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Pollution Incident Response Management Plan

MMP Industrial, 3-5 Hannabus Place, Mulgrave, NSW

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MMP Industrial, 3-5 Hannabus Place, Mulgrave, NSW

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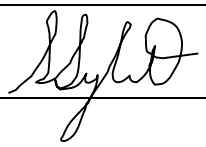
0	9-Feb- 2015	Final	Steve Sylvester Director - Risk Engineering	

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ABBREVIATIONS

Abbreviations	Description
ADG	Australian Dangerous Goods Code
AS	Australian Standard
BLEVE	Boiling Liquid Expanding Vapour Explosion
CW	Chief Warden
DGs	Dangerous Goods
DME	Di-Methyl Ether
EHS	Environmental Health and Safety
EPA	Environmental Protection Authority
ERP	Emergency Response Plan
FRL	Fire Resistance Level
FSS	Fire Safety Study
IBC	Intermediate Bulk Container
ISO	OHSAS
kg	kilograms
kL	kilo-Litres
kms	kilometres
kPa	kilo Pascals
kW/m^2	kilo Watts per square metre
L/min.	Litres per minute
LEL	Lower Explosive Limit
LPG	Liquefied Petroleum Gas
MMP	MMP Industrial Pty Ltd
NDT	Non-Destructive testing
NRV	Non-Return Valve
OH&S	Occupational Health and Safety
PG	Packaging Group
PHA	Preliminary Hazard Analysis
PIRMP	Pollution Incident Response Management plan
POEO	Protection of Environmental Operations
PRV	Pressure Relief Valve
QRA	Quantitative Risk Assessment
SEC	Site Emergency Controller
SMS	Safety Management System
UN	United Nations
UST	Underground Storage Tank

1.0 Introduction

1.1 Background

MPP Industrial Pty Ltd (MMP) operates an aerosol filling facility located at 3-5 Hannabus Place, Mulgrave, NSW ('the Site'). The facility stores and handles a number of flammable, toxic and corrosive substances, including liquids and gases. Site operations include the filling of aerosol cans and bottles with various products predominantly for the car care industry.

As a facility that stores and handles a number of flammable, toxic and corrosive liquids, the Environmental Protection Authority (EPA) has requested MMP prepare and implement a pollution incident response management plan (PIRMP). The specific requirements for the PIRMP are set out in Part 5.7A of the POEO Act and outlined in the NSW EPA Environmental Guidelines: Preparation of pollution incident response management plans (NSW EPA, March 2012). The new legislation requires the following:

- All holders of environment protection licences must prepare a pollution incident response management plan (section 153A, POEO Act), however, whilst the site does not require a licence, the EPA has requested a plan be prepared;
- The plan must include the information detailed in the POEO Act (section 153C) and be in the form required by the POEO(G) Regulation (clause 98B);
- Licensees must keep the plan at the premises to which the environment protection licence relates;
- Licensees must test the plan in accordance with the POEO(G) Regulation (clause 98E); and
- If a pollution incident occurs in the course of an activity so that material harm to the environment is caused or threatened, licensees must immediately implement the plan (section 153F, POEO Act).

This document includes the PIRMP for the MMP facility and provides a review of the current pollution incident reporting processes as part of the Management Systems documented and implemented on the Site.

1.2 Objectives

The objectives of the study are to develop a PIRMP on behalf of MMP for the site to:

- Ensure comprehensive and timely communication about a pollution incident to staff at the premises, the Environment Protection Authority (EPA), other relevant authorities (Hawkesbury Council, NSW Ministry of Health, WorkCover NSW and Fire and Rescue NSW);
- Minimise and control the risk of a pollution incident at the MMP facility by identifying the risks and development of planned actions to minimise and manage these risks; and
- Ensure that the plan is properly implemented by trained staff at the facility, identifying personnel responsible for implementing it, and ensuring that the plan is regularly tested for accuracy, currency and suitability.

1.3 Scope of Work

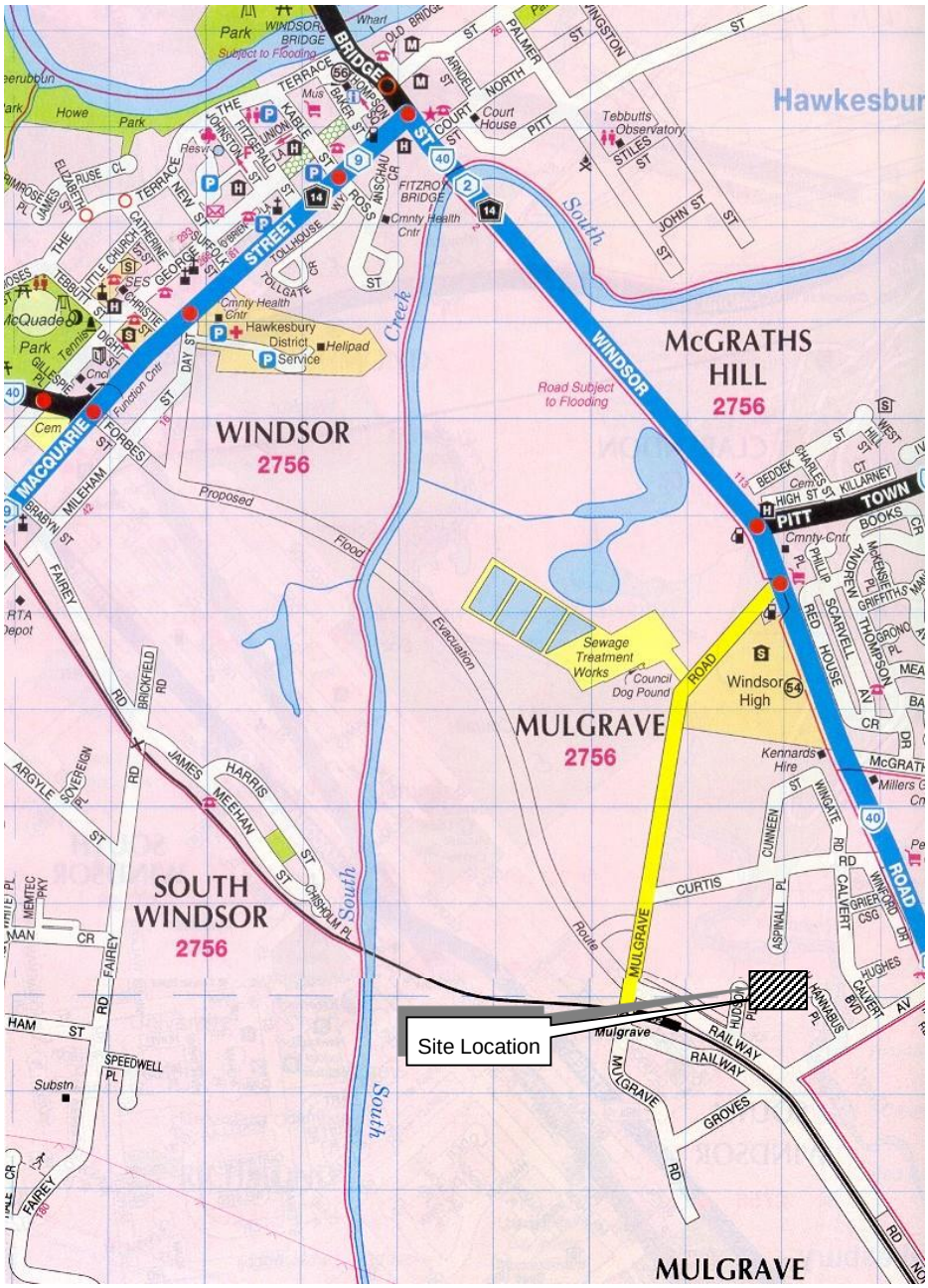
The scope of works comprises the following tasks:

- Site inspection to identify potential pollution incidents that may occur on Site and result in an unacceptable risk of harm to human health or the environment;
- Review of other relevant emergency plans; and
- Development of a Pollution Incident Response Management Plan.

2.0 Description of Site Operations

2.1 Site Location

Figures 2.1 shows the regional and site location of the MMP facility at Mulgrave, NSW. The site layout is shown in **Figure 2.2**. The description below is given to aid in understanding the site warehousing operations and the types of hazards that may require emergency response.



Ref: UBD - 2003

Figure 2-1: Location of MMP in the Mulgrave Area

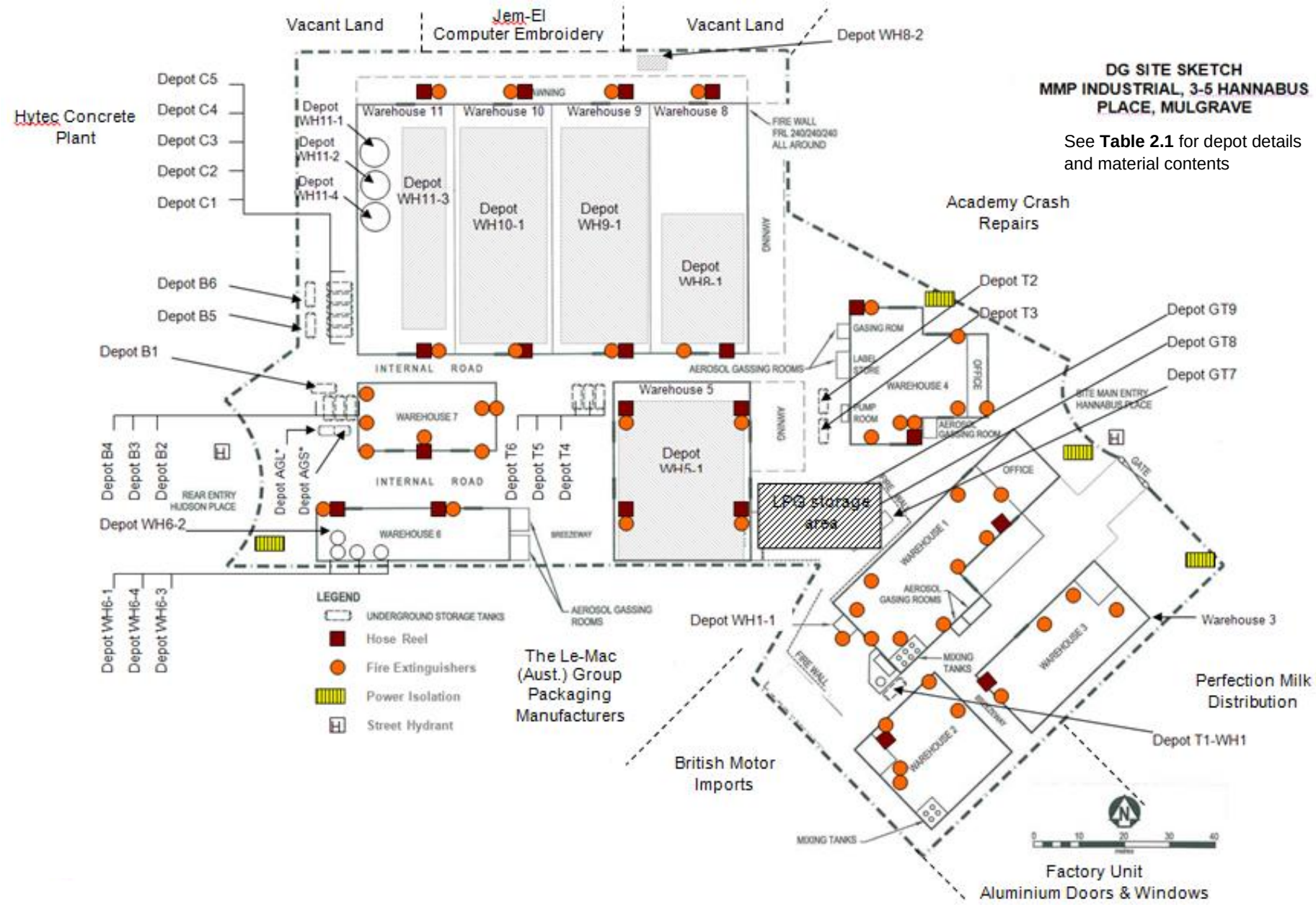


Figure 2-2: Site Layout of the MMP Facility Showing Adjacent Properties

2.2 Land Zoning and Adjacent Land Use

The MMP facility is located in between Hannabus Place and Hudson Pace, Mulgrave, NSW. The land is zoned 4(a) industrial. The site has an area of about 6 acres and is located on a block of land between Hudson Place (west) and Hannabus Place (east). The following facilities and businesses are adjacent to the warehouse facility:

- Perfection milk distribution centre - comprising a milk storage facility with sheet metal walls and roof (internal refrigerators and loading dock area - boundary south - east);
- Aluminium windows and doors manufacturing plant – comprising a factory unit with masonry walls (boundary south-east);
- Motor vehicle importer – comprising a warehouse building and showroom of sheet metal walls and roof (boundary south west)
- A packaging manufacturing plant – comprising buildings of sheet metal walls and roofs (boundary south-west);
- Hytec cement production plant – comprising silos, conveyors, sand storage bins and truck loading areas (boundary north-west);
- Computer embroidery plant – comprising concrete tilt-up panel building (boundary north);
- Warehouse facility (boundary north); and
- Vehicle repair facility – comprising sheet metal building (boundary east).

