PUBLIC NOTIFICATION

Approval Sought:	Material Change of Use
Proposed Development:	Medium Impact Industry
Where:	Lot 46 Bajool – Port Alma Road, Port Alma
Lot Description:	Lot 46 on DS438
Application Reference:	D/91-2024

Make a submission from:

16 September 2024 to 8 October 2024

You may make a submission to Rockhampton Regional Council

PO BOX 1860, Rockhampton QLD 4700
Email: enquiries@rrc.qld.gov.au
Phone: 07 4932 9000 or 1300 22 55 77

Click here to view the 'Guide to public notification of development and change applications'

For more information on planning requirements within the Rockhampton Region feel free to visit www.rrc.qld.gov.au

Queensland Government

SARA reference: 2403-39433 SPL
Applicant reference: -

3 June 2024

IXOM Operations PTY LTD
PO Box 450
ROCKHAMPTON QLD 4700
gg@gideontownplanning.com.au

Attention: Gideon Genade

Dear IXOM Operations PTY LTD

SARA Pre-lodgement advice - Bajool - Port Alma Road, Port Alma

I refer to the pre-lodgement meeting held on 19 March 2024 in which you sought advice from the State Assessment and Referral Agency (SARA) regarding the proposed development at the above address. This notice provides advice on aspects of the proposal that are of relevance to SARA.

SARA's understanding of the project

Current onsite operations include the storage of ethylene in ISO containers (12 ISO containers) on the western portion of the subject site. Each ISO container holds approximately 9.5 tonnes of ethylene. The operators want to increase it to 18 ISO containers. The facility may be defined as a Hazardous Chemical Facility under the *Planning Act 2017.*

Supporting information

The advice in this letter is based on the following documentation that was submitted with the pre-lodgement request or tabled at the pre-lodgement meeting.

Drawing/report title	Prepared by	Date
Locality Plan (2).pdf	Queensland Government	7/3/2024

Fitzroy/Central regional office
Level 2, 209 Bolsover Street,
Rockhampton
PO Box 113, Rockhampton QLD 4700

Pre-lodgement meeting record

Meeting date	19 March 2024
Meeting location	Online (Teams)
Meeting chair	Carl Porter
Meeting attendees	*Refer to **Attachment 1***

Pre-lodgement meeting notes

Overview – Gideon Genade / IXOM	
1.	• Site currently contains 12 ISO containers for Ethylene storage. • Discussion about site history and existing land use approvals and previous contact with the Office of Industrial Relations (OIR) • Proposal is to increase to 18 containers due to changes in transport. Each container is roughly 9.5 tons. • Currently ship to Brisbane and truck from Brisbane to Port Alma. Change to ship from Darwin to Port Alma and truck 100m to storage area. • Trigger Dangerous goods - hazardous chemical facility. • Council survey – Flooding and Bushfire – Evidence Data • Evacuation plan
Office of Industrial Relations	
2.	• Office of Industrial Relations does not provide land use approval. The matter of existing land use approval is unclear. This application can rectify that. • Confirmed the proposal will trigger a Material Change of Use for storage under the Planning Regulation 2017 as stored chemicals exceed 10% of the threshold volumes listed in Schedule 15 for the activity of storage. • Suggest existing land use approval was through council – should have been referred to State. • Confirmed a Quantitative risk assessment (QRA) is not necessary in this instance, however, would need to look at impact in relation to other neighbouring facilities and in particular Performance Outcome 5 of State code 21: Hazardous chemical facilities. • Consider matters such as proximity to other industrial uses and any other hazardous chemicals stored in the area. Consider the impacts of natural hazards – e.g. coastal hazards in terms of storm tide, flooding, etc. and what mitigation might be required.
Department of Housing, Local Government, Planning and Public Works (DHLGPPW)	
3.	• Confirmed DAMS mapping indicates site is outside the Coastal Management District, however, is mapped as wholly within the mapped high storm tide area. • DAMS mapping also indicates the western portion of the site where the development is proposed is mapped as a tidal waterway. As such, there may be consideration regarding triggers for Waterway Barrier Works [and marine plants] or a process for seeking a change to the mapping to the Department of Agriculture and Fisheries (DAF). Fish movement in the tidal areas of these salt flats has been a concern for DAF in the past. It is noted that there is already infrastructure in this area.
Conclusion	
4.	• Action: SARA to seek written advice from DAF • Action: Gideon to look into ERA aspect and will request written advice from DESI if required • Action: Gideon to investigate current/required land use approval from Council

Pre-lodgement advice

The following advice outlines the aspects of the proposal that are of relevance to SARA.

SARA's jurisdiction and fees	
1.	The application will require referral to SARA under the following provisions of the Planning Regulation 2017: • Schedule 10, Part 7, Division 3, Table 1, Item 1 – Assessable development—material change of use for a hazardous chemical facility This will require a fee of 856 fee units* to be paid in accordance with Schedule 10, Part 7, Division 3, Table 1, Item 8. **At the time of issue the fee unit value is currently $1.060. The value of the fee unit is prescribed in the Acts Interpretation (Fee Unit) Regulation 2022.* SARA would be a referral agency for the proposed application.
Key matters and action items	
2.	The applicant is encouraged to seek advice from the Department of Environment, Science and Innovation (DESI) as to whether the storage of ethylene in the quantities proposed is an Environmentally Relevant Activity (ERA). Should the activity be considered an ERA, SARA can provide further pre-lodgement advice upon request.
3.	The Department of Agriculture and Fisheries (DAF) has confirmed that there are no triggers applicable to the proposed development with regard to marine plant impacts or waterway barrier works.
Lodgement material	
4.	It is recommended that the following information is submitted when referring the application to SARA: • DA form 1. • A full response to the relevant sections of SDAP State code 21: Hazardous chemical facilities. • Landowner's consent. • Relevant plans as per the DA Forms guide.

This advice outlines aspects of the proposed development that are relevant to SARA's jurisdiction. This advice is provided in good faith and is:

- based on the material and information provided to SARA
- current at the time of issue
- not applicable if the proposal is changed from that which formed the basis of this advice.

The advice in this letter does not constitute an approval or an endorsement that SARA supports the development proposal. Additional information may be required to allow SARA to properly assess the development proposal after a formal application has been lodged.

For further information please contact Carl Porter, Principal Planning Officer, on 074924 2918 or via email RockhamptonSARA@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely

Anthony Walsh
Manager Planning

enc Attachment 1 – Pre-lodgement meeting attendance record

Development details	
Proposal:	Ethylene storage
Street address:	Bajool - Port Alma Road, Port Alma
Real property description:	46DS438
SARA role:	Referral agency
Assessment Manager:	Rockhampton Regional Council
Assessment criteria:	State Development Assessment Provisions (SDAP): State code 21: Hazardous chemical facilities
Existing use:	Ethylene storage
Relevant site history:	12 ISO containers are currently used on the site for storage of ethylene. 3/04/2023 - D/158-2022 - Development Permit for Material Change of Use for Utility Installation (Storage and Processing of Used Cooking Oils)

Attachment 1 — Pre-lodgement meeting attendance record

Meeting attendees:

Name	Position	Organisation
Craig Clarke	Regulatory Affairs & Technical Manager	IXOM
Gideon Genade	Principal Town Planner	Gideon Town Planning
Ben Fleming	Senior Safety Advisor Major Hazard Facilities Unit	Office of Industrial Relations
Carl Porter	Principal Planning Officer	SARA
Amanda Fraser	Project Support Officer	SARA

State code 21: Hazardous chemical facilities

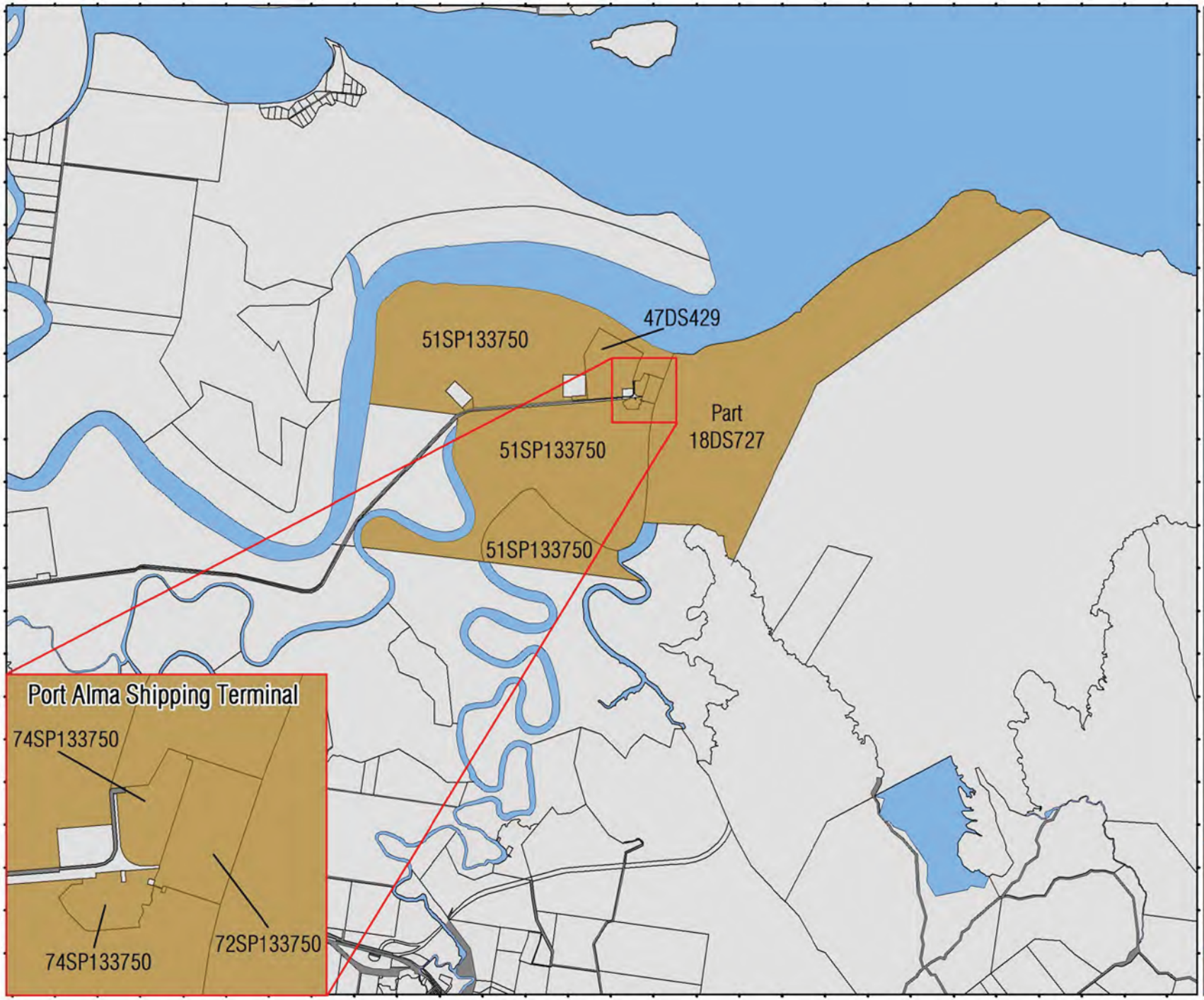
Planning guideline – State code 21: Hazardous chemical facilities provides direction on how to address this code.

Table 21.1: Material change of use

Performance outcomes	Response
Off-site impacts—vulnerable land use or land zoned for a vulnerable land use	
PO1 The **hazardous chemical facility** does not create a **dangerous dose to human health**.	**Not Applicable** – the subject site is not located in close proximity to a vulnerable land use or land zoned for a vulnerable land use.
Off-site impacts—sensitive land use or land zoned for a sensitive land use	
PO2 The **hazardous chemical facility** does not create a **dangerous dose to human health**.	**Not Applicable** – the subject site is not located in close proximity to a sensitive land use or land zoned for a sensitive land use
Off-site impacts—commercial or community activity land use or land zoned for a commercial or community activity land use	
PO3 The hazardous chemical facility does not create a dangerous dose to human health.	**Not Applicable** – the subject site is not located in close proximity to a commercial or community activity land use or land zoned for a commercial or community activity land.
Off-site impacts—open space land use or land zoned for an open space land use	
PO4 The hazardous chemical facility, does not create: a. a **dangerous dose to human health**; or b. where (a) cannot be achieved, an **individual fatality risk level** of 10 x 10^{-6}/year and the societal risk criteria in figure 21.1.	**Not Applicable** – the subject site is not located near an open space land use or land zoned for an open space land use.
Off-site impacts—industrial land use or land zoned for an industrial land use	
PO5 The **hazardous chemical facility**, does not create either of the following: a. a **dangerous dose to the built environment**; and b. an **individual fatality risk level** of 50 x 10^{-6}/year.	**Complies** – Refer to *Appendix E - Hazard and Risk Assessment* and *Appendix F – Memo Preliminary Hazard Assessment* for the Port Alma ethylene storage facility.
Storage and handling areas	

PO6 Storage and handling areas for **fire risk hazardous chemicals** are provided with a 24-hour monitored fire detection system that has the ability to detect a fire in its early stages and notify an **emergency responder** at all times.	**Complies** - The site has alarmed and monitored gas detectors. If the sensors detect ethylene, site personnel and the Ixom 24-hour emergency response service are notified via automated message. Ethylene is stored in specialised vacuum-insulated ISO containers designed for refrigerated gases. Refer to *Appendix G — Emergency Response Plan.*
PO7 Storage and handling areas for **packages** of liquid or solid **fire risk hazardous chemicals** are provided with a spill containment system with a working volume capable of containing a minimum of 100 percent of all **packages** (**prescribed hazardous chemicals** and/or non-hazardous chemicals) within the area plus the output of any **fixed firefighting system** provided for the area over a minimum of 90 minutes.	**Not Applicable** – Ethylene is a gas with a boiling point of minus 104C. An important principle in reacting to flammable gas fires is to allow the flame to continue to burn until the supply of fuel can be isolated or is exhausted. This is the only safe way to extinguish the flame. Extinguishing the flame using standard fire control methods such as water spray, or extinguishers must be avoided or the leaking gas could accumulate into a dangerous cloud with explosive potential. Refer to *Appendix G — Emergency Response Plan.*
PO8 Storage and handling areas for liquid or solid **fire risk hazardous chemicals** in **tanks** are provided with a spill containment system with a working volume capable of containing a minimum of: a. 110 percent of the largest **tank** within a spill compound or 25 percent of the aggregate where multiple **tanks** are located within a spill compound, whichever is the greater; and b. the output of any **fixed firefighting system** provided for any bulk **tank** within a spill compound over a minimum of 90 minutes.	**Not Applicable** – Ethylene is a gas with a boiling point of minus 104C. An important principle in reacting to flammable gas fires is to allow the flame to continue to burn until the supply of fuel can be isolated or is exhausted. This is the only safe way to extinguish the flame. Extinguishing the flame using standard fire control methods such as water spray, or extinguishers must be avoided, or the leaking gas could accumulate into a dangerous cloud with explosive potential.
PO9 Storage and handling areas for **prescribed hazardous chemicals** that, if in contact with each other, may react to produce a fire, explosion or other harmful reaction, or a flammable, toxic or corrosive vapour are designed to prevent contact between the **prescribed hazardous chemicals**.	**Complies -** Ethylene is the only chemical stored within the secure facility. No other incompatibles are present.
PO10 Development is designed and sited to mitigate impacts on **storage and handling areas** from **natural hazard** including, but not limited to: a. flood; b. bushfire; c. erosion;	**Complies –** Refer to *Appendix G - Emergency Response Plan.* The site sits on built-up land within a tidal area and is not at risk of bushfires, landslides, flooding or earthquakes. All site structures and containers have been

d. storm tide inundation; e. landslide; f. earthquake; g. **wind action**.	reviewed against AS 1170.2 and have been designed in accordance with the standard to withstand the impact of cyclones. Ethylene is stored in transportable ISO containers that are designed to be readily moved by road, rail and sea in the event of a storm tide inundation that may impact the site. For the life of the operation of the Port Alma port and Pt Side Storage site the area has not had a tidal inundation that has impacted operations.
All development	
PO11 Development is designed and sited to mitigate the risks from **hazard scenarios** occurring at existing **hazardous chemical facilities**.	**Complies -** Refer to *Appendix E - Hazard and Risk Assessment* and *Appendix G—Emergency Response Plan.*



PORT ALMA LOCALITY

LEGEND

Strategic Port Land.....

Map 11

NORTH

Imagery Date: 20 June 2011

Projection: GDA 1994 - MGA Zone 56

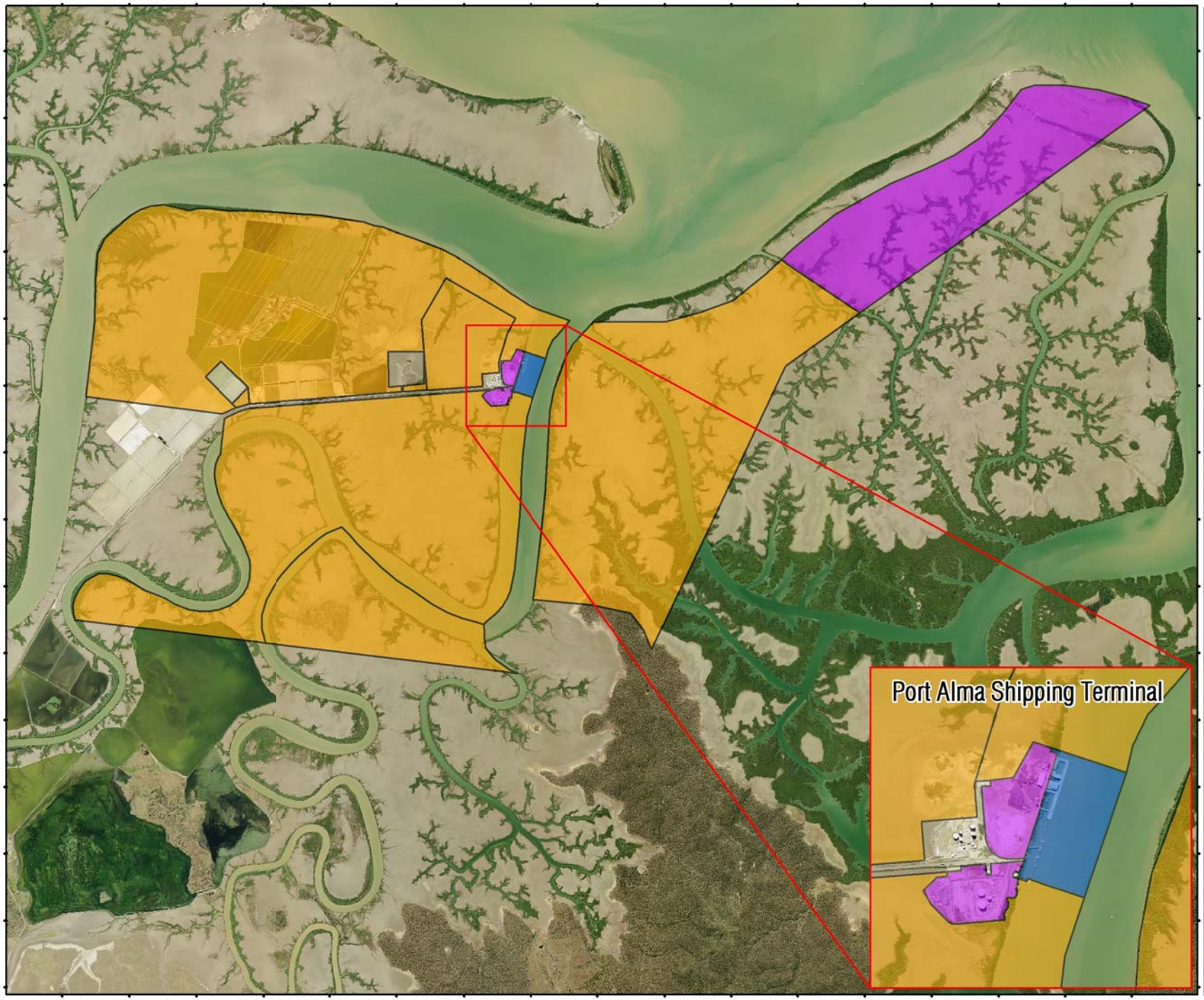
Gladstone Ports Corporation

Growth, Prosperity, Community.

GPC110020

5 4 3 2 1 0 5 kilometres

QUEENSLAND 1: 125 000



PORT ALMA LAND USE PRECINCTS

LEGEND

Port Industry.....

Wharves (Offshore).....

Port Operations Support.....

Map 11a

NORTH

Imagery Date: 20 June 2011

Projection: GDA 1994 - MGA Zone 56

Gladstone Ports Corporation

Growth, Prosperity, Community.

GPC110020

0 1 2 3 4 5 6 7 8 9 10 kilometres

QUEENSLAND 1: 80 000

Zones

Spatial reference

GDA2020_MGA_Zone_56

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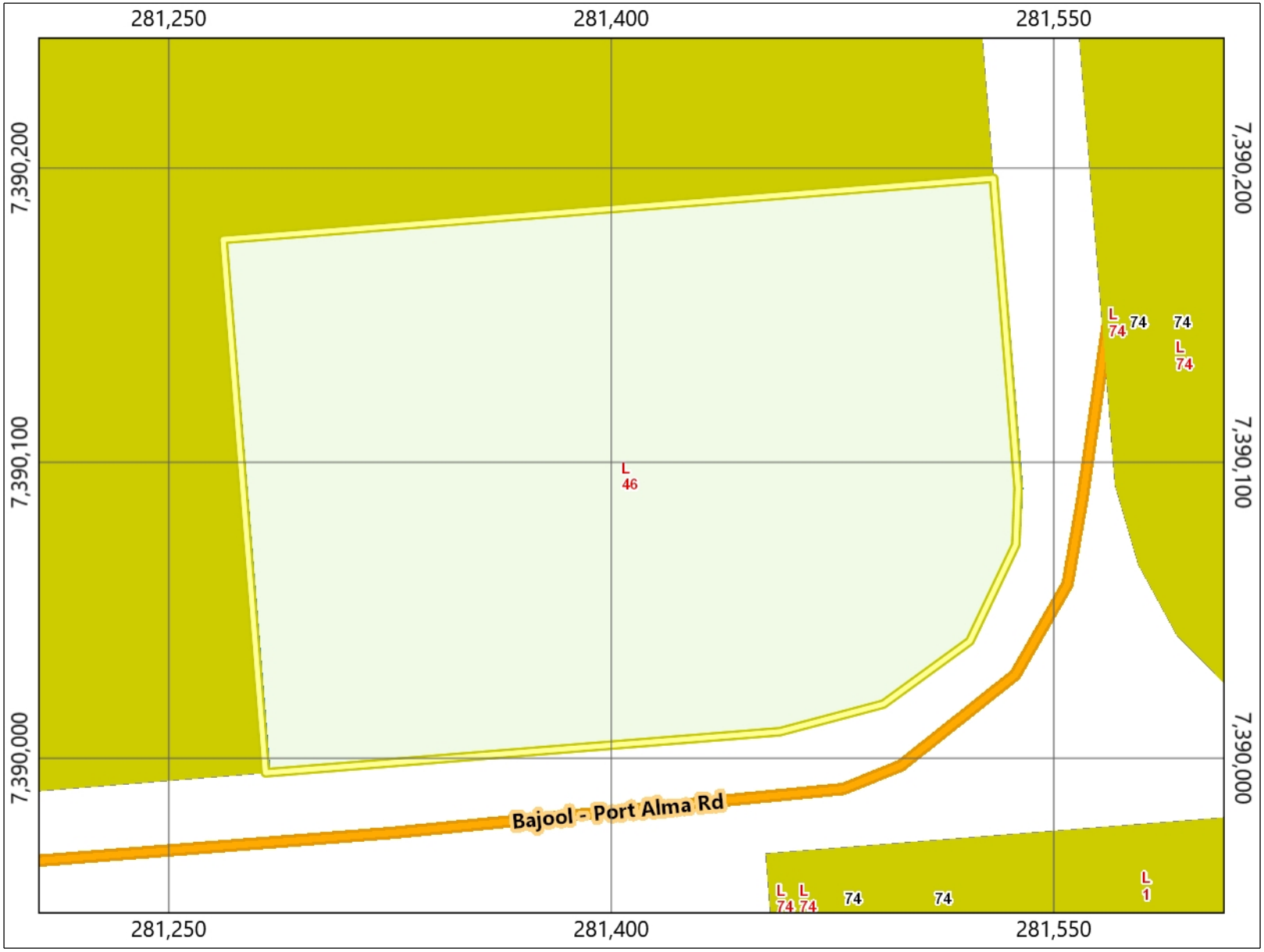

Legend

- Precincts Text
- Precincts
- Sub Precincts
- Priority Development Area
- Strategic Port Land
- Zones
  - Low density residential
  - Low-medium density residential
  - High density residential
  - Principal centre
  - Major centre
  - District centre
  - Local centre
  - Neighbourhood centre
  - Sport and recreation
  - Open space
  - Environmental management and conservation
  - Low impact industry
  - Medium impact industry
  - High impact industry
  - Special industry
  - Waterfront and marine industry
  - Community facilities
  - Emerging communities
  - Limited development (constrained land)
  - Rural
  - Rural residential
  - Special purpose
  - Specialised centre
  - Township
- Roads1
  - Main roads
  - Major council roads
  - Standard council roads
  - Access roads
  - Private roads
- Easements
- Property Parcels
- Ocean
- DCDB Parks
- CQ LGA Boundaries

GDA 2020

Rockhampton Regional Council

Acid Sulphate Soils

Spatial reference

GDA2020_MGA_Zone_56

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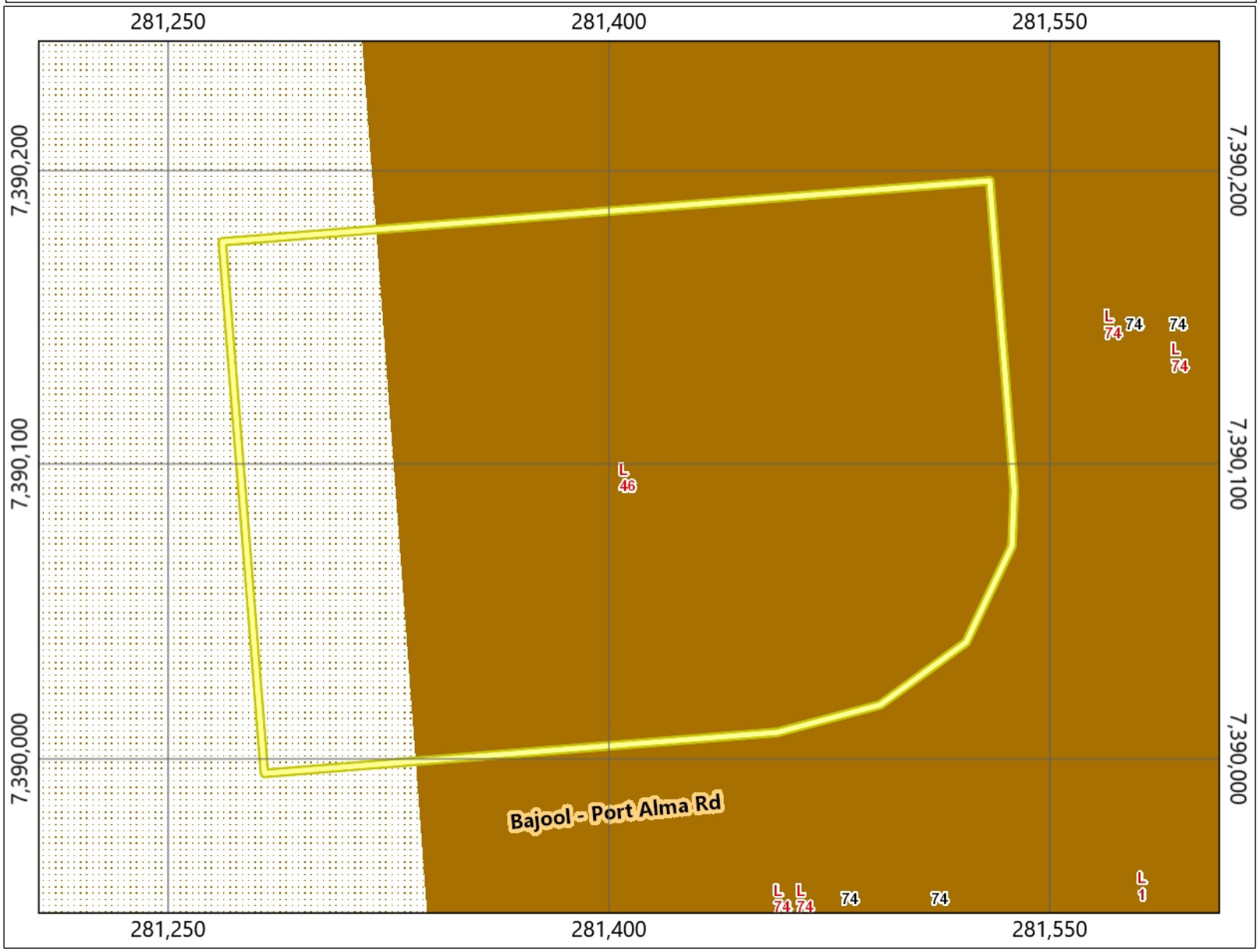

Legend

- Limit of know or potential acid sulphate soils (Department of Resources)
- Land at or below 5m AHD
- Land above 5m and below 20m AHD
- Roads1
  - Main roads
  - Major council roads
  - Standard council roads
  - Access roads
  - Private roads
- Easements
- Property Parcels
- Ocean
- DCDB Parks
- CQ LGA Boundaries

