parameters for Organisational safety. This organisation maintains Average Industry practices therefore  $n_o = 0$

Table XI applies correction Parameters for Wind direction towards populated areas in the affected Zone and specifically looks at where people are living within this zone. In this instance, there are no residential properties located within the Affected Area and therefore 5% coverage is applied and  $n_p = 0.5$

so,

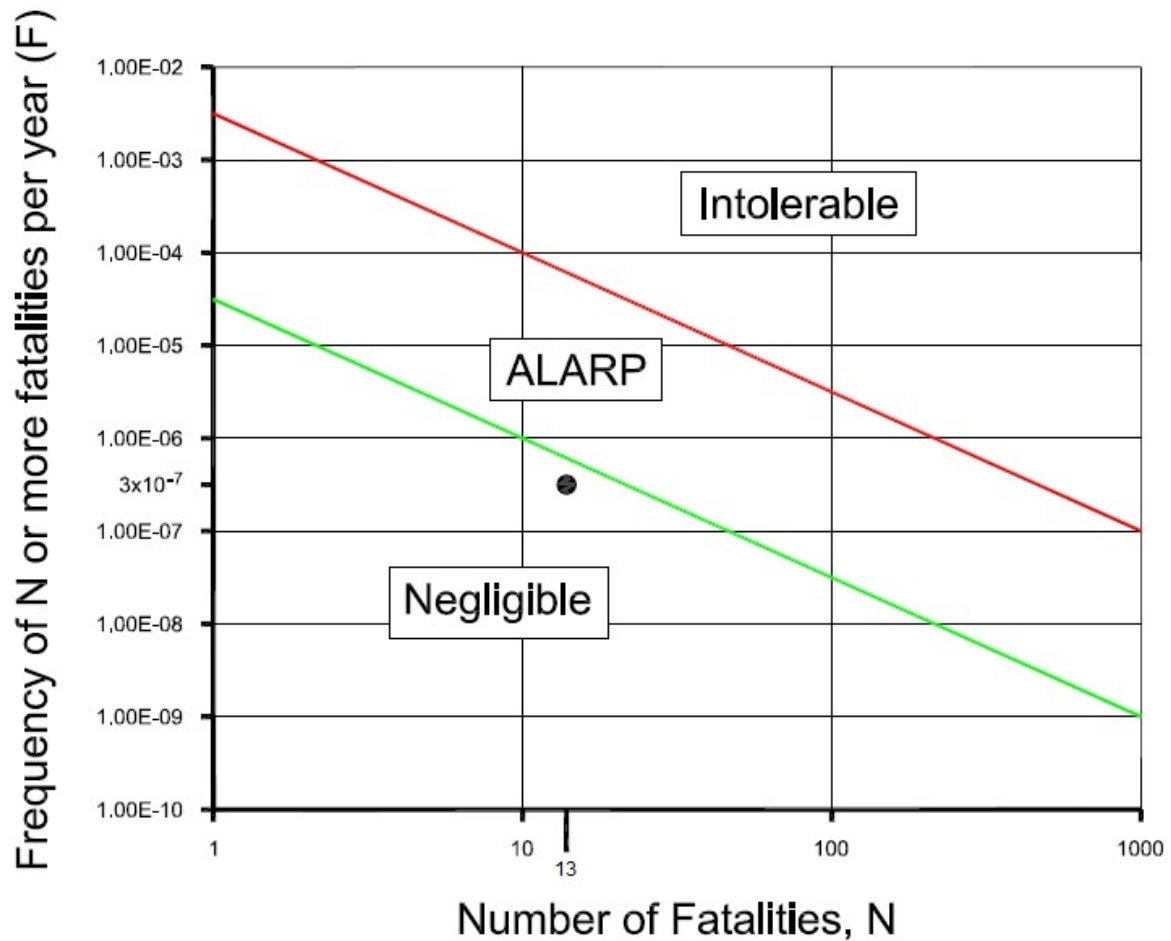
where

$$N_{i,s} = N_{i,s}^* \cdot n_l \cdot n_f \cdot n_o \cdot n_p$$

$$N_{i,s} = 7 + (-1) + 0 + 0 + 0.5 = 6.5$$

Converting probability into frequency, in table XII, we get  $1 \times 10^{-6}$

This result can be plotted on the following graph:



By intersecting the frequency ( $P = 3 \times 10^{-7}$ ) with the consequences (**13** 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.

## **DOCUMENT REFERENCES**

- <sup>1</sup> State Environmental Planning Policy 33, Hazardous & Offensive Development Application Guidelines. – Department of Planning NSW, January 2011.
- <sup>2</sup> State Environmental Planning Policy 33, Hazardous & Offensive Development Application Guidelines. – Department of Planning NSW. Page 1, 1.2 the policy, last para
- <sup>3</sup> State Environmental Planning Policy 33, Hazardous & Offensive Development Application Guidelines. – Department of Planning NSW. Page 9, 4.2
- <sup>4</sup> Protection of the Environment Operations (Underground Petroleum Storage Systems) regulation 2014 division 1, clause 5 and 6
- <sup>5</sup> Protection of the Environment Operations (Clean Air) regulation 2010
- <sup>6</sup> State Environmental Planning Policy 33, Hazardous & Offensive Development Application Guidelines. – Department of Planning NSW. Page 18, table 2

## **OTHER REFERENCES**

### **Australian Standards:**

AS 1940-2004	"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 3000-2007	"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:**