The location of these facilities in relation to the MMP site is shown on **Figure 2.2**. The closest zoned residential area is at McGraths Hill about 1.5-2kms from the site.

2.3 General Operations

The site is predominantly used for the filling and storage of aerosols, with some small container (bottles) filling, prior to delivery to commercial operators and retailers. Raw materials (e.g. containers and liquid products) are brought to site in bulk. The containers are stored in warehouses and the bulk liquids in above ground and underground tanks. Filled products are located in dedicated dangerous goods stores prior to shipping to retailers.

Containers are filled in bottling and can filling lines at various locations around the site. Containers/bottles are placed on filing lines and the bulk product delivered by pipework to the filling heads. The filled containers/bottles are then removed from the filling line and packaged in cardboard cartons and loaded to pallets. The pallets are then stored in warehouses on site ready for delivery to retailers as required.

2.4 LP Gas Storages

Liquefied Petroleum Gas (LPG) is be stored in a single tank farm at the site. The existing risk assessment study identified that two LPG tank farms were installed at the site. However, the smaller of the two tank farms (located on the southern side of Warehouse 1), was removed in 2006.

The LPG tank farm stores the liquefied gas in two forms; propane/butane blend and di-methyl-ether. These gases are used to fill the aerosols and provide the propellant for the material within the aerosol can. The propane/butane is stored in two tanks, each of 63 kL capacity. The di-methyl-ether is stored in a single tank of 43 kL capacity. **Figure 2.2** shows the location of the storage.

The operating pressures of the gases are:

- LPG – 760 kPa; and
- Di-methyl-ether – 510 kPa.

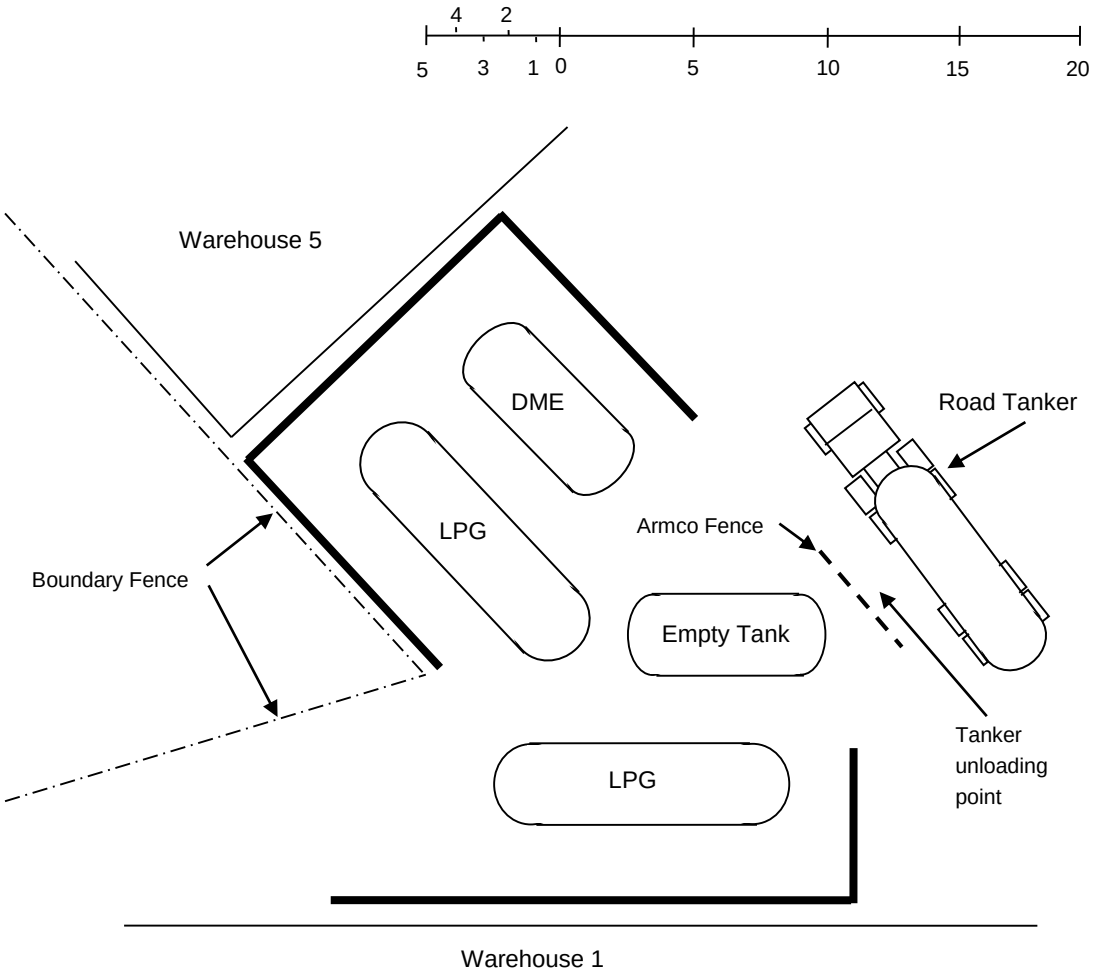


Figure 2-3: Proposed LPG Storage Area Layout Schematic – MMP Site

The liquefied gas storage consists of 4 tanks, associated pipework, pumps and a tank loading facility (i.e. tanker and transfer point). It is noted that one of the four tanks is not in use and is currently inerted with nitrogen **Figure 2.3** shows the liquefied gas storage facility layout. The facility components are:

- 2 x 63kL tanks;
- 2 x 42kL tanks;
- associated pipework and fittings,
- LPG transfer pumps; and
- LPG tanker unloading facilities.

Each storage tank has been installed to AS1596-2000, “The Storage and Handling of LP Gas” (Ref.1). This standard requires stringent LPG storage design and compliance with safety requirements.

2.5 LPG Tanker to LPG Tanks Transfer

The tanks are filled using a liquefied gas transport vehicle, which is a dedicated tanker truck used for the transport of liquefied gases. The transport of these gases is a carefully controlled industry, which is regulated by the NSW Government.

The tank storage has been fitted with a liquefied gas transfer point, which has been designed in accordance with AS1596 to ensure the appropriate safety features were installed as part of the design. A brief transfer procedure is summarised below. It is noted that this procedure is a summary only and the actual operation contains many more steps, however, these are in compliance with AS1596.

The trucks enter the site from Hannabus Place and park adjacent to the transfer point. The tanker driver/operator connects the flexible transfer hoses to the tanker vehicle and then to the transfer point pipework. Dedicated connections for the transfer of the liquefied gas are used for this purpose. Once connected, the tanker driver checks the connections prior to opening the appropriate valves. The liquefied gas is then pumped to the tanks using truck mounted transfer pump. The tanker driver continually monitors the tank contents and stops the transfer once the tanks have reached the desired level. On completion of the transfer, the driver purges the lines and isolates the system using the valves installed on the transfer pipework. Once purged, the flexible lines are removed from the system and stored on the tanker truck. The tanker driver then leaves the site on completion of the transfer operation.

A number of safety features are installed to minimise the potential for incidents during the transfer, these are summarised below.

- **Driveaway Prevention** – the truck is fitted with a system that applies the truck brakes and prevents the driver from moving the vehicle whilst the flexible hoses are connected to the vehicle.
- **Weak Coupling** – a weak coupling joint is installed immediately after the flexible line connection which breaks in the event a driveaway occurs when the hose is connected.
- **Snap Shut Valve** – a snap shut valve is installed immediately after the weak coupling. In the event the coupling breaks, the snap shut valve isolates any potential gas leaks (NRV's also prevent backflow from the tank).
- **Earthing Connection** – an earthing lead is provided so that the driver can "electrically" connect the vehicle to the storage system, eliminating the potential for sparks from static build up.
- **Isolation and Non-Return Valves** – are installed on the delivery lines to prevent liquefied gas flow back down the line in the event of a release at the flexible line.
- **Training** – liquefied gas tanker drivers are dedicated operators trained in the handling of liquefied gases. Each driver is trained in the transfer procedure and the emergency response requirements in the event of an incident.

2.6 Product Transfer for Use

The storage tanks hold a mixture of butane and propane (LPG), which is delivered to site in premixed quantities. These products are used in various locations around the aerosol manufacturing areas on site. The products are currently transferred using pumps and 50mm pipework.

All current LPG tanks on site are fitted with both manual and automatic isolation valves in accordance with the requirements of AS1596. Additional safety features of the LPG systems are summarised below.

- **Pressure Relief Valves (PRV)** – will be installed on each tank to eliminate the potential for tank overpressure. The PRVs will be set to operate above the gas operating pressure but well below the failure pressure of the vessel.
- **Hydrostatic PRVs** – will be installed on pipelines where liquefied gas may be trapped between isolation valves (hence, trapped liquid cannot expand and cause line failure).
- **Automatic Isolation Valves** – that will operate on gas detection, fire detection or activation of the emergency shut-off system (button).
- **Gas Detectors** – installed around the tanks and storage area to detect gas and alarm well below the lower explosive limit (LEL).
- **Fire Detection & Response** – plastic air lines installed on auto-isolation valves. In the event of fire, air lines fail and valves are automatically closed, isolating the gas in the tank and starving the fire of fuel.
- **Excess Flow Valves** – installed at the liquid discharge line from each tank. In the event of line rupture, excess flow valves automatically close, preventing gas discharge through the rupture.

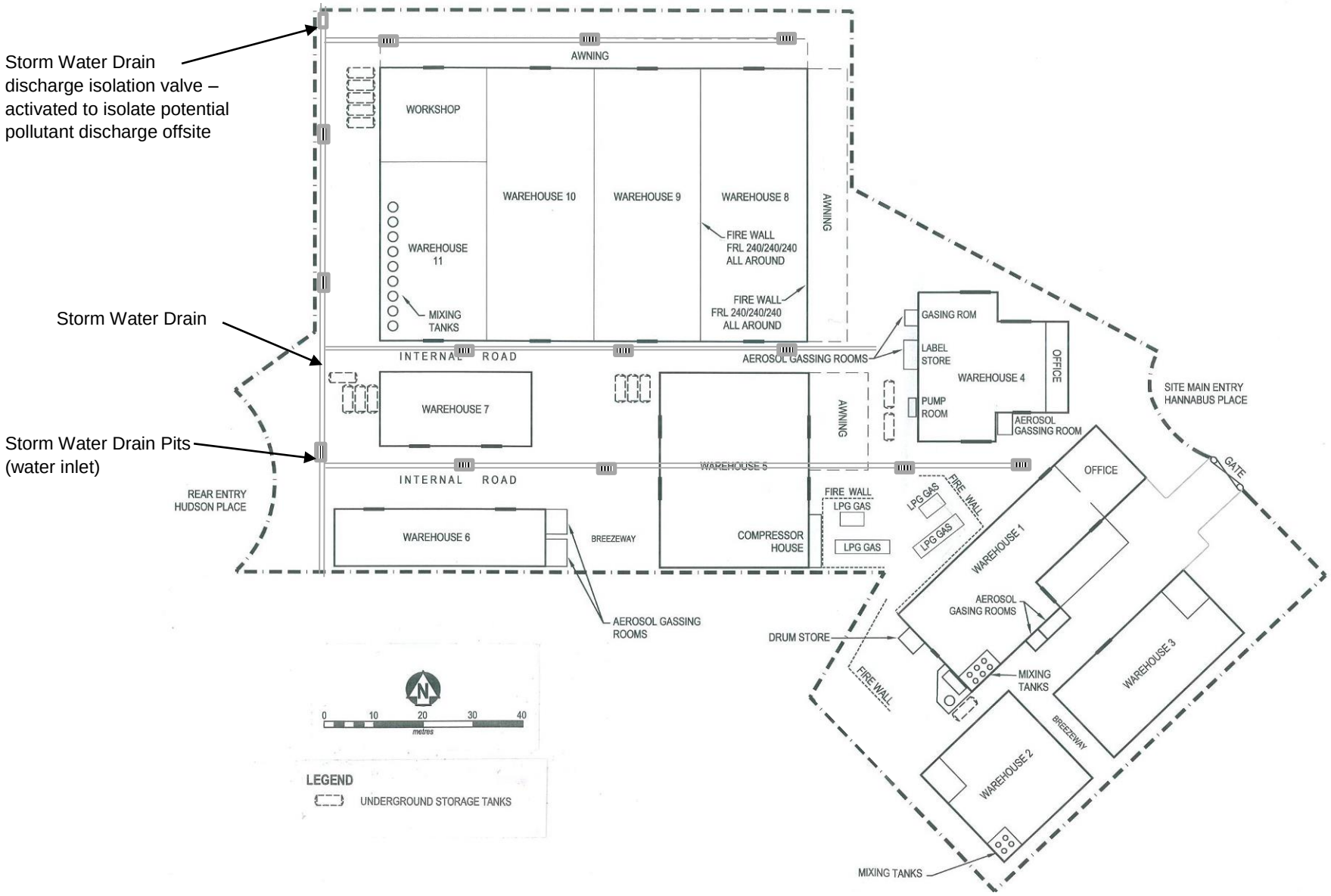


Figure 2-4: Scaled Drawing of the MMP Site Showing Building Layouts and Drainage Systems