GDA 2020

Rockhampton Regional Council

Coastal Hazard - Erosion Prone Area

Spatial reference

GDA2020_MGA_Zone_56

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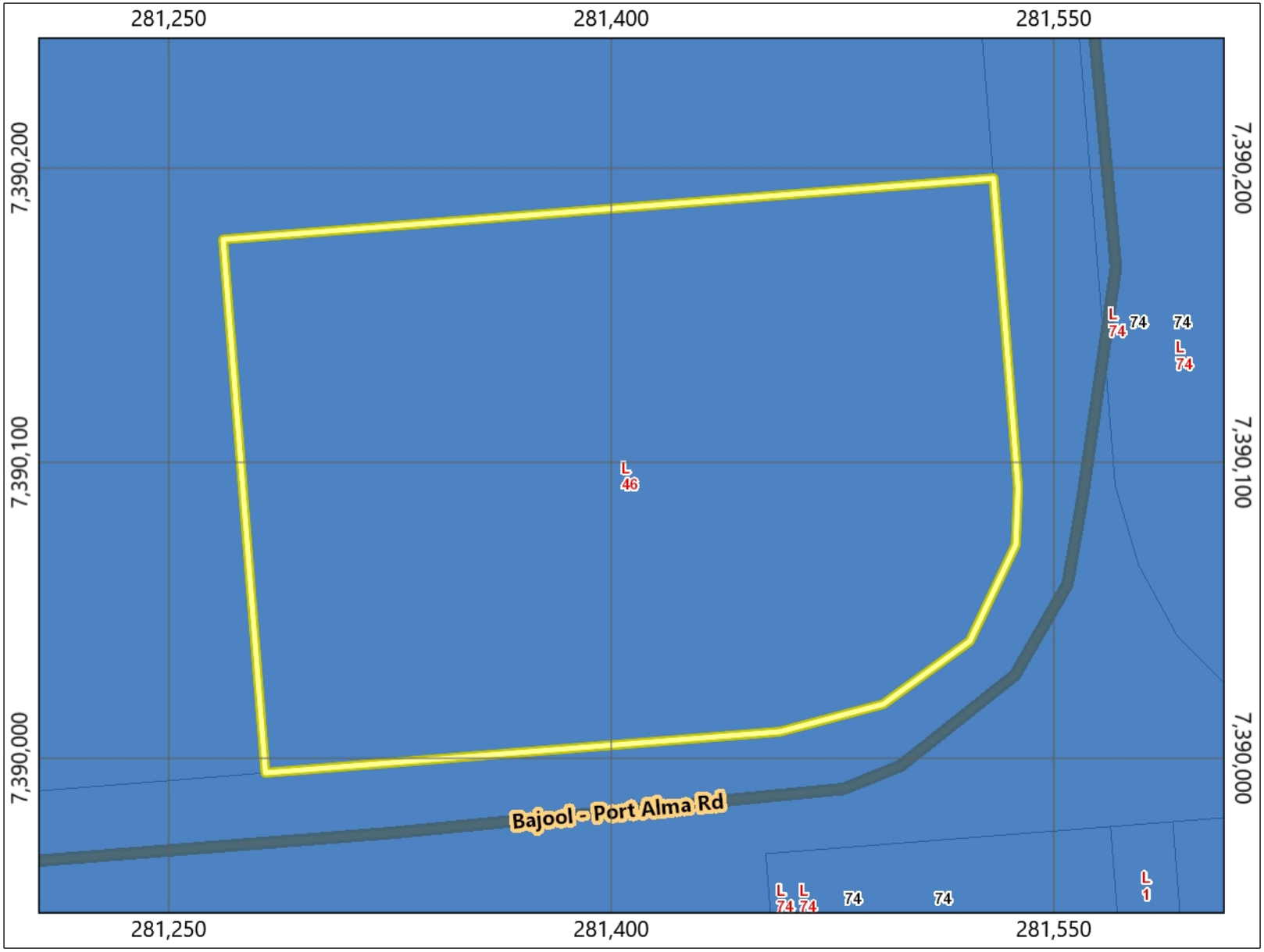

Legend

- Ocean
- Erosion Prone Area
- Roads1
  - Main roads
  - Major council roads
  - Standard council roads
  - Access roads
  - Private roads
- Easements
- Property Parcels
- Ocean
- DCDB Parks
- CQ LGA Boundaries

GDA 2020

Rockhampton Regional Council

Coastal Hazard - Hazard Area

Spatial reference

GDA2020_MGA_Zone_56

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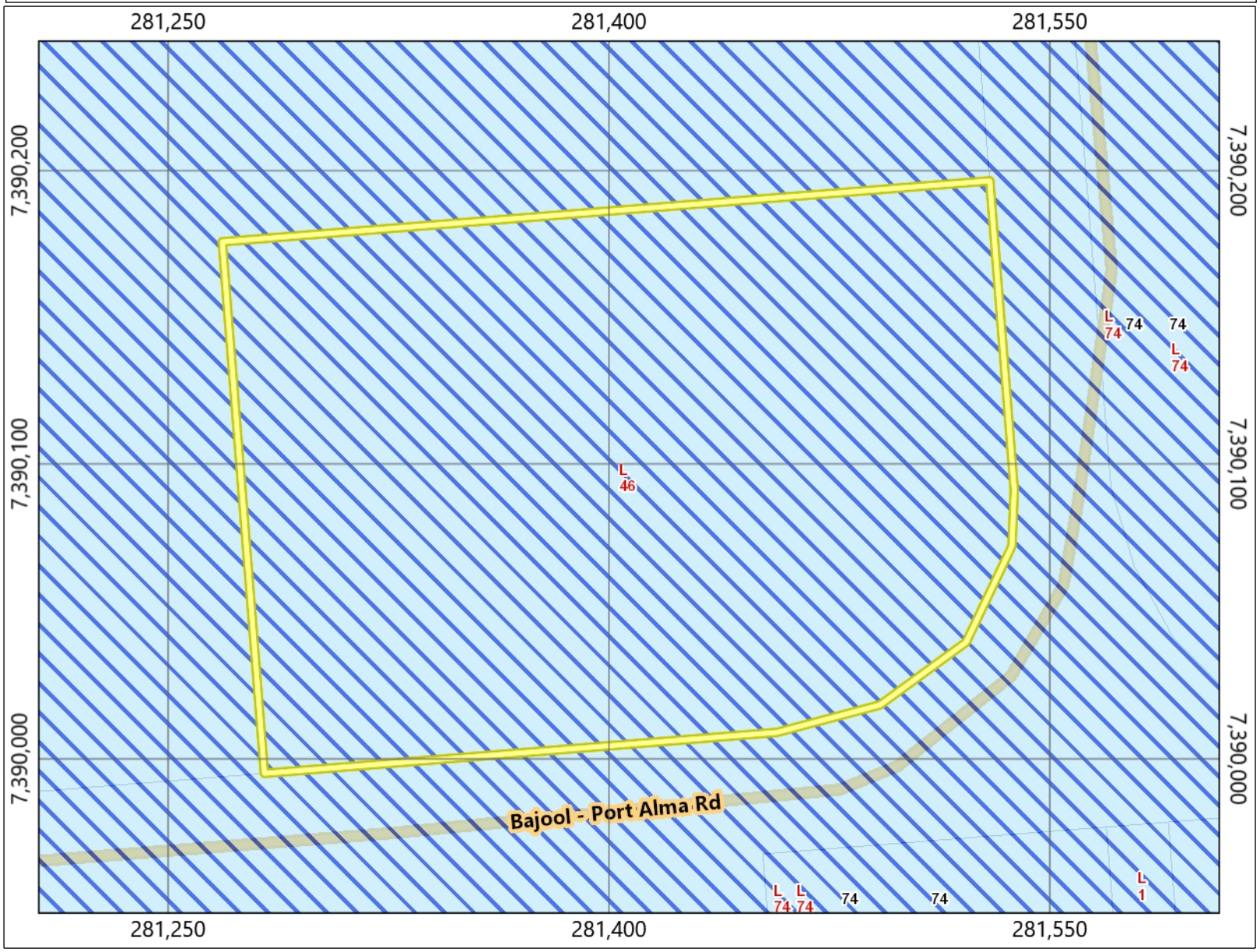

Legend

- Ocean
- Hazard
  - Medium Hazard
  - High Hazard
- Roads1
  - Main roads
  - Major council roads
  - Standard council roads
  - Access roads
  - Private roads
- Easements
- Property Parcels
- Ocean
- DCDB Parks
- CQ LGA Boundaries

GDA 2020

Rockhampton Regional Council

Defined Storm Tide Event Level

Spatial reference

GDA2020_MGA_Zone_56

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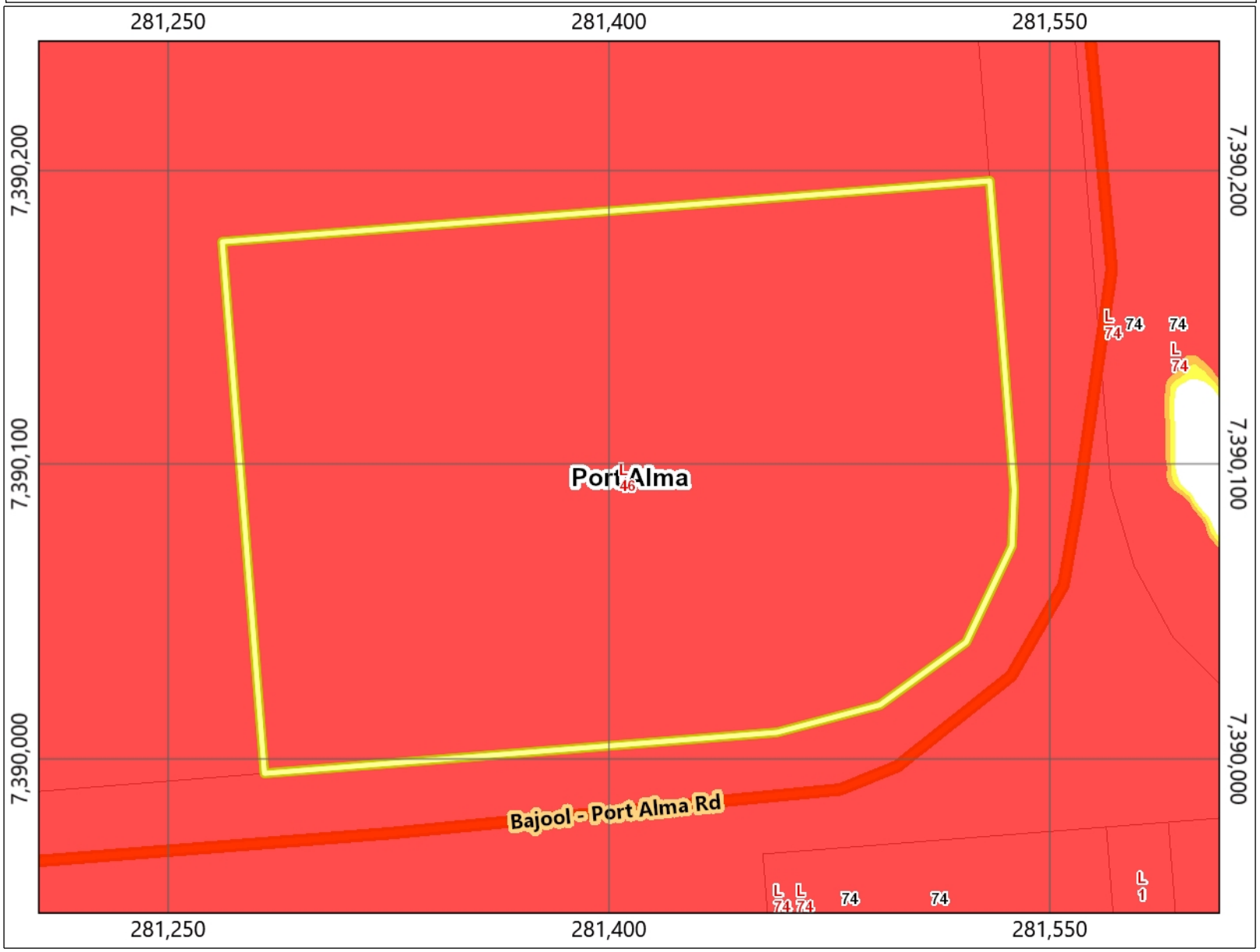

Legend

- HAT Zones
- Storm Surge Potential - Rockhampton
  - Extreme
  - High
  - Medium
  - (HAT=3.90mAHD)
- Storm Surge Potential - Port Alma
  - Extreme
  - High
  - Medium
  - (HAT=4.75mAHD)
- Roads1
  - Main roads
  - Major council roads
  - Standard council roads
  - Access roads
  - Private roads
- Easements
- Property Parcels
- Ocean
- DCDB Parks
- CQ LGA Boundaries

GDA 2020

Rockhampton Regional Council

Flood Hazard

Spatial reference

GDA2020_MGA_Zone_56

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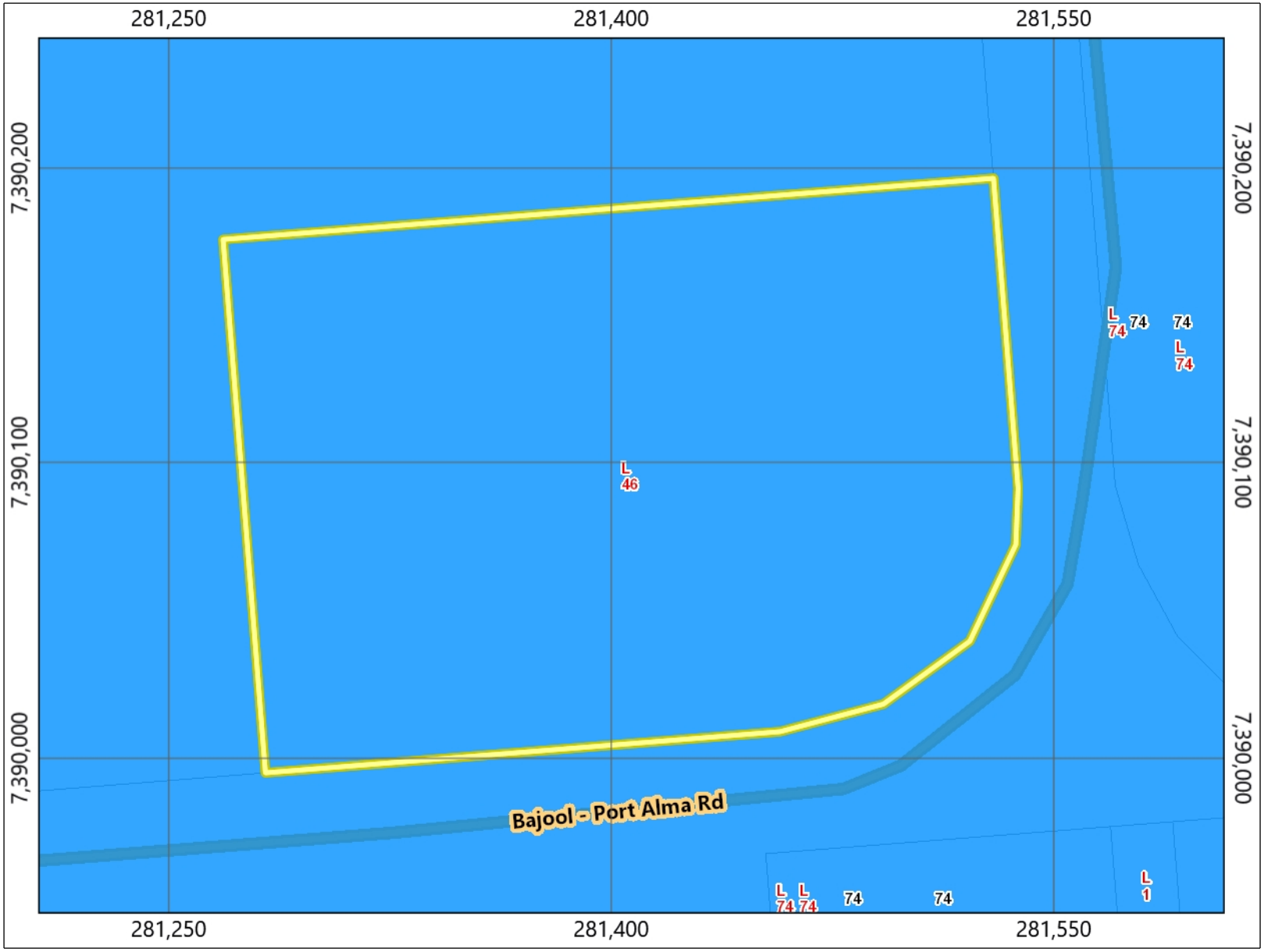

Legend

- Development Information
- Fitzroy River Flood
  - H1 (Low)
  - H2 (Medium)
  - H3 (High)
  - H4 (High)
  - H5 (Extreme)
  - H6 (Extreme)
- Fitzroy River Flood Study Extent
- Floodplain Investigation Area
- North Rockhampton Flood Management Area
- Roads1
  - Main roads
  - Major council roads
  - Standard council roads
  - Access roads
  - Private roads
- Easements
- Property Parcels
- Ocean
- DCDB Parks
- CQ LGA Boundaries

GDA 2020

Rockhampton Regional Council

Road Hierarchy

Spatial reference

GDA2020_MGA_Zone_56

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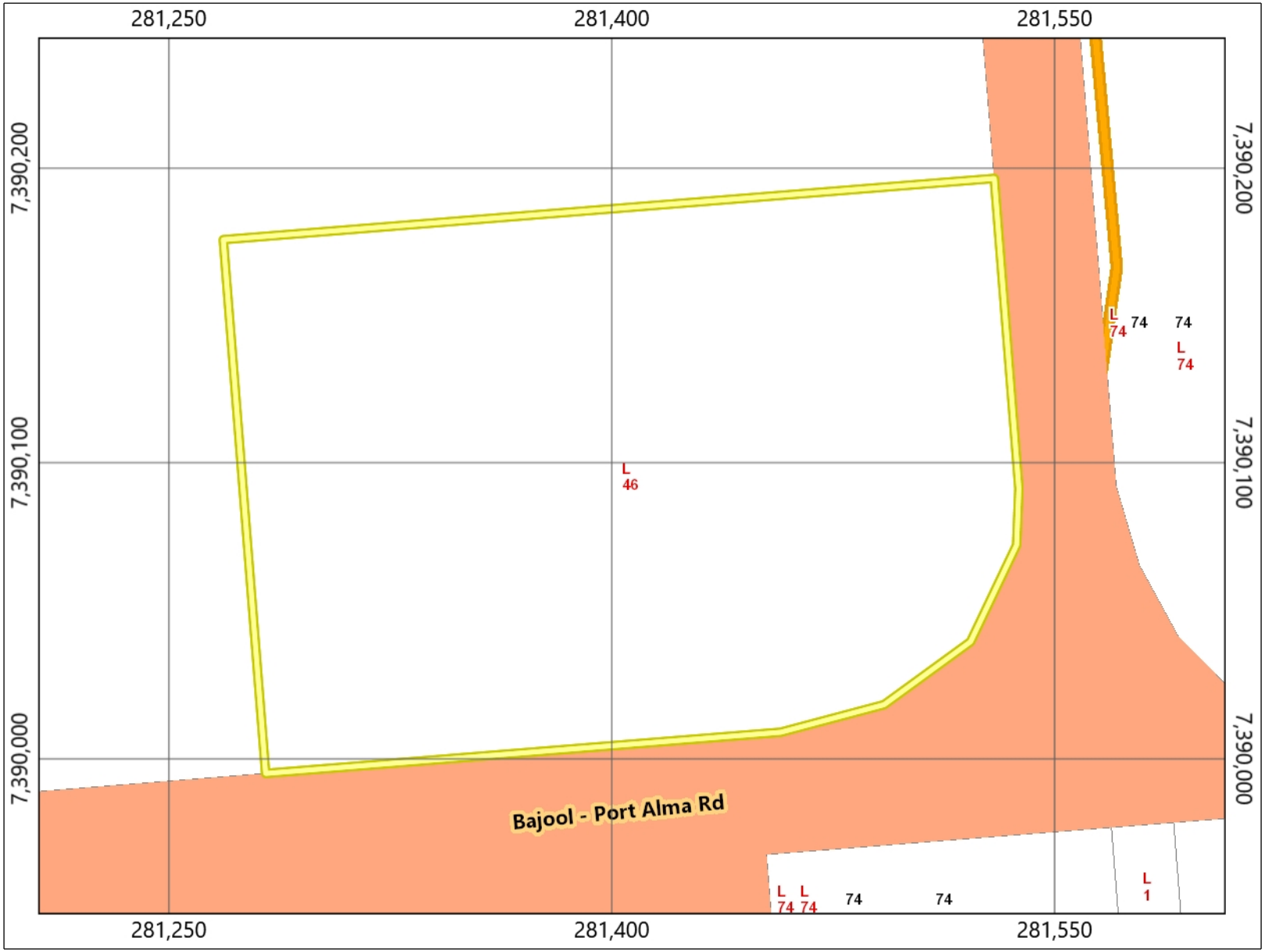

Legend

Road Hierarchy
- Highway
- State Controlled Road
- Urban Arterial
- Urban Sub-Arterial
- Major Urban Collector
- Minor Urban Collector
- Urban Access Street
- Urban Access Place
- Industrial Collector
- Industrial Access
- Rural Arterial
- Major Rural Collector
- Minor Rural Collector
- Rural Access

Roads1
- Main roads
- Major council roads
- Standard council roads
- Access roads
- Private roads

- Easements
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GDA 2020

Rockhampton Regional Council

Hazard and Risk Assessment

Ethylene ISO Container Storage Facility, Port Alma, QLD

Hazard and Risk Assessment

Ethylene ISO Container Storage Facility, Port Alma, QLD

Client: Orica Chemicals

ABN: 17076253695

Prepared by

AECOM Australia Pty Ltd
Level 8, 540 Wickham Street, PO Box 1307, Fortitude Valley QLD 4006, Australia
T +61 7 3553 2000 F +61 7 3553 2050 www.aecom.com
ABN 20 093 846 925

16-Feb-2015

Job No.: 60328714

AECOM in Australia and New Zealand is certified to the latest version of ISO9001, ISO14001, AS/NZS4801 and OHSAS18001.

Quality Information

Document Hazard and Risk Assessment

Ref 60328714

Date 16-Feb-2015

Prepared by Lauren Bowden

Reviewed by Kevin Blackie

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	18-Aug-2014	Draft for Review	Kevin Blackie Senior Risk Engineer	
B	26-Aug-2014	Updated Draft Report	Kevin Blackie Senior Risk Engineer	
C	28-Aug-2014	Final Report	Kevin Blackie Principal Risk Engineer	
D	16-Sept-2014	Final Report V2	Kevin Blackie Senior Risk Engineer	
E	03-Feb-2015	Draft Addendum Report	Kevin Blackie Principal Risk Engineer	
F	10-Feb-2015	Final Report (Updated)	Kevin Blackie Principal Risk Engineer	

Table of Contents

List of Tables

List of Figures

Executive Summary

AECOM Australia Pty Ltd (AECOM) were engaged by Orica Chemicals to undertake a hazard and risk study in the form of a Preliminary Hazard assessment (PHA) for the proposed storage of ethylene ISO containers at their existing facility located at Lot 46 Bajool-Port Alma Rd, Port Alma, QLD.

The purpose of this study is to identify the hazardous events associated with the proposed storage of ethylene ISO containers at the facility, and particularly, the major accident events (MAEs) which are likely to result in offsite impacts to the surrounding populations and adjacent land uses.

In August 2014, AECOM completed the Preliminary Hazard Analysis (PHA) for the proposed Ethylene Storage facility, to be located at the Portside Storage facility in Port Alma, QLD.

Following the completion of the original PHA, the Hazardous Industries and Chemicals Board (HICB) provided comments and requested clarification on a number of items. These items were subsequently addressed and closed out through email correspondence and an update of the study Report.

Following additional consultation between Orica and HICB and Gladstone Ports Corporation (GPC), it is understood that HICB and GPC has requested that Orica consider the impacts of a number of additional factors, and update the original study accordingly.

In February 2015, AECOM Pty Ltd (AECOM) was engaged by Orica Chemicals to prepare an update to the original PHA to address these additional factors, including:

- Further detail on the meteorological data for the region and how this data is incorporated into the model.
- Further detail on the significance of the 50 per million per annum (pmpa) contour with respect to land-use safety planning, taking into specific consideration the activities at Port Alma and other neighbouring facilities and land-uses.
- Further explanation for the consequence distances associated with Major Accident Events (MAEs), which is considered to be the credible ‘worst-case scenarios’.
- Description of the likely impacts of a potential ethylene incident on the explosive storage at Port Alma.
- Description of the likely impacts of a potential ethylene incident on the LPG storage located at the Portside Storage site.
- Description of the likely impacts of an ethylene incident on the bulk liquids stored at Portside Storage, such as tallow and bio diesel.
- Description of the likely impact of external fires such as bush fire on the ethylene storage at Portside storage also including, Bushfire Attack Levels (BAL), taking into consideration the surrounding vegetation.
- While, the original PHA describes the consequences associated with flash fires in a general sense, this addendum report includes a specific description of the likely impacts of flash fires on AN storage facilities at Port Alma.
- An assessment of the impact of an AN incident on the ethylene storage at portside storage (including storage of up to 8,000 tonne on the vessels at and 500 tonne at Port Alma).

Credible hazard scenarios have been analysed qualitatively based on qualitative likelihood and consequence criteria. Based on application of these qualitative criteria, a number of hazard scenarios were identified as having potential off-site impacts and as a result, these scenarios were carried forward for further detailed analysis.

A number of postulated hazard scenarios have been considered in the context of **Land use safety planning** – being those risks posed to land uses at and beyond the boundary of the storage facility.

With reference to industry recognised guidelines, such as the NSW Department of Planning and Infrastructure's Hazardous Industry Planning Advisory Papers (HIPAP) and the Brisbane City Plan 2000, the following risk assessment criteria are suggested for various land uses:

Table 1 Individual Fatality Risk Criteria

Land Use Category	Risk pmpa (per million people per annum)
Hospitals, schools *	< 0.5
Residential areas	< 1
Commercial areas	< 5
Active open space (sports areas) *	< 10
Industrial sites	< 50

*It should be noted that there are no hospitals, schools or sports areas in the vicinity of the Portside Storage facility.

The area surrounding the proposed ethylene storage facility including the Port Alma shipping facilities is zoned as a light industrial district. As per the criteria provided in Table 1, the accepted individual fatality risk level for the industrial land use category is less than 50 per million people per year. The closest residence to the Portside Storage facility is the fisherman's cottage to the south-east from the site boundary. As per the criteria provided in Table 1, the accepted individual fatality risk level for residential areas is less than 1 per million people per year. It should be noted that the area surrounding the Portside Storage facility is predominately unoccupied salt flats.

Figure 1 below shows the overall risk profile or location specific individual fatality risk (LSIFR) contours for the Ethylene ISO container storage area. The ethylene ISO containers are stored in a designated fenced area in the northwest corner of the portside storage site shown as a yellow rectangle in Figure 1 (reference 801, 1018).

From the location specific individual fatality risk (LSIFR) contours, the following conclusions and observations can be made:

- It can be seen from Figure 1 that the individual fatality risks are low outside the facility and the individual fatality risk at 50 pmpa (risk acceptance criteria for industrial sites) is retained within the property boundary.
- For land use planning purposes, and in accordance with the industry guidelines accepted throughout Australia for land-use safety planning assessments, the individual fatality risk levels of interest are from 50pmpa down to 0.5pmpa. An individual fatality risk of 50pmpa is the accepted risk level for industrial land uses and 0.5 pmpa being acceptable for schools and hospitals and other sensitive land uses. However, the output of the risk modelling software also provides risk levels down to as low as low as 0.1 pmpa, 0.05 pmpa and 0.01 pmpa. These contours depict risk levels which are extremely low and would be suitable for all land uses in this context.
- BLEVE and pool fire events tend to be omni-directional and not strongly influenced by wind directions. The risk level due to these events is the main contributors to the inner risk contours.
- The risk pattern observed for the 0.01pmpa contour (which represents a risk level that is extremely low) in Figure 1 is primarily driven by wind directions dominated by south-easterly wind flows. It should be noted however that winds in all directions have been incorporated into the model.
- The vapour cloud impacts extend to the west of the site, due to the higher strength and frequency of wind from the southeast direction. The meteorological data showing the higher strength and frequency of winds in the southeast direction is presented in the wind roses developed for Port Alma (refer to figures 5 - 7).

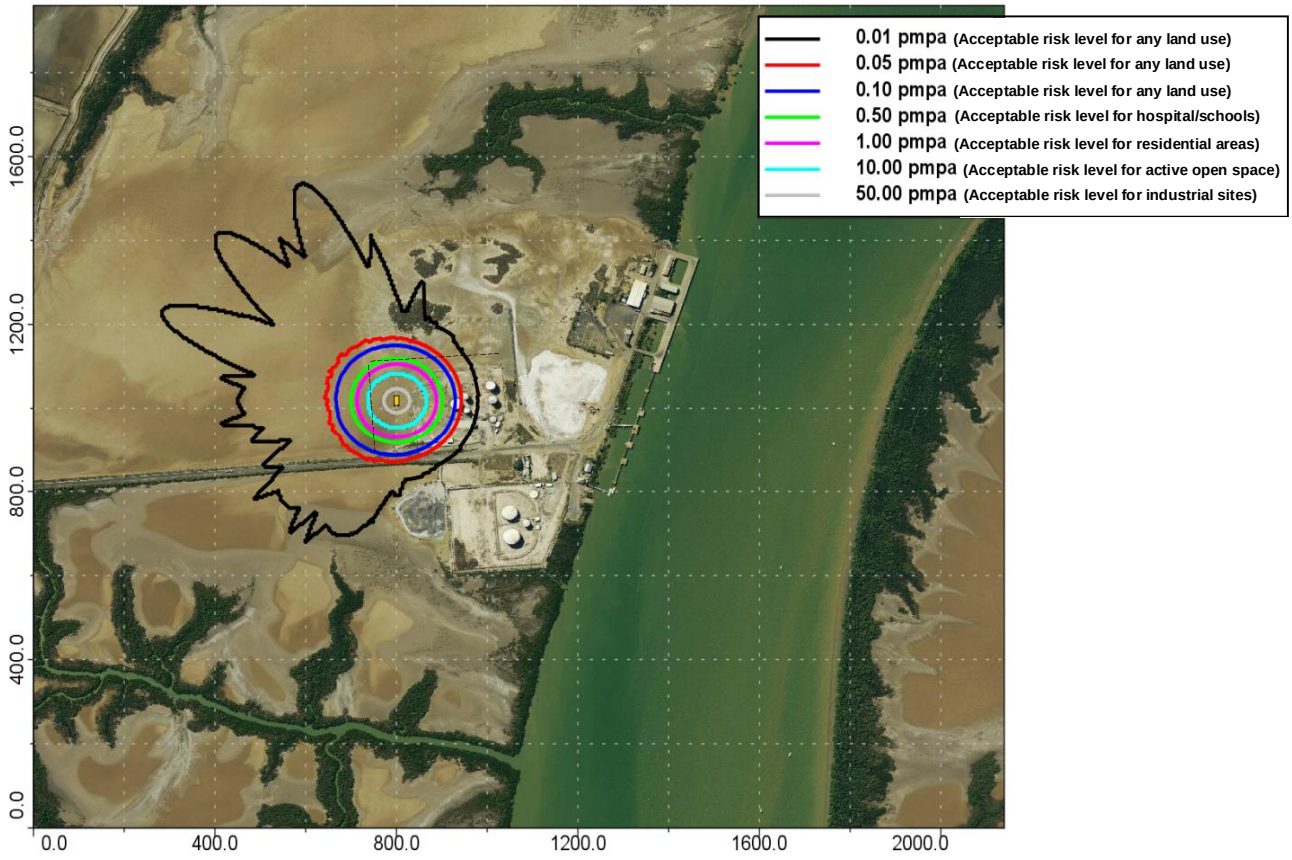

Figure 1 Individual fatality risks per million per annum (pmpa)

1.0 Introduction

1.1 Background

Portside storage is proposing to store ethylene in bulk ISO containers at their facility. The ISO containers will be stored at the facility until they are collected for transport to Curtis Island to be used as a refrigerant in the LNG liquefaction plants.