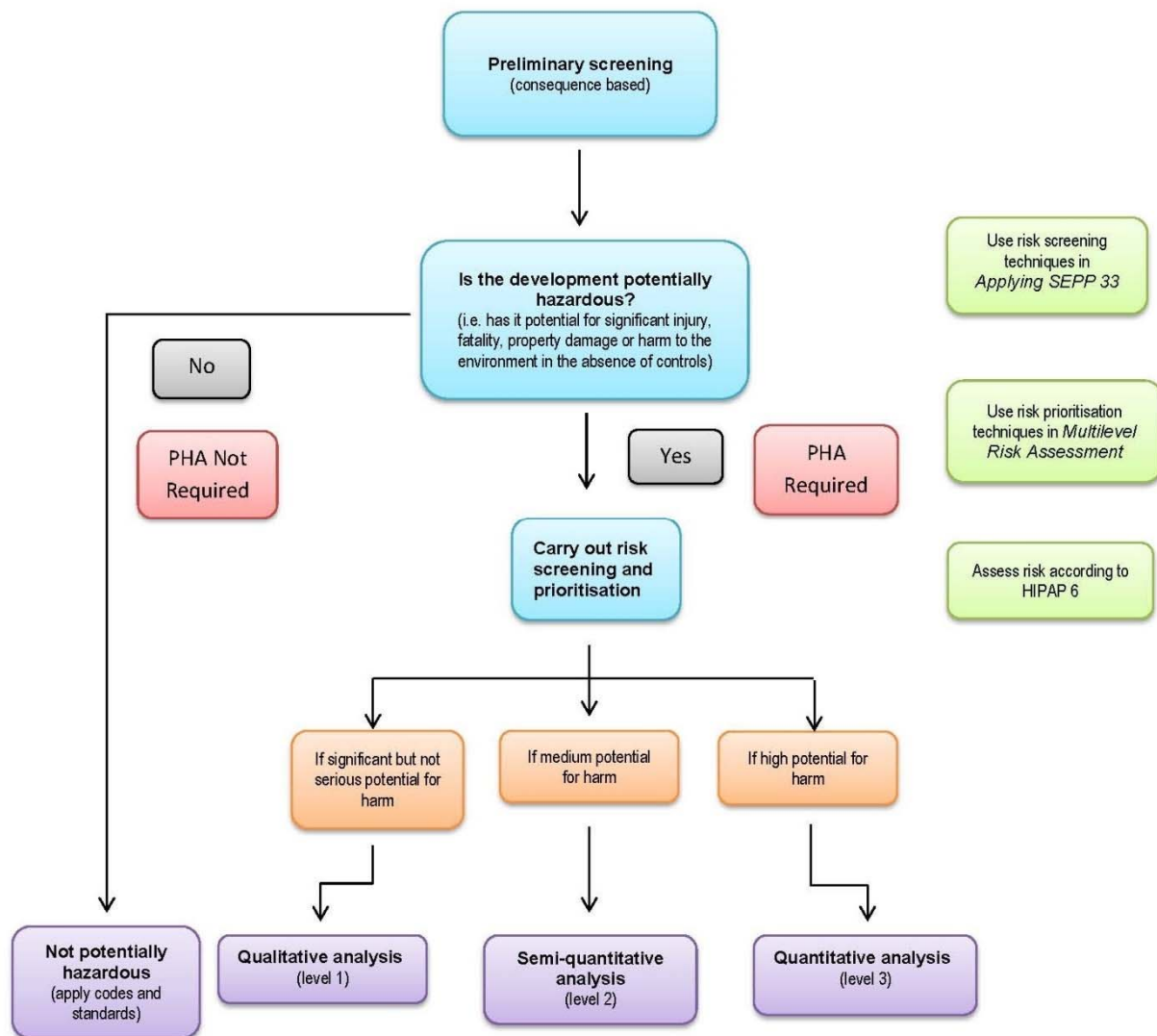
Hazardous and Offensive Development Application Guidelines - Applying SEPP 33  
 Hazardous and Offensive Development Application Guidelines - Multi-Level Risk Assessment  
 Hazardous Industry Planning Advisory Paper No. 4 - Risk Criteria for Land Use Safety Planning  
 Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis  
 Hazardous Industry Planning Advisory Paper No. 8 - Hazard and Operability Studies

### **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	
<p>Risk is the combination of the likelihood of a specific unwanted event and the potential consequences if it should occur.</p>	
<p><b>Probabilities</b></p> <p>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</p>	
<p><b>Consequences</b></p> <p><b>People</b>            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</p> <p><b>Equipment, assets or environment</b>            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</p> <p><b>Production</b>            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</p>	
<p><b>Risk Ranking Method (above)</b>            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.</p> <p><b>Risk Ranking Table (below)</b>            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.</p>	

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

## APPENDIX 3

### HAZARD ANALYSIS

#### Hazard Analysis

**Project:**  
**Description/Activity:**

Proposed Service Station at Aberdeen Valley Fair, Aberdeen NSW  
Service Station

**Assessment Ref No:** AVF-203596  
**Date:** 30.06.17

#### Consequences (C)

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 3

No.	Hazard	(L)	(C)	(L)x(C)	Action Required (Y/N)
1	Overfill of tank	4	4	16	N
2	Hose trip hazard	5	4	20	N
3	Fire at fill point	5	3	15	N
4	Fire on site	5	3	15	N
5	Leak in pipework	5	4	20	N
6	Ruptured fill hose	4	4	16	N
7	Equipment wear and tear	4	4	16	N
8	Vandalism of equipment	4	4	16	N
9	Fire on adjoining property	5	3	15	N

[illegible]



## **APPENDIX 4**

### **PROPOSED SITE DRAWINGS**

Drawing No 203596-A004 Issue G Titled "Site Plan – General Arrangement (GA)"

Drawing No 203596-A004 Issue G Titled "Site Plan – General Arrangement (GA)"  
- Nominated lease boundaries outlined



Drawing No 203596-A004 Issue G Titled "Site Plan – General Arrangement (GA)"  
- Nominated lease boundaries outlined