2.7 Product Mixing Operations

A number of paint and flammable/combustible product mixing/manufacturing machines are located in various buildings around the site. **Figure 2.4** shows a scaled drawing of the MMP site with the locations of the various buildings and the aerosol gassing lines, and rooms, and the bottle filling plants. The product mixing machines are located adjacent to the filling lines and are used to manufacture the paint and other flammable/combustible products that are filled to aerosol cans. The operation requires the loading of various chemicals (resins, thinners, tints, etc.) to the mixers, which combine the materials to manufacture the paint/flammable-combustible product.

The materials are loaded from 205 Litre or a variety of smaller containers (e.g. 25 Litres) or from bulk storage tanks located external to the filling line buildings. The location of the bulk storage tanks (underground) are shown on **Figure 2.4**. When drums are used for filling they are lifted using a dedicated drum lifting device. This provides a lift and tilt mechanism which aids in the loading of materials to the mixers. Raw materials in drums are delivered to by truck. Drums are stored on pallets and are transferred to the various Dangerous Goods stores using forklift trucks. When bulk tanks are used for filling, product is transferred using a pump. Bulk tanks are filled from road tankers that deliver raw materials in bulk directly to the underground tanks using a flexible hose. The tanks are filled by gravity transfer.

Once loaded, lids are placed on the mixer pots and the mixing process commenced. The lids are fitted with exhaust ventilation, which extracts vapours from the mixer and exhausts them to the exterior of the building.

Once mixed, the paint is transferred to 205 Litre drums ready for use in the aerosol or bottle filling operation.

In some locations around the site, the product is mixed in batching tanks, which are located close to the filling point. Pipework is used to transfer the products directly to the injection heads on the filling line. Product is pumped from raw materials tanks into the batching tank, which is fitted with a stirring device. The product is mixed over a period of time prior to transfer to the filling line. Once prepared, the product is pumped to the filling line for loading to the cans/bottles.

2.8 Aerosol and Bottle Filling Operations

Aerosol cans are filled in various locations around the site. Dedicated aerosol filling lines are used for the filling of cans with product and propellant (LPG). **Figure 2.5** shows a diagrammatic layout of a typical aerosol filling operation. The product is mixed in either product mixing tanks or 205 Litre drums. The tanks and/or drums are located adjacent to the line for injection into the cans using the filling heads.

An example of a batching operation is given below for a water based product, however, flammable and combustible materials may be used, in lieu of water, for specific products such as paint and degreasers. The batching tanks is first filled with water and the products are loaded to the mixing tank from either 25 litre, 205 litres drums or raw material product tanks. Where 25 litre drums are used, the drums are lifted to a tank filling access platform, using a forklift truck, and manually poured into the tank via the manhole. 205 Litre drums are lifted using a forklift truck and positioned over the manhole cover. The operator then opens the tap (installed on the drum earlier) to transfer the contents to the tank. The products are then mixed prior to delivery to the filling line. Where a tank is used for raw material transfer, the material is pumped to the batching tank.

Once the batched mix is complete a centrifugal pump is used to transfer the mixed product to the filling line. This is performed via underfloor pipework, which delivers the product to a small float-operated ready use tank adjacent to the filling head. As the cans progress along the conveyor, the filling head and attached fill tube is lowered and the tube enters the can top. The product (liquid) is then filled to the can and the fill head/tube retracted when full. This process is repeated for each can. The same principle is used to fill bottles.

The 205 Litre drums are used predominantly for the mixing of paint prior to filling cans. Paint mixing is described in **Section 2.7**. The paint is then transferred to 205 Litre drums and transported to the required filling area. The drum lids are removed and a mixer and withdrawal spear placed in the drum. Drums remain on pallets throughout the whole operation and are not handled.

For aerosol gassing, the cans, which now contain product and are moving down the conveyor, are fitted manually with a product release cap. This is crimped onto the can using a cap crimping machine. The cans then pass to a conveyor, which feeds them through a small slot in the factory wall to a gassing head. The gassing assembly is located inside a concrete block room, which is fitted with gas detection and gas isolation valves, activated in the event of gas detection. Propane/Butane gas mix (500kPa) is used as the propellant, which is loaded to the can

using a gassing head. Once filled with gas, the cans return to the factory, via conveyor, through a small slot in the wall.

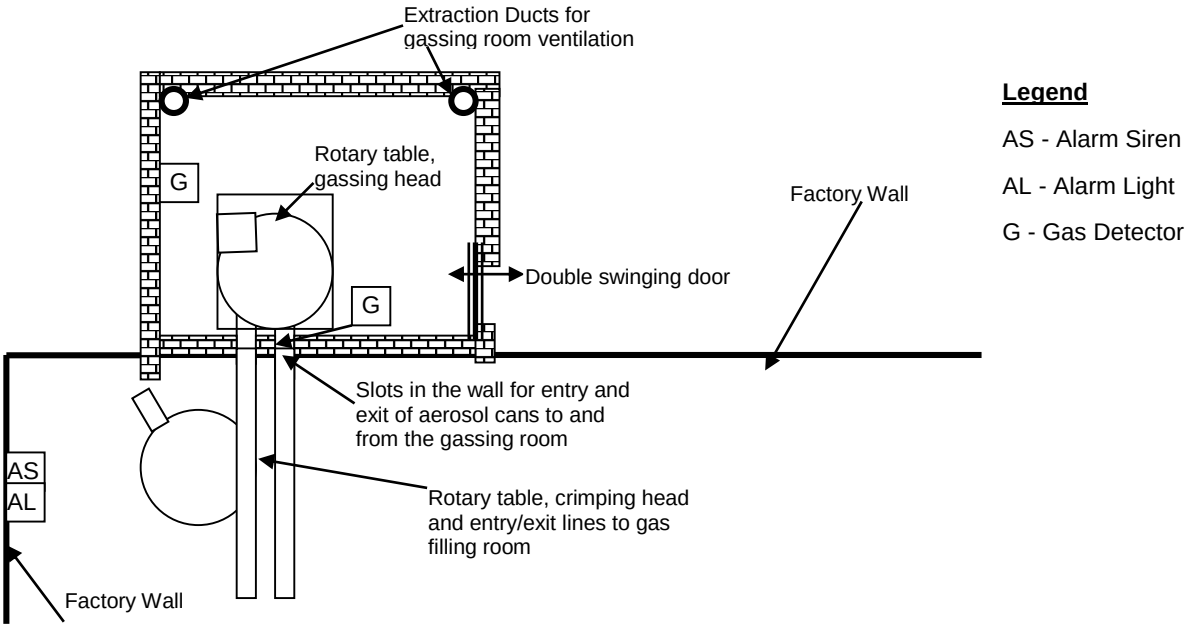


Figure 2-5: Plan of a Typical Aerosol Filling Room

2.9 Raw Materials, Product and Packaging Storage

Raw materials and product are stored in a number of locations around the site. These are detailed in **Figure 2.4**. Raw materials are stored in bulk tanks or 205 litres drums. Tanks and drum store locations are shown on **Figure 2.4**.

Once the cans are filled, they are manually packed into boxes. The boxes are taped and stacked on a pallet, which is transferred to the Dangerous Goods store when full. Products are then transported to market as required.

2.10 Dangerous Goods Stored On-Site

MMP stores a number of Dangerous Goods (DGs) for use in the manufacture of aerosols and filling of bottles. These are:

- Class 2.1 Flammable Gas;
- Class 3 Flammable Liquid;
- Class 8 Corrosive Liquids; and
- Class 6.1 Toxic Substances.

Whilst other materials are stored and used on-site, these are non-dangerous and are used in a number of bottle and aerosol filling lines. In addition to the materials stored and used for the filling of aerosols and bottles, MMP stores containers (cans and bottles) that are filled as part of the facility operations.

Table 2.1 lists the Dangerous Goods storage details (types, quantities, UN.No., Class and PG).

Table 2-1: List of Dangerous Goods Stored at the MMP Facility

Depot No. and Name of DG	UN.No.	Class	PG	Quantity Stored	Storage Type & Location*
Depot N1 – LPG	1075	2.1	-	63kL (32 tonnes)	Above Ground Tank East of the Aerosol store and compressor house
Depot N2 – LPG	1075	2.1	-	63kL (32 tonnes)	
Depot N2 – LPG	1075	2.1	-	45kL (23 tonnes)	
Depot N4 – LPG	1075	2.1	-	45kL (23 tonnes)	
Depot 2 – LPG	1075	2.1	-	7.5kL (3.5 tonnes)	Above Ground Tank Adjacent to the southern most boundary of the site
Depot 3 – LPG	1075	2.1	-	7.5kL (3.5 tonnes)	
Depot 19 – LPG	1075	2.1	-	7.5kL (3.5 tonnes)	
Depot 20 – LPG	1075	2.1	-	7.5kL (3.5 tonnes)	
Depot 21 – LPG	1075	2.1	-	7.5kL (3.5 tonnes)	
Depot N5 – Acetone	1090	3	II	10,000 Litres	Underground Tanks West of Warehouse 11
Depot N6 – Xylene	1307	3	II	10,000 Litres	
Depot N7 – Acetone	1090	3	II	55,000 Litres	Underground Tanks West of Warehouse 7
Depot N8 – White Spirit	1300	3	II	55,000 Litres	
Depot N9 – White Spirit	1300	3	II	55,000 Litres	
Depot N10 – Toluene	1294	3	II	55,000 Litres	
Depot 17 – Acetone	1090	3	II	10,000 Litres	Underground Tanks Between warehouses 5 and 7
Depot 15 – Toluene	1294	3	II	20,000 Litres	
Depot 16 – Toluene	1294	3	II	20,000 Litres	
Depot 11 – White Spirit	1300	3	II	20,000 Litres	Underground Tanks Immediately west of Warehouse 4
Depot 10 – White Spirit	1300	3	II	20,000 Litres	
Depot 1 – White Spirit	1300	3	II	20,000 Litres	Underground Tank Southern corner of Warehouse 1
Depot WH5-1 – Aerosol	1950	2.1	-	300,000kg	Warehouse 5
Depot N11 – Aerosol	1950	2.1	-	22,500kg	Warehouse 9
Depot N12 – Aerosol	1950	2.1	-	25,000kg	Warehouse 10
Depot N13 – Paint Related Products	1263	3	III	15,000 Litres	Warehouse 8 (Paint Tints)
Depot 12 - LPG	1075	2.1	-	500 Litres	Cylinder Store West of Warehouse 6 (Minor Storage)

Table 2-1: List of Dangerous Goods Stored at the MMP Facility

Depot No. and Name of DG	UN.No.	Class	PG	Quantity Stored	Storage Type & Location*
Depot WHS3-1 - Dichloromethane Trichloro ethylene	1593 1897	6.1 6.1	II II	1000 Litres 9000 Litres	Warehouse 3
Depot WHS3-2 – Ethanolamine	2491	8	III	1600 Litres	Warehouse 3
Depot WHS2-1 – Sodium Nitrate	1500	5.1		300kg	Warehouse 2
Depot WHS1-2 – Diesel	-	C1	-	2100 Litres	Warehouse 1
Depot WHS1-1 - Ethanolamine	2491	8	III	205 Litres	Warehouse 1
Depot WHS7 – Flammable Solid Organic, NOS	1325	4.1		500kg	Warehouse 7
Depot 4 – Ethanol (ethyl alcohol)	1179	3	II	20,000 Litres	Package Store (205 Litre drums) South west of Warehouse 1

* see **Figure 2.5** for map of storage locations

All Dangerous Goods on site are stored in accordance with the Australian Dangerous Goods Code (Ref.2), the WHS Regulation (2011) (Ref.3), and AS 1940-2004 (Ref.4). WorkCoverNSW has been notified of the storage quantities and provisions at the site.