Cryogenic ethylene is transported in specially built ISO containers. The ISO containers are vacuum-jacketed to keep cryogenic ethylene in a liquid state. The space between the inner and outer tanks is filled with an insulating material and is under vacuum. The insulation and vacuum reduce heat transfer from the outside, allowing cryogenic ethylene to remain in liquid state.

1.2 Study Objectives and Methodology

1.2.1 Study Objectives

The purpose of the PHA is to consider the potential off-site impacts associated with the Ethylene storage from a Land-use Safety Planning perspective to ensure that acceptable risk outcomes are achieved at the site boundaries and surrounding receivers in line with the relevant Regulations including the Workplace Health and Safety Regulations 2011 and Industry Guidelines.

The area surrounding the proposed ethylene storage facility including the Port Alma shipping facilities is zoned as a light industrial district. As per the criteria provided in table 6 below, the accepted individual fatality risk level for the industrial land use category is less than 50 per million people per year. The closest residence to the Portside Storage facility is the fisherman's cottage to the south-east from the site boundary. As per the criteria provided in Table 2, the accepted individual fatality risk level for residential areas is less than 1 per million people per year. The predominate area surrounding the proposed storage area being unoccupied salt flats.

With reference to industry recognised guidelines, such as the NSW Department of Planning and Infrastructure's Hazardous Industry Planning Advisory Papers (HIPAP) and the Brisbane City Plan 2000, the following risk assessment criteria are suggested for various land uses:

Table 2 Individual Fatality Risk Criteria

Land Use Category	Risk (per million people per year)
Hospitals, schools *	< 0.5
Residential areas	< 1
Commercial areas	< 5
Active open space (sports areas) *	< 10
Industrial sites	< 50

*It should be noted that there are no hospitals, schools or sports areas in the vicinity of the Portside Storage facility

1.2.2 Study Methodology

This report considers the potential hazards and risks associated with the storage of cryogenic ethylene ISO containers at the Portside Storage facility. A tiered risk assessment approach has been applied, consistent with the risk classification technique described in the United Nations Manual for the *Classification and Prioritization of risks due to major accidents in the process and related industries* (the IAEA Method).

This purpose of the study is to identify potentially significant hazards associated with the proposed storage of the ethylene ISO containers, and where necessary, to quantify the level of risk to people, surrounding property and the biophysical environment through a Quantitative Risk Assessment Process (QRA). The primary objective of a QRA is to estimate the offsite risks to people in the vicinity of the proposed ethylene storage area.

The QRA sets out to answer three fundamental questions:

- What can go wrong?
- What are the consequences?
- What is the probability that it will go wrong?

To answer the first question, a hazard identification study was carried out and is included in Appendix A and summarized in Section 4.0. The purpose of the hazard identification study is to identify credible hazard scenarios and the mechanisms by which they occur.

To answer the second question, a consequence analysis of the identified hazards was carried out and is included in Section 5.0. The consequence analysis includes assessing the impacts due to:

- Heat radiation resulting from fires and explosions
- Overpressures resulting from explosions
- Toxic exposure resulting from toxic releases or toxic products of combustion.

The third question is answered by a frequency analysis and is included in Section 6.0.

The overall process is shown in Figure 2.

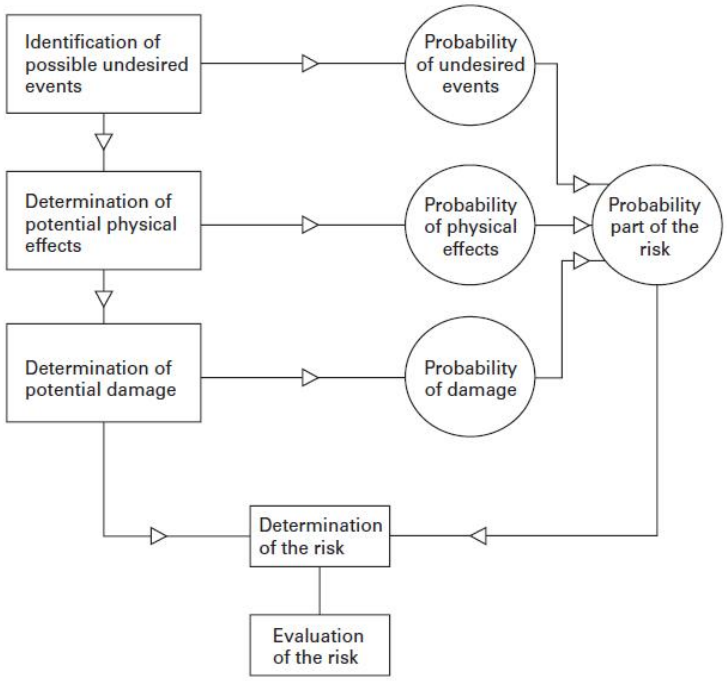

Figure 2 Quantitative Risk Assessment Process

In order to facilitate the process shown in Figure 2, a multi-level risk assessment approach is applied. The multilevel risk assessment process utilizes relatively simple techniques (qualitative and semi-quantitative) to initially assess the hazards as part of a screening process. Once the initial screening process is completed, the hazards identified as having a high risk or uncertainties were then subjected to a more detailed quantitative analysis.

This multi-level approach is consistent with the risk classification technique described in the United Nations Manual for the *Classification and Prioritization of risks due to major accidents in the process and related industries* (the IAEA Method).

The primary tasks of the multi-level risk assessment include:

- Hazard Identification
- Consequence Analysis
- Frequency Analysis
- Risk quantification
- Evaluation against risk acceptance criteria.

1.3 Scope of Study

The scope of the study includes a hazard and risk assessment for the proposed bulk storage of ethylene in Port Alma.

A number of postulated hazard scenarios have been considered in the context of **Land use safety planning** – being those risks posed to land uses at and beyond the boundary of the storage facility.

It is noted that the primary purpose of this report is for land use safety planning purposes and the principal driver for assessment of risks is in the context of statutory development assessment and regulation. However, this report also addresses a number of site safety considerations. **Site safety** – being those risks posed within the project boundaries to employees, plant and equipment. It should be noted however, that the assessment of site safety impacts is not exhaustive in this study. Such assessments would be undertaken during the detailed design stage of the project.

The update to the original PHA also addresses these additional factors:

- Further detail on the meteorological data for the region and how this data is incorporated into the model.
- Further detail on the significance of the 50 pmpa contour with respect to land-use safety planning, taking into specific consideration the activities at Port Alma and other neighbouring facilities and land-uses.
- Further explanation for the consequence distances associated with Major Accident Events (MAEs), which is considered to be the credible ‘worst-case scenarios’.
- Description of the likely impacts of a potential ethylene incident on the high explosive storage at Port Alma which is understood to include Class 1s and munitions.
- Description of the likely impacts of a potential ethylene incident on the LPG storage located at the Portside Storage site.
- Description of the likely impacts of an ethylene incident on the bulk liquids stored off-site in the area such as tallow and bio diesel.
- Description of the likely impact of external fires such as bush fire on the ethylene storage at Portside storage also including, Bushfire Attack Levels (BAL), taking into consideration the surrounding vegetation.
- While, the original PHA describes the consequences associated with flash fires in a general sense, this addendum report includes a specific description of the likely impacts of flash fires on AN storage facilities at Port Alma.
- An assessment of the impact of an AN incident on the ethylene storage at portside storage (including storage of up to 8,000 tonne on the vessels at and 500 tonne on the dock at Port Alma)

1.3.1 Exclusions

Excluded from the scope of this study are the ancillary processes such as transport activities and routes. The assessment was conducted based on a desktop assessment based on information provided by Orica, and meteorological data for the region.

2.0 Site Description

2.1 Site Location

Portside Storage is located at Lot 46 Bajool-Port Alma Rd, Port Alma, QLD, approximately 60 kilometres by road from the city of Rockhampton on the southern end of the Fitzroy River delta. The coordinates are 23.58 South and 150.86 East. The Portside Storage property boundary, as advised by Portside Storage, has been indicated in Figure 3 (dashed line). The proposed ISO container storage area is also annotated on Figure 3.

2.2 Layout of On-site Storage Areas

The proposed ethylene ISO container storage location is located on the western side of the property indicated in Figure 4a and Figure 4b.

2.3 Surrounding Land Uses

The following section gives a description of the surrounding land uses, noting any significant sensitive land uses surrounding the site.

Characteristics of the land uses surrounding the facility are described in Table 3.

Table 3 Portside Storage Surrounding Land Uses

Direction	Characteristics
North	The area to the north of the property is an unoccupied salt flat.
North-East	The area to the northeast of the site is a light industrial district including Port Alma shipping facilities. Port Alma is the deep sea port for Rockhampton and provides both import and export facilities and services. The port currently handles Ammonium Nitrate, explosives, munitions, Class 1s, Tallow and other general cargos. Potentially up to 8,000 tonne of AN will be stored in the vessel which docks at the northern end of the birth, a distance of approx. 700m from the ethylene ISO container storage location. There is also a proposed temporary unloading AN storage area at the dock, storing up to 500 tonne of AN, a distance of approx. 550m from the ethylene storage area.
South-East	The area to the south-east of the site includes a single residential property, the fisherman's cottage south of Bajool-Port Alma Rd approximately 100m from the site boundary.
South	The area to the south of the site includes the Stolthaven Terminal facility south of Bajool-Port Alma Rd approximately 150m from the site boundary.
West	The area to the west of the property is an unoccupied salt flat.

2.4 Surrounding Populations

There are limited sensitive land uses within the affect distances of a major storage release of ethylene from the ISO container storage area due to the predominate area surrounding the proposed storage area being unoccupied mud flats. The closest residence to the Portside Storage facility is the fisherman's cottage to the south-east, approximately 100m from the site boundary. The nearest town is the Bajool Township which is approximately 15km from the site.

The locations of surrounding land uses have been shown in Figure 3 including:

- Port Alma Shipping Facilities
- Stolthaven Terminal
- Single residential dwelling (Fisherman's cottage)

Figure 3 Portside storage facility, Lot 46 Bajool-Port Alma Rd, Port Alma, QLD

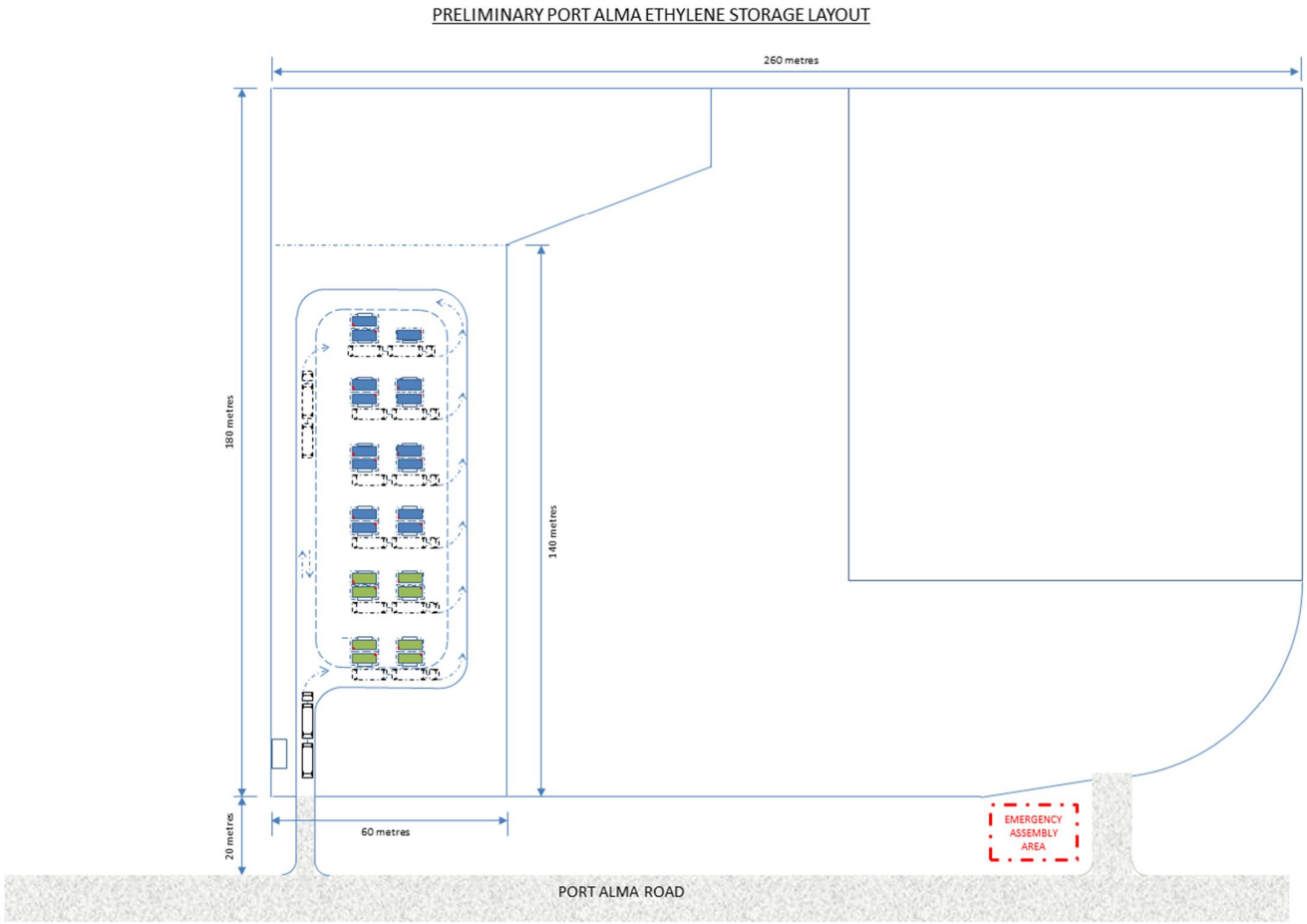

Figure 4a Portside storage facility site layout map

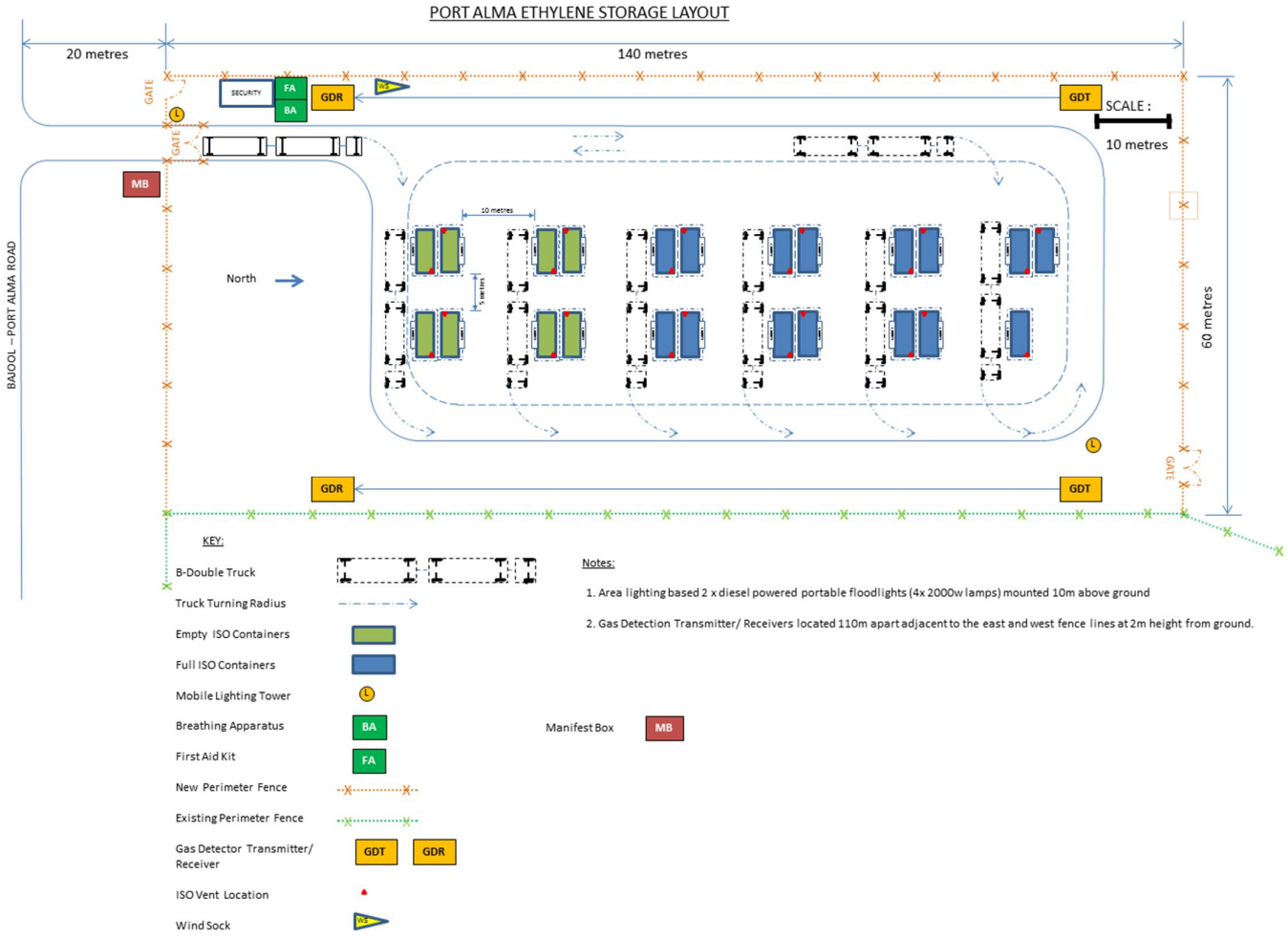

Figure 4b Portside storage facility site layout map

2.5 Meteorology

The meteorological conditions within the vicinity of the site may have significant impacts on the consequence distances, particularly with regard to gas dispersion. Therefore, it is necessary to understand the “typical” and “worst case” scenario meteorological conditions which may affect the site during a potential major accident event. The amount of turbulence in the ambient atmosphere has an effect on the dispersion of gas. It is therefore important to categorize the amount of atmospheric turbulence present at any given time.

The most commonly used method of categorizing the amount of atmospheric turbulence present is the Pasquill stability classes named A, B, C, D, E and F with class A being the most unstable or most turbulent class, and class F the most stable or least turbulent class. The table below lists the six classes.

Table 4 Stability class definitions

Stability class	Definition
A	Very unstable
B	Unstable
C	Slightly unstable
D	Neutral
E	Slightly stable
F	Stable

Meteorological data is available in terms of wind direction, wind speed and stability classes. While all wind directions, wind speeds and stability classes have been considered, it is useful to group the data in a limited number of representative weather classes defined by wind speed and stability class to input into the consequence model.

Three (3) separate stability–wind speed classes were adopted to cover unstable, neutral and stable atmospheric situations. The stability-wind speed classes used in the consequence analysis are outlined in Table 5.

Table 5 Port Alma, Stability-wind speed classes

Stability-wind speed class	Percentage Occurrence
B3.6 (unstable)	24.6%
D3.1(neutral)	43.6%
F2.4 (stable)	31.8%

The Bureau of Meteorology (BOM) operates a network of monitoring stations around Australia. Meteorological data was sourced from BOM monitoring stations located at Rockhampton and Gladstone. Both BOM stations are located over 40km from site and have a noticeably different terrain and/or land-sea when compared to the project site therefore the BOM data was supplemented with meteorological data derived from The Air Pollution Model (TAPM) developed by CSIRO.

To allow for assessment of multiple seasons and dispersion patterns meteorological data included in the air quality modelling were generated from TAPM for a full year. TAPM meteorological data was generated using the parameters shown in Table 4 below.

Table 4 TAPM meteorology input parameters (TAPM v4.04)

Parameter	Input			
Number of grids (spacing)	3 (10 km, 3 km, 1 km)			
Number of grid points	25 x 25 x 25			
Number of vertical levels	25			
Year of analysis	2013			
Centre of Analysis	X (m)	281297	Y (m)	7390069

Separate wind roses for the Port Alma region were developed for each stability-wind speed class based on TAPM Ausplume model output. A full year (2013) data was used as an example year. Wind roses (from direction) for the original stability classes are given below for the 3 main stability classes at Port Alma.

A wind rose is a graphic tool used by meteorologists to give a succinct view of how wind speed and direction are typically distributed at a particular location. Presented in a circular format, the wind rose shows the frequency of winds blowing from particular directions over a specified period. The length of each "spoke" around the circle is related to the frequency that the wind blows from a particular direction per unit time. Each concentric circle represents a different frequency, emanating from zero at the center to increasing frequencies at the outer circles. A wind rose plot may contain additional information, in that each spoke is broken down into color-coded bands that show wind speed ranges.

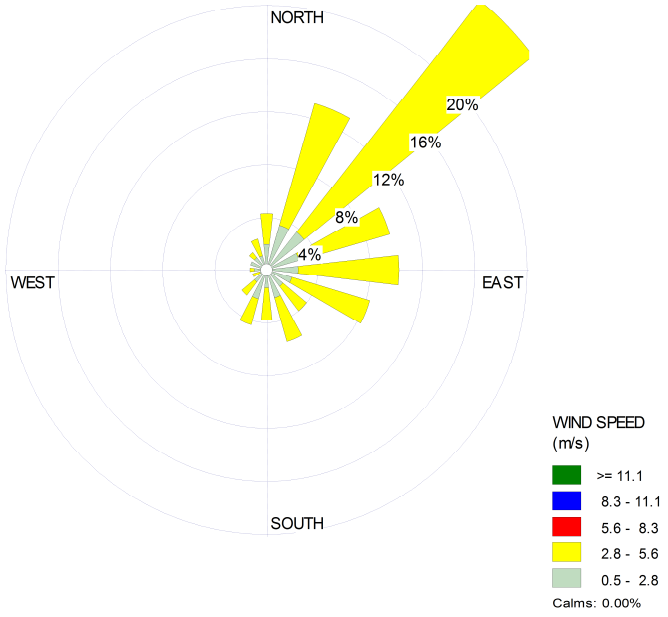

Figure 5 Stability Class B Wind Rose

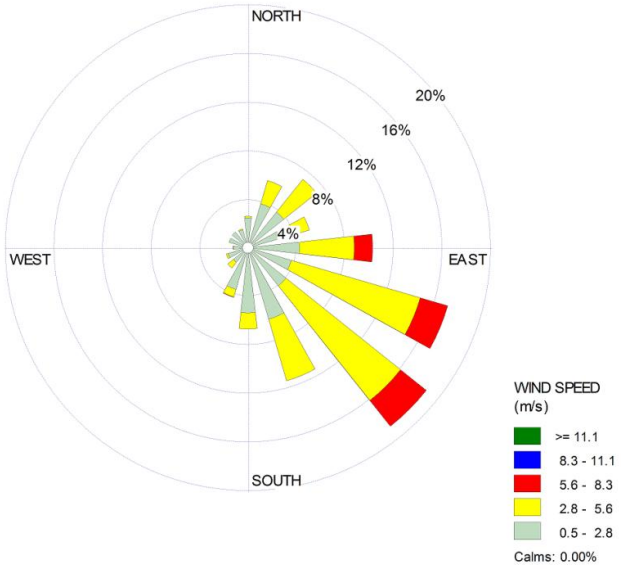

Figure 6 Stability Class D Wind Rose

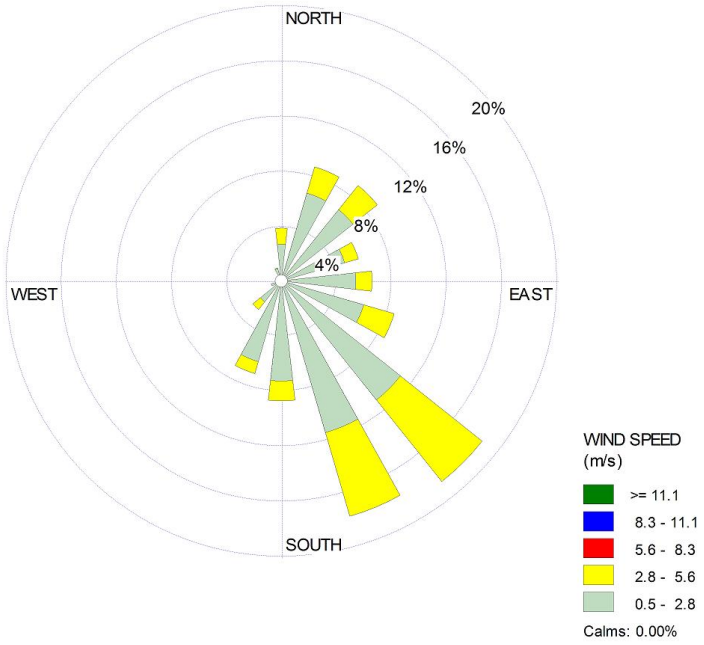

Figure 7 Stability Class F Wind Rose

The following data summarizes the atmospheric assumptions used in this study:

- Data obtained from the Australian Bureau of Meteorology was assessed to obtain the average day and night conditions for the Port Alma region.
- The average day conditions were 27ºC and 59% relative humidity. Terrestrial (ground) temperature was assumed to be 35ºC and cloud cover was 3/8 or 0.4
- The average night conditions were 17ºC and 70% relative humidity. Terrestrial temperature was assumed as 10ºC and cloud cover at 0.4
- Classes B (unstable) and D (neutral) are regarded as daytime conditions, whilst class F (stable) was typical of night conditions.
- While the wind roses for the Port Alma region show winds from all directions, it should be noted that the wind roses show that there is a higher frequency of winds in the south easterly and north easterly directions. There is also a low frequency of westerly winds, and as such a potential ethylene dispersion is more likely to travel towards the western side of the storage facility. This will help minimize the risk level for any impacts on Port Alma facilities.

3.0 Process Description

3.1 Project Overview

The ethylene horizontal tank farm owned by Portside Storage includes ten (10) to fifteen (15) 20,000L horizontal ethylene ISO shipping containers at 1,030 kPag, arranged side-by-side.

3.2 Ethylene Storage and Properties

3.2.1 Storage arrangement

The total quantity of Ethylene DG Class 2.1, UN number 1038, stored at the facility will be 171 tonnes. This quantity is below the threshold limit of 200 tonnes for the storage of hazardous chemicals for major hazard facilities as prescribed in the Workplace Health and Safety regulation 2011. The ethylene will be stored as a liquid. The ISO container is a double walled tank, vacuum jacketed at -1Bar (vacuum).

3.2.2 Ethylene properties

Ethylene is a hydrocarbon with the formula C_2H_4. It is a colourless flammable gas with a faint "sweet and musky" odour when pure. It is the simplest alkene and the second simplest unsaturated hydrocarbon after acetylene. Ethylene has a density of 1.18 kg/m³ and a molar mass of 28.05 g/mol. Ethylene is practically insoluble in water. Cold ethylene gas is heavier than air and may travel a considerable distance to a source of ignition.

Ethylene is not significantly toxic by inhalation, but high concentrations may be anaesthetic or may cause asphyxiation via displacement of air. Contact with cryogenic ethylene and concentrated cold ethylene gas may cause frostbite.

Ethylene is a dangerous goods Class: 2.1. The explosion limits of ethylene range from 2.7 volume % to 36 volume % in air.

The Safety Data Sheet for Ethylene is included in Appendix D.

3.2.2.1 Flash point

The flash point of ethylene gas is -136 ºC. The flash point of a volatile material is the lowest temperature at which it can vaporise to form an ignitable mixture in air. At the flash point, the vapour may cease to burn when the source of ignition is removed.

3.2.2.2 Auto ignition temperature

The auto ignition temperature of ethylene is about 540 ºC. The auto ignition temperature, or the fire point which does not require an ignition source, is the temperature at which the vapour continues to burn after being ignited. Neither the flash point nor the fire point is dependent on the temperature of the ignition source, which is much higher.

3.2.3 LPG Storage

There is also LPG storage at the Portside Storage site. The location of the LPG storage area at the Portside Storage site is also annotated on Figure 3. It is estimated that the LPG storage cylinders are approximately 110m from the nearest proposed ethylene ISO container. As advised by Orica Chemicals, the total quantity of LPG, stored at the facility is 23.24 tonnes (23,240 kg). The largest containment system of LPG at the facility is 7.48 tonnes (7,480 kg).

There are a number of compliance requirements against AS/NZS 1596 – The storage and handling of LP Gas, including separation to other dangerous goods areas, such as the ethylene storage area. It is recommended that a site audit is conducted to ensure that the LPG storage on site is compliant with AS/NZS 1596 – The storage and handling of LP Gas and other relevant regulations including the WHS regulation 2011.

3.2.4 Combustible Liquids (Biodiesel and Tallow) Bulk Liquid Storage

There are also bulk liquid fuel tanks at the Portside Storage site. The location of the bulk liquids fuel tanks are shown in figure 3. It has been advised by Orica that the bulk liquid storage tanks contain combustible liquids including Biodiesel and Tallow. The nearest bulk liquid tank is estimated to be a distance of approximately 120m from the ethylene ISO container storage area.

4.0 Hazard Identification

4.1 Major Accident Events (MAE) Identification

Hazards associated with the proposed storage of the ethylene ISO containers were identified using a hazard identification study which is included in Appendix A.

Each credible event was qualitatively assessed in terms of its consequences and potential to have off-site impacts. The hazardous events considered to have off-site impacts were categorized as Major Accident Events (MAEs), and were carried forward for quantitative consequence analysis (**refer to Section 5.0**) and frequency analysis (**refer to Section 6.0**), the result of which are presented in this report.

The MAEs carried forward for quantitative consequence and frequency analysis includes:

- **Scenario 1: Catastrophic ISO tank failure** - ISO tank catastrophic failure and rapid loss of containment of the entire inventory of ethylene due to inherent mechanical failures or lifting failures
- **Scenario 2: Major ISO tank failure** - ISO tank piping (50NB) and/or valve major failure leading to loss of containment due to inherent mechanical failures and lifting failures
- **Scenario 3: Jet Fire** - Potential jet fires due to immediate ignition of ethylene from high velocity discharge of ethylene from ISO tank pipework failures (50NB)
- **Scenario 4: BLEVE** - ISO tank BLEVE incident due to sustained, uncontrolled fire and ultimate tank rupture

Due to the nature of the area surrounding the storage location and the properties of the ethylene product, risks to the biophysical environment have not been carried forward for further assessment.