2.11 Quality and Environmental Standards

The MMP organisation operates under the principles of a number of international standards, including ISO and Australian Standards. The principles contained within the following standards are implemented at the MMP Mulgrave site:

- ISO14000 - 2004 (Series) – Environmental management Systems.
- OHSAS18000 – 2007 (Series) ,Occupational Health and Safety Management Systems.
- ISO9000 – 2005 (Series), Quality Management Systems.

The assessment conducted in this review included a review of the current system to identify the appropriate procedures applicable to emergency response, pollution control and incident reporting.

A review of the relevant procedures, currently used at MMP, is presented in the following table.

Title	Applicability	Comments
Environmental Health & Safety (EHS) incident Statutory Reporting and Investigation Process SMS 4.4.3 and ERP (Section 12)	Defines the statutory requirements for EHS incident reporting and procedure for internal reporting and conducting incident investigation	Applies to internal incident report and reporting to WorkCover. Also applies to any incident and reporting to appropriate government agencies.

Title	Applicability	Comments
Emergency Response Plan (ERP)	Provides a planned and coordinated response to emergency situations related to environmental health and safety.	Includes responsibilities, procedures, training for emergency drills.
Crisis Management Plan (ERP)	Assists in the response, management and recovery of a crisis situation directly impacting the people or operations of MMP.	The Crisis Management Plan is incorporated within the ERP and includes the responsibility of the Site personnel for crisis management and the notification process that should be completed.
Environmental Aspect and Impact Analysis	Describes the methods used to identify the environmental aspects and impacts, how to assess the significance of the aspects and impacts and how they are managed.	Environmental Aspects and Impacts register has not been developed for the site – Recommend an Aspects and Impact Register be developed for the site – Register to be developed by end Oct 14.
Emergency Preparedness and Response (Risk Assessment & Risk Register, ERP)	Describes the process of identifying the potential for and response to Environmental and OHS incidents and emergency situations and the actions to prevent and mitigate the likely illness that may be associated.	Procedures should be documents specifically for emergencies such as liquid DGs release and clean-up; release of aerosol can contents, dropped drums, LPG release, etc. An inventory of safety/incident response equipment should be included in this procedure. Needs to be updated annually. SMS document includes requirements for PIRM updates.
Aspect/Impact Analysis for Operations	Identifies the works activities, aspects and impacts specific to the MMP operations at the Site in Mulgrave	Includes all the work activities for the operations conducted at the Site – see Various documents including SMS, ERP and Risk Assessments
Hazard Identification and Risk Assessment Preliminary Hazard Analysis (PHA)	Documents the identification of hazards relating to occupational health and safety, evaluate the risks associated with these hazards and to ensure that appropriate actions are taken to manage the risks involved.	Relates to hazards and risks at the site including OH&S, process hazards, major hazards, liquid/gas releases and spill retention and environmental impacts from potentially contaminated fire water.
Environmental Occupational Health & Safety (OHS) Accident/Incident and Non-Conformance	Defines the responsibility and authority for the handling of investigation of Environmental and OH&S accidents, incidents and non-conformances as well as the mitigation action, the implementation and verification for corrective/preventive action.	Outlines procedures for handling of investigations of environmental, OH&S incidents and non-conformances.

3.0 PIRMP

This pollution incident response management plan (PIRMP) has been prepared for the MMP facility in Mulgrave, NSW. The PIRMP sets out the procedure to be followed in the event of a pollution incident at the site.

3.1 What is a Pollution Incident?

In accordance with the POEO Act (section 153F), if a pollution incident occurs in the course of an activity so that material harm to the environment is caused or threatened, the person carrying on the activity must immediately implement the PIRMP.

'Pollution Incident 'is defined in the dictionary of the POEO Act as:

> *A pollution incident means an incident or set of circumstances during or as a consequence of which there is, or is likely to be, a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise.*

'Material Harm' is defined in section 147 of the POEO Act. Material harm includes on-site harm, as well as harm to the environment beyond the premises where the pollution incident occurred.

> *147 Meaning of material harm to the environment*
>
> *(1) For the purposes of this Part:*
>
> *(a) harm to the environment is material if:*
>
> *(i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or*
>
> *(ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and*
>
> *(b) loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.*
>
> *(2) For the purposes of this Part, it does not matter that harm to the environment is caused only in the premises where the pollution incident occurs.*

3.2 Immediate notification

EPL licensees and anyone carrying on an activity or occupying a premises who becomes aware of a pollution incident are required to report the pollution incident **immediately** (under section 148 of the POEO Act). (Formerly the requirement was 'as soon as practicable').

'Immediate' means licensees or operators need to report pollution incidents promptly and without delay. There is a $2 million maximum penalty for failure to notify of a pollution incident in accordance with the requirements of the POEO Act.

The duty to notify does not apply to a pollution incident involving only the emission of an odour, and does not include an incident or set of circumstances involving only the emission of noise.

4.0 Requirement of the PIRMP

The legislative requirements of the PIRMP and where these requirements have been met in this document are shown in the table below. Each of the legislative requirements is listed in the table below and a reference provided as to where compliance for the specific section of the legislation is found. The parts of the PIRMP that must be made publicly available are noted in the table below, row 98D.

Legislation	Requirement	Where this requirement is met	Must be Publicly Available?
POEO Act: Part 5.7A Duty to prepare and implement pollution incident response management plans			
153A - Duty of licence holder to prepare pollution incident response management plan	The holder of an environment protection licence must prepare a pollution incident response management plan that complies with this Part in relation to the activity to which the licence relates. It is noted that MMP does not hold or require a licence, however, the EPA has requested MMP prepare a PIRMP.	This PIRMP in conjunction with the following MMP documents: • Emergency Response Plan (ERP) • Crisis Management Plan (incorporated in the ERP) • Environmental Health & Safety (EHS) incident Statutory Reporting and Investigation Process (included in the SMS & ERP) • Emergency Preparedness and Response (Risk Assessment documents and ERP) • Work instructions and procedures.	
153C - Information to be included in plan	A pollution incident response management plan must be in the form required by the regulations and must include the following: a) the procedures to be followed by the holder of the relevant environment protection licence, or the occupier of the relevant premises, in notifying a pollution incident to: i) the owners or occupiers of premises in the vicinity of the premises to which the environment protection licence or the direction under section 153B relates, and	Refer to Section **6.0** of this PIRMP.	✓
	ii) the local authority for the area in which the premises to which the environment protection licence or the direction under section 153B relates are located and any area affected, or potentially affected, by the pollution, and	Refer to Section 5.0 of this PIRMP – the contact details, of the local regulatory authority, is included in **Table 5.1**.	✓
	iii) any persons or authorities required to be notified by Part 5.7	Refer to Section 5 of this PIRMP. **Table 5.1** lists the various contact details for the authorities required to be contacted.	✓
	b) a detailed description of the	Response procedures are specified in:	

Legislation	Requirement	Where this requirement is met	Must be Publicly Available?
	action to be taken, immediately after a pollution incident, by the holder of the relevant environment protection licence, or the occupier of the relevant premises, to reduce or control any pollution	• Emergency Response Plan • Crisis Management Plan (within the ERP)	
	c) the procedures to be followed for co-ordinating, with the authorities or persons that have been notified, any action taken in combating the pollution caused by the incident and, in particular, the persons through whom all communications are to be made	Refer to Section **5.3** of this PIRMP.	
153D - Keeping of plan	A person who is required to prepare a pollution incident response management plan under this Part must ensure that it is kept at the premises to which the relevant environment protection licence relates, or where the relevant activity takes place, and is made available in accordance with the regulations.	A copy of the PIRMP will be kept on-site at MP, Mulgrave.	
153E - Testing of plan	A person who is required to prepare a pollution incident response management plan under this Part must ensure that it is tested in accordance with the regulations.	Testing of the PIRMP will be undertaken in accordance with the regulations as set out in Section 9 of this PIRMP.	
153F- Implementation of plan	If a pollution incident occurs in the course of an activity so that material harm to the environment (within the meaning of section 147) is caused or threatened, the person carrying on the activity must immediately implement any pollution incident response management plan in relation to the activity required by this Part.	Noted – the plan will be implemented in the unlikely event of an incident.	
Protection of the Environment Operations (General) Regulation 2009: Part 3A Pollution incident response management plans			
98B - Form of plan	1) A plan is to be in written form	This PIRMP meets the requirements of the written form plan.	
	2) A plan may form part of another document that is required to be prepared under or in accordance with any other law so long as the information required to be included in the plan is readily identifiable as such in that other document.	As noted, this PIRMP in conjunction with the following MMP documents: – Emergency Response Plan (ERP) – Crisis Management Plan (incorporated within the ERP) – Environmental Health & Safety (EHS) incident Statutory Reporting and Investigation Process (within	

Legislation	Requirement	Where this requirement is met	Must be Publicly Available?
		the ERP and SMS – Emergency Preparedness and Response (ERP) – Work instructions and procedures.	
98C - Additional matters to be included in plan	1) General The matters required under section 153C (d) of the Act to be included in a plan are as follows: a) a description of the hazards to human health or the environment associated with the activity to which the licence relates (the relevant activity),	Refer to Section 7 of this PIRMP. Hazards associated with the operations that may impact people (on and offsite), plant and the environment is covered in the quantitative risk assessment conducted in the Preliminary Hazard Analysis (PHA) study.	
	b) the likelihood of any such hazards occurring, including details of any conditions or events that could, or would, increase that likelihood	Refer to Section 7 of this PIRMP. The likelihood of hazards associated with the operations that may impact people (on and offsite), plant and the environment is covered in the quantitative risk assessment conducted in the Preliminary Hazard Analysis (PHA) study.	
	c) details of the pre-emptive action to be taken to minimise or prevent any risk of harm to human health or the environment arising out of the relevant activity	Refer to Section 7 of this PIRMP. Pre-emptive actions that are taken to avert hazards associated with the operations that may impact people (on and offsite), plant and the environment is covered in the quantitative risk assessment conducted in the Preliminary Hazard Analysis (PHA) study. The site Dangerous Goods (DG) risk assessment also included actions (safeguards) that should be applied to minimise the impacts of hazards at the Site.	
	d) an inventory of potential pollutants on the premises or used in carrying out the relevant activity.	Refer to Section 7 of this PIRMP. A Dangerous Goods risk assessment has been conducted for the site which includes a detailed list of hazardous materials that may impact people (on and offsite), plant and the environment.	
	e) the maximum quantity of any pollutant that is likely to be stored or held at particular locations (including underground tanks) at or on the premises to which the licence relates	Refer to Section 7 of this PIRMP. A Dangerous Goods risk assessment has been conducted for the site which includes a detailed list of hazardous materials that may impact people (on and offsite), plant and the environment, and the locations of all goods held at the site.	
	f) a description of the safety equipment or other devices	Refer to: – Emergency Response Plan (ERP)	