5.0 Consequence Analysis

Consequence analysis involves the analysis and quantification of the physical effect of the various incident outcomes. Mathematical models and computerised tools have been used to calculate the impact of fires and their effect on people and buildings.

When interpreting the results of a consequence analysis, the following factors should be taken into account:

- A 'consequence' analysis involves the analysis of worst-case scenarios only and does not account for probability or frequency of the events taking place.
- When risk is to be imposed on an individual or a group of people (e.g. by locating a hazardous facility in an area), the concept of 'acceptability' of that risk for the decision making process is that it should be low relative to other known and tolerated risks. The 'acceptability' of risk considers both consequence and likelihood factors.

Consideration of worst case scenarios or consequence analysis becomes important for the purposes of Emergency Response Planning. This section of the report shows consequence distances associated with Major Accident Events (MAEs), which are considered to be credible 'worst-case scenarios', and do not account for frequency of the events.The consequence analyses carried out included the following loss of containment (LoC) scenarios:

- **Scenario 1: Catastrophic ISO tank failure** - ISO tank catastrophic failure and rapid loss of containment of the entire inventory of ethylene due to inherent mechanical failures or lifting failures
- **Scenario 2: Major ISO tank failure** - ISO tank piping (50NB) and/or valve major failure leading to loss of containment due to inherent mechanical failures and lifting failures
- **Scenario 3: Jet Fire** - Potential jet fires due to immediate ignition of ethylene from high velocity discharge of ethylene from ISO tank pipework failures (50NB)
- **Scenario 4: BLEVE** - ISO tank BLEVE incident due to sustained, uncontrolled fire and ultimate tank rupture

To estimate the physical effects from loss of containment (LoC) events, it is necessary to use well established predictive models. In summary:

- The estimation of release rates of gases, liquids and two-phase releases from pipework and vessels were performed with the Shell release models (Shell, 2006) or using the TNO release models (VROM 2005b).
- The estimation of the thermal radiation levels (kW/m^2) to various distances from the origin of the release, predominately due to jet fires, were performed using a model based on original work by Shell (UK), as implemented by TNO (VROM, 2005b).

Of importance in performing consequence modelling are the physical effects imposed on vulnerable resources such as people, structures or environment. The significance of thermal radiation impacts from jet fires or pool fires is seen in Table 5.

Table 6 Thermal Radiation Effects

Thermal radiation intensity (kW/m^2)	Effects (People)	Effects (Structures)
1	Likely level of summer sun exposure	No expected weakening of steel structures
1.6	Minimum necessary to be felt as pain	No expected weakening of steel structures
4.7	Pain in 15 - 20 seconds. 2^{nd} degree burns after 30 seconds	No expected weakening of steel structures
12.6	30% chance of fatality for continuous exposure	No expected weakening of steel structures
23	100% chance of fatality for continuous exposure 10% chance of fatality for instantaneous exposure	Weakening of steel structures over 15-20 minutes exposure

A summary of the consequence analysis for each MAE has been detailed in the following sections.

5.1 Scenario 1: Catastrophic ISO tank failure

5.1.1 Assumptions

For the catastrophic ISO tank failure loss of containment scenario, the following assumptions apply:

- Total inventory of the ISO container is lost over 20 seconds, which amounts to approximately $1m^3$ per second of ethylene discharge to ground.
- Flash fraction of ethylene was 15%. This related to discharge to atmospheric conditions from a tank at -76.3ºC and 410 kPa (abs).
- A value 2.7 volume % (0.0309 kg/m^3) was used as the lower flammability limit (LFL) for ethylene. The upper flammability limit (UFL) was 36 volume % (0.412 kg/m^3).
- Tank discharges to an unconfined pool (i.e. there is no bunding) which spreads and evaporates under prevailing wind conditions. The pool eventually retracts as all ethylene is evaporated.
- Ground surface was regarded as hard packed and impermeable.
- For a loss of containment during the day (i.e. characterised by stability class B3.6 and D3.1 conditions), the worst case meteorological conditions (i.e. atmospheric temperature, relative humidity, ground temperature and cloud cover) were considered to occur at 12noon. The worst case meteorological conditions were used in the consequence modelling for determining the Lower Flammable Limit (LFL) impact distances.
- For a loss of containment during the night (i.e. characterised by stability class F2.4), the worst case meteorological conditions (i.e. atmospheric temperature, relative humidity, ground temperature and cloud cover) were considered to occur at 4am. The worst case meteorological conditions were used in the consequence modelling for determining the LFL impact distances.
- Surface roughness was set at z_0 = 0.03m, this being appropriate for the area.
- The general storage area was assumed to be at the northwest corner of the site, close to the northern boundary.

5.1.2 Results

The outcomes were generated using the LPOOL and HEGADAS-T (time varying) codes from the HGSYTEM suite of Shell's heavy gas programs[1]. The models were used to:

- Estimate ethylene evaporation rates and pool spread over time.
- Locate the lateral and downwind distances to the LFL value.
- Output cloud conditions at observer times of 30, 60, 120, 180, 240 and 300 seconds.
- Obtain an estimate of the amount of ethylene in the evaporating cloud that lies between the lower and upper flammability limit.

The results of the flash fire impact zones due to a catastrophic failure of the ISO tank (for the drifting cloud at D3.6 and D3.1 worst case conditions which occur at midday and for F2.4 worst conditions which occur at 4:00am) are shown in Table 7. Appendix B, Figures B1, B2 and B3 contain the graphs of the time varying evaporation rates, pool area growth and contraction.

[1] Shell, 2006, The HGSYSTEM package, (PC based set of atmospheric dispersion models developed by Shell Research Ltd), http://www.hgsystem.com/user_guide/genintro.html

Table 7 Distance to LFL due to Catastrophic ISO Tank Failure

Atmospheric conditions	LFL maximum downwind distance (m)	LFL maximum lateral distance from axis (m)	Time to reach maximum extent (s)	Maximum evaporating pool diameter (m)	Comments
B3.6 (Day)	350	73	~200	60	Drifting, separated cloud exists at t >120s After 110s all ethylene has been evaporated into the cloud. Downwind at 140s has cloud LFL at 275m
D3.1 (Day)	560	61	~300	62	Drifting, separated cloud exists at t >200s
F2.4 (Night)	650	100	~1200	65	Pool evaporates in ~150s Drifting cloud forms after 900s

The results in Table 6 above are not location specific distances and are worst case scenario maximum downwind and cross wind distances to the LFL. The location specific individual fatality risk contours shown in Figure 1 incorporate the percentage occurrence of winds in all directions. While these worst case scenario impact distances could occur in any direction, Figure 8 below as a representative image for the flash fire impact zones for winds from the south for the three atmospheric conditions.

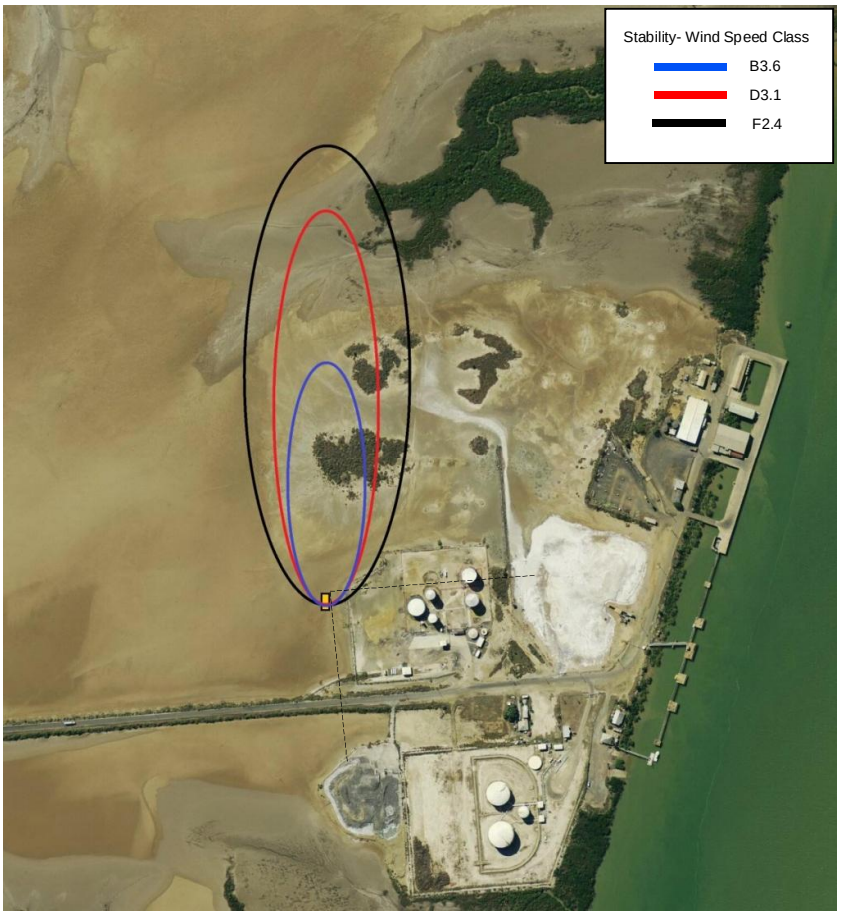

Figure 8 ISO Tank Rupture consequence distance for flash fire impact zones (wind shown from south)

Observations of worst case scenario consequence impacts:

- Catastrophic tank failures can lead to large effect distances by means of dispersion of flashing and evaporating ethylene.
- Large spreading pools of ethylene are possible when these catastrophic tank failures occur. However it should be noted that the frequency of such catastrophic failures for double walled tanks will be extremely low. See section 6.2 for further details of the frequency analysis conducted.
- There can be significant amounts of flammable ethylene vapour present. If no strong ignition occurs on the site then offsite ignition sources could initiate flash fires.
- The predominant wind direction means any vapour cloud would be more likely to be driven west onto mud/salt flats.
- There is also the potential for Open Flammable Cloud Explosions (OFCEs) in the case where there is flammable ethylene vapour present in quantities greater than approximately 1 tonne. It was estimated that approximately 5 to 6 tonnes of ethylene could be available in the developed cloud between the flammability limits. Any explosion is likely to be at a low to moderate overpressure given the open nature of the area where flammable clouds would predominantly travel and the degree of confinement is low.
- There is very little confinement apart from what might exist immediately around the ISO tank storage area. The amount of flammable material in the confined area would be quite low for the developed cloud. The strength of the OFCE blast (initial overpressure) using the TNO Multi-energy method would be low for the majority of the cloud[2].
- Blast strengths are rated from 1 to 10, where the initial over-pressure has a range of 1kPa (blast strength of 1), through 10kPa for blast strength of 4, up to more than 1000kPa for blast strength 10, which is a detonation. The lower blast strengths represent deflagrations where blast wave velocities are less than the speed of sound.
- For the open areas to the west of the storage site the blast strength would be 4 or less. Any potential blast could cause structural damage on the site.
- It should be noted that the key overpressures of interest for land use planning are 7 kPa at nearby residential land uses, and 14 kPa on neighbouring industrial land uses[3]. This is at a maximum frequency of 50 per million per annum (50 pmpa).
- Further discussion for the consideration of OFCE's is provided in Section 5.5.

[2] VROM, 2005, Methods for the calculation of physical effects, CPR14E, Ministerie van Verkeer en Waterstaat, The Netherlands.
[3] Qld Government, 2013, State Planning Policy Guidelines, Guidance of development involving hazardous chemicals, Draft, DSDIP, Queensland State Government, December

5.1.3 Discussion of Results

Table 8 Impacts of catastrophic failures on-site and off-site

Receptors of interest	Description of potential impacts of a catastrophic tank failure	Recommendations to manage the Risk
Discussion of likely impacts of flash fires on AN storage facilities at Port Alma.	For the worst case meteorological conditions, it is estimated that the LFL impact distances for a flammable ethylene cloud resulting from a catastrophic failure can reach up to a maximum downwind distance of 650m during night conditions (i.e. stability-wind class F2.4) and up to 560m during day conditions (i.e. stability-wind class D3.1) as show in table 6. Potentially up to 8,000 t of AN will be stored in the vessel which docks at the northern end of the birth, a distance of approx. 700m from the ethylene ISO container storage location. The vessel is located outside of the worst case scenario flash fire impact zone for a catastrophic failure of the ISO tank during day (D3.1 and B3.6) and night (F2.4) conditions. An AN store may also be established at Port Alma. It is understood that the AN will be stored in compliance with relevant Australian Standards, legislative requirements and codes of practise which include limiting the maximum stack size of AN to 500t which are separated from each other in a manner that will prevent sympathetic detonation. It is understood that there may be up to a total of 5,000t of AN in the storage area. The store will be approximately 550m from the ethylene storage area. This is within the worst case scenario flash fire impact zone during both day (D3.1) and night (F2.4) conditions. This means, in the case there is a catastrophic failure of an ISO container, emptying the entire inventory of ethylene, forming a vapour cloud within the LFL, which is not immediately ignited, and travels a distance of 550m to the AN storage area at the dock, which is then ignited by an available ignition source, there is the potential for a flash fire to occur in the vicinity of the AN storage. In the case there is a flash fire, structures and objects inside the cloud will be subjected, for a few seconds, to the burning portion of the gas cloud and there is the potential for combustible materials within the cloud to catch fire. This may also lead to secondary fires within the cloud. It is therefore recommended that both ignition sources and the amount of combustible materials stored at Port Alma are kept to a minimum. A flash fire in the vicinity of the AN storage area could potentially result in bagged AN exposed to such flash fires. However, it is understood that the AN will be stored in accordance with relevant Australian Standards, legislative requirements and codes of practise, which includes appropriate storage which will act as a barrier between the AN and heat radiation of any potential	While the likelihood is very low, the proposed temporary unloading AN storage area at the dock (storing up 500 tonne of AN) is within the worst case scenario flash fire impact zone during both day (D3.1) and night (F2.4) conditions. It is therefore recommended that appropriate risk mitigation measures are implemented which includes confirming the storage and handling of AN at the Port is in compliance with all relevant Acts, Regulations and Australian Standards including but not limited to: - AS 4326-2008, The storage and handling of oxidizing agents - AS 2187 Explosives – Storage, Transport, Use - Explosives Act 1999 - Explosives Regulation 2003 - Workplace Health and Safety Act 2011 - Workplace Health and Safety Regulation 2011 - Information Bulletin No. 53 Storage requirements for security sensitive ammonium nitrate (SSAN) It is also recommended that the Emergency Response Procedures (both for the Ethylene Storage facility and the AN Storage) include specific response procedures for the unlikely event of a loss of containment of ethylene and potential travelling gas cloud. It is also recommended that the coordination of transport activities of AN with ethylene transport activities is documented in the safety management systems for both Port Alma and Portside

Receptors of interest	Description of potential impacts of a catastrophic tank failure	Recommendations to manage the Risk
	Flash Fires. Weakening of steel structures occurs after 15-20 minutes exposure to a heat radiation intensity of 23KW/m^2. However, due to the short duration of a flash fire event which is estimated to only last a few seconds, there is not expected to be an exposure long enough to cause weakening of steel structures. Accordingly, the risk of knock on effects between the AN storage and the ethylene storage at Portside Storage due to a travelling gas cloud is considered extremely low.	Storage facilities.
Discussion of the likely impacts of a potential ethylene incident on the explosive storage at Port Alma.	Port Alma is the deep sea port for Rockhampton and provides both import and export facilities and services. In addition to Ammonium Nitrate, it is understood that the port also currently handles explosive cargos including explosives and munitions. In the case there is a catastrophic failure of an ISO container, emptying the entire inventory of ethylene, forming a vapour cloud within the LFL, which is not immediately ignited, and travels a distance of approximately 550m to the location of the shipping facilities which is then ignited by an available ignition source, there is the potential for a flash fire to occur in the vicinity of the explosive storage at Port Alma. In the case there is a flash fire, structures and objects inside the cloud will be subjected, for a short time, to the burning portion of the gas cloud and there is the potential for combustible parts of the structure to catch fire. This may also lead to secondary fires within the cloud. It is therefore recommended that both ignition sources and the amount of combustible materials stored at Port Alma are kept to a minimum. A flash fire in the vicinity of the explosive cargos storage areas at Port Alma could potentially result in an incident where the explosive cargos are exposed to such flash fires. However, it is understood that the explosive cargos will be stored in appropriately designed storage areas, which will act as a barrier between the cargos and heat radiation of any potential Flash Fires. Weakening of steel structures occurs after 15-20 minutes exposure to a heat radiation intensity of 23KW/m^2. However, due to the short duration of a flash fire event which is estimated to only last a few seconds, there is not expected to be an exposure long enough to cause weakening of steel structures. Accordingly, the risk of knock on effects between the explosive cargos and the ethylene storage at Portside Storage due to a travelling gas cloud is considered extremely low.	It is recommended that the storage and handling of all explosives is compliant with relevant legislation and Australian Standards including but not limited to: - Workplace Health and Safety Act 2011 - Workplace Health and Safety Regulation 2011 - Explosives Act 1999 - Explosives Regulation 2003 - AS 2187 Explosives – Storage, Transport and use It is also recommended that the Emergency Response Procedures (both for the Ethylene Storage facility and the explosive Storage at Port Alma) include specific response procedures for the unlikely event of a loss of containment of ethylene and potential travelling gas cloud.

Receptors of interest	Description of potential impacts of a catastrophic tank failure	Recommendations to manage the Risk
Discussion of the likely impacts of a potential ethylene incident on the LPG storage located at the Portside Storage site.	There is a LPG cylinder storage area on the portside storage facility adjacent to the ethylene storage area. Based on the site layout drawings provided by Orica, the LPG storage is located approximately 110m from the ethylene storage location. The LPG cylinders are located within the worst case scenario flash fire impact zone during both day (D3.1) and night (F2.4) conditions. This means, in the case there is a catastrophic failure of an ISO container, emptying the entire inventory of ethylene, forming a vapour cloud within the LFL, which is not immediately ignited, and travels a distance of 110m, to the LPG storage area at Portside storage, which is then ignited by an available ignition source, there is the potential for a flash fire to occur in the vicinity of the LPG Storage. In the case there is a flash fire, structures and objects inside the cloud will be subjected, for a short time, to the burning portion of the gas cloud. Combustible parts of the structure will catch fire. This may also lead to secondary fires. It is therefore recommended that both ignition sources and the amount of combustible materials stored at the Portside Storage Site area kept to a minimum. A flash fire in the vicinity of the LPG storage area could potentially result in an incident where the LPG cylinders are exposed to such flash fires. However, it is understood that the LPG cylinders will be stored in compliance with the requirements of AS/NZS 1596 – The storage and handling of LP Gas, including separation to other dangerous goods areas, such as the ethylene storage area and control of ignition sources. It is recommended that a site audit is conducted to ensure that the LPG storage on site is compliant with AS/NZS 1596 – The storage and handling of LP Gas and other relevant regulations including the WHS regulation 2011. Appropriate LPG storage requirements may also include screen walls or heat radiation shields / barriers with appropriate fire resistance and blast protection used in accordance with Dangerous Goods Regulations and Standards.	It is recommended that Portside Storage ensure that the storage and handling of LPG cylinders on the site are compliant with the relevant legislation, Australian Standards and codes of Practise including but not limited to: - AS/NZS 1596:2014 : The storage and handling of LP Gas - Workplace Health and Safety Act 2011 - Workplace Health and Safety Regulation 2011 It is also recommended that the Emergency Response Procedures (both for the Ethylene Storage Facility and the Portside Storage facility) include specific response procedures for the unlikely event of a loss of containment of ethylene and potential travelling gas cloud. It is recommended to consider the use of heat radiation shields / barriers with appropriate fire resistance and blast protection ratings around the ethylene storage facility.
Discussion of	It is understood that there are bulk liquids storage tanks at the Portside storage facility containing tallow and bio diesel. Based on the site layout drawings provided by Orica, the bulk liquids tanks are located approximately 120m from the ethylene ISO container storage area. Therefore, the bulk liquid storage tanks (including bio diesel and tallow) are located within the worst case scenario flash fire impact zone during both day (D3.1) and night (F2.4) conditions. This means, in the case there is a catastrophic failure of an ISO container, emptying the entire inventory of	It is recommended that Portside Storage ensure that the storage and handling of combustible liquids (biodiesel and tallow) on the site are compliant with the relevant legislation, Australian Standards and codes of Practise including but not limited to: - AS 1940 Storage and Handling of Flammable and Combustible Liquids

Receptors of interest	Description of potential impacts of a catastrophic tank failure	Recommendations to manage the Risk
the likely impacts of an ethylene incident on the bulk liquids stored at Portside storage including combustible liquids (biodiesel and tallow).	ethylene, forming a vapour cloud within the LFL, which is not immediately ignited, and travels a distance of 120 m, to the bulk liquids storage tanks at Portside storage, which is then ignited by an available ignition source, there is the potential for a flash fire to occur in the vicinity of the bulk liquid tanks. In the case there is a flash fire, structures and objects inside the cloud will be subjected, for a short time, to the burning portion of the gas cloud. Combustible parts of the structure will catch fire. This may also lead to secondary fires. It is therefore recommended that both ignition sources and the amount of combustible materials stored at the Portside Storage Site area kept to a minimum. A flash fire in the vicinity of the bulk liquid storage tanks could potentially result in an incident where the combustible liquids (biodiesel and tallow) are exposed to such flash fires. However, it is understood that the bulk liquid storage tanks are stored in compliance with the requirements of AS1940 Storage and Handling of Flammable and Combustible Liquids, including separation to other dangerous goods areas, such as the ethylene storage area and control of ignition sources. Appropriate LPG storage requirements may also include screen walls used in accordance with Dangerous Goods Regulations and Standards. Screen walls will act as a barrier between the LPG cylinders and heat radiation of any potential Flash Fires. Accordingly, the risk of knock on effects between the AN storage and the ethylene storage at Portside Storage due to a travelling gas cloud is considered low.	- Workplace Health and Safety Act 2011 - Workplace Health and Safety Regulation 2011 It is also recommended that the Emergency Response Procedures (both for the Ethylene Storage Facility and the Portside Storage facility) include specific response procedures for the unlikely event of a loss of containment of ethylene and potential travelling gas cloud.

5.2 Scenario 2: Major ISO tank failure

5.2.1 Assumptions

Smaller aperture failures are possible. The case of a 50mm aperture was considered, this being the diameter of the outlet pipework from the ISO tank. This event could be caused by dropping of the tank during lifting operations, mechanical failure of pipework or isolation valve.

The predictions used the HGSYSTEM high momentum jet discharges (Aeroplume model, and where necessary the Hegadas-S model for heavy gas dispersion downwind.

The assumptions were:

- Two-phase pipe flow from flashing liquid at -76.3ºC and 410 kPa(abs)
- Discharge coefficient of 0.61, representing a sharp edged orifice[4]
- Similar atmospheric and dispersion parameters as used in the LPOOL model for catastrophic failures of ISO tanks
- LFL distances were calculated at 1m above grade.

[4] CCPS, 2000, Guidelines for Chemical Process Quantitative Risk Analysis, 2nd edition, AIChE, New York (pg. 69)

5.2.2 Results

Table 9 Ethylene Loss of Containment through pipeline or valve failure

Atmospheric conditions	Discharge rate (kg/s)	LFL maximum downwind distance (m)	LFL maximum lateral distance from axis (m)	Comments
B3.6	4.4	55	2.5	Choked discharge. Very little hydrocarbon in the dispersing jet (~13kg). Potential jet fire on immediate ignition. Flash fire possible with subsequent jet fire.
D3.1	4.4	54	2.6	
F2.4	4.4	52	3.0	

Observations:

- High pressure discharges rapidly mix with air and distances to the LFL are relatively short. Figures C1, C2 and C3 in Appendix C give isopleths for the ethylene releases reported in Table 9.
- There is a potential for immediate ignition given the low minimum ignition energy of ethylene (0.07mJ compared to methane at 0.28mJ[5]).
- Dispersed jets have a relatively small foot print compared with clouds from pool evaporation.
- If a jet fire occurs then impingement on nearby vessel and other structures could be a serious form of escalation.

5.2.3 Discussion of Results

Table 10 Impacts of major ISO tank failures on-site and off-site

Receptors of interest	Description of potential impacts of a major tank failure (50NB release size)
Discussion of likely impacts of flash fires on AN storage facilities at Port Alma.	For the worst case meteorological conditions, it is estimated that the LFL impact distances for a flammable ethylene cloud resulting from a major failure can reach up to a maximum downwind distance of 52m during night conditions (i.e. stability-wind class F2.4) and up to 55m during day conditions (i.e. stability-wind class D3.6) as show in table 8. The AN storage on the vessel and on the dock at Port Alma are outside the worst case scenario flash fire impact zone for a major failure of the ISO tank during day (B3.1 and D3.6) and night (F2.4) conditions. Therefore, there is not considered to be a risk of a flash fire adjacent to the AN storage areas at the port due to a major failure of the ISO tank.
Discussion of the likely impacts of a potential ethylene incident on the explosive storage at Port Alma.	The storage areas for explosives at Port Alma Port are outside the worst case scenario flash fire impact zone for a major failure of the ISO tank during day (B3.1 and D3.6) and night (F2.4) conditions. Therefore, there is not considered to be a risk of a flash fire adjacent to the Class 1s and munitions storage areas at the port due to a major failure of the ISO tank.
Discussion of the likely impacts of a potential ethylene incident on the LPG storage located at the Portside	There is a LPG cylinder storage area on the portside storage facility adjacent to the ethylene storage area. Based on the site layout drawings provided by Orica, the LPG storage is located approximately 110m from the ethylene ISO container storage area. Therefore, the LPG cylinders are not located within the worst case scenario flash fire impact zone during both day (D3.1) and night (F2.4) conditions. Therefore, there is not considered to be a risk of a potential flash fire adjacent to the bulk

[5] Babrauskas6, V, 2003, Ignition Handbook, Fire Sciences Publishers, Issaquah, WA, USA.

Receptors of interest	Description of potential impacts of a major tank failure (50NB release size)
Storage site.	liquid storage tanks due to a major failure of the ISO tank.
Discussion of the likely impacts of an ethylene incident on the bulk liquids stored at Portside Storage such as tallow and bio diesel.	It is understood that there are bulk liquids storage tanks at the Portside storage facility containing combustible liquids (bio diesel and tallow). Based on the site layout drawings provided by Orica, the bulk liquids tanks are located approximately 120m from the ethylene ISO container storage area. Therefore, the bulk liquids storage tanks are not located within the worst case scenario flash fire impact zone during both day (D3.1) and night (F2.4) conditions. Therefore, there is not considered to be the potential for a flash fire adjacent to the combustible liquids (bio diesel and tallow) storage areas due to a major failure of the ISO tank.

5.3 Scenario 3: Jet fires

5.3.1 Assumptions

There is a possibility that on release from containment direct ignition will generate a jet fire which can have thermal radiation impacts on people and nearby assets.

Using the discharge rates from Table 8 (i.e. 50NB release size), thermal radiation predictions were made using an implementation of the Shell "Thornton" jet fire model (see TNO 1997)[6].

Key assumptions were:

- That the jet fire was considered to be at 15º from the horizontal which provides the most conservative result (i.e. the worst case scenario).
- Wind speed of 4 m/s, this being typical average wind speed for the area.

5.3.2 Results

Figure **9** shows the predicted downwind thermal radiation impacts as release angle changes.

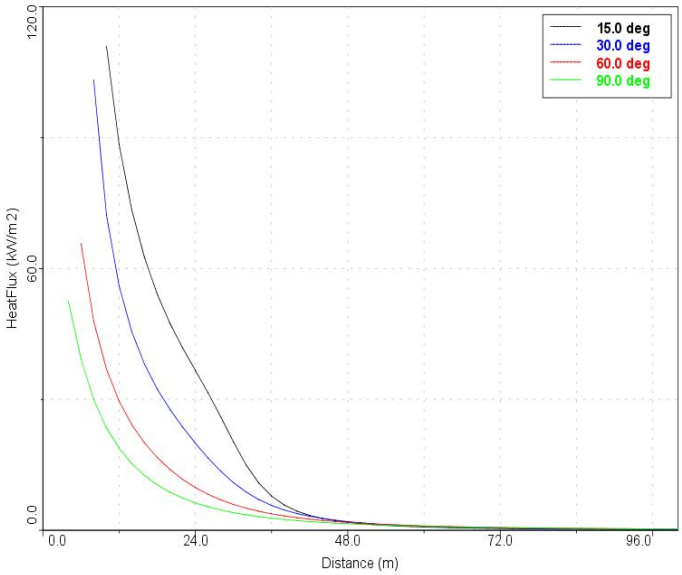

Figure 9 50mm release: Jet fire thermal radiation

[6] TNO, 1997, Methods for the calculation of physical effects, 3rd Edition, Voorburg, ISBN 90-12-08497-0

Observations:

- As the angle of release becomes more vertical thermal radiation at ground level reduces as expected.
- Thermal radiation levels can be high but for this release are confined on-site.

5.3.3 Results

Table 11 Impacts of Jet Fires on-site and off-site

Receptors of interest	Description of potential impacts due to jet fires (i.e. immediate ignition of a release of size 50NB)
Discussion of the likely impacts of a potential ethylene incident on the LPG storage located at the Portside Storage site.	Based on the site layout drawings provided by Orica, the LPG storage is located approximately 110m from the ethylene ISO container storage area. From the results of the consequence model of a jet fire resulting from the immediate ignition of a high momentum release, (presented in Figure 9), show the thermal radiation levels are zero at a distance of 75m. Therefore, the LPG cylinders are not located within the worst case scenario jet fire impact zone.
Discussion of the likely impacts of an ethylene incident on the bulk liquids stored off-site in the area such as tallow and bio diesel.	Based on the site layout drawings provided by Orica, the bulk liquids storage tanks are located approximately 120m from the ethylene ISO container storage area. From the results of the consequence model of a jet fire resulting from the immediate ignition of a high momentum release, (presented in Figure 9), show the thermal radiation levels are zero at a distance of 75m. Therefore, the bulk liquids storage tanks are not located within the worst case scenario jet fire impact zone.

5.4 Scenario 4: Tank BLEVE incidents

5.4.1 Assumptions

Boiling liquid expanding vapour explosions (BLEVEs) were considered in the MAEs carried forward. The BLEVE model derived from TNO (1997)[7] was used for the thermal radiation predictions.

Key assumptions were:

- Assumed that the ISO tank contained 10,000kg of ethylene which formed the fire ball
- Atmospheric conditions were taken from the three (3) key stability-wind speed classes.

5.4.2 Results

Figure 10 shows the thermal radiation levels for a range of tank inventories.

[7] TNO, 1997, Methods for the calculation of physical effects, 3rd Edition, Voorburg, ISBN 90-12-08497-0

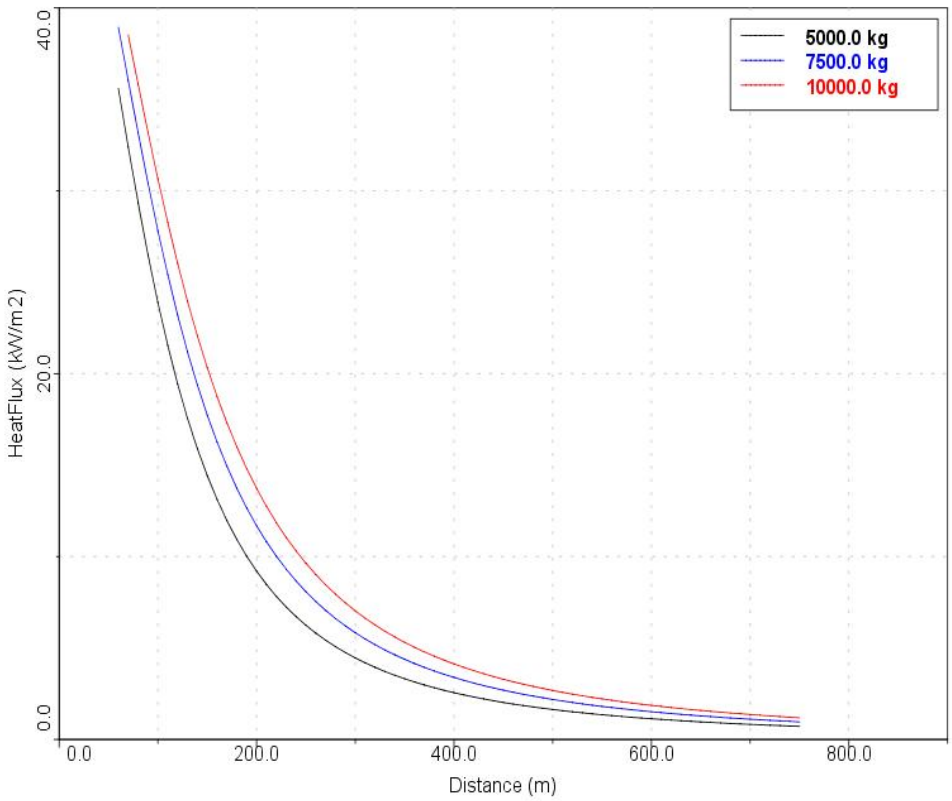

Figure 10 BLEVE of ISO tank: thermal radiation vs inventory

Observations:

- Thermal radiation levels can be very significant at substantial distances as seen in Figure 10.
- For the case of 10,000kg of ethylene:
  - The fireball size was 128m diameter with a fire duration of 9.3 seconds.
  - The heat radiation level intensity of 4.7 KW/m^2 was calculated at a radius of approximately 385m.
  - The heat radiation level intensity of 12.6 KW/m^2 was calculated at a radius of approximately 300m.
  - The heat radiation level intensity of 23 KW/m^2 was calculated at a radius of approximately 140m.

The consequence contour plots for the heat radiation effects of 4.7KW/m^2, 12.6KW/m^2 and 23KW/m^2 are shown in Figure 11, Figure 12 and Figure 13.

Figure 11 ISO Tank BLEVE heat radiation effects of 4.7KW/m^2

Figure 12 ISO Tank BLEVE heat radiation effects of 12.6KW/m^2

Figure 13 ISO Tank BLEVE heat radiation effects of 23KW/m^2

5.4.3 Discussion of Results

Table 12 Impacts of BLEVES on-site and off-site

Receptors of interest	Description of potential impacts of a BLEVE
Discussion of the likely impacts of a potential ethylene incident on the LPG storage located at the Portside Storage site.	It is estimate the LPG storage area is located 110 m from the ethylene storage area. For the case of 10,000kg of ethylene, with a fireball size was 128m diameter with a fire duration of 9.3 seconds, the heat radiation effects experienced at the LPG storage area due to a BLEVE can potentially reach up to 23KW/m^2 as seen in Figure 13. Weakening of steel structures occurs after 15-20 minutes exposure to a heat radiation intensity of 23KW/m^2. Heat radiation levels of 23kW/m^2 as the result of fire incidents at a hazardous plant may affect a neighbouring installation to the extent that unprotected steel may suffer thermal stress, potentially resulting in structural failure. This may trigger a hazardous event unless protection measures are adopted. However, due to the short duration of a BLEVE event with a fireball estimated to last only 9.3 seconds, there is not expected to be an exposure long enough to cause weakening of steel structures at the LPG Storage Area. It is also understood that the LPG cylinders will be stored in compliance with the requirements of AS/NZS 1596 – The storage and handling of LP Gas and other relevant regulations including the WHS regulation 2011. Appropriate LPG storage requirements may also include screen walls or heat radiation shields / barriers with appropriate fire resistance and blast protection used in accordance with Dangerous Goods Regulations and Standards.
	The combustible liquids storage areas (Biodiesel and Tallow) are assumed to be at a distance of 120m from the ethylene storage area. For the case of 10,000kg of ethylene, with a fireball size was 128m diameter with a fire duration of 9.3 seconds, the heat radiation effects experienced at the combustible liquids

Receptors of interest	Description of potential impacts of a BLEVE
Discussion of the likely impacts of an ethylene incident on the bulk liquids stored off-site in the area such as tallow and bio diesel.	storage area due to a BLEVE can potentially reach up to 23KW/m^2 as seen in Figure 13. Weakening of steel structures occurs after 15-20 minutes exposure to a heat radiation intensity of 23KW/m^2. Heat radiation levels of 23kW/m^2 as the result of fire incidents at a hazardous plant may affect a neighbouring installation to the extent that unprotected steel may suffer thermal stress, potentially resulting in structural failure. This may trigger a hazardous event unless protection measures are adopted. However, due to the short duration of a BLEVE event with a fireball estimated to last only 9.3 seconds, there is not expected to be an exposure long enough to cause weakening of steel structures at the Combustible Liquids Tanks storage area. It is also understood that the bulk liquid storage tanks are stored in compliance with the requirements of AS1940 Storage and Handling of Flammable and Combustible Liquids and other relevant regulations including the WHS regulation 2011. Appropriate combustible liquids storage requirements may also include screen walls or heat radiation shields / barriers with appropriate fire resistance and blast protection used in accordance with Dangerous Goods Regulations and Standards.

5.5 Open flammable cloud explosions (OFCEs)

Catastrophic failure of an ISO tank can lead to substantial vapour clouds being formed as ethylene liquid flashes and is released to ground with subsequent evaporation under the effect of wind and ground conditions. These clouds are driven downwind and as they travel dispersion takes place to below the lower flammability limit where burning will not be sustained. Of interest is the potential for generating damaging overpressure blasts if the cloud is ignited.

As described in section 5.1, consideration was given to the formation of vapour clouds that could potentially explode. It was estimated that up to 6,000 kg of ethylene could be contained in the developed vapour cloud within the flammable range. However, given the unobstructed and flat surrounding landscape and dominant wind directions, it is likely that the blast strength using the TNO Multi-Energy model would be category 4 or less for a large majority of the vapour cloud. The initiating overpressure for blast strength 4 is 10kPa.

Fatalities will rarely occur due to over-pressures less than 30kPa[8]. They are more likely to occur due to shrapnel.

Given the location of the site and the prevailing winds the overpressure effects of OCFEs was not included in this analysis.

5.6 Bush Fires

Bushfires were considered for the Portside Storage site taking into consideration the surrounding vegetation. The Hazard Identification provided in Appendix A considered bush fires as a potential cause of an external fire adjacent to the ethylene storage at Portside storage. Due to the lack of surrounding vegetation, a bush fire was not considered to be a likely cause of an external fire. However, the event of a BLEVE incident due to external fires of any source was identified as a Major Accident Event Scenario and has been assessed within this report.

5.7 Impact of an AN incident on the Ethylene Storage Area

An AN storage facility may be established at Port Alma with up to a total of 5,000t of AN stored in stacks. It is understood that the AN will be stored in compliance with relevant Australian Standards, legislative requirements and codes of practise which include limiting the maximum stack sizes of AN to 500t. The standards and Codes of Practice also require storage stacks to be separated from each other in a manner that will prevent sympathetic detonation.

[8] VROM, 2005, Guidelines for quantitative risk assessment, CPR18E, Ministerie van Verkeer en Watersaat, The Netherlands, (section 5.2.4)

It is also understood that there may be storage of ammonium nitrate (AN) up to 8,000 tonne on the ships docked at the northern end of the unloading berth at Port Alma. The proposed storage for the ammonium nitrate on the dock is approximately 550m form the ethylene storage facility, and the ship will be stationed approximately 700m from the ethylene facility.

Ammonium nitrate is a strong oxidising agent that will support combustion of organics and metal powders as it produces oxygen as one of its decomposition products. When subjected to heat, AN undergoes a series of complex decomposition reactions that produce low levels of toxic nitrogen oxides (namely nitrous oxide) at atmospheric pressure. If the reaction is confined and the gases are maintained at the temperature at which they were formed, further gas phase reactions can occur giving off nitric acid oxide and nitrogen dioxide gases.

The sensitivity of AN to detonation is largely dependent on three variables; high temperature, confinement and contamination. Without any one of these being present, AN would require a strong initiation charge (i.e. high explosives) to detonate at all.

Variable in the calculation of overpressure consequences from an AN explosion include the proportions of material present that is sensitised to detonation, the proportion of the sensitised material that actually detonates in the explosion (efficiency), and an equivalency of the sensitised material to that of TNT (equivalency). This technique is used because of the significant quantity of information on the consequences of explosions involving TNT and the scarcity of reliable information on the explosive nature of other materials.

In this analysis, the impact criteria presented in the Table below were used to define respective overpressure consequence distances, as referenced by the HIPAP No. 4.

Explosion Overpressure	Effects
3.5 kPa (0.5 psi)	90% glass breakage. No fatality and very low probability of injury
7 kPa (1 psi)	Damage to internal partitions and joinery but can be repaired. Probability of injury is 10%. No fatality.
14 kPa (2 psi)	Houses uninhabitable and badly cracked.
21 kPa (3 psi)	Reinforced structures distort. Storage tanks subject to failure. 20% chance of fatality for a person in a building. 10% chance of fatality for a person outdoors.
35 kPa (5 psi)	House uninhabitable. Wagons and plant items overturned. Threshold of eardrum damage. 50% chance of fatality for a person in buildings and 15% chance of fatality for a person in open.
70 kPa (10 psi)	Threshold of lung damage. 100% chance of fatality for a person in a building or in the open. Complete demolition of houses.

In the context of Land Use safety Planning, the overpressure effects of interest are from 21 kPa to 70 kPa. Accordingly, the consequence distances associated with these overpressure levels were calculated.

1.0 AN Explosion Events:

As previously described, two explosion scenarios were considered:

- 500 tonne Storage on the Dock at Port Alma
- 8,000 tonne on a ship

In order to determine the impacts due to an explosion, it is necessary to convert the storage quantity to an equivalent mass of TNT. The Queensland Guidance Note 4 (which references the COAG Guidelines), specifies an overall Net Explosive Quantity (NEQ) of 32% to be used for AN Prill. Therefore, the equivalent TNT mass for the two postulated scenarios are as follows:

- 160 tonne (at the dock); and
- 2,560 tonne (on the ship).

The consequence distances associated with these two postulated scenarios were calculated using the US Military TNT overpressure equation as detailed below. This equation is based on a robust empirical relationship and is appropriately conservative for the level of detail required in this study.

1.1.1 Overpressure vs. Distance Model

Using the efficiency and equivalence factors, a mass of Ammonium Nitrate is equated to a mass of TNT. The distances to defined overpressures of interest are calculated using the TNT overpressure vs. scaled distance relationship. This method was first discovered by Hopkinson in 1915 [Bulson 1997] and has proven since then to be a robust method of explosive consequence prediction. An Overpressure vs. Scaled Distance relationship can take the form of an equation or graph. In this case an equation is used which is sourced from the US Army [Bulson 1997] and has the form:

$$p_o = \frac{4120}{Z^3} - \frac{105}{Z^2} + \frac{39.5}{Z}$$

$$where:\ 2 < p_o < 160\ psi\ gauge$$

$$Z = \frac{R}{W^{1/3}} \quad and \quad 3 < Z < 20\ ft/lbs^{1/3}$$

1. Convert the explosive quantity of interest into an equivalent mass of TNT in pounds (W).
2. Choose the overpressure of interest in psi (p_o).
3. Solve the equation for R, the distance in feet the overpressure is felt at.

The following consequence distances were calculated for the overpressure of interest:

	Overpressure		
	21 kPa	35 kPa	70 kPa
Distance (8,000 tonne)	870m	645m	460m
Distance (500 tonne)	350m	260m	180m

The detonation of 8,000 tonne of AN (worst case scenario) was conservatively calculated to give overpressure levels (21 kPa) sufficient to cause death of 10% of outdoor human personnel and potential to cause storage tank failure at the proposed ethylene storage facility.

The storage of 500 tonne of AN does not pose significant threats to the proposed ethylene storage location, however does impact on the existing Portside Storage tank farm.

6.0 Frequency Analysis

6.1 Background

Given the limited historical frequency data of major accidents involving cryogenic ISO containers, there is very limited statistical information on the frequency of individual failure scenarios. For this reason, logic models, such as event trees, are typically used to estimate the likelihood of the identified final outcomes, using failure data for individual components and subsystems.

The frequency analysis consisted of:

- Documentation of individual vessels or sections of lines including an estimate of line length, valve numbers and major equipment relevant to the line.
- Application of standard failure frequencies for rupture, major and minor releases recommended by the UK HSE for land use planning purposes (HSE, 2012). Where certain items were not available in the HSE data, values from the Dutch Government's "coloured books" were used (VROM, 2005c).
- Application of the frequency values for various size releases for identified loss of containment events to derive a cumulative frequency for the event.
- In the case of the release of flammable substances such ethylene gas, the likelihood of immediate ignition or flash fire was made via a simple event tree.

The cumulative event frequencies were obtained by summing contributions from estimates for pipework lengths, valves and individual equipment items.

The following incidents were included in the analysis:

- ISO tank BLEVE incident
- Catastrophic failures of the ISO tanks leading to flash fires and pool fires
- Major failures of the ISO tanks leading to flash fires and jet fires.

6.2 Frequency data

In generating risk estimates it was necessary to adopt failure frequencies for a range of events. Little if no data is available on the failure rates of double walled ISO tanks. As such some adjustments from data on single walled ISO tanks and pressure vessels were made. The following frequency values were used:

- **BLEVE events**: for a single walled tank the values are between 0.5 and 10 x 10^{-6} per tank per year[9]. Given the ISO tanks are double walled, a factor of 0.1 was applied to these standard values to obtain a range from 0.05 to 1 x 10^{-6} per year per tank. The value of 1 x 10^{-6} per year per tank was used in the risk analysis. This was considered conservative.
- **Catastrophic failure events**: The ISO tank catastrophic failure rate was 3 x 10^{-8} per tank per year for tanks with pressure relief. This was based on the observation that double walled storage tanks have a catastrophic failure rate 1/100th that of single walled tanks, this being 3 x 10^{-6} per tank per year. (see VROM[10] or UK-HSE).
- **Major failure events**: The ISO tank major failure rate (for 50mm holes) was taken as 3 x 10^{-7} per tank per year, based on a 1/100th failure reduction from single walled tanks.
- The failure of single walled tanks due to lifting was obtained from UK-HSE (2012) data. This was 0.6 x 10^{-6} per tank per lift creating a 50mm equivalent hole in the tank. This was adjusted down by a factor of 0.1 to 0.06 x 10^{-6} per tank per lift for double walled tanks. This figure is for lifts that are less than 5m from the ground.
- The catastrophic failure of ISO tanks during lifts above 5 meters was set at 3 x 10^{-9} per tank per lift, this being 1/10th of the single walled tank. (see UK-HSE 2012).

[9] HSE, 2012, Failure rate and event data for use within risk assessments (28/06/2012), accessed at: www.hse.gov.uk/landuseplanning/failure-rates.pdf
[10] VROM, 2005, Guideline for quantitative risk assessment, CPR18E, Ministerie van Verkeer en Waterstaat, The Netherlands.

- The major failure of 50mm equivalent diameter at lifts less than 5 meters was 6 x 10^{-8} per tank per lift, being 1/10^{th} of the single walled value. (see UK-HSE 2012).
- It was also assumed that for lift failures above 5 metres, 5% of the outcomes will be catastrophic, whilst 95% will lead to major failures. (see UK- HSE 2012).

6.3 Event trees

To estimate a range of outcomes from the underlying failure, two event trees were used to estimate final outcomes. The event trees were for a high pressure major release of material, the other event tree was for catastrophic failures. Figure 14 and Figure 15 show these event trees.

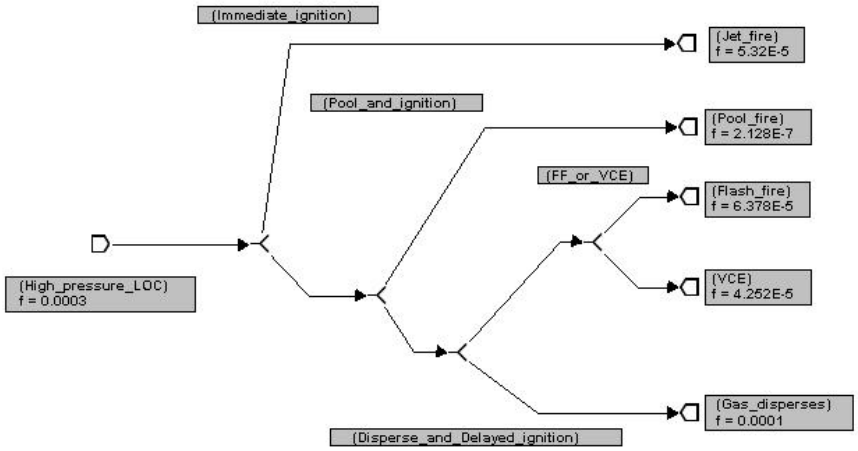

Figure 14 Event tree for high pressure release outcomes

The key values used in the tree were:

- Immediate ignition probability of ethylene was 0.2 (see VROM 2005)
- Delayed ignition probability was set at 0.5, as the jets are retained on site and strict ignition controls are in place
- Flash fire probability was set at 0.6 and OCFE/VCE at 0.4 (see VROM 2005).

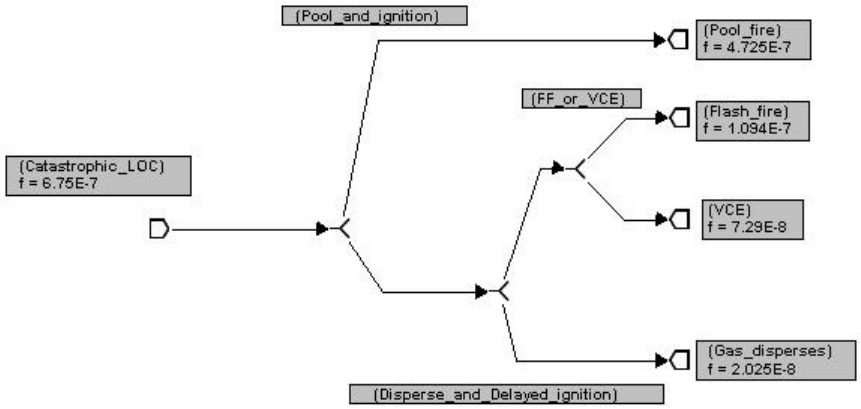

Figure 15 Event tree for catastrophic releases

The key values in the tree were:

- Immediate ignition was 0.7 given the quantity of ethylene being released
- Delayed ignition was set at 0.9 as the clouds extend off-site
- Flash fire was set at 0.6
- It can be seen that large scale vapour cloud explosions have an extremely low frequency.

6.4 Event Frequencies

The initial event frequencies depend on a range of failures[11]. They included:

Frequency for high pressure releases:

= High pressure releases from 4m of 50mm pipework per tank per year + 50mm valve full bore failure per tank per year + lifting failure based on 1500 lifts per tank per year (95% of lifts)

= $(15) \times (4) \times (0.5 \times 10^{-6}) + (15) \times (10 \times 10^{-6}) + (86 \times 10^{-6}/yr)$

= $(30 \times 10^{-6}/yr) + (150 \times 10^{-6}/yr) + (86 \times 10^{-6}/yr)$

= $266 \times 10^{-6}/yr$.

Large catastrophic releases:

= 15 double walled ISO tanks + lifting failures leading to catastrophic failure (5% of lifts)

= $(15) \times (3 \times 10^{-8}/tank/yr) + (0.05) \times (4.5 \times 10^{-6}/tank/yr)$

= $0.675 \times 10^{-6}/yr$.

These trees were used in the risk estimations, along with death and injury probits taken from TNO (1992)[12].

[11] HSE, 2012, Failure rate and event data for use within risk assessments (28/06/2012), accessed at: www.hse.gov.uk/landuseplanning/failure-rates.pdf
[12] TNO, 1992, Methods for the determination of possible damage, CPR16E, Voorburg, ISBN 90-5307-052-4

7.0 Risk Analysis (Results)

7.1 Risk Assessment Criteria

In order to evaluate the results of a risk assessment, it is necessary to have appropriate risk criteria.

When risk is to be imposed on an individual or a group of people (e.g. by locating a hazardous facility in an area), the concept of 'acceptability' of that risk for the decision making process is that it should be low relative to other known and tolerated risks.

Individual risk is generally expressed as 'individual fatality risk', i.e. the frequency at which an individual may be exposed to a fatal consequence 'dose' (heat radiation, explosion overpressure or toxic exposure) off-site.

Individual fatality risk acceptance criteria have been developed for various land-uses and are published in various international standards and guidelines.

The assessment has been carried as per the Hazardous Industry Advisory Paper (HIPAP) No 4, Risk Criteria for Land Use Planning and in accordance with HIPAP No 6, Guidelines for Hazard Analysis.

The assessment of risk necessitates the establishment of criteria against which judgments can be made as to the compatibility of various land uses. The adoption of formal criteria assists in a consistent approach to risk assessment and in the decision making process. In order to make informed land use safety planning decisions, the results of any risk evaluation need be assessed against appropriate qualitative and quantitative risk criteria

The following factors have been taken into account:

- The suggested risk criteria should be probabilistic in nature. That is, they should account for both the consequences (effects) and likelihood (probability) of hazardous events. Criteria based on the consequences of events in isolation are considered unrealistic as they ignore the availability of safeguards and may result in unnecessary sterilisation of land. This is not to say that the consequences of hazardous events should be ignored. In principle at least, qualitative criteria should specify the limit of consequences for certain incidents.
- All activities have an associated level of risk. It is not possible to eliminate that risk unless the activity itself is eliminated. The criteria are therefore based on the concept of a residual risk, the acceptability of which should be established in relation to various land uses.
- Acceptability of a level of risk involves many considerations of which safety is only one, although safety is playing an increasingly important role in planning considerations. Attitudes towards risk acceptability can vary widely depending on local situations. In some cases, certain risks may only be acceptable when they are outweighed by certain advantages which people associate with the considered activity. However, regions of unacceptable risks - whatever the advantages may be - can be shown to exist.
- The basis for risk criteria is that, generally, various levels of risks are tolerated on a daily basis, both to individuals and to society as a whole. Where risk is taken with free choice and full knowledge, that risk can be described as voluntary risk. Examples of voluntary risk include smoking, driving and rock climbing, provided that the individual knows and understands the risks. Where the individual does not have knowledge of the risks or is not entirely free to choose to avoid the risk exposure, then the risk can be termed involuntary.
- Examples of involuntary risks include meteorite strike, some illnesses and some natural disasters. In reality, most types of risk exposure have degrees of both the voluntary and involuntary. People in general are willing to expose themselves to quite high levels of individual risk by undertaking certain activities. On the other hand, society offers growing resistance to risks perceived as being imposed involuntarily on one group of people for the benefits of others, or where the risk exposure of one group does not fit with their share of benefits. The risk from a hazardous industrial development is usually perceived as a non-voluntary risk.
- When a risk is to be imposed on an individual or a group of people (e.g. by locating a hazardous facility in an area), the concept of 'acceptability' of that risk for the decision-making process is that it should be low relative to other known and tolerated risks.
- When considering strategic planning, the primary emphasis needs to be on the suitability of land for the proposed range of uses, having regard to existing risk exposure and the sensitivity of the current land use.

It is reasonable to conclude that if a risk from a potentially hazardous installation is below most risks being experienced by the community, then that risk may be tolerated.

In setting criteria, it is also necessary to account for variations in the duration of exposure to that risk at any particular point by any one individual. People's vulnerability to the hazard and their ability to take evasive action when exposed to the hazard also need to be taken into account.

Accordingly, the following risk assessment criteria are suggested for the assessment of the safety of location of the proposed ethylene ISO Container Storage Area:

Table 13 Individual Fatality Risk Criteria

Land Use Category	Risk (per million people per year)
Hospitals, schools *	< 0.5
Residential areas	< 1
Commercial areas	< 5
Active open space (sports areas) *	< 10
Industrial sites	< 50

*It should be noted that there are no hospitals, schools or sports areas in the vicinity of the Portside Storage facility.

7.2 Offsite Individual Fatality Risk Evaluation

The overall risks of the proposed Ethylene ISO Container Storage were assessed, and in doing so, the following key risk contributors were identified:

- ISO tank catastrophic failure and rapid loss of containment of all ethylene due to inherent mechanical failures or failures during lifting and off-lifting to and from vehicles for transport to and from site.
- ISO tank piping and/or valve major failure leading to 50mm aperture and two phase flow due to inherent mechanical failures and lifting failures.
- Potential jet fires from high velocity discharge of ethylene from ISO tank pipework failures.
- ISO tank BLEVE incident due to sustained, uncontrolled fire and ultimate tank rupture.

In order to quantify the overall individual fatality risk associated with the proposed facility, the thermal radiation probit models from TNO (TNO, 1997) were used and a human exposure time of 20 seconds was assumed. The probit function for fatality from thermal radiation level Q (W/m^2) and exposure time t in seconds used was:

$$Y = -38.48 + 2.56 \ln (Q^{4/3}.t)$$

Using the thermal radiation probit for fire scenarios, together with the assumption of certain probability of death within the outline of a flash fire, the risk estimates can be generated for a grid over the area of interest.

Figure 16 shows the scenario used for the estimate of individual fatality risks as well as injury risks. It shows a range of incidents that are combined to get the cumulative risk values. It was assumed that the storage facility would be in the northwest corner of the site at location (reference 801, 1018 in Figure 17).

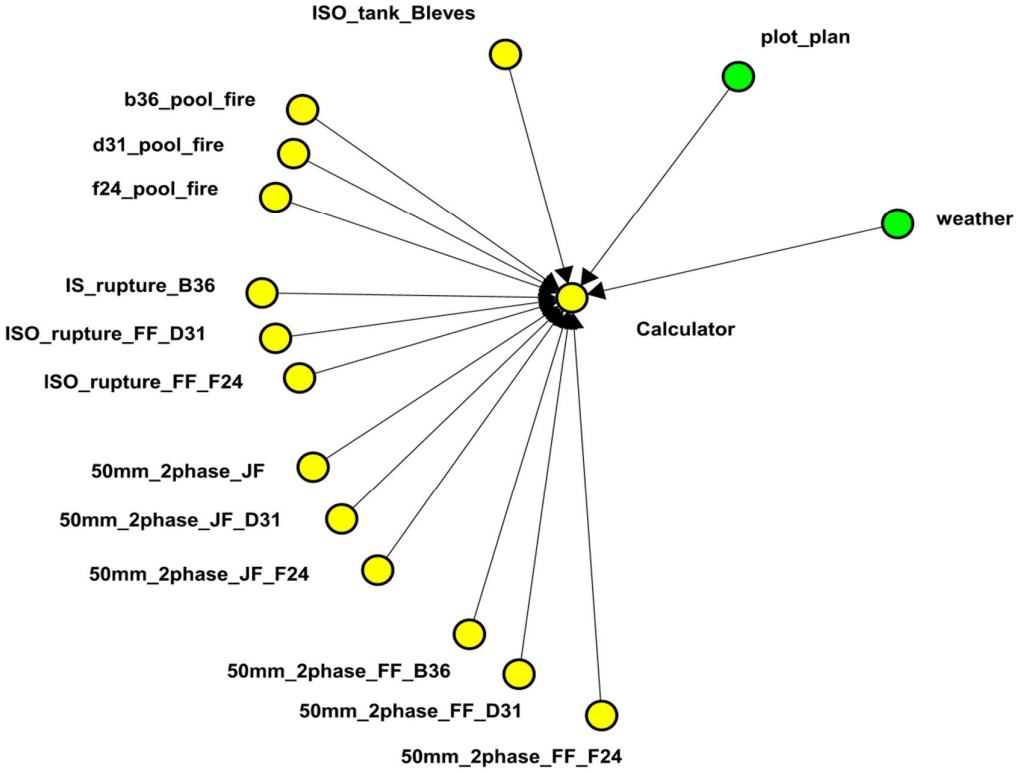

Figure 16 Scenario used for risk estimation (JF=jet fire, FF= flash fire)

7.3 Location specific individual fatality risk (LSIFR)

For land use planning purposes the individual fatality risk levels of interest are from 50pmpa down to 0.5pmpa. A LSIFR of 50pmpa is the accepted risk level for industrial land uses and 0.5 pmpa being acceptable for schools and hospitals and other very sensitive land uses. However, to demonstrate the low level of risk, contours have also been included for risk levels down to as low as 0.1 people per million per year, 0.05 people per million per year and 0.01 people per million per year. However, it should be emphasised that these risk levels are extremely remote.

The iso-risk contours for the scenarios considered are seen in Figure 17.