Legislation	Requirement	Where this requirement is met	Must be Publicly Available?
	that are used to minimise the risks to human health or the environment and to contain or control a pollution incident	– Preliminary Hazard Analysis Study	
	g) the names, positions and 24-hour contact details of those key individuals who: i) are responsible for activating the plan, and ii) are authorised to notify relevant authorities under section 148 of the Act, and iii) are responsible for managing the response to a pollution incident	Refer to the site ERP. The appendices in the ERP provide contact details, including phone numbers.	
	h) the contact details of each relevant authority referred to in section 148 of the Act	Refer to Section 5.0 of this PIRMP (see **Table 5.1** for contact details of each authority) The ERP also contains contact details of the authorities and requirements for contacting regulators, including reports and documents to be submitted after an incident has occurred.	✓
	i) details of the mechanisms for providing early warnings and regular updates to the owners and occupiers of premises in the vicinity of the premises to which the licence relates or where the scheduled activity is carried on	Refer to Section 6.0 of this PIRMP. The ERP contains details of adjacent sites and contact phone numbers for adjacent sites.	✓
	j) the arrangements for minimising the risk of harm to any persons who are on the premises or who are present where the scheduled activity is being carried on	Refer to the following procedures: • Emergency Response Plan (ERP), including Emergency Preparedness and Response procedures incorporated within the ERP	
	k) a detailed map (or set of maps) showing the location of the premises to which the licence relates, the surrounding area that is likely to be affected by a pollution incident, the location of potential pollutants on the premises and the location of any stormwater drains on the premises	Refer to **Figure 2.1** and **Figure 2.2** of this PIRMP for materials storage locations. See **Table 2.1** for details of material quantities held in each storage depot. See **Figure 2.4** for details of stormwater system and drain locations, including drain system isolation point.	
	l) a detailed description of how any identified risk of harm to human health will be reduced,	Refer to • Emergency Response Plan (ERP) • Preliminary Hazard Analysis (PHA)	

Legislation	Requirement	Where this requirement is met	Must be Publicly Available?
	including (as a minimum) by means of early warnings, updates and the action to be taken during or immediately after a pollution incident to reduce that risk	study prepared for the site, including a Quantitative Risk Assessment (QRA)	
	m) the nature and objectives of any staff training program in relation to the plan	Training for the PIRMP will be conducted in conjunction with in Emergency Response Training,	
	n) the dates on which the plan has been tested and the name of the person who carried out the test	Refer to Section 7 of this PIRMP.	
	o) the dates on which the plan is updated	Refer to Section 7 of this PIRMP.	
	p) the manner in which the plan is to be tested and maintained.	Refer to Section 7 of this PIRMP.	
	2) Trackable waste transporters Environmental Treatment Solutions Contact: Geoff O'Dell Phone: 02 9605 8534 Address:12 Shaw Road, Ingleburn, NSW	Trackable wastes are collected by Environmental Waste Solutions and transferred to a licensed disposal facility. All wastes are tracked using the required EPA documentation. Contact details of the trackable wastes company are included in the ERP and listed in the adjacent cell.	
98D - Availability of plan	1) A plan is to be made readily available: a) to an authorised officer on request, and	The PIRMP will be made readily available to an authorised EPA officer on request.	
	b) at the premises to which the relevant licence relates, or where the relevant activity takes place, to any person who is responsible for implementing the plan.	The PIRMP will be kept onsite at Mulgrave.	
	2) A plan is also to be made publicly available in the following manner within 14 days after it is prepared: a) in a prominent position on a publicly accessible website of the person who is required to prepare the plan, b) if the person does not have such a website—by providing a copy of the plan, without charge, to any person who makes a written request for a copy.	The PIRMP is publicly available on MMP's website.	
	3) Subclause (2) applies only in	The publicly available PIRMP includes	

Legislation	Requirement	Where this requirement is met	Must be Publicly Available?
	relation to that part of a plan that includes the information required under: a) section 153C (a) of the Act, and b) clause 98C (1)(h) and (i) or (2)(b) and (c) (as the case requires).	those sections referred to in the Act and Regulation (refer to the right hand column of this Table).	
	4) Any personal information within the meaning of the Privacy and Personal Information Protection Act 1998 is not required to be included in a plan that is made available to any person other than a person referred to in subclause (1).	Noted.	
98E Testing of plan	1) The testing of a plan is to be carried out in such a manner as to ensure that the information included in the plan is accurate and up to date and the plan is capable of being implemented in a workable and effective manner.	Refer to Section 7 of this PIRMP.	
	2) Any such test is to be carried out: a) routinely at least once every 12 months, and b) within 1 month of any pollution incident occurring in the course of an activity to which the licence relates so as to assess, in the light of that incident, whether the information included in the plan is accurate and up to date and the plan is still capable of being implemented in a workable and effective manner.	Refer to Section 7 of this PIRMP.	

5.0 Pollution Incident Notification Protocol

This Section of the PIRMP sets out the procedure to be followed by MMP in notifying a pollution incident to authorities.

5.1 Who do you notify?

Firstly, call 000 if the incident presents an immediate threat to human health or property. Fire and Rescue NSW, the NSW Police and the NSW Ambulance Service are the first responders, as they are responsible for controlling and containing incidents.

Upon receiving notification, the Chief Warden (CW), or Site Emergency Controller (SEC), must determine the level of the incident. If the event is a pollution incident (refer to **Section 3.1**), the CW/SEC must then immediately (that is, promptly and without delay), provide notification of the pollution incident to all the authorities identified in **Table 5.1**, in the order as listed.

Table 5-1: List of Authorities that Must Be Contacted in the Event of a Pollution Incident

Contact	Phone Number
1. The EPA Environment Line	131 555
2. The Ministry of Health via the Westmead Hospital	Ph: 02 9845 5555
3. The WorkCover Authority	13 10 50
4. Hawkesbury Council	4560 4444
5. Fire and Rescue NSW	General Emergency – 000 Fire Safety Division – 9742 7400
6. NSW Department of Planning (Major Hazards)	9228 6333 (mhu@planning.nsw.gov.au)

Whenever an incident notification is made **contact all six** relevant authorities. For example:

- if the initial call is to NSW Fire and Rescue on 000, due to an immediate threat to life and property, the other five authorities must still be contacted; or
- if the incident did not require an initial combat agency, all of the response authorities (including Fire and Rescue) must still be notified in the order listed in the above Table.

Notification is not necessary if the operators of the facility know that all relevant authorities are already aware of the incident (section 151 POEO Act).

If, at the time of making the notification, it is understood that some of these authorities do not need to attend the incident, such advice may be provided. However, all information must still be provided including all the information held at the site, regarding the incident, to each authority. It is the responsibility of each authority to decide whether they need to attend the incident.

Where authorities decide not to attend, the incident notification enables each authority to respond to enquiries about the incident and provides them with initial information in the event that the incident escalates or their involvement in managing the incident is required at some later stage.

5.2 What information must be provided?

Sufficient detail of the incident must be reported to the EPA to enable appropriate follow-up action. The relevant information required includes:

a) the time, date, nature, duration and location of the incident;

b) the location of the place where pollution is occurring or is likely to occur;

c) the nature, the estimated quantity or volume and the concentration of any pollutants involved, if known;

d) the circumstances in which the incident occurred (including the cause of the incident, if known); and

e) the action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution, if known.

Any information that is not known when the incident is notified must be provided immediately once it becomes known.

5.3 Coordination with authorities

In the event of an immediate threat to life and property, the incident will be coordinated by the CW/SEC, who will co-ordinate site activities with the relevant Combat Agency who attends the site. MMP will act under instruction from emergency services and take any action as directed to combat pollution caused by the incident. The site Emergency response Plan contains response procedures for spills and the action to be taken in the event of a material release to the environment. Contact details of the site emergency response team are contained within the ERP. The ERP should be consulted for any incidents that occur at the site.

Following initial notification, the MMP person through whom all communications are to be made, and who will coordinate with authorities, is the site Production Manager. Contact details are provided in **Table 5.2**.

Table 5-2: MMP Person Responsible for Communications with Authorities

Roles	Name	Contact	Phone Number
Chief Site Warden/Site Emergency Commander - Primary	Barney Stuart	Production Manager	0434 314 441
Chief Site Warden/Site Emergency Commander - Secondary	Amy Borgman	Safety Manager	0402 538 482

6.0 Notifying a Pollution Incident to Neighbours

This section of the PIRMP sets out the procedures to be followed by MMP in notifying a pollution incident to the owners or occupiers of premises in the vicinity of MMP in the locality of Mulgrave.

6.1 Wider Notification

The EPA can formally direct MMP to notify others. If so directed, MMP would contact commercial, industrial and residential neighbours to inform them of the circumstances of the incident and what action is being taken in response to it. It will be an offence not to comply with such a direction.

The EPA may advise MMP of the extent of notification required. If not, MMP would determine the extent of who to contact based on the nature of the pollution incident and the conditions at the time (for example, the type of pollutant, prevailing winds, magnitude of incident, and possible impacts).

6.2 Community communication mechanisms

In the event that the pollution incident is being coordinated by emergency services, communications would be under the control of the Combat Agency. The Combat Agency are able to communicate SMS messages to defined catchment areas to alert and advise the community if required. MMP (through the person nominated in **Table 5.2**) would work with the Combat Agency to provide communications assistance and support, including direct doorknocks if they were required.

If communication is not coordinated by the Combat Agency, notification to the owners or occupiers of premises in the vicinity of the MMP Mulgrave site would be coordinated by the person nominated in Emergency response Plan, being the CW/SEC (the site Production Manager).

The communication response to be used in the event of a pollution incident would depend on the circumstances of the event, and any direction that may be provided by the EPA.

A media liaison officer is available to be contacted 24/7 in the event that a media release is required. Media updates could be provided on an ongoing basis depending on the incident.

6.3 Information to be provided

In the event of a pollution incident, communication to the community would include specific information to minimise the risk of harm. For example, this may include instructions to close windows and doors and remain inside for incidents involving emission of air pollutants.

The information to be provided would be dependent on the nature and circumstances of the event.

7.0 Hazards

7.1 Hazard Analyses Conducted at the MMP Mulgrave Facility

A number of hazard and risk assessment studies have been conducted at the MMP Mulgrave site. These studies relate to the site operations and the storage and handling of Dangerous goods, which have the potential to cause hazard to people, plant and the environment.

The key studies are:

- Preliminary Hazard Analysis – performed as part of the site development and installation of LPG tanks. The study includes a quantitative risk assessment, which provides details of the fatality and injury risk to people at adjacent properties as a result of incidents at the MMP site.
- Dangerous Goods Risk Assessment – a semi-quantitative analysis of the storage and handling of Dangerous Goods at the MMP Mulgrave site. The study was conducted as a compliance requirement with the Work Health and Safety Regulation – 2011.
- Fire Safety Study (FSS) – conducted as part of the site development and Conditions of consent. The FSS includes assessment of the application of hoses at the site and the retention of potentially contaminated fire water that may contain chemicals, flammable liquids, toxic materials and/or corrosives.

A summary of the hazards has been presented in the following sections.

7.2 Hazardous Nature of Chemicals Stored and Handled at MMP

7.2.1 Hazardous Nature of Liquefied Flammable Gas (LPG)

Propane, Butane and LPG are all liquefied flammable gasses, that is the gas is held at elevated pressure and atmospheric temperature as a liquid. In the event the pressure of the liquefied gas falls (i.e. is release from its pressurised containment), it will vaporise into a gas.

The liquefied gases are classified as Class 2.1 Flammable Gas by the Australian Dangerous Goods Code (ADG – Ref.2). The characteristics of the liquefied flammable gases (propane, butane and LPG) are that they are heavier than air and behave as a dense gas when released. Dense gases accumulate in low areas and have the potential to reach concentrations that will ignite, burn and/or explode. The lowest concentration at which a gas will explode is known as the lower explosive limit (LEL).

In the event a continuous release of liquefied flammable gas occurs and is ignited immediately, the gas release will burn as a jet, this is known as a jet fire. In the event a release is not ignited immediately, there is a potential for the released gas to accumulate and form a gas cloud. Ignition of the cloud at a distance and after a time may result in one of two phenomena; a flash fire or a gas cloud explosion.

A flash fire occurs when a gas cloud is ignited in the open air. The lack of restrictions and confinement limits the potential for rapid flame speed (i.e. greater than sonic) and ,hence, the cloud burns rapidly and without a percussive wave. Damage to buildings and structures as a result of flash fires is minimal, however, if people are caught within the sphere of the flash fire injury or potential fatality may occur.

A gas cloud explosion occurs when an ignition of a flammable gas cloud occurs in a confined area. The confinement/restrictions cause rapid mixing as the flame front progresses and moves around objects. The rapid mixing causes increased flame speed, which causes further rapid mixing. The process continues until the flame speed exceeds sonic levels, the cloud then deflagrates and creates a percussive wave. Percussive waves as a result of explosions can cause significant damage to buildings and structures as well as releasing projectiles, which strike people, resulting in injury and possible fatality.

As liquefied flammable gas evaporates when released, there will eventually be no remaining liquid, hence, there is no environmental impact to ground or water bodies close to the release point.

7.2.2 Hazardous Nature of Flammable Liquids

Flammable liquids vary in the nature of the hazard they pose. The ADG (Ref.2) categorises flammable liquids into three sections; high hazard, medium hazard and low hazard. These are classified into Packaging Groups (PG) I, II, and III respectively. The hazard is related to the flash point of the liquid, high hazard being low flash point (i.e.

the material vaporises freely at room temperature) medium hazard having a flash point less than 23ºC, and low hazard having a flash point between 23ºC and 65ºC (Ref.4).

In the event a flammable liquid is released it will pool under the release point (e.g. drum or equipment). The vapour release may ignite causing a liquid pool fire under and around the release point. The pool fire will act as a cylinder of flame that radiates heat into the area surrounding the fire. People impacted by heat radiation may be injured or, in the worst case, the heat radiation will cause a fatality. Equipment impacted by heat radiation may, after a period of exposure, weaken and fail (e.g. collapse). Combustible materials may spontaneously ignite after a period of exposure.

Flammable liquids pose a hazard to the environment in that they may contaminate soils into which they are accidentally released.

7.2.3 Hazardous Nature of Corrosive Materials

A corrosive substance has the potential to cause visible necrosis (death) of human skin tissue, or the potential to corrode metal or other materials. The severity of the impact of the materials is based on the pH level of the corrosive substance. Water, for example is has a neutral pH of 7. Highly acidic substances have a pH of 3 or less, highly alkaline materials have a pH of 11 or more. The packaging groups allocated to corrosive substances reflect the hazard and risks associated with the particular packaging group. Corrosives that affect the skin (i.e. visible necrosis) in less than 3 minutes of exposure are allocated PGI status (high risk). Corrosives that affect the skin between 3 and 60 minutes of exposure are allocated to PGII (moderate risk). Corrosives that affect the skin between 60 minutes and four hours are allocated to PG III (low risk).

7.2.4 Hazardous Nature of Toxic Materials

The toxicity of a substance is its ability to cause harmful effects to people or the biophysical environment. These effects can strike a single cell, a group of cells, an organ system, the entire body, a small area of the environmental or a total ecosystem. All chemicals can cause harm. When only a very large amount of the chemical can cause damage, the chemical is considered to be relatively non-toxic. When a small amount can be harmful, the chemical is considered toxic.

The toxicity of a substance to humans depends on three factors: its chemical structure, the extent to which the substance is absorbed by the body, and the body's ability to detoxify the substance (change it into less toxic substances) and eliminate it from the body.

Like corrosive materials, toxic substances are categorised by the ADG (Ref.2) into packaging groups (PG). Generally the following applies. Highly toxic materials are defined as those that will result in fatality to 50% of the population from exposure to between 10 and 1000 parts per million (ppm). These materials are listed in PGI. Moderately toxic materials are those that will result in fatality to 50% of the population from exposure to 1000 and 3000ppm. These materials are listed in PGII. Low toxicity materials are those that will result in fatality to 50% of the population from exposure to 3000 and 5000ppm. These materials are listed in PGIII.

Releases of toxic materials to the biophysical environment may also result in damage to plant, animal and birdlife. Toxic materials may be retained within a biophysical environment without damaging the environment, however, contact between humans and animals with that environment may result in toxic impact to the contact group. Under the Contaminated Land Management Act storage and handling of toxic materials can be classified as operations with the potential to cause “significant risk of harm”. This is a concept covered by the Contaminated Land Management Act.

7.3 Liquefied Flammable Gas Hazards

It is proposed to install four liquefied flammable gas tanks at the MMP facility, Mulgrave. The liquefied gases will be stored in the tanks in the following configuration:

- propane – 1 x 63kL Tank;
- butane – 1 x 63kL Tank and 1 x 42kL Tank; and
- liquefied gas blend (LPG) – 1 x 42kL Tank.

MMP also stores LPG in 5 existing LPG tanks, each of the same dimensions, capacity and design. Each tank holds 7,500 litres of gas (about 3,800kg). The location of all tanks (existing and proposed) is shown in **Figure 2.5**.

The existing facilities are, and the proposed facilities will, be designed, installed and operated in accordance with AS1596-2002 (Ref.1). This is an important feature in minimising risk as this standard requires specific safety

features to be installed such as excess flow valves, isolation valves at the point where the gas/liquid leaves the vessel, pressure testing of vessels, weld testing of pipework and nozzle welds in vessels, etc. The safety management regime of AS1596 is stringent and compliance with this standard provides significant safety assurance.

Notwithstanding the compliance of the LPG storage with AS1596, there is always a possibility of component failure leading to gas release, ignition and explosion/fire. A number of incidents are identified to have the potential to occur these are:

- liquefied flammable gas delivery incidents involving release and fire/explosion;
- liquefied flammable gas tank incidents involving release and fire/explosion; and
- liquefied flammable gas equipment (pipes, pumps and fittings) incidents involving release and fire/flash fire/explosion.

Each incident has been assessed in detail below.

7.3.1 Liquefied Flammable Gas Delivery

Tankers deliver the gas in liquefied form and transfer the material from the tanker to the existing storage vessel using a flexible hose and fixed pipework, this operation will be the same for the proposed tanks. The tanker and transfer equipment/operation are designed and conducted in accordance with AS1596. This ensures the potential for incident is minimised.

Notwithstanding this, failure of the transfer hose could occur, leading to gas release, immediate or delayed ignition and explosion and/or fire. However, it is noted that the driver/operator is in attendance at all times during the delivery operation and that the hoses are hydrostatically tested annually. In the event of an incident during the transfer, the driver/operator will have access to a remote emergency shut of valve, that will isolate the fuel transfer and prevent gas release in the event of hose leak, equipment failure or coupling failure. The quantity of gas released between detection of incident occurrence and isolation of the gas would be minimal.

Operations of this kind are conducted many thousands of time per annum throughout NSW without major incident. Hence, this incident has not been carried forward for further analysis due to the attendance of the tanker driver at all deliveries and the low risk of incident.

On completion of delivery, the driver will isolate all gas lines, purge the lines, disconnect the lines and leave site. In the event the driver forgets to disconnect the lines, there is a potential that the driver may attempt to leave the site with the flexible hoses still connected. This could result in pipeline rupture and major gas release. However, as the system is designed and operated to AS1596, a number of safety features are installed these include:

- **Driver Training** – all drivers must be trained and regularly tested on liquefied gas deliveries.
- **Driveaway Protection on the Delivery Vehicle** – all liquefied gas delivery vehicles are fitted with driveaway protection. These devices are fitted to the delivery connections on the vehicle, such that when the delivery connection cover is removed, the vehicle air brakes are applied. This prevents the vehicle from being driven away during the transfer operation. Once the filling point cover is replaced, after transfer, the brakes are released and the vehicle may be driven away.
- **Non-Return Valve on Delivery Line** – the delivery line is fitted with a non-return valve (NRV) which prevents gas from being released from the vessel if the delivery line ruptures from driveaway incident.
- **Weak Point on the Delivery Line** – a weak joint is designed into the delivery line, close to the flexible hose connection point, this joint fails in the event of driveaway, with lines still connected, and prevents the total delivery line from being torn from the vessel.

Due to the installed safety features and systems, this incident has not been carried forward for further analysis.

An important point to note is that many thousands of liquefied gas deliveries are made to tanks of this capacity each year, all without major incident. The operation is well designed and executed with the safety features providing adequate protection for this operation. MMP will use experienced liquefied flammable gas transport companies with vast experience in the liquefied gas transfer operations.

7.3.2 Liquefied Flammable Gas Tank Incidents

Gas Cloud Explosion

The liquefied gas tanks and associated pipework are designed and operated in accordance with AS1596. The pipework is well designed, tested and regularly checked to ensure leaks are minimised. However, there is still a potential for leaks to occur at flanges, joints, valves and other equipment.

Ruptures are unlikely, as commissioning tests (i.e. Non-Destructive Testing or NDT and hydrostatic testing) of the vessel and pipework reduces the likelihood of rupture failure to negligible levels. Notwithstanding this, minor leaks at valves, flanges and joints may still occur. Minor releases may have a sufficient liquefied flammable gas release rate to generate a gas cloud that may ignite resulting in explosion. It is highly unlikely that gas clouds will explode in the open (Ref.5), however, where confinement occurs there is a potential for explosion. It is noted that the proposed tank location (see **Figure 2.2**) is in a partially confined area which occurs due to the construction of fire walls around parts of the tank facility. MMP has installed gas detectors that identify the gas leak and signal all valves within the gas storage area to close, isolating the gas release and preventing further accumulation of gas within the area.

In the unlikely event of an ignition and explosion, the gas will most likely vent upwards (i.e. into the open) as the area above the tanks is open and unrestricted.

Flash Fire

A flash fire occurs when a gas cloud is ignited in an unconfined area. The periphery of the cloud, which is within the flammable/explosive range (i.e. air/fuel mix) begins to burn rapidly with flame speed less than that of the speed of sound. As the flammable gas burns it creates disturbance, which causes mixing of air in the non-flammable part of the cloud. This part of the cloud is then within the flammable range and burns. As there is no restriction of the flame speed, the process continues at less than sonic velocity until the fuel in the cloud is consumed. There is no percussive wave in this fire and therefore very little if any explosion damage. However, fatalities may occur as a result of personnel caught within the burning cloud. The heat impact and potential to breath burning gases may cause fatalities.

In the proposed gas tank installation, the more likely scenario (if protection systems fails) is gas cloud explosion, due to the confinement of the fire walls. This explosion will vent upwards and the blast walls will provide some protection to the adjacent structures.

Gas Jet Fire

In the event a release is ignited immediately, a gas jet fire will occur at the release point. The gas jet fire will radiate heat to the surrounding area. The liquefied flammable gas vessels are located within a fire walled compound, which prevents direct flame and heat radiation projection across the site boundaries. However, if the flame is vertical (i.e. a release occurs at, say, the top of a flange) the flame may project above the fire wall and some heat radiation will be projected across the site boundary into adjacent facilities and properties.

Boiling Liquid Expanding Vapour Explosion (BLEVE)

In the event the jet flame impinges on the vessel, and the vessel is not cooled in the impingement area, there is a possibility that the vessel will weaken where the flame burns on the vessel shell. A point will be reached whereby the internal pressure of the vessel will exceed the material strength of the heat weakened vessel shell. At this point shell failure will occur, releasing the “boiling” liquefied flammable gas that has been heated by the impinging flame. The rapid gas release is ignited by the impinging flame and a fireball occurs. This incident is known as a boiling liquid expanding vapour explosion or BLEVE.

The vessels at the site have been fitted with a thermal insulation coating that will protect against heat radiation and jet fire impact. Further, fire hydrants and a fire pump have been installed to provide fire water application to the vessels, cooling the area and minimising the potential for BLEVE.

7.4 Aerosol Gas Charging Room and Aerosol Line Incidents

Aerosol charging rooms are used to load LP gas to aerosol cans. The rooms are constructed from concrete block walls with hinged doors and a sheet metal roof. The liquefied gas is transferred to the room via welded 50mm diameter pipework. Once inside the room the liquefied gas passes through a metering system, isolation valves and flexible hose (25mm) to the gassing head. Each room is fitted with a mechanical ventilation system which extracts the atmosphere within the room from flor level and discharges it externally at a point higher than the roof

of the adjacent warehouse building. Each room is fitted with a gas detector system which, on detection of gas, isolated the gas supply to the room and initiates and alarm (audible and visual).

In the event of gas release, the gas is immediately extracted to atmosphere preventing gas build up within the room. In the event of ventilation system failure, there is a potential for gas to build up in the room reaching the lower flammable limit. However, all equipment in the room is installed in accordance with the hazardous area zoning for the room (i.e. flameproof equipment). Hence, ignition is unlikely.

In the unlikely event an ignition occurs within the room, the explosion would be contained within the “blast” walls of the room and the sheet metal roof would be destroyed permitting percussive wave escape in a vertical direction. There would be no percussive wave projected off-site from potential explosion incidents in the aerosol filling rooms.

In the unlikely event of explosion in the aerosol filling room, the ignited gas that may continue to escape from the leak point would form a jet fire. This would be contained by the fire/blast walls of the aerosol filling room.