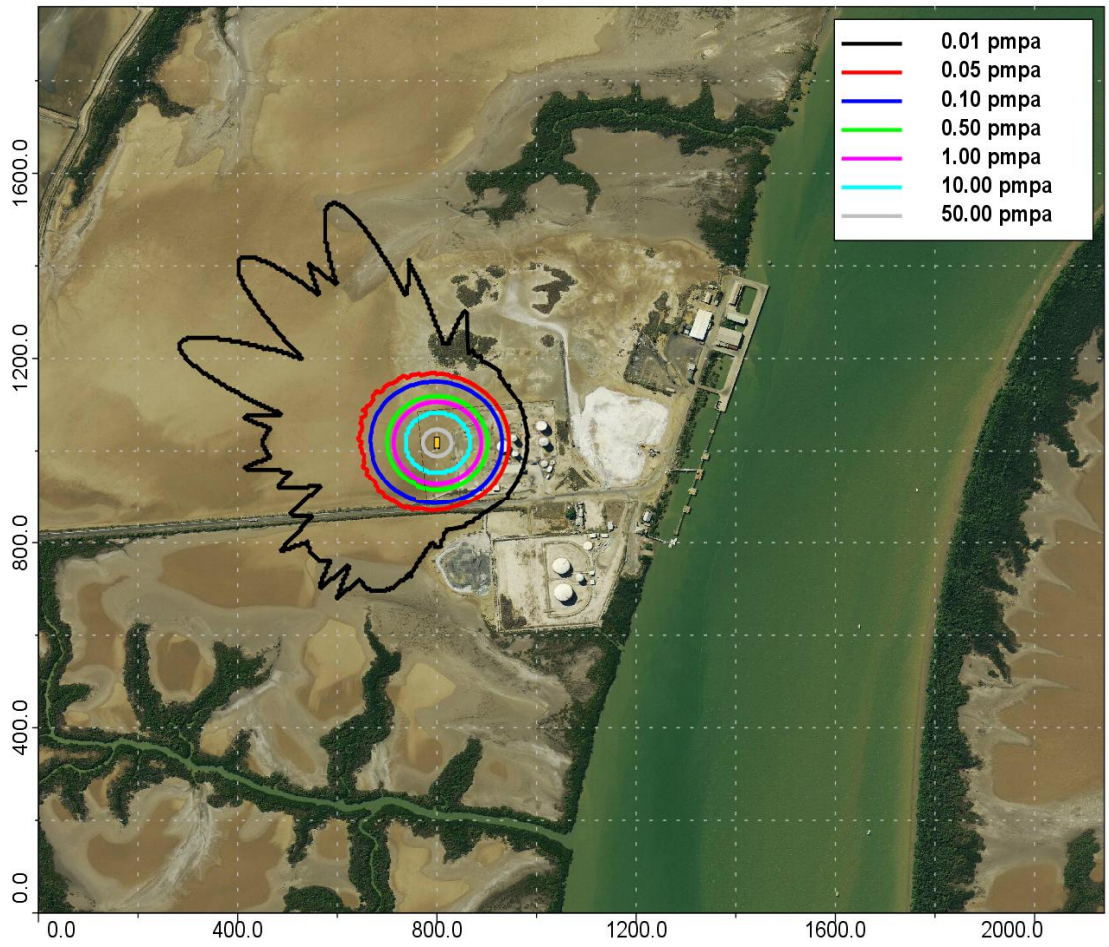

Figure 17 Individual fatality risks per million per annum (pmpa)

Figure 18 shows a closer view of the same plot.

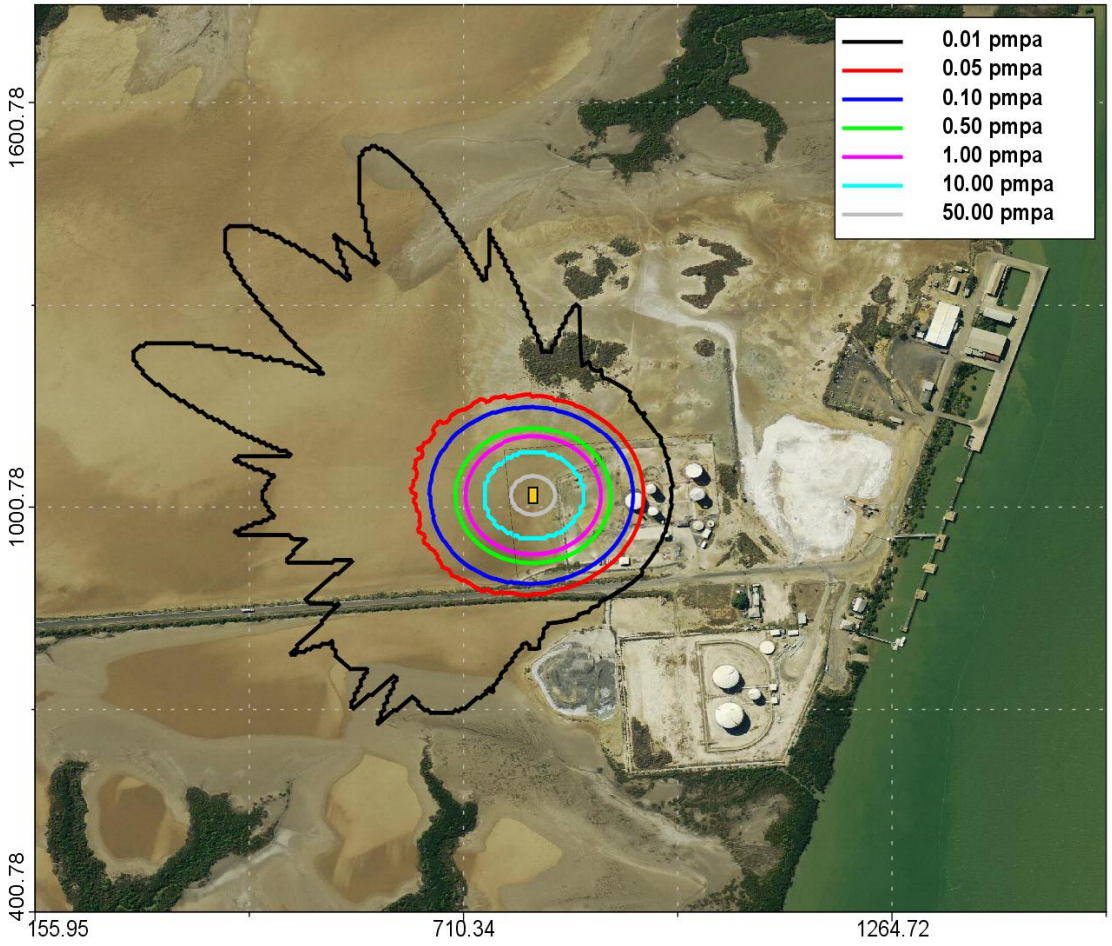

Figure 18 Individual fatality risk contours (zoomed view)

Observations:

- Individual fatality risks are low outside the facility.
- The wind direction extends the vapour cloud impacts to the west of the site but the risk is low.
- The inner risk contours are dominated by BLEVE and pool fire events which tend to be omni-directional and not strongly influenced by wind directions.
- The individual fatality risk level of 50 pmpa which relates to industrial sites is retained on the site.
- It should be noted that the risk contour can be altered if required depending on the final location of the storage of ISO containers.
- There are limited sensitive land uses within the affect distances of a storage release of ethylene from the ISO container storage area due to the predominate area surrounding the proposed storage area being unoccupied mud flats.
- The closest residence to the Portside Storage facility is the fisherman's cottage to the south-east, approximately 100m from the site boundary. The area to the northeast of the site is a light industrial district including Port Alma shipping facilities approximately 300m from the site boundary. It is to be noted that the wind roses show very little wind from the southwest to northwest, and as such any ethylene dispersions will predominantly travel towards the western side of the storage facility. This will help minimize any impacts on Port Alma facilities.

- From the assessment, it was identified that the key risk value of 1 pmpa extends out beyond the site boundary, however, does not extend into residential areas. The risk level of 0.5 pmpa which relates to very sensitive land uses does not extend to any sensitive land uses.
- While all other risk contours are not predominately effected by wind flow, the risk pattern observed for the 0.01pmpa contour (which represents a risk level that is extremely remote) in Figure 18 is primarily driven by wind directions dominated by south-easterly wind flows.

7.4 Injury level risks

An estimate was made of thermal radiation risks from all relevant incidents on the site. This mainly involves jet fire, pool fire and BLEVE impacts.

Figure 19 shows the various risk levels for a thermal radiation impact of 12.6 kW/m^2.

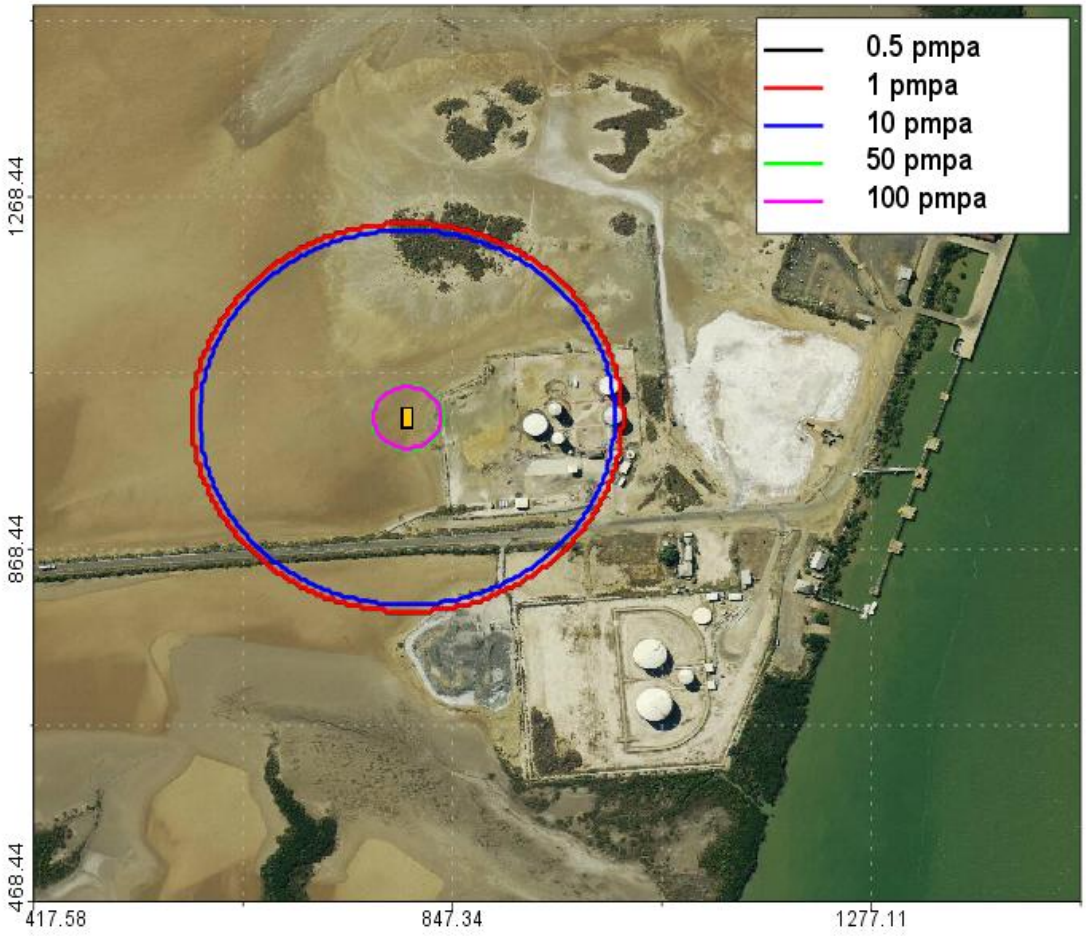

Figure 19 Risk contours for thermal radiation at 12.6kW/m2

Observations:

- The risk at 50 pmpa for 12.6kW/m2 is retained on-site.

8.0 Conclusion

The off-site risks arising from the proposed Ethylene ISO Container storage area are below the land use criteria used in this study. The study has initially taken a conservative approach, given some of the uncertainties in process and atmospheric data.

In summary, for the incident scenarios analysed in this report:

- The fatality risk at 50 pmpa is essentially retained on site and this could be altered depending on the final location of the storage of ISO tanks.
- Individual fatality risks are low outside the facility.
- For land use planning purposes the individual fatality risk levels of interest are from 50pmpa down to 0.5pmpa. A LSIFR of 50pmpa is the accepted risk level for industrial land uses and 0.5 pmpa being acceptable for schools and hospitals and other very sensitive land uses. However, to demonstrate the low level of risk, contours have also been included for risk levels down to as low as 0.1 people per million per year, 0.05 people per million per year and 0.01 people per million per year. However, it should be emphasised that these risk levels are extremely remote.
- The inner risk contours are dominated by BLEVE and pool fire events which tend to be omni-directional and not strongly influenced by wind directions.
- While all other risk contours are not predominately effected by wind flow, the risk pattern observed for the 0.01pmpa contour (which represents a risk level that is extremely remote) in Figure 18 is primarily driven by wind directions dominated by south-easterly wind flows.

The wind direction extends the vapour cloud impacts to the west of the site as the wind roses for Port Alma show very little wind from the southwest to northwest, and as such any ethylene dispersions will predominantly travel towards the western side of the storage facility. This will help minimize any impacts on Port Alma facilities.It is recommended that site management procedures aim to minimize or eliminate loss of containment incidents due to lifting failures or mechanical failures and minimize or eliminate the presence of ignition sources and minimize the combustible material loading at the portside storage facility in order to minimize the impacts of a BLEVE, Jet Fire or Flash Fire.

With respect to the control, mitigation and management of initiating factors relevant to the identified credible hazard scenarios with onsite impacts, the following is recommended:

- A comprehensive Safety Management System should be prepared and implemented as a necessary and effective means of managing hazards and risks posed by the project through construction, operation and eventual decommissioning.
- Design, construction and operation of the ethylene storage facility should be in accordance with relevant Legislation, Australian Standards and Codes of Practise.
- Consideration needs to be given to Safety in Design requirements for all phases of the project lifecycle, including construction, operations, maintenance and decommissioning.
- Appropriate fire protection should be installed in accordance with applicable Australian Standards and State Regulations.
- An appropriate emergency management plan needs be developed in accordance with the regulations and relevant Australian Standards.
- Appropriate site security in accordance with the regulations and relevant Australian Standards.
- The storage and handling of all dangerous goods on site should be in accordance with the Workplace Health and Safety Act and Regulations 2011, and relevant Australian Standards which include but not limited to:
    - Separation and segregation distances in relation to protected works, on-site facilities and boundaries based on the specific Class of dangerous goods, storage quantities and storage arrangements.
    - Screen walls (where required) used in accordance with Dangerous Goods Regulations and Standards.
    - Appropriate bunding, ventilation for tanks and package storage areas
    - Ignition source control.

To achieve acceptable consequence outcomes, the proposed ethylene storage area project should be undertaken in a manner that is low so far as reasonably practicable (SFARP) to human health and safety (onsite and offsite), and the biophysical environment.

9.0 References

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Appendix A

Hazard Identification Study

Appendix A Hazard Identification Study

Hazard No.	Section /Area	Hazard Description	Cause	Consequence	MAE (Y/N)	Notes
1	Pressure Relief Valve	Loss of containment of ethylene storage system from Pressure Relief Valve	Damage to tank causing over-pressure Damage to vacuum jacket	Gas release resulting in vapour cloud dispersion without ignition	N	Venting may be required for pressure control i.e. due to loss of vacuum, too-long transit time, contamination. It is assumed there are 3 PRVs on each ISO container. The start to discharge pressure for a PRV is 150 psi.
				Gas release resulting in vapour cloud dispersion with immediate ignition (flash fire) resulting in potential fatality	N	
				Gas release resulting in vapour cloud dispersion with delayed ignition (flash fire) resulting in potential fatality	N	
2	Cabinet	Loss of containment of ethylene storage system from cabinet	Damage to the pipework/ cabinet	Gas release resulting in vapour cloud dispersion without ignition	N	
				Gas release resulting in vapour cloud with immediate ignition (flash fire) resulting in potential fatality	N	
				Gas release vapour cloud with delayed ignition (flash fire)	N	

Hazard No.	Section /Area	Hazard Description	Cause	Consequence	MAE (Y/N)	Notes
3	ISO container	Loss of containment of ethylene storage system from hole in tank or catastrophic rupture	Impact damage to tank due to inherit mechanical failures or lifting failures	Gas release resulting in vapour cloud dispersion without ignition	Y	
				Gas release resulting in vapour cloud dispersion with immediate ignition (flash fire) resulting in potential fatality	Y	
				Gas release resulting in vapour cloud dispersion with delayed ignition (flash fire)	Y	
				Liquid release resulting in pool fire resulting in potential fatalities due to heat radiation.	Y	
4	ISO container	Rupture of ISO container due to external fire heating the material in the tank, leading to the shell overheating resulting in container rupture.	External fire adjacent to the ISO container: - Gas leak ignites, flame spread to the tank. - Bushfire	BLEVE (boiling liquid expanding explosion) resulting in potential fatalities due to heat radiation.	Y	

Appendix B

ISO Tank Rupture, Ethylene Pool Dynamics

Appendix B ISO Tank Rupture, Ethylene Pool Dynamics

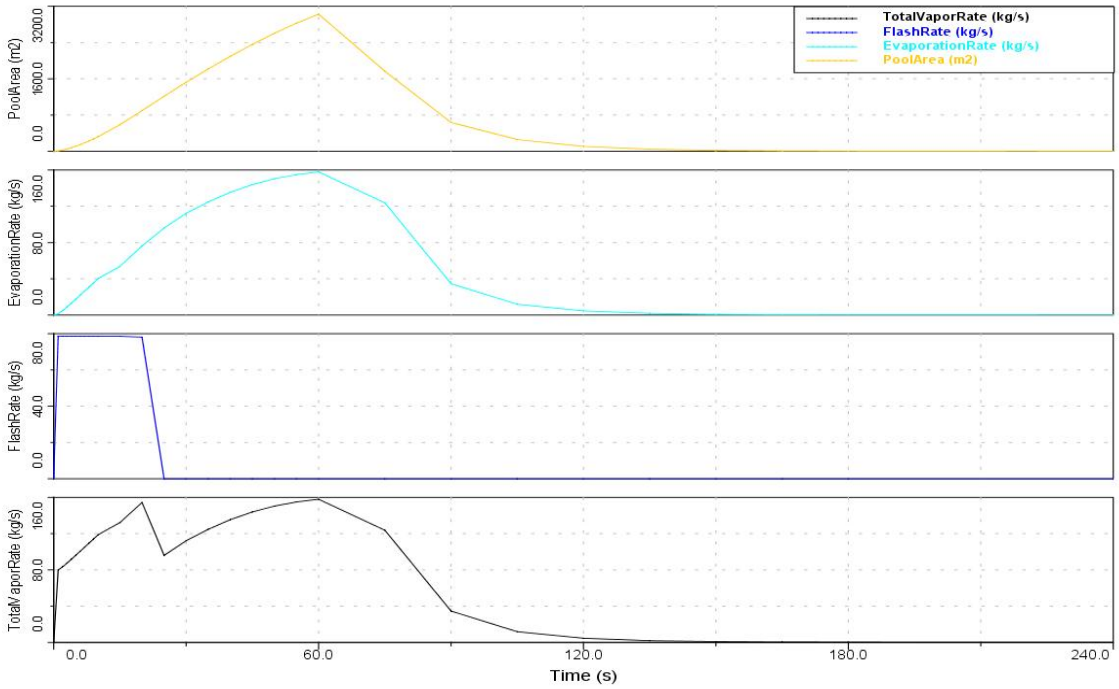

Figure B1 Total vapour, flash, evaporation rates and pool area: B3.6 conditions

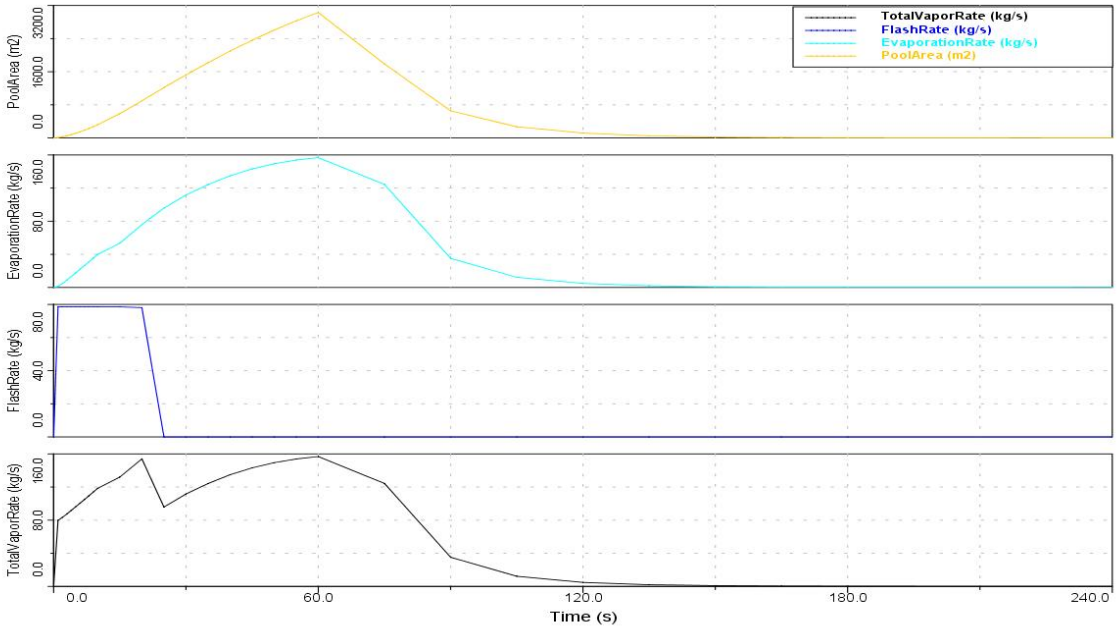

Figure B2 Total vapour, flash, evaporation rates and pool area: D3.1 conditions

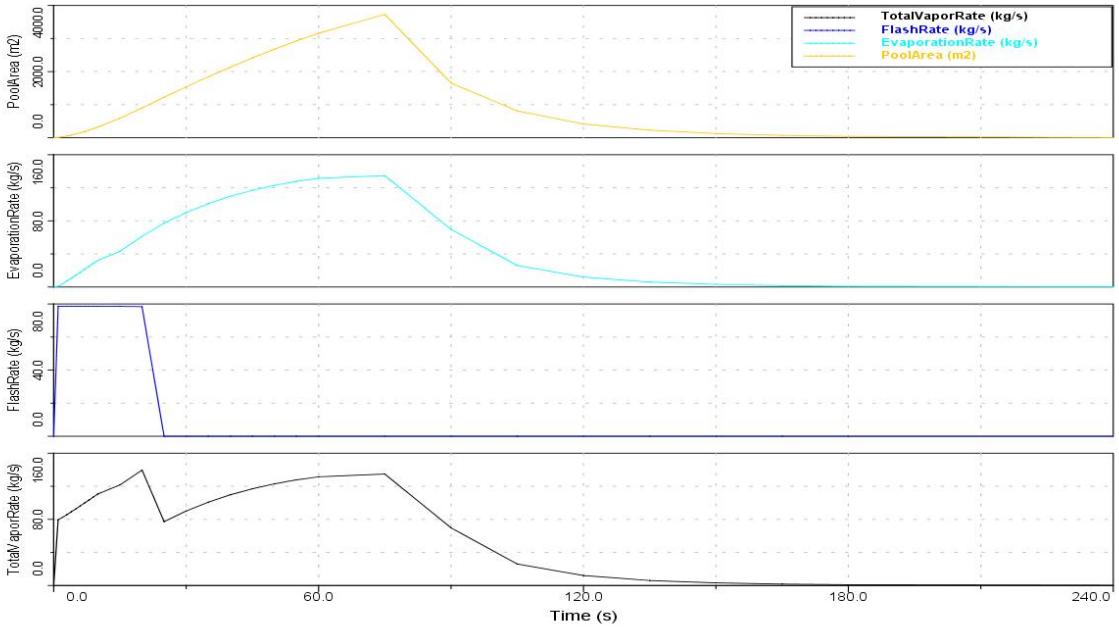

Figure B3 Total vapour, flash, evaporation rates and pool area: F2.4 conditions

Appendix C

High Momentum Dispersing Ethylene Releases

Appendix C High Momentum Dispersing Ethylene Releases

High momentum dispersing jets for ethylene releases from ISO tank storage (-76.3ºC, 410 kPa (abs))

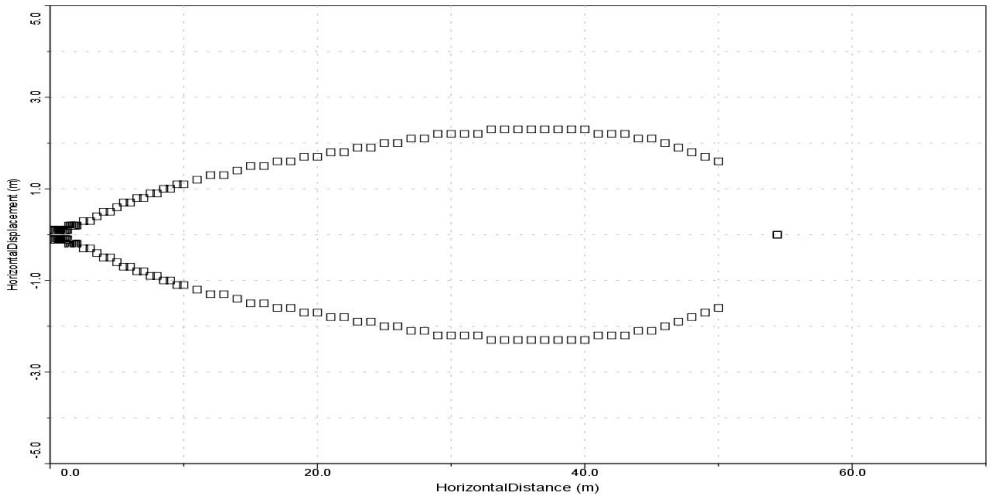

Figure C1 LFL (2.7 vol %) isopleth for B3.6 conditions

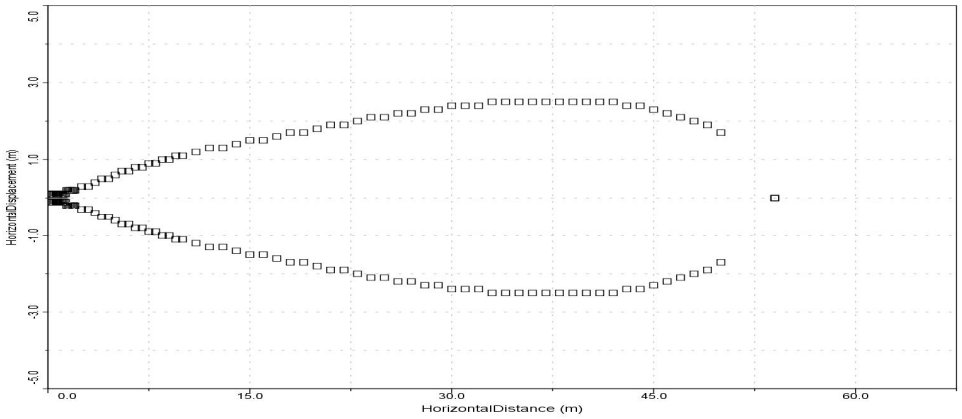

Figure C2 LFL (2.7 vol %) isopleth for D3.1 conditions

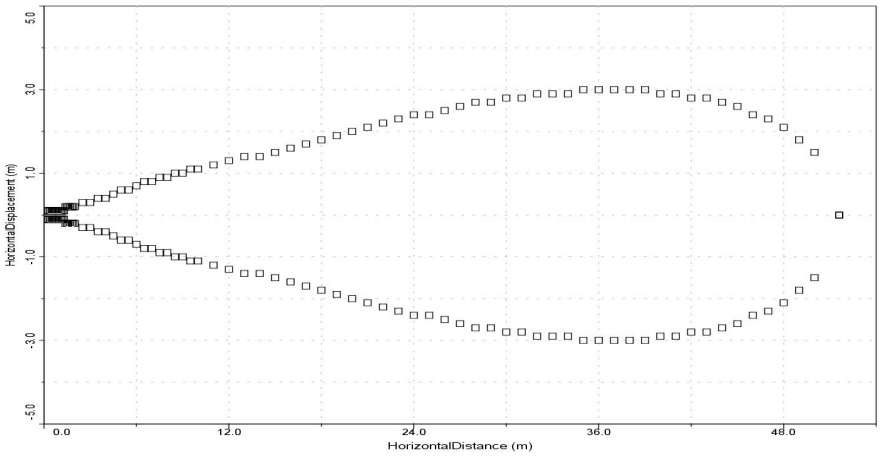

Figure C3 LFL (2.7 vol %) isopleth for F2.4 conditions

Appendix D

Safety Data Sheet - Ethylene (Refrigerated)

Product: **Ethylene (refrigerated)**

Date: 20 / 02 / 2012

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

Product name	Ethylene
Chemical name	Ethylene
Chemical formula	C_2H_4
Company identification	SSB Cryogenic Equipment Pte Ltd
Emergency phone numbers	(65) 6752 2711

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation	Substance.
Components/Impurities	Contains no other components or impurities which will influence the classification of the product.
CAS Nr	74-85-1
EEC Nr	200-815-3

3. HAZARDS IDENTIFICATION

Hazards identification

Refrigerated liquefied gas. Contact with product may cause cold burns and frostbite. Extremely Flammable.

4. FIRST AID MEASURES

Inhalation

In high concentration may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stop.

Skin/eye contact

Immediately flush eyes thoroughly with water for at least 15 minutes. In case of frostbite spray with water for at least 15 minutes. Obtain medical assistance.

Ingestion

Ingestion is not considered a potential route of exposure.

5. FIRE FIGHTING MEASURES

Specific hazards

Exposure to fire might cause containers to rupture/explode.

Hazardous combustion products

Incompletion combustion may form carbon monoxide.

Suitable extinguishing media

All known extinguishants can be used.

Specific methods

If possible, stop flow of product. Move container away or cool with water from protected position. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Evacuate all personnel from affected area. Wear protective clothing and self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation. Eliminate ignition sources.

Environmental precautions

Stop flow if atmosphere is proved to be safe. Do not enter any place (e.g. basements, workpits) where its accumulation could be dangerous.

Clean up methods

Ventilate area.

7. HANDLING AND STORAGE

Electrical classification

Non-hazardous

Handling and storage

Ensure equipment is adequately earthed. Suck back of water into container and backfeed must be prevented. Purge air from system before introducing gas. Use only properly specified equipment, supply pressure and temperature for this product. Contact supplier if in doubt. Keep away from ignition sources (including static discharge). Segregate from oxidant gases and other oxidants in store. Keep container below 50^{o}C in a well-ventilated place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protection

Ensure adequate ventilation. Protect eye, face and skin from liquid splashes

9. PHYSICAL AND CHEMICAL PROPERTIES

Molecular weight	28
Melting point	-169 ^{o}C
Boiling point	-103 ^{o}C
Critical temperature	9.5 ^{o}C
Relative density, gas	1 (air = 1)
Relative density, liquid	0.57 (water= 1)
Auto-ignition temperature	425 ^{o}C
Flammability range	2.7~34 vol% in air
Vapour pressure 20 ^{o}C	Not application
Solubility mg/l water	No reliable data avaliable
Odour and appearance	Colourless liquid which evaporates to colourless, sweetish odour.

Other data

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

10. STABILITY AND REACTIVITY

Stability and reactivity

May decompose violently at high temperature and/or pressure or in the presence of a catalyst. Can form explosive mixture with air. Liquid spillages can cause embrittlement of structural materials. May react violently with oxidants.