Once the cans have been filled they are returned to the aerosol filling factory via a conveyor. An important safety feature fitted throughout the aerosol filling lines is the water bath. All aerosol cans are passed through a water bath, which is held at 50^{o}C. The heated water causes a slight pressure rise in the cans as they pass through the bath. This provides a rigorous leak test and detection method. Hence, leaking cans are unlikely once they have passed through the bath and are packed.

In the unlikely event a can is leaking as it passes from the aerosol charging room to the filling factory area, there is a potential for the leak to ignite, resulting in localised gas jet fire. It is noted that the quantity of gas in each can is relatively small (between 20 and 140 grams) which would not result in significant impact beyond the immediate release area. The can filling operations are attended at all times by a number of operators who can respond in the event if such an incident. Emergency response equipment (e.g. fire extinguishers) is located around all filling lines, which can be used to contain any fire incidents.

As the filling room design is such that the postulated incidents in the area are contained within the room, and as the potential leaking can incidents in the factory area are contained to the single can leak, incidents within the aerosol filling rooms and on the filling lines (aerosol room discharge side) within the factory are considered to be effectively controlled.

7.5 Aerosol Storage Warehouse Incidents

On completion of aerosol filling, the aerosol cans are packaged in cardboard boxes and stored on site ready for shipment to clients and customers. A number of aerosol storage facilities are located around the site in the following locations:

- Warehouse 5 – 300,000kg; and
- Warehouse 9 – 22,500kg.

Some minor storage quantities are held adjacent to production areas for short periods of time (less than 12 hours) in accordance with the requirements of AS1940-1993 (Ref.4), Process Storage.

In the event of a can leak within the storage area, there is a potential for ignition and fire. The fire surrounding the cans adjacent to the leak can heat the full aerosol cans resulting in can overpressure and failure (explosion). The exploding can will then release its contents, which ignite, and cause the can to “rocket” and be projected into another area of the store. The burning can then causes other packaging to burn heating the cans within that package. The process continues until there are numerous “rocketing” cans and fires within the store.

Each of the stores in which the aerosol products are stored has significant containment facilities to minimise the potential for rocketing cans to escape the site. The three main aerosol storages are listed above. Warehouses 9 and 10 are constructed from 10m high concrete tilt up panels. In the event of a rocketing can scenario in these warehouses, the cans would be contained within the warehouse store itself and they would not be projected offsite. In warehouse 5, the walls are constructed from concrete tilt up panels on the boundary (south) side of the warehouse and sheet metal clad steel frames on the internal (to the site) walls. These type of walls will contain rocketing cans and eliminate the potential for offsite projection of cans.

However, in the event of fire impact on sheet metal walls, there is a potential for eventual wall failure leading to can projection beyond the store itself. **Figure 2.2** shows the location of warehouse 5 in relation to adjacent buildings and Dangerous Goods stores. The adjacent tanks are protected by a 6m high fire wall (concrete tilt up

panels – FRL 240/240/240), the warehouses to the north are also constructed from concrete tilt up panels (FRL 240.240.240). There is a significant distance to the closest warehouses to the west (23m), and over 20m to the aerosol filling factory to the east.

Based on the aerosol storage warehouse designs, incidents in these areas have been considered adequate to contain incidents within the site.

7.6 Flammable Liquid Hazards

Flammable liquid products are used in the manufacture of, for example, paints and other products that are filled to aerosol cans and bottles. A number of flammable liquid operations occur at the MMP site including bulk and drum deliveries, transfer of products from storage to areas of use, product mixing, and filling of bottles and cans. Once the aerosol cans are filled, the propellant (LP Gas) is loaded to the can, which is then used to propel the product from the can for application and use. Details of each operation and the potential hazards are discussed below.

7.6.1 Bulk Flammable Liquids Deliveries

The bulk flammable liquids are held on site in Underground Storage Tanks (UST) at various locations and of varying capacities. **Figure 2.2** shows the locations of the underground tanks and **Table 8.1** lists the underground tank capacities. The flammable liquids are delivered to site by road tanker. The tankers are located adjacent to the tank fill point and the tanker driver dips the tank prior to delivery to determine the maximum quantity that can be delivered to the tank. A flexible hose is then attached to the tanker unloading lines and to the tank fill point. The tank is then filled by gravity. Once completed the hose is removed and stowed on the vehicle. The tank fill caps are replaced and the tanker leaves site.

In the event a tanker driver makes and error, or a hose splits, there is a potential for a spill of flammable materials. If ignition does not occur, there is a potential for offsite impact from flammable materials entering drains and gutters. It is critical that immediate response occurs to contain the spill and prevent spread of the product. Tanker drivers are in attendance during the whole transfer operation and therefore can immediately isolate the delivery lines, minimising the spill quantity. Spill kits have been located at various positions around the site to assist with localised containment and clean up.

Inclusion of spill kits and spill response procedures minimises the potential for offsite impact. Hence, the risk of this incident is considered to be low, as the spill kits and spill response procedures are developed and used.

In the event of ignition of a spill, the tanker driver can isolate the flammable liquid delivery, minimising the impact magnitude. However, unlike the LPG transfer points, the bulk flammable liquid transfer points are close to the boundary in a number of areas, there is a potential for offsite impact from fires during delivery. To minimise the potential for offsite release, an isolation valve has been installed on the site discharge drain, which can be closed in the event of a spill, preventing off site impact. The activation of the drain isolation valve is included in the site Emergency response Plan and is tested regularly (monthly).

7.6.2 Delivery of Flammable Liquid in Drums

The delivery of flammable liquids in drums takes place well clear of the site boundaries. Drums are delivered to site in pallets with drums secured by banding. In the event of a banding failure, drums may fall from the pallets resulting in a split and leak. Like the bulk flammable liquids delivery, operators are on hand to commence immediate response. However, spill kits, emergency response plan and training are key functions in the control for these incidents. These are implemented at the site.

In the event of an ignition of a spill from a drum split, a pool fire would form radiating heat to the surrounding areas. Operators are present during all transfers and can therefore respond to such incidents. Drum unloading would take place well clear of site boundaries (closest boundary would be well over 20m from the unloading area. The heat radiation impact distance at 4.7kW/m^2* from a drum split pool fire is about 20m for toluene/xylene type products. Hence, there would be no impact offsite from these incidents.

7.6.3 Transfer of Flammable Liquid from Underground Tanks to Mixing Areas

Prior to filling the product to the aerosol cans, mixing and blending is required. Product mixes can contain a number of flammable liquids and other products, depending on the specific manufacture in process. Products are either transferred from underground tanks directly to the mixing vessels or materials are loaded to the mixing vessels from drums (varying sizes up to 205 litres).

The flammable liquids are transferred from the underground tanks by pumps and pipework, located in the various aerosol/paint mixing areas around the site. These locations are shown on **Figure 2.2**.The transfer pressure is relatively low (less than 300kPa) and pumps are relatively small. Pump seal failures and small leaks at gaskets are the main hazards associated with the transfer operation. The length of exposed pipework between underground tanks and mixing vessels is relatively small, as the majority of this pipework is also underground, only surfacing in the areas close to the mixing tanks.

A dropped flammable liquid drum or flammable liquid leak from a pipe or pump would spill the material onto the factory floor. In the event the material does not ignite, it will be contained within the factory bunding provided in all factory areas. There would be no leak offsite in this instance. In the event of ignition the pooled material would form a pool fire, which would radiate heat to the surrounding area. Noting that all transfer and mixing operations are conducted within the factory buildings, any fires would be contained within building confines and would not impact offsite.

Operators are present during all transfer and mixing operations and are available to commence emergency response to any incidents (e.g. product transfer isolation, spill control and first response fire fighting). Hence, the likelihood of incident growth is small. However, should operators be unable to control a fire, there is a potential for the incident to grow and become a full factory fire. This incident has the potential to impact offsite.

Small incidents within the factory such as spills and minor fires have little potential to result in offsite environmental impact or as the bunding and incident response is considered adequate to prevent incident impact offsite. A review of the site ERP indicates that this document has procedures for responding to spill incident and fires in factory areas.

7.6.4 Paint and Flammable Products Mixing (Flammable Liquids)

Products for filling aerosol cans and bottles are mixed in tanks and drums in a number of locations around the site. These are listed below:

- Warehouse 1 (north and south sides);
- Warehouse 2 (southern corner);
- Warehouse 6 (eastern end);
- Warehouse 7 (eastern end);
- Warehouse 8 (north side); and
- Warehouse 11 (south side).

Flammable products, tints, and other ingredients are loaded to the mixing tanks either by product transfer lines or directly from drums (up to 205 litres in capacity). Once loaded the products are stirred and mixed to form a homogenous product that can be loaded to the cans or bottles.

Loading of products to tanks could result in tank overflow and release into the warehouse area. All warehouses where products are mixed are bunded, hence, any spills are contained within the warehouse are there would be no release to the environment.

As the products loaded to the mixing tanks are flammable, there is a potential for release of vapours during the mixing process. Flammable vapours from the Class 3 products are heavier than air, hence, the vapours may concentrate in corners and under machinery, reaching concentrations in excess of the lower flammable limit. Hence, when started, machinery may ignite the vapours resulting in a flash fire and mixing tank fire.

To reduce the risk of incidents of this type occurring, MMP has installed tank covers with ventilation ducts to extract any vapours that may be generated during the mixing. Hence, while the covers are fitted and operational, there is no potential for vapour release and ignition fire. However, if the covers are not fitted there is a potential for fire at the surface of the product in the open mixing tanks. The mixing tanks vary in size, however, on average the tanks are about 1m in diameter. Hence a fire in a mixing tank would result in a pool fire of 1m diameter and about 2m tall. Heat would be radiated to the area immediately surrounding the mixing tanks. As all mixing operations are located within buildings, there would be no immediate impact offsite. Operators are present during all mixing operations. These personnel can respond to such incidents and commence immediate first attack fire fighting, using dry powder or foam extinguishers.

In the event a fire cannot be contained, there is a potential for fire growth and eventual full warehouse fire. Hence, developing fires will not have an offsite impact and have therefore not been carried forward for further analysis. However, full warehouse fires may impact adjacent facilities, hence, these incidents have been carried forward for consequence analysis.

7.6.5 Product Delivery to Cans/Bottles (Can/Bottle Filling)

Products are filled to cans and bottles in a number of locations around the site. These are listed below:

- Warehouse 1 (north and south sides);
- Warehouse 2 (southern corner);
- Warehouse 4 (northern and southern sides);
- Warehouse 6 (eastern end);
- Warehouse 7 (eastern end); and
- Warehouse 11 (south side).

Once the product is mixed, it is either transferred directly to the mixing line filling heads, via pipework, or filled to drums (205 litres) and located adjacent to the mixing lines where it is transferred to the filling for filling cans or bottles.

Similar incidents may occur in the product filling operations as to those described above in the product mixing and transfer operations. For example, pipework may leak resulting in flammable product spill without ignition or if an ignition occurs a fire would result. Drums may fall from transfer equipment (e.g. forklifts) and product may be spilled resulting in fire and heat radiation impact.

As discussed above, spills would be retained within the warehouse and there would be no release to the environment. Minor fires as a result of single drum incidents or pipework/gasket failures and spills would be contained to the immediate area of the spill. All can and bottle filing operations are conducted within the factory/warehouse buildings and, hence, there will be no release to the environment and no heat radiation impact offsite as a result of fires of this magnitude. Operators are present at all times during the transfer and can/bottle filling operations and can respond to spill incidents providing rapid clean up (if ignition does not occur), and first attack fire response if the spill is ignited. It is noted that all warehouse buildings on site are bunded and minor spills discussed above (i.e. pipe leaks, dropped drums etc.) will be retained within the building and will not escape offsite.

7.7 Corrosive and Toxic Materials Hazards

The corrosive (Class 8) and toxic (Class 6) materials stored at the MMP site are all PGIII, indicating low hazard. The materials are stored in intermediate bulk containers (IBCs) and smaller drums that are located in Warehouse 3. The storage area in warehouse 3 is fully bunded and complies with Section 7 of the NSW Work health and Safety Regulation (WHS Regs - Ref.3).

Drums and IBCs are unloaded from trucks in the driveway area adjacent to warehouse 3. In the event of a dropped drum/IBC, there is a potential for the drum or IBC to split and spill the contents of the goods onto the driveway area. Spilled goods may reach stormwater drains which could result in a release offsite. Quick spill response will prevent this event from occurring, hence, it is critical that MMP has a good emergency response plan and spill clean-up procedure.

In the event of a drum or IBC failure within the storage area, the spilled materials would be contained within the storage bund. Hence, there would be no release offsite. In this event spill clean-up would be required. This event is also included in the site emergency plan and spill clean-up procedures.

The development of a spill clean-up procedure and effective emergency response plan minimises the risk of release of Class 6 and 8 materials offsite in the event of a spill. The requirements for a spill procedure and emergency response plan should be part of the site conditions of consent.

8.0 Potential Pollutants

8.1 Inventory of Chemicals Potentially Harmful to the Environment

An inventory of chemicals is held on site and updated regularly to ensure the list is a current as possible. **Table 8.1** lists the chemicals by depot, as the depots contain the majority of chemicals on site and are the most hazardous facilities to the environment.

Table 8-1: List of Dangerous Goods Stored in Each Depot at the MMP Facility

Depot No. and Name of DG	Un.No.	Class	PG	Quantity Stored	Storage Type & Location*
Depot N1 – LPG	1075	2.1	-	63kL (32 tonnes)	Above Ground Tank East of the Aerosol store and compressor house
Depot N2 – LPG	1075	2.1	-	63kL (32 tonnes)	
Depot N2 – LPG	1075	2.1	-	45kL (23 tonnes)	
Depot N4 – LPG	1075	2.1	-	45kL (23 tonnes)	
Depot 2 – LPG	1075	2.1	-	7.5kL (3.5 tonnes)	Above Ground Tank Adjacent to the southern most boundary of the site
Depot 3 – LPG	1075	2.1	-	7.5kL (3.5 tonnes)	
Depot 19 – LPG	1075	2.1	-	7.5kL (3.5 tonnes)	
Depot 20 – LPG	1075	2.1	-	7.5kL (3.5 tonnes)	
Depot 21 – LPG	1075	2.1	-	7.5kL (3.5 tonnes)	
Depot N5 – Acetone	1090	3	II	10,000 Litres	Underground Tanks West of Warehouse 11
Depot N6 – Xylene	1307	3	II	10,000 Litres	
Depot N7 – Acetone	1090	3	II	55,000 Litres	Underground Tanks West of Warehouse 7
Depot N8 – White Spirit	1300	3	II	55,000 Litres	
Depot N9 – White Spirit	1300	3	II	55,000 Litres	
Depot N10 – Toluene	1294	3	II	55,000 Litres	
Depot 17 – Acetone	1090	3	II	10,000 Litres	Underground Tanks Between warehouses 5 and 7
Depot 15 – Toluene	1294	3	II	20,000 Litres	
Depot 16 – Toluene	1294	3	II	20,000 Litres	
Depot 11 – White Spirit	1300	3	II	20,000 Litres	Underground Tanks Immediately west of Warehouse 4
Depot 10 – White Spirit	1300	3	II	20,000 Litres	
Depot 1 – White Spirit	1300	3	II	20,000 Litres	Underground Tank Southern corner of Warehouse 1
Depot WH5-1 – Aerosol	1950	2.1	-	300,000kg	Warehouse 5
Depot N11 – Aerosol	1950	2.1	-	22,500kg	Warehouse 9
Depot N12 – Aerosol	1950	2.1	-	25,000kg	Warehouse 10

Table 8-1: List of Dangerous Goods Stored in Each Depot at the MMP Facility

Depot No. and Name of DG	Un.No.	Class	PG	Quantity Stored	Storage Type & Location*
Depot N13 – Paint Related Products	1263	3	III	15,000 Litres	Warehouse 8 (Paint Tints)
Depot 12 - LPG	1075	2.1	-	500 Litres	Cylinder Store West of Warehouse 6 (Minor Storage)
Depot WHS3-1 - Dichloromethane Trichloro ethylene	 1593 1897	 6.1 6.1	 II II	 1000 Litres 9000 Litres	Warehouse 3
Depot WHS3-2 – Ethanolamine	2491	8	III	1600 Litres	Warehouse 3
Depot WHS2-1 – Sodium Nitrate	1500	5.1		300kg	Warehouse 2
Depot WHS1-2 – Diesel	-	C1	-	2100 Litres	Warehouse 1
Depot WHS1-1 - Ethanolamine	2491	8	III	205 Litres	Warehouse 1
Depot WHS7 – Flammable Solid Organic, NOS	1325	4.1		500kg	Warehouse 7
Depot 4 – Ethanol (ethyl alcohol)	1179	3	II	20,000 Litres	Package Store (205 Litre drums) South west of Warehouse 1

9.0 Testing the Plan

The PIRMP will be tested in accordance with the internal audit schedule:

a) routinely at least once every 12 months; and

b) within one month of any pollution incident occurring.

The objective of testing is to assess whether the information included in the PIRMP is accurate and up to date and the PIRMP is capable of being implemented in a workable and effective manner.

The routine testing will be a desktop assessment. During the desktop assessment the PIRMP will be reviewed and all components of the plan will be checked for effectiveness:

- contact details will be checked to ensure they are up-to-date;
- procedures in the PIRMP will be checked to ensure they are workable;
- learnings from practical site exercises will be transferred to the PIRMP where applicable; and
- the effectiveness of training will be assessed.

The PIRMP would be tested during the QA annual audit cycle.

The date on which the plan is tested, and the name of the person who carries out the test, will be recorded in MMP's Records Management System. If the PIRMP is updated, the date on which the plan is updated will also be recorded in MMP Records Management System and on the documentation management sheet at the front of the report.

9.1 Description and Likelihood of Hazards

The description and likelihood of hazards are described in the following sections:

Spillage of chemicals during the transfer between delivery vehicles and storage areas:

All transfers are conducted with a driver present. The driver/operator continually monitors the transfer operation and has access to an emergency stop button on the transfer vehicle. Activation of the e-stop closes the tanker delivery valve and stops the transfer pump, preventing continued release of materials at the transfer point.

In addition to the operator monitoring and e-stop functions, the transfer hoses are manufactured and tested in accordance with the requirements of the ADG (Ref.2). This requires hose testing annually to ensure hose integrity is maintained.

The transfer of drums and IBCs from truck to storage areas could result in a dropped drum or IBC causing drum/IBC damage and leak. However, the likelihood of a dropped drum is low as all drums are banded during transport on site, preventing drums from falling from pallets. IBCs containers form an integral structure with the pallet, Hence, the container cannot fall from the pallet as long as the tines are securely in place. Drums and IBCs are transferred at low height (i.e. with the mast in the lowered position), minimising the fall height and potential drum/IBC damage in the unlikely event of a fall.

The likelihood of spills during transfer of materials is considered low, if not negligible.

Spillage of chemicals from tanks during storage:

The vast majority of tanks on site are underground. Those tanks located in above ground positions are all bunded to prevent any spills offsite. Some tanks are constructed with integral bunds, that prevent any releases beyond the immediate tank area due to the outer skin protection provided by the integral bund. Underground tanks are monitored for fuel inventory. Inventory in and inventory out is reconciled to determine any losses. A discrepancy in the inventories will indicate that a tank is leaking. Tanks are tested every 5 years to identify tank integrity. The 2014 tank testing programme identified all underground tanks were in good operating condition with good integrity and no evidence of leaks.

The likelihood of tank leak without detection is considered low.

Spillage of chemicals during transfer from tanks to mixing areas (i.e. using pipework):

Materials are transferred from underground tanks to mixing areas using pumps and transfer pipework. The vast majority of pipework is above ground and is within the bunded areas of the mixing warehouses (e.g. warehouse 11 and warehouse 7. Spills within the warehouse areas will be contained within the warehouse bund, hence, there will be no spill offsite. Transfers are also monitored by operations staff on site. Discrepancies between the quantity transferred and the delivery quantity are reconciled to ensure the

All pipework underground is welded to minimise the potential for joint failure and leak. Pipework is corrosion protected by an outer protective coating of no-corrosive materials (e.g. Denso-Tape).

The likelihood of a spill during the transfer of materials is considered low to negligible.

Spillage of chemicals during the mixing operations

All mixing operations is conducted within the warehouse areas. All warehouses are constructed with bunded area. There will be no spill offsite as a result of a release during mixing operations.

Spillage of hydraulic fluids and lubricating oils during the maintenance of fork lift:

The forklifts require periodic maintenance on the Site and there is potential for spillage of hydraulic fluids or lubricating oils during these works. However, the volume of hydraulic fluids/lube oil used in each forklift is minimal and any spills would be contained within the forklift immediate area, hence would not pose an environmental/human health risk.

Release of hazardous materials during storage and transfer of manufactured products on site:

The manufactured products are all held in small containers (i.e. <5 litres). Containers may leak during storage or transport or fall from pallets when transferred from the manufacturing area to storage or from storage to transport vehicle.

It is feasible that a very small number of containers may leak after manufacture, however, the overall quantity of material released would be less than 5 to 10 litres in any one location. In the storage locations, all stored materials are within bunded areas, hence, releases would not escape beyond the immediate sill point. There would therefore be no impact off-site.

All manufactured products transferred around the site are held within outer cardboard packages and/or shrink wrapped on to the pallet. The likelihood of dropped containers or spills is therefore minimal.

9.2 Pre-emptive actions to be taken

The pre-emptive actions to be implemented to minimise or prevent any risk of harm to human health or the environment arising from the activities undertaken at the site are outlined as follows:

Provision and use of spill kits –spills that are likely to take place will be localised spills of flammable, toxic or corrosive materials from containers, drums or other receptacles. These spills will only occur if containers/receptacles fail or a dropped and split open during storage and handling work. The volume of chemicals will be very low as only a relatively small volume of containers would leak or be dropped at any time. The spill is likely to be very localised and not result in releases to the drains.

Spill kits are available in all areas around the site and can be used to clean-up the spill immediately, either in the bunded areas or floor/ground with the concrete areas of the site. Specific procedures for spills of materials are documented in the ERP for the correct handling of the spills and for the appropriate disposal of the clean-up material.

Use of fire safety equipment on Site – In the event of a fire on Site, a number of personnel are trained to use the fire safety equipment such as extinguishers and hose reels to control a fire. In the event that there is a large fire on Site and Fire Services are required, then procedures are in place (ERP) to communicate with the Combat Agency. The site is fitted with fire hydrants for Fire & rescue NSW use.

Use of stormwater cut-off valves – It is unlikely that the site drain discharge cut-off valve will be required as any spills of chemicals will be localised and most likely to happen in the immediate work areas, which are in the warehouse buildings. In the event of a large fire on Site, then Fire Services will be required. Each fire hose attached to a hydrant or engine pumping unit generates about 600 L/min. Assuming that that there are four hoses on each engine and that two engines would arrive to the site in a short period of time. The volume of water used amounts to 4,800 L/min, hence, the stormwater cut-off valves would be used in the event of a large fire.

9.3 Inventory of Pollutants

The pollutants stored on Sites are listed as follows:

- Flammable Liquids (Class 3 PG II&III) – held in underground and above ground (integrally bunded) tanks;
- Corrosive Liquids (Class 3 – PGIII) – held in above ground tanks and IBCs; and
- Toxic Materials (Class 3 – PGIII) - held in above ground tanks and IBCs.

9.4 Safety Equipment

The Safety Equipment stored on Site comprise of the following:

- Safety Showers and Eye Wash stations in areas where decanting of chemicals occurs (e.g. warehouse 7 mixing area);
- Spill kit located throughout the site for the containment and clean-up of flammable, corrosive and toxic materials;
- First Aid station (e.g. first aid box) located in various areas around the site;
- Fire extinguishers (fire hose reels, carbon dioxide fire extinguisher and dry chemical powder fire extinguisher ABE) installed throughout the site.
- Stormwater cut-off valve, located in the south west corner of the site. Manually activated valve which is kept closed at all times and opened after rain events after checking of water quality

The location of the safety equipment is shown in **Figure 2.2**.

10.0 References

1. AS1596-2008, The storage and handling of flammable and combustible liquids, Standards Association of Australia;
2. The Australian Code for the Transport of Dangerous Goods by Road and rail, (known as the Australian Dangerous goods Code or ADG), 7th ed., 2007, federal Office of Road Safety, Canberra, ACT
3. The Work Health and Safety Regulation – 2011, under the Work Health and Safety Act – 2011, administered by WorkCover, NSW, Lisarow.
4. AS1940-2004, The storage and handling of flammable and combustible liquids, Standards Association of Australia;
5. Tweeddale, H.M. (1993), “Hazard Assessment and Reduction”, Department of Chemical Engineering, University of Sydney.