Company owner's consent to the making of a development application under the *Planning Act 2016*

I, Colleen Lott

Director/ of the company mentioned below.

PORTSIDE STORAGE PTY LTD (ACN 076 253 695)

the company being the owner of the premises identified as follows:

Lot 46 BAJOOL-PORT ALMA ROAD, PORT ALMA (Lot 46 DS438)

consent to the making of a development application under the *Planning Act 2016* by:

IXOM OPERATIONS PTY LTD

on the premises described above for:

MATERIAL CHANGE OF USE FOR MEDIUM-IMPACT INDUSTRY / WAREHOUSE

Company seal *[if used]*

Company Name and ACN:
Portside Storage P/L
ACN 076 253 695

C J. Lott
Signature of Sole Director/Secretary

12th July 2024
Date

The Planning Act 2016 is administered by the Department of Local Government, Infrastructure and Planning, Queensland Government.

6.7.4.3.1 Rural zone code

<table>
<tr><th>Performance outcomes</th><th>Acceptable outcomes</th><th>Assessment</th></tr>
<tr><td colspan="3">Where involving a new building or expansion to an existing building</td></tr>
<tr><td colspan="3">Built form</td></tr>
<tr><td>PO1
Development does not adversely impact on the rural character of the locality, having regard to the scale and visibility of buildings.</td><td>AO1.1
The height of buildings and structures does not exceed two (2) storeys and ten (10) metres above ground level, excluding silos, windmills and similar structures ancillary to rural uses.

Note—Building heights on the airport obstacle limitation surface map OM-2A prevail over building heights detailed in the zone codes.</td><td>Complies –
development does not involve a new building or expansion to existing building. The proposal is for the storage of ISO Containers, similar size and scale to a shipping container.</td></tr>
<tr><td colspan="3">Land use</td></tr>
<tr><td colspan="3">Aquaculture</td></tr>
<tr><td>PO2
Aquaculture that is low impact in nature is located and designed on sites of sufficient size and dimension, to minimise adverse impacts on the amenity, water quality and ecological values.</td><td>AO2.1
Aquaculture activities using ponds or tanks that are less than or equal to ten (10) hectares in total water surface area are carried out in accordance with the Department of Agriculture, Fisheries and Forestry Code for accepted development requirements for material change of use that is aquaculture as updated from time to time.</td><td>Not applicable –
The proposed development is for a medium impact industry.</td></tr>
<tr><td colspan="3">Dwelling house or dwelling unit</td></tr>
<tr><td>PO3
Development does not compromise the continued operation of an intensive animal industry, extractive industry, or a similar potential use on neighbouring rural land.</td><td>AO3.1
Development:
(a) is set back a minimum of twenty (20) metres from all site boundaries; and
(b) is separated from an existing or approved:
(i) intensive animal industry by a minimum of 1,000 metres; and
(ii) extractive industry operation as follows:

<table><tr><th>Operation</th><th>Separation distance</th></tr><tr><td>Extractive industry operation involving blasting</td><td>1,000 metres</td></tr><tr><td>A hard rock extractive industry</td><td>500 metres</td></tr><tr><td>A sand and gravel</td><td>200 metres</td></tr></table></td><td>Not applicable –
The proposed development is for a medium impact industry.</td></tr>
</table>

Performance outcomes	Acceptable outcomes	Assessment
	extractive industry | A designated haul route | 100 metres **AND** **AO3.2** Where a secondary dwelling is proposed, that dwelling: (a) is contained within the same lot; and (b) is no more than eighty (80) square metres gross floor area.	**Not applicable**
PO4 Dwellings have adequate access to services to ensure the safety and well-being of residents and the water supply is adequate for the current and future needs of the development.	**AO4.1** A dwelling (a) has a legal access to a constructed road; and (b) where within a water supply area has a legal connection to Council's reticulated water supply. Editor's note—A constructed road can be sealed, graded or gravel. Editor's note—Where development is located outside of the water supply area refer to the requirements under the Plumbing Code of Australia.	**Not applicable**
Caretaker's accommodation		
PO5 The development does not compromise the productivity of the use.	**AO5.1** No more than one (1) caretaker's accommodation is established on the site.	**Not applicable –** The proposed development is for a medium impact industry.
PO6 A caretaker's accommodation has adequate access to services to ensure the safety and well-being of residents and the water supply is adequate for the current and future needs of the development.	**AO6.1** A caretaker's accommodation: (a) has a legal access to a constructed road; and (b) where within a water supply area has a legal connection to Council's reticulated water supply. Editor's note—A constructed road can be sealed, graded or gravel. Editor's note—Where development is located outside of the water supply area refer to the requirements under the Plumbing Code of Australia.	**Not applicable**
Home based business		
PO7 Development for a home based business is operated, designed and sited in a manner that: (a) is an appropriate scale and intensity; (b) is integrated with the primary use of the site for a dwelling house;	**AO7.1** The home based business has a maximum gross floor area of 100 square metres. **AND** **AO7.2**	**Not applicable –** The proposed development is for a medium impact industry. **Not applicable**

Performance outcomes	Acceptable outcomes	Assessment
(c) does not adversely affect the safety and private recreation needs of adjoining premises; (d) does not adversely affect the streetscape and street function; and (e) does not compromise the character and amenity of the surrounding area by way of noise, light, dust, fumes, vibration, odour or storage of potentially hazardous materials.	The home based business is carried out within an existing building or structure. Note—This does not include the parking of vehicles. **AND** **AO7.3** Hours of operation are between the hours of 07:00 and 19:00 Monday to Saturday and 08:00 and 19:00 Sunday and public holidays (except for a bed and breakfast accommodation or home based child care). **AND** **AO7.4** The home based business involves a minimum of one (1) resident of the dwelling. **AND** **AO7.5** A maximum of one (1) worker, not residing in the dwelling house, is employed in the home based business. **AND** **AO7.6** The home based business contains visitor parking within the site. **AND** **AO7.7** The home based business where for bed and breakfast accommodation: (a) the combined total number of guests and permanent residents does not exceed twelve (12) persons at any one time; and (b) guests stay a maximum of fourteen (14) consecutive nights. **AND** **AO7.8**	**Not applicable** **Not applicable** **Not applicable** **Not applicable** **Not applicable**

Performance outcomes	Acceptable outcomes	Assessment
	Goods or services for sale or hire are not displayed where they are visible from the street frontage or an adjoining residential premise. **AND**	
	AO7.9 No more than one (1) commercial vehicle is associated with the business and the vehicle does not exceed a gross vehicle mass of 4.5 tonnes tare weight unless associated with a home based business involving heavy vehicles. Editor's note—Refer to provisions under additional outcomes for home based business involving heavy vehicles. **AND**	**Not applicable**
	AO7.10 The home based business does not generate traffic exceeding ten (10) vehicle trips per day and the trips are not by a vehicle exceeding a gross vehicle mass of 4.5 tonnes tare weight. **AND**	**Not applicable**
	AO7.11 Noise levels do not exceed acoustic quality objectives under the *Environmental Protection (Noise) Policy 2008*, as updated from time to time.	**Not applicable**
Additional outcomes for home based business involving heavy vehicles		
PO8 Development does not compromise the character and amenity of the surrounding area by way of noise, light, dust, fumes, vibration, odour or storage of potentially hazardous materials.	**AO8.1** A maximum of two (2) heavy vehicles and two (2) heavy trailers are stored on site at any one time. **AND**	**Not applicable –** The proposed development is for a medium impact industry.
	AO8.2 Heavy vehicles and heavy trailers: (a) each heavy vehicle or heavy trailer does not exceed a gross vehicle mass of more than 4.5 tonnes; (b) are not started or manoeuvred on site	**Not applicable**

Performance outcomes	Acceptable outcomes	Assessment
	between the hours of 22:00 and 06:00, or left running unattended for any period up to five (5) minutes; (c) if used for the transport of cattle or waste disposal, are stored a minimum of 100 metres away from an adjoining dwelling; and (d) do not have a refrigeration unit running while on-site if within 100 metres of a sensitive land use on an adjoining lot. **AND** **AO8.3** The business does not include the loading or unloading of vehicles or storage of goods. **AND** **AO8.4** The site has direct access to a minor urban collector road or higher order road, but not to a state controlled road. **AND** **AO8.5** Heavy vehicles are stored onsite and located a minimum distance of: (a) twenty (20) metres from the frontage; and (b) fifteen (15) metres from side and rear boundaries. **AND** **AO8.6** Only minor maintenance is carried out on the property and does not involve major body work and mechanical repairs.	**Not applicable** **Not applicable** **Not applicable** **Not applicable**
Roadside stall		
PO9 A roadside stall: (a) does not impact on the amenity of adjoining land uses and the surrounding area; (b) does not adversely affect the safety and efficiency of the road network;	**AO9.1** Any structure used for a roadside stall: (a) has a maximum floor area of twenty (20) square metres; (b) is located entirely within the property and not on the road reserve; and	**Not applicable –** The proposed development is for a medium impact industry.

Performance outcomes	Acceptable outcomes	Assessment
(c) is ancillary to the farming use conducted on the same site; and (d) sells only fresh produce grown locally.	(c) is set back from any boundary adjoining residential premises a minimum of six (6) metres. **AND** **AO9.2** Site access, car parking and storage areas: (a) are located entirely within the property and not on the road reserve; and (b) use the same driveway as the primary property access. **AND** **AO9.3** The roadside stall is associated with a rural use conducted on the same site.	 **Not applicable** **Not applicable**
Rural workers' accommodation		
PO10 The amenity of the rural workers' accommodation is not adversely impacted upon and appropriately separated from intensive rural and industrial uses.	**AO10.1** On-site cabins or dwellings housing workers are sited no closer than 250 metres to intensive rural uses and industrial uses.	**Not applicable –** The proposed development is for a medium impact industry.
PO11 The rural workers' accommodation has adequate access to services to ensure the safety and well-being of occupants and the water supply is adequate for the current and future needs of the development.	**AO11.1** Rural workers' accommodation: (a) has a legal access to a constructed road; and (b) where within a water supply area has a legal connection to Council's reticulated water supply. Editor's note—A constructed road can be sealed, graded or gravel. Editor's note—Where development is located outside of the water supply area refer to the requirements under the Plumbing Code of Australia.	**Not applicable**
Effects of development		
PO12 Outdoor lighting maintains the amenity of any adjoining residential zoned premises and does not adversely impact the safety of vehicles or pedestrians on the adjoining streets as a result of light emissions, either directly or by reflection.	**AO12.1** Outdoor lighting is designed, installed and maintained in accordance with the parameters and requirements of the Australian Standard AS 4282 — Control of the obtrusive effects of outdoor lighting, as updated from time to time.	**Comply –** The site is fitted with relevant security lighly in accordance with the relevant standard.
Where in the Alton Downs precinct		

Performance outcomes	Acceptable outcomes	Assessment
Note—Where acceptable outcomes in this section vary from this code, the precinct based acceptable outcomes take precedence.		
PO13 Residential uses are sufficiently separated from road frontages in order to protect the amenity of residents and to ensure the character of the area is maintained.	**AO13.1** A dwelling house is setback a minimum of six (6) metres from front boundaries. Note—There is no specific setback to any other boundary.	**Not applicable –** The subject site is not located within the Alton Downs precinct.
General		
PO14 Development that does not involve rural uses: (a) is located on the least productive parts of a site and not on land identified on the agricultural land classification (ALC) overlay maps; (b) does not restrict the ongoing safe and efficient use of nearby rural uses; and (c) is adequately separated or buffered where it is likely to be sensitive to the operational characteristics associated with rural uses, rural industries or extractive industries. Editor's note—Agricultural land classified as Class A or Class B is shown on the agricultural land classification overlay map OM-13. Editor's note—Applicants should have regard to the State Planning Policy Guideline – State Interest – Agriculture.	No acceptable outcome is nominated.	**Complies –** a) The subject site is not mapped as agricultural land. b) There are no nearby rural uses. c) The subject site is located amongst other Port land uses where contact with sensitive uses is minimal.
PO15 Uses that require isolation from urban areas are accommodated only where: (a) they cannot be more appropriately located in an industrial or other relevant zone; (b) they can be adequately separated from sensitive land use(s) (whether or not in the rural zone); and (c) potential impacts can be appropriately managed. Editor's note—Applicants seeking approval for intensive animal industries are to refer to State Planning Policy Guideline – State Interest – Agriculture and consult with the relevant State government department prior to the lodgement of a development application. Council may require a study that, amongst other matters, identifies how the development is in accordance with Environmental Protection (Air) Policy 2008 or Environmental Protection (Noise) Policy 2008.	No acceptable outcome is nominated.	**Complies** – (a) Due to the nature of the development and the subject site having a existing connection with the Port Alma operations, this location is the most suitable for the proposal. (b) The proposed development is not in proximity to sensitive land uses. (c) The proposed development will cope with all potential impacts according with the policies and regulations.

Performance outcomes	Acceptable outcomes	Assessment
		Refer to *Appendix E- Hazard Risk Assessment.*
PO16 Ecological values, habitat corridors and soil and water quality are protected, having regard to: (a) maximisation of vegetation retention and protection of vegetation from the impacts of development; (b) avoidance of potential for erosion and minimisation of earthworks; (c) retention and protection of natural drainage lines and hydrological regimes; and (d) avoidance of leeching by nutrients, pesticides or other contaminants, or potential for salinity.	No acceptable outcome is nominated.	**Complies** – The development is for the inclusion of 6 additional ISO containers on-site alongside the existing 12 containers. The nature of the development will not pose any further environmental risk.
Land use		
Animal keeping – kennels or catteries		
PO17 Animal keeping (being kennels or catteries) is sited, constructed and managed such that: (a) animals are securely housed; (b) the use does not create a nuisance beyond the site boundaries; and (c) the use does not create adverse environmental impacts.	**AO17.1** Animal keeping (being kennels or catteries) is located on a site having a minimum site area of three (3) hectares. **AND** **AO17.2** Animal enclosures are set back a minimum of 250 metres from any sensitive land use. **AND** **AO17.3** Buildings used for animal keeping are: (a) constructed with impervious reinforced concrete floors; and (b) gravity drained to the effluent collection/treatment point. **AND** **AO17.4** Animals are kept in fenced enclosures that are located inside buildings at all times between the hours of 18:00 and 07:00. **AND** **AO17.5**	**Not applicable –** The proposed development is for a medium impact industry. **Not applicable** **Not applicable** **Not applicable** **Not applicable**

<table>
<tr><th>Performance outcomes</th><th>Acceptable outcomes</th><th>Assessment</th></tr>
<tr><td></td><td>A person who is responsible for the supervision of the operation of the development is accommodated on the premises at all times.

AND

AO17.6
Animal enclosures are set back to roads, streets and water resources as follows:
<table>
<tr><th>Location</th><th>Setback</th></tr>
<tr><td>Road frontages</td><td>50 metres</td></tr>
<tr><td>Top bank of creek, river, stream, wetland, edge of well, bore, dam, weir, intake or the like which provides potable water supply to the site or surrounds</td><td>100 metres</td></tr>
<tr><td>Top bank of dry or perennial gully</td><td>30 metres</td></tr>
</table></td><td>Not applicable</td></tr>
<tr><td colspan="3">Aquaculture</td></tr>
<tr><td>PO18
Aquaculture is located and designed on sites of sufficient size and dimension, to minimise adverse impacts on the amenity, water quality, ecological values and existing fish habitats.</td><td>AO18.1
Aquaculture activities using ponds or tanks that are greater than ten (10) hectares in total water surface area are carried out in accordance with State Planning Policy Guideline – State Interest – Agriculture Part D 4. Model land use code provisions for aquaculture, as updated from time to time.</td><td>Not applicable –
The proposed development is for a medium impact industry.</td></tr>
<tr><td colspan="3">Bulk landscaping supplies, rural industry or wholesale nursery</td></tr>
<tr><td>PO19
Development is located on sites:
(a) of sufficient size, to minimise adverse impacts on the amenity of adjoining land, in particular noise, odour, light and dust emissions;
(b) where the operation is within the safe and effective design capacity of the road system; and
(c) where the operation does not impact upon water quality.</td><td>AO19.1
A minimum site area of two (2) hectares is required with at least fifteen (15) metre setback from any adjoining premises.

AND

AO19.2
Sales, storage, handling, packaging and production areas are set back a minimum of:</td><td>Not applicable –
The proposed development is for a medium impact industry.

Not applicable</td></tr>
</table>

Performance outcomes	Acceptable outcomes	Assessment
	(a) 100 metres from any dwelling on surrounding land; (b) fifty (50) metres from state controlled roads and twenty (20) metres from all other roads; and (c) thirty (30) metres from top bank of creek, river, stream or wetland edge of well, bore, dam, weir, or intake that provides potable water. **AND** **AO19.3** Infrastructure and material storage areas are confined to free draining areas and sites on slopes not exceeding ten (10) per cent. **AND** **AO19.4** There is direct access to a minor urban collector or higher order road.	 **Not applicable** **Not applicable**
Intensive animal industry		
PO20 Intensive animal industry uses are sited, constructed and managed such that: (a) animals are securely housed; (b) the use does not create a nuisance on adjoining sensitive land uses; (c) buildings used for intensive animal industry are constructed with floors, that are gravity drained to the effluent collection/treatment point; (d) animal proof fencing or other appropriate barrier feature is provided of an appropriate height within the site to prevent the escape of animals; and (e) a person who is responsible for the supervision of the operation of the development is accommodated on the premises at all times. Editor's note—Applicants seeking approval for intensive animal industries are to refer to State Planning Policy Guideline – State Interest – Agriculture and consult with the relevant State government department prior to the lodgement of a development application. Council may require a study that, amongst other matters, identifies how the development is in accordance with	No acceptable outcome is nominated.	**Not applicable –** The proposed development is for a medium impact industry.

Performance outcomes	Acceptable outcomes	Assessment
Environmental Protection (Air) Policy 2008 or Environmental Protection (Noise) Policy 2008.		
PO21 Intensive animal industry does do not detract from the amenity of a nearby sensitive land use and community related activities and are not visible from any road or other public view point.	No acceptable outcome is nominated.	**Not applicable**
PO22 Intensive animal industry is not located within: (a) a declared catchment area; or (b) a declared groundwater area.	No acceptable outcome is nominated.	**Not applicable**
PO23 Intensive animal industry has suitable access to road or rail infrastructure via a sealed road to an access point with a state controlled road.	No acceptable outcome is nominated.	**Not applicable**
Intensive horticulture		
PO24 The region's water quality is protected from the inflow of waste water or run-off from intensive horticulture activities. Waste water or run-off from intensive horticulture: (a) is contained and treated so that nutrients and sediments can be removed from the water; (b) where possible, treated water is re-used; and (c) waste water is only disposed of when acceptable nutrient levels are achieved. Editor's note—Applicants should have regard to the State Planning Policy Guideline – State Interest – Agriculture. Editor's note—The *Environmental Protection (Water) Policy 2009* applies to intensive horticultural uses.	No acceptable outcome is nominated.	**Not applicable –** The proposed development is for a medium impact industry.
PO25 Intensive horticulture activities are not located within: (a) a declared catchment area; or (b) a declared groundwater area.	No acceptable outcome is nominated.	**Not applicable**
Outdoor sport and recreation or community use		
PO26 Development is provided primarily to service the needs of the surrounding rural area or is inappropriate in urban areas (as a result of amenity impacts or land area requirements). The development is located and designed to: (a) minimise adverse impacts on the agricultural productive capacity of the site and the locality; (b) minimise impacts on the amenity of the locality, in particular noise (including limiting the hours of	No acceptable outcome is nominated.	**Not applicable –** The proposed development is for a medium impact industry.

Performance outcomes	Acceptable outcomes	Assessment
operation), odour, light and dust emissions; and (c) operate within the safe and effective design capacity of the region's road system.		
Renewable energy facility — wind farms		
PO27 Wind farms are located, designed and operated to minimise impacts on the environment and residential amenity, having regard to such matters as shadow flicker, noise (including low frequency noise), avifauna, separation from dwellings and site boundaries and scenic amenity.	No acceptable outcome is nominated.	**Not applicable –** The proposed development is for a medium impact industry.
Rural workers' accommodation, farm stay and tourism uses		
PO28 Tourism, short-term accommodation (farm stay) and rural workers' accommodation uses are: (a) associated with and compatible with rural production, natural resources and scenic landscape features in the immediate vicinity; and (b) not located in areas identified on the Agricultural Land Classification (ALC) overlay maps.	No acceptable outcome is nominated.	**Not applicable –** The proposed development is for a medium impact industry.
Transport and freight uses		
PO29 Transport and freight uses, which do not meet the definition of a home based business involving (heavy vehicles), are not established in the rural zone.	No acceptable outcome is nominated.	**Alternate Solution –** Refer to PO 15. The proposed development is for a medium-impact industry.
Effects of development		
PO30 Effective separation distances are provided to minimise conflicts with sensitive land use(s). Editor's note—Where potential conflicts between agricultural and residential land uses may occur, applicants should refer to State Planning Policy Guideline – State Interest – Agriculture. Applicants should consult with the relevant State government department prior to the lodgement of a development application.	No acceptable outcome is nominated.	**Complies –** the subject site is well separated from sensitive land uses.
PO31 Development does not unduly impact on the existing amenity and character of the locality having regard to: (a) the scale, siting and design of buildings and structures; (b) visibility of buildings and structures when viewed from roads and other public view points; and (c) any heritage places.	No acceptable outcome is nominated.	**Complies –** The proposed addition of 6 containers in the same location as the existing 12 containers will not impact the existing amenity and character of the area. Refer to

Performance outcomes	Acceptable outcomes	Assessment
		Appendix E- Hazard Risk Assessment.
PO32 Development responds sensitively to on-site and surrounding topography, drainage patterns, utility services, access, vegetation and adjoining land uses, such that: (a) any hazards to people or property are avoided; (b) any earthworks are minimised; (c) the retention of natural drainage lines is maximised; (d) the retention of existing vegetation is maximised; (e) leeching by nutrients, pesticides or other contaminants, or potential for salinity is minimised; (f) damage or disruption to sewer, stormwater and water infrastructure is avoided; and (g) there is adequate buffering, screening or separation to adjoining development.	No acceptable outcome is nominated.	**Complies** – The proposed development does not alter the existing topography within and outside the premises and do not modify the existing infrastructure services available in the area. Refer to *Appendix E- Hazard Risk Assessment.*
PO33 Development is designed and managed so that it provides appropriate protection for community safety and health and avoids unacceptable risk to life and property.	No acceptable outcome is nominated.	**Complies** – The proposed development does not pose a risk for the community or the property. All potential impact will be managed adecuately according to the regulations. Refer to *Appendix E- Hazard Risk Assessment.*
Reconfiguring a lot		
PO34 The further subdivision of land is limited to reflect the suitability of the land for primarily grazing purposes and to protect water quality, environmental and landscape values.	**AO34.1** Unless otherwise stated in a precinct the minimum lot size is 100 hectares.	**Not applicable –** The proposed development is for a medium impact industry.
Where in the Alton Downs precinct Note—Where outcomes in this section vary from this code, the precinct based outcomes take precedence.		
PO35 Development: (a) is compatible with the residential amenity of the area and avoids impacts on surrounding dwellings; and (b) has adequate water supply and sewerage treatment and disposal.	No acceptable outcome is nominated.	**Not applicable –** The subject site is not located within the Alton Downs precinct.

Performance outcomes	Acceptable outcomes	Assessment
PO36 The subdivision of land reflects the desired character of the area being smaller rural lots for primarily residential purposes.	**AO36.1** The minimum lot size in the precinct is eight (8) hectares. **AND** **AO36.2** Newly created lots must have access to a sealed road where sequential connection or integration with an existing sealed road can be achieved.	**Not applicable**
Where in the cropping and intensive horticulture precinct Note—Where outcomes in this section vary from this code, the precinct based outcomes take precedence.		
PO37 Rural industries are established only where associated with rural production in the immediate vicinity.	No acceptable outcome is nominated.	**Not applicable –** The subject site is not located within the cropping and intensive horticulture precinct.
PO38 The subdivision of land is limited to protect the ongoing viability and productivity of existing and potential cropping and horticulture uses.	**AO38.1** The minimum lot size in the precinct is forty (40) hectares.	**Not applicable**

8.2.6.3.1 Coastal protection overlay code

Performance outcomes	Acceptable outcomes	Assessment
Development in coastal hazard areas – medium or high hazard or coastal erosion prone areas Editor's note—Refer to overlay maps OM-6A and OM-6B		
PO1 Development within a coastal hazard area or erosion prone area: (a) is located, designed and constructed to avoid adverse coastal hazard impacts; and (b) has siting and layout that responds to flooding potential and maintains personal safety at all times.	**AO1.1** Floor levels of all habitable rooms are at least 500 millimetres above the defined storm tide event (DSTE) level. Editor's Note—The following defined storm tide event level applies: • Rockhampton HAT Zone: 9.90 metres AHD • Port Alma HAT Zone: 10.75 metres AHD To determine finished floor level, 500 millimetres is to be added to the DSTE level. Editor's Note— Refer to overlay map OM-16B and OM-16C for information regarding the defined storm tide event level. **AND** **AO1.2** All services and utilities connected to the property (including electrical outlets) are designed, located and installed at least 500 millimetres above the defined storm tide event level. **AND** **AO1.3** Ground floors are not enclosed underneath to allow for flow-through water movement. **AND** **AO1.4** A small lower level enclosure of no more than five (5) square metres accommodates a laundry or workshop use and is constructed from flood resilient materials. Note—Where a conflict exists between the flood hazard overlay code and the coastal	**Complies** – The development is for a medium impact industry and does not include habitable rooms. **Complies –** The existing services and utilities are at least 500mm above the defined storm tide event level. **Not applicable –** development does not include additional building or extensions to existing buildings. **Not applicable** – The development is for a medium impact industry.

Performance outcomes	Acceptable outcomes	Assessment
	protection overlay code, the highest defined event level prevails.	
Development in coastal erosion prone areas Editor's note—Refer to overlay map OM-6A		
PO2 Coastal-dependent development or redevelopment must: (a) locate built structures outside of the erosion prone area; or (b) demonstrate that it is not reasonable to locate the development outside the erosion prone area; or (c) locate built structures and services (water, power and sewerage) landward of the alignment of adjacent habitable buildings; or (d) where (a), (b) or (c) cannot be met, the following is achieved: (i) the development footprint within the erosion prone area is minimised and is located as far landward as practicable; (ii) the development is designed to accommodate for future erosion events; (iii) buildings or structures are able to be decommissioned, disassembled or relocated either on the site or to another site; and (iv) on-site protection works are installed and maintained.	No acceptable outcome is nominated.	**Complies –** The entire site is mapped as erosion-prone, and many structures are already existing. Therefore it is not reasonable to locate the proposal outside the erosion prone area. **AO2.2** The proposal does not include permanent buildings or structures. The proposed additional ISO containers will be located further landward from the existing containers and will, therefore, not create additional risk for erosion on-site.
PO3 Development that is not for a coastal-dependent land use: (a) is located outside of the erosion prone area; or (b) where it only involves redevelopment that intensifies the use of a site, it mitigates any increase in risk to people and property from adverse coastal erosion impacts, having regard to: (i) ensuring the development footprint within the erosion prone area is minimised and is located as far landward as possible; (ii) the practical design life of the development in the context of future erosion threat; (iii) the ability for buildings or structures to be decommissioned, disassembled or relocated either on the site or to another site; and (iv) installing and maintaining on-site protection works.	No acceptable outcome is nominated.	**Not applicable –** development is coastal-dependent.
PO4 Development (not including coastal dependent development) is set back as far landward as possible to maintain the amenity and use of the coast	**AO4.1** For development within the urban area, development (including all buildings and other	**Not applicable –** development is coastal-dependent.

Performance outcomes	Acceptable outcomes	Assessment
	permanent structures such as swimming pools and retaining walls) are set back not less than six (6) metres from the seaward boundary of the lot.	
PO5 Coastal dependent development minimises the risk to people and property from adverse coastal erosion impacts by: (a) installing and maintaining coastal protection works; or (b) locating, designing and constructing relevant buildings or structures to withstand coastal erosion impacts; or (c) allowing for natural fluctuations of the coast to occur, including appropriate allowance for climate change and sea level rise, and avoids the need for additional coastal protection work.	No acceptable outcome is nominated.	**Complies –** the proposed ISO containers will be adequately secured to the ground with sufficient clearance to allow for the free flow of water beneath.
PO6 Development in an erosion prone area must demonstrate that it will: (a) maintain, protect and enhance vegetation on coastal landforms outside a port, where its removal or damage may: (i) destabilise the area and increase the potential for erosion; or (ii) interrupt natural sediment trapping processes; or (iii) interrupt dune or land building processes; (b) maintain sediment volumes of dunes and near-shore coastal landforms, or where a reduction in sediment volumes can not be avoided, increased risks to development from coastal erosion are mitigated by location, design, construction and operating standards; (c) maintain physical coastal processes outside the development footprint for the development, including longshore transport of sediment along the coast; (d) prevent increasing the risk of shoreline erosion for areas adjacent to the development footprint unless the development is an erosion control structure; and (e) allow for natural fluctuations of the coast to occur which minimises the need for additional coastal protection work. Editor's note—A report that is certified by a registered professional engineer with a development application is to be submitted.	No acceptable outcome is nominated.	**Complies –** The proposed development will not negatively impact the coastal landform.
Development in coastal hazard areas – medium or high hazard area Editor's note—Refer to overlay map OM-6B		

Performance outcomes	Acceptable outcomes	Assessment
PO7 Development within an urban area (including residential, rural residential and emerging community zones) that is not for a coastal-dependent development, or temporary, readily relocatable or able to be abandoned structures or essential community infrastructure is: (a) located outside the high hazard area; or (b) it is located, designed, constructed and operated to avoid adverse coastal hazard impacts (including impacts on the development's ongoing operation) as demonstrated by a risk assessment (addressing its vulnerability to storm tide inundation and the proposed access to and protection of evacuation routes), that must be prepared to support the development proposal. Editor's note—Refer to SC6.7 – Coastal protection management planning scheme policy for further guidance.	No acceptable outcome is nominated.	**Not applicable –** subject site is not within an urban area.
PO8 Development within an urban area (including residential and emerging community zones) and the rural residential zone, that is not for a coastal-dependent land use, or temporary, readily relocatable or able to be abandoned structures or essential community infrastructure is located outside a medium coastal hazard area unless: (a) it does not result in an increase in the intensity of development on the site; or (b) the development is located, designed, constructed and operated to avoid adverse coastal hazard impacts (including impacts on the development's ongoing operation) as demonstrated by a risk assessment (addressing its vulnerability to sea-level rise and storm tide inundation and the proposed access to and protection of evacuation routes), that must be prepared to support the development proposal. Editor's note—Refer to SC6.7 – Coastal protection management planning scheme policy for further guidance.	No acceptable outcome is nominated.	**Not applicable –** subject site is not within an urban area.
PO9 In non-urban areas, urban or rural residential development does not occur in a coastal hazard – medium or high hazard area.	No acceptable outcome is nominated.	**Not applicable –** the proposed development is not an urban or rural residential use.
PO10 Development avoids the release of hazardous materials during storm tide events.	No acceptable outcome is nominated.	**Complies –** development does not involve the release of hazardous materials.
Public access		
PO11 Development ensures public access to and along the state coastal land and coastal waters	No acceptable outcome is nominated.	**Complies -** The development does

Performance outcomes	Acceptable outcomes	Assessment
is provided to a safe and serviceable standard and is not impeded by private use of the coastal resource.		not impact public access.
Coastal-dependent development — minor public marine development		
PO12 New minor public marine development co-locates with existing public marine infrastructure.	No acceptable outcome is nominated.	**Not applicable -** The proposal is not for a minor public marine development.
PO13 New locations for minor public marine development are only supported where: (a) there are no public landing facilities servicing the same part of the Fitzroy River or to and along state coastal land; or (b) it is established that there is a demonstrated need for the facility in the proposed location. Editor's note—Minor public marine development refers to maritime facilities such as boat ramps, pontoons, slipways, wharves and jetties that serve a public purpose.	No acceptable outcome is nominated.	**Not applicable** - The proposal is not for a minor public marine development.
Reconfiguring a lot		
PO14 Development does not result in the creation of additional lots in areas subject to coastal hazards.	**AO14.1** Reconfiguring a lot does not result in new lots within the coastal hazard – medium or high hazard.	**Not applicable** – The proposal does not include Reconfiguring a lot.
PO15 Where land containing an erosion prone area identified on map OM-6A is required to create additional lots, the erosion prone area is to be maintained as a development-free buffer zone.	No acceptable outcome is nominated.	**Not applicable –** The proposal does not include Reconfiguring a lot.

9.3.1.3.1 Access, parking, and transport code

Performance outcomes	Acceptable outcomes	Assessment
Access driveways		
PO1 Access driveways are located to avoid conflicts and designed to operate efficiently and safely, taking into account: (a) the size of the parking area; (b) the volume, frequency and type of vehicle traffic; (c) the need for some land uses (for example hospitals) to accommodate emergency vehicle access; (d) the type of use and the implications on parking and circulation, for example long-term or short-term car parking; (e) frontage road function and conditions; and (f) the capacity and function of the adjoining street system.	**AO1.1** Access driveways are not located within: (a) twenty–five (25) metres of a signalised road intersection; (b) twenty (20) metres of an un-signalised road intersection in an industrial or centres zone or ten (10) metres otherwise; and (c) one (1) metre of any street signage, power poles, street lights, manholes, stormwater gully pits or other Council asset.	**Complies** – The proposal will retain and reuse the existing access driveway along Bajool-Port Alma Road.
PO2 Access driveways do not disrupt existing road or footpath infrastructure.	**AO2.1** Access driveways: (a) do not require the modification, relocation or removal of any infrastructure including street trees, fire hydrants, water meters and street signs; (b) do not front a traffic island, speed control device, car parking bay, bus stop or other infrastructure within the road carriageway; (c) must be sealed and to a formed road; (d) are not constructed over an access point to equipment under the control of a regulatory authority, including storm water pits, water meters, hydrants and telephone pits; and (e) are raised or lowered to match the surface level of the driveway, where an access chamber is to be incorporated within the driveway.	**Complies**—The proposal will retain and reuse the existing access driveway along Bajool-Port Alma Road, so no infrastructure relocation is required.
PO3 Access driveways are designed and constructed so as to: (a) enable safe and functional vehicular access from the street to the property; and	**AO3.1** Access driveways are constructed in compliance with the Capricorn Municipal Development Guidelines.	**Complies** – The proposal will retain and reuse the existing access driveway along Bajool-Port Alma Road following the

Performance outcomes	Acceptable outcomes	Assessment
(b) not cause a change in the level of a footpath.		Capricorn Municipal Development Guidelines.
PO4 A driveway does not allow water to pond adjacent to any buildings or cause water to enter a building.	**AO4.1** A driveway has a minimum cross fall of one (1) metre (vertical) to 100 metres (horizontal) away from all adjoining buildings.	**Complies** – The proposal will retain and reuse the existing access driveways which does not enable water to pond next to any structures.
Parking		
PO5 Provision is made for on-site vehicle parking: (a) to meet the demand likely to be generated by the development; and (b) to avoid on-street parking where that would adversely impact on the safety or capacity of the road network or unduly impact on local amenity. Editor's note—SC6.6 — Car parking contributions planning scheme policy prescribes circumstances under which an applicant can satisfy PO5.	**AO5.1** AO5.1.1 On-site car parking is provided at the rates set out in Table 9.3.1.3.2 of the access, parking and transport code. OR AO5.1.2 Where a change of use of existing premises is proposed and there is no increase in the gross floor area, the existing number of on-site car parks is retained or increased. **AND** **AO5.2** All parking, loading and manoeuvring facilities for visitors and employees to be located on-site. **AND** **AO5.3** Manoeuvring facilities to be of adequate dimensions to prevent any queuing in a roadway.	**Complies –** Given the nature of the proposed use, the provision of onsite car parking is not required. **Complies –** As above **Complies –** As above
PO6 Parking and servicing facilities are designed to meet user requirements.	**AO6.1** Parking spaces, access and manoeuvring facilities, loading facilities and connections to the transport network are sealed and designed in accordance with Australian Standard AS 2890.	**Not Applicable**
PO7 Sites with more than one (1) road frontage (excluding laneways) gain access only from the lower order road, except if it will introduce traffic generated by a non–residential use into a street that is in a residential zone.	No acceptable outcome is nominated.	**Complies** - The subject site will gain access only from Bajool-Port Alma Road.

Performance outcomes	Acceptable outcomes	Assessment
PO8 Parking areas are illuminated in a manner that maximises user safety but minimises the impacts on adjoining residents.	**AO8.1** Parking areas for uses that operate at night are illuminated in accordance with the requirements of Australian Standard AS 1158. **AND** **AO8.2** Lighting used in parking areas does not cause an environmental nuisance and complies with Australian Standard AS 4282.	**Not applicable –** development does not operate at night. **Not applicable**
PO9 Car parking areas, pathways and other elements of the transport network are designed to enhance public safety by discouraging crime and antisocial behaviour, having regard to: (a) provision of opportunities for casual surveillance; (b) the use of fencing to define public and private spaces, whilst allowing for appropriate sightlines; (c) minimising potential concealment points and assault locations; (d) minimising opportunities for graffiti and other vandalism; and (e) restricting unlawful access to buildings and between buildings.	No acceptable outcome is nominated. Editor's note—Refer to Crime Prevention Through Environmental Design (CPTED) guidelines for Queensland for guidance.	**Complies**
PO10 Parking and servicing areas are kept accessible and available for their intended use at all times during the normal business hours of the activity.	No acceptable outcome is nominated.	**Complies –** All parking areas will be accessible during all hours of operation.
Transport impact Editor's note—Applicants should note that the Department of Transport and Main Roads may have additional requirements.		
PO11 Development contributes to the creation of a transport network which is designed to: (a) achieve a high level of permeability and connectivity for all modes of transport, including pedestrians and cyclists, within the development and to the surrounding area; and (b) encourage people to walk, cycle or use public transport to and from the site instead of using a car.	No acceptable outcome is nominated. Editor's note—Refer to SC6.19 – Structure plan planning scheme policy for guidance.	**Complies** – The subject site is located within an established port land area and does not negatively impact the surrounding transport network.
PO12 Development is located on roads that are appropriate for the nature of traffic (including vehicles, pedestrians and cyclists) generated, having regard to	**AO12.1** Traffic generated by the development is safely accommodated within the design capacity of roads as provided in SC6.15 — Road infrastructure	**Complies** – The proposed development being consistent with the port operations, have access to

Performance outcomes	Acceptable outcomes	Assessment
the safety and efficiency of the transport network.	and hierarchy planning scheme policy. **AND** **AO12.2** A road or street does not connect with another road or street that is more than two (2) levels higher or lower in the road hierarchy. **AND** **AO12.3** The existing infrastructure fronting the proposed development is upgraded in accordance with SC6.15 — Road infrastructure and hierarchy planning scheme policy and Capricorn Municipal Development Guidelines.	suitable road infrastructure. **Not applicable –** the scale of the proposed development does not necessitate upgrades ot the road infrastructure.
PO13 Where the nature of the development creates a demand, provision is made for set down and pick-up facilities by bus, taxis or private vehicle, which: (a) are safe for pedestrians and vehicles; (b) are conveniently connected to the main component of the development by pedestrian pathway; and (c) provide for pedestrian priority and clear sightlines.	No acceptable outcome is nominated.	**Not applicable** - The development is for a medium impact industry and does not propose any pick-up facilities.
Site access		
PO14 Development does not impact on the safety, operation or function of the road network or system.	**AO14.1** Vehicle manoeuvring into and from the site for all vehicles is designed in accordance with Australian Standard AS 2890, as updated from time to time. **AND** **AO14.2** No direct property access is gained to a highway, main road, urban arterial or sub arterial road as defined in SC6.15 — Road infrastructure and hierarchy planning scheme policy other than via a service road or a joint access arrangement with other sites. **AND** **AO14.3**	**Complies** – All vehicle manoeuvring into and from the site does not negatively impact the safety of local road users. **Complies** – The subject site is located along Bajool-Port Alma Road classified as a State Controlled Road. **Not applicable** – The proposed

Performance outcomes	Acceptable outcomes	Assessment
	Development that generates greater than 100 vehicle movements per day does not gain access to or from an urban access place or urban access streets as defined in SC6.15 — Road infrastructure and hierarchy planning scheme policy.	development does not create more than 100 vehicle movements per day.
PO15 Development facilitates the orderly provision and upgrading of the transport network or contributes to the construction of transport network improvements.	No acceptable outcome is nominated.	**Complies** – Development allows to provide and upgrade the transportation network in an orderly manner.
PO16 On-site transport network infrastructure integrates safely and effectively with surrounding networks.	**AO16.1** Intersections, connections and access arrangements are designed in accordance with the Capricorn Municipal Development Guidelines and Australian Standard AS 2890.	**Complies** - The proposal allows for the transport network to connects in a safe and efficient manner.
Pedestrian and cyclist facilities		
PO17 Development provides safe and convenient pedestrian and cycle movement to the site and within the site having regard to desire lines, users' needs, safety and legibility.	**AO17.1** Pedestrian and cyclist movements are designed in compliance with the Capricorn Municipal Development Guidelines and Australian Standard AS 2890.	**Not applicable –** the nature of the development does not necessitate pedestrian and cyclist facilities.
PO18 Provision is made for adequate bicycle parking and end of trip facilities, to meet the likely needs of users and encourage cycle travel.	No acceptable outcome is nominated. Editor's note—Provisions are made for parking and end of trip facilities in accordance with the SC6.4 – Bicycle network planning scheme policy.	**Not applicable**
Servicing		
PO19 Refuse collection vehicles are able to safely access on-site refuse collection facilities.	**AO19.1** Refuse collection areas are provided and designed in accordance with the waste management code and Australian Standard AS 2890.	**Complies** – General waste will be collected by private contractors.

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Memorandum

To	Dr Craig Clarke (Regulatory Affairs & Quality Assurance Manager, Orica)	Page	1
CC	Paul Cornford (Process Technology Manager, Orica), Kevin Blackie (Principal Risk Engineer, AECOM)		
Subject	Summary of findings for the Principal Hazard Assessment (PHA) conducted for the proposed Ethylene ISO container storage at Portside Storage facility in Port Alma, QLD		
From	Lauren Bowden (Risk Engineer, AECOM)		
File/Ref No.	AECOM Project No.: 60328714	Date	16-Feb-2015

Purpose

The purpose of this Memorandum is to provide a summary of the findings of the Preliminary Hazard Assessment (PHA) conducted for the proposed Ethylene ISO container storage at Portside Storage facility in Port Alma, QLD.

Executive Summary

Background:

AECOM Australia Pty Ltd (AECOM) were engaged by Orica Chemicals to undertake a hazard and risk study, in the form of a PHA for the proposed storage of ethylene ISO containers at their existing facility located at Lot 46 Bajool-Port Alma Rd, Port Alma, QLD.

In August 2014, AECOM PHA for the proposed Ethylene Storage facility, to be located at the Portside Storage facility in Port Alma, QLD.

Following the completion of the original PHA, the Hazardous Industries and Chemicals Board (HICB) provided comments and requested clarification on a number of items. These items were subsequently addressed and closed out through email correspondence and an update of the study Report. The outcomes of the original study are also presented in this memorandum.

Following additional consultation between Orica and HICB and Gladstone Ports Corporation (GPC), it is understood that HICB and GPC has requested that Orica consider the impacts of a number of additional factors, and update the original study accordingly. Additional factors to be considered are summarised in this memorandum.

Overall objective:

The overall objective of the original study was to identify and assess the risk associated with the identified major accident events (MAEs) which are likely to result in offsite impacts to the surrounding populations and adjacent land uses, and to determine whether the level of risk is “acceptable” and consistent with the surrounding land-uses. It is important to note that the context of the study is to assess the suitability of the development from a land use safety planning perspective only and not to assess all onsite health and safety risks in detail. These issues would typically be addressed as part of the later design stages of the facility.

When assessing risk on an individual or a group of people (e.g. by locating a hazardous facility in an area), the concept of ‘acceptability’ of that risk for the decision making process is that it should be low relative to other known and tolerated risks in the area. The ‘acceptability’ of risk considers both consequence and likelihood factors.

With reference to industry recognised guidelines, such as the NSW Department of Planning and Infrastructure’s Hazardous Industry Planning Advisory Papers (HIPAP) and the Brisbane City Plan 2000, the following risk assessment criteria are suggested for various land uses:

Table 1 Individual Fatality Risk Criteria

Land Use Category	Risk (per million people per year)
Hospitals, schools *	< 0.5
Residential areas	< 1
Commercial areas	< 5
Active open space (sports areas) *	< 10
Industrial sites	< 50

*It should be noted that there are no hospitals, schools or sports areas in the vicinity of the Portside Storage facility

The area surrounding the proposed ethylene storage facility including the Port Alma shipping facilities is zoned as a light industrial district. The predominate area surrounding the proposed storage area being unoccupied salt flats. The closest residence to the Portside Storage facility is the fisherman's cottage to the south-east from the site boundary. Refer to Figure 1 below for a map showing the Portside Storage site boundary, proposed ethylene ISO container storage area and surrounding land uses.

Figure 1 Portside storage facility, Lot 46 Bajool-Port Alma Rd, Port Alma, QLD

Outcomes of the original Study:

Figure 2 below shows the overall risk profile (risk contours) for the Ethylene ISO containers storage area. The ethylene ISO containers are stored in a designated fenced area in the northwest corner of the site shown as a yellow rectangle (at reference 801, 1018) in Figure 2. The land immediately adjacent to the proposed storage area is an unoccupied salt flat.

From these individual fatality risk contours, the following conclusions and observations have been made:

- It can be seen from Figure 2 that the individual fatality risks are low outside the facility and the individual fatality risk at 50 pmpa (risk acceptance criteria for industrial land uses) is retained within the property boundary.
- For land use planning purposes, and in accordance with the industry guidelines accepted throughout Australia for land-use safety planning assessments, the individual fatality risk levels of interest are from 50pmpa down to 0.5pmpa A location specific individual fatality risk (LSIFR) of 50pmpa is the accepted risk level for industrial land uses and 0.5 pmpa being acceptable for schools and hospitals and other sensitive land uses. However, the outputs of the modelling software also provides risk levels down to as low as 0.1 pmpa, 0.05 pmpa and 0.01 pmpa. These contours depict risk levels which are extremely low and would be suitable for all land uses
- The inner risk contours are dominated by BLEVE and pool fire events which tend to be omni-directional and not strongly influenced by wind directions.
- The risk pattern observed for the 0.01pmpa contour (which represents a risk level that is extremely remote) in Figure 2 is primarily driven by wind directions dominated by south-easterly wind flows. It should be noted however, that wind in all directions have been taken into consideration.
- Taking into account the frequency of all wind strengths and directions, the higher frequency of wind from the south east extends the vapour cloud impacts to the west of the site. This is consistent with the data shown on the wind roses, extrapolated from the meteorological data for Port Alma.
- In generating risk estimates it was necessary to adopt failure frequencies for a range of events. Given the limited historical frequency data of major accidents involving cryogenic ISO containers, there is very limited statistical information on the frequency of individual failure scenarios. Little if no data is available on the failure rates of double walled ISO tanks. As such some adjustments from data (see VROM[1] or UK-HSE[2]) on single walled ISO tanks and pressure vessels were made. For this reason, logic models, such as event trees, are typically used to estimate the likelihood of the identified final outcomes, using failure data for individual components and subsystems. This approach is considered conservative.

[1] VROM, 2005, Guideline for quantitative risk assessment, CPR18E, Ministerie van Verkeer en Waterstaat, The Netherlands.
[2] HSE, 2012, Failure rate and event data for use within risk assessments (28/06/2012), accessed at: www.hse.gov.uk/landuseplanning/failure-rates.pdf

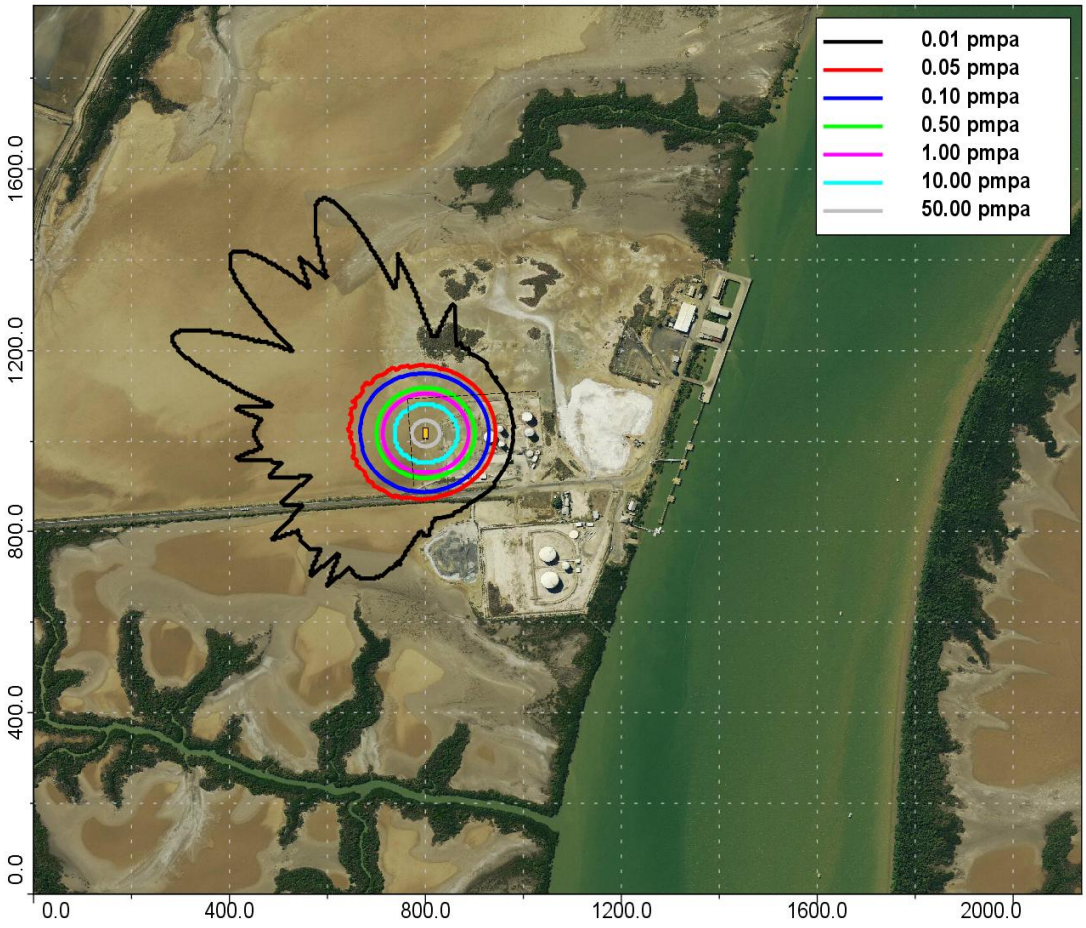


Figure 2 Individual fatality risks per million per annum (pmpa)

Further Discussion of Key Major Accident Events:

With reference to recent concerns raised by HICB and GPO, the following sections provides further details on the key major accident scenarios, with specific focus on the potential impacts on the future Ammonium Nitrate (AN) storage at Port Alma, and other neighbouring dangerous goods storage areas/facilities.

Scenario 1: Catastrophic ISO Tank Failure

The results in Table 2 below are the worst case scenario distances to the LFL (i.e. the potential flash fire impact zone) due to a Catastrophic ISO Tank Failure due to inherent mechanical failures or lifting failures involving the rapid loss of containment of the entire inventory of ethylene.

Table 2 Distance to LFL due to Catastrophic ISO Tank Failure

Atmospheric conditions	LFL maximum downwind distance (m)	LFL maximum lateral distance from axis (m)	Time to reach maximum extent (s)	Maximum evaporating pool diameter (m)	Comments
B3.6 (Day)	350	73	~200	60	Drifting, separated cloud exists at t >120s After 110s all ethylene has been evaporated into the cloud. Downwind at 140s has cloud LFL at 275m
D3.1 (Day)	560	61	~300	62	Drifting, separated cloud exists at t >200s
F2.4 (Night)	650	100	~1200	65	Pool evaporates in ~150s Drifting cloud forms after 900s

A discussion of the on-site and off-site impacts of a catastrophic failure is presented in Table 3.

Table 3 Discussion of results - Impacts of catastrophic failures on-site and off-site

Receptors of interest	Description of potential impacts of a catastrophic tank failure	Recommendations to manage the Risk
Discussion of likely impacts of flash fires on AN storage facilities at Port Alma.	For the worst case meteorological conditions, it is estimated that the LFL impact distances for a flammable ethylene cloud resulting from a catastrophic failure can reach up to a maximum downwind distance of 650m during night conditions (i.e. stability-wind class F2.4) and up to 560m during day conditions (i.e. stability-wind class D3.1) as show in table 3. Potentially up to 8,000 tonne of AN will be stored in the vessel which docks at the northern end of the birth, a distance of approx. 700m from the ethylene ISO container storage location. The vessel is located outside of the worst case scenario flash fire impact zone for a catastrophic failure of the ISO tank during day (D3.1 and B3.6) and night (F2.4) conditions. There is also a proposed temporary unloading AN storage area at the dock, storing up 500 tonne of AN, a distance of approx. 550m from	While the likelihood is very low, the proposed temporary unloading AN storage area at the dock (storing up 500 tonne of AN) is within the worst case scenario flash fire impact zone during both day (D3.1) and night (F2.4) conditions. It is therefore recommended that appropriate risk mitigation measures are implemented which includes confirming the storage and handling of AN at the Port is in compliance with all relevant Acts, Regulations and Australian Standards including but not limited to: - AS 4326-2008, The storage and handling of oxidizing agents - Workplace Health and Safety Act 2011

Receptors of interest	Description of potential impacts of a catastrophic tank failure	Recommendations to manage the Risk
	the ethylene storage area. This is within the worst case scenario flash fire impact zone during both day (D3.1) and night (F2.4) conditions. This means, in the case there is a catastrophic failure of an ISO container, emptying the entire inventory of ethylene, forming a vapour cloud within the LFL, which is not immediately ignited, and travels a distance of 550m to the AN storage area at the dock, which is then ignited by an available ignition source, there is the potential for a flash fire to occur in the vicinity of the AN storage. In the case there is a flash fire, structures and objects inside the cloud will be subjected, for a few seconds, to the burning portion of the gas cloud and there is the potential for combustible materials within the cloud to catch fire. This may also lead to secondary fires within the cloud. It is therefore recommended that both ignition sources and the amount of combustible materials stored at Port Alma are kept to a minimum. A flash fire in the vicinity of the AN storage area could potentially result in bagged AN being exposed to such flash fires. However, it is understood that the AN will be stored in accordance with relevant Australian Standards, legislative requirements and codes of practise which includes appropriate storage area which will act as a barrier between the AN and heat radiation of any potential Flash Fires. Steel is not a combustible material; however, weakening of steel structures occurs after 15 - 20 minutes exposure to a heat radiation intensity of 23KW/m^2. Due to the short duration of a flash fire event (a few seconds) there is not expected to be an exposure long enough to cause weakening of steel structures. Accordingly, the risk of knock on effects between the AN storage and the ethylene storage at Portside Storage due to a travelling gas cloud is considered extremely low.	- Workplace Health and Safety Regulation 2011 - AS 2187 Explosives – Storage, Transport, Use - Explosives Act 1999 - Explosives Regulation 2003 - Information Bulletin No. 53 Storage requirements for security sensitive ammonium nitrate (SSAN) It is also recommended that the Emergency Response Procedures (both for the Ethylene Storage facility and the AN Storage) include specific response procedures for the unlikely event of a loss of containment of ethylene and potential travelling gas cloud. It is also recommended that the coordination of transport activities of AN with ethylene transport activities is documented in the safety management system for both Port Alma and Orica.
	Port Alma is the deep sea port for Rockhampton and provides both import and export facilities and services. In addition to Ammonium Nitrate, it is understood that the port also currently handles explosive cargos including explosives and munitions. In the case there is a catastrophic failure of an	It is recommended that the storage and handling of all explosives is compliant with relevant legislation and Australian Standards including but not limited to: - Workplace Health and Safety Act 2011 - Workplace Health and Safety

Receptors of interest	Description of potential impacts of a catastrophic tank failure	Recommendations to manage the Risk
Discussion of the likely impacts of a potential ethylene incident on the explosive storage at Port Alma.	ISO container, emptying the entire inventory of ethylene, forming a vapour cloud within the LFL, which is not immediately ignited, and travels a distance of approximately 550m to the location of the shipping facilities which is then ignited by an available ignition source, there is the potential for a flash fire to occur in the vicinity of the explosive storage at Port Alma. In the case there is a flash fire, structures and objects inside the cloud will be subjected, for a short time, to the burning portion of the gas cloud and there is the potential for combustible parts of the structure to catch fire. This may also lead to secondary fires within the cloud. It is therefore recommended that both ignition sources and the amount of combustible materials stored at Port Alma are kept to a minimum. A flash fire in the vicinity of the explosive cargos storage areas at Port Alma could potentially result in an incident where the explosive cargos are exposed to such flash fires. However, it is understood that the explosive cargos will be stored in appropriately designed Shipping Containers, which will act as a barrier between the cargos and heat radiation of any potential Flash Fires. Weakening of steel structures occurs after 15-20 minutes exposure to a heat radiation intensity of 23KW/m^2. However, due to the short duration of a flash fire event which is estimated to only last a few seconds, there is not expected to be an exposure long enough to cause weakening of steel structures. Accordingly, the risk of knock on effects between the explosive cargos and the ethylene storage at Portside Storage due to a travelling gas cloud is considered extremely low.	Regulation 2011 - Explosives Act 1999 - Explosives Regulation 2003 - AS 2187 Explosives – Storage, Transport and use It is also recommended that the Emergency Response Procedures (both for the Ethylene Storage facility and the explosive Storage at Port Alma) include specific response procedures for the unlikely event of a loss of containment of ethylene and potential travelling gas cloud.
Discussion of the likely impacts of a potential ethylene incident on the LPG storage located at the Portside Storage site.	There is a LPG cylinder storage area on the portside storage facility adjacent to the ethylene storage area. Based on the site layout drawings provided by Orica, the LPG storage is located approximately 110m from the ethylene storage location. The LPG cylinders are located within the worst case scenario flash fire impact zone during both day (D3.1) and night (F2.4) conditions. This means, in the case there is a catastrophic failure of an ISO container, emptying the entire inventory of ethylene, forming a vapour cloud within the LFL, which is not immediately ignited, and travels a distance of 110m, to the	It is recommended that Portside Storage ensure that the storage and handling of LPG cylinders on the site are compliant with the relevant legislation, Australian Standards and codes of Practise including but not limited to: - AS/NZS 1596:2014 : The storage and handling of LP Gas - Workplace Health and Safety Act 2011 - Workplace Health and Safety Regulation 2011

Receptors of interest	Description of potential impacts of a catastrophic tank failure	Recommendations to manage the Risk
	LPG storage area at Portside storage, which is then ignited by an available ignition source, there is the potential for a flash fire to occur in the vicinity of the LPG Storage. In the case there is a flash fire, structures and objects inside the cloud will be subjected, for a short time, to the burning portion of the gas cloud. Combustible parts of the structure will catch fire. This may also lead to secondary fires. It is therefore recommended that both ignition sources and the amount of combustible materials stored at the Portside Storage Site area kept to a minimum. A flash fire in the vicinity of the LPG storage area could potentially result in an incident where the LPG cylinders are exposed to such flash fires. However, it is understood that the LPG cylinders will be stored in compliance with the requirements of AS/NZS 1596 – The storage and handling of LP Gas, including separation to other dangerous goods areas, such as the ethylene storage area and control of ignition sources. It is recommended that a site audit is conducted to ensure that the LPG storage on site is compliant with AS/NZS 1596 – The storage and handling of LP Gas and other relevant regulations including the WHS regulation 2011. Appropriate LPG storage requirements may also include screen walls or heat radiation shields / barriers with appropriate fire resistance and blast protection used in accordance with Dangerous Goods Regulations and Standards.	It is also recommended that the Emergency Response Procedures (both for the Ethylene Storage Facility and the Portside Storage facility) include specific response procedures for the unlikely event of a loss of containment of ethylene and potential travelling gas cloud. It is recommended to consider the use of heat radiation shields / barriers with appropriate fire resistance and blast protection ratings around the ethylene storage facility.
Discussion of the likely impacts of an ethylene incident on the bulk liquids stored at Portside storage including combustible liquids (biodiesel and tallow).	It is understood that there are bulk liquids storage tanks at the Portside storage facility containing tallow and bio diesel. Based on the site layout drawings provided by Orica, the bulk liquids tanks are located approximately 120m from the ethylene ISO container storage area. Therefore, the bulk liquid storage tanks (including bio diesel and tallow) are located within the worst case scenario flash fire impact zone during both day (D3.1) and night (F2.4) conditions. This means, in the case there is a catastrophic failure of an ISO container, emptying the entire inventory of ethylene, forming a vapour cloud within the LFL, which is not immediately ignited, and travels a distance of 120 m, to the bulk liquids storage tanks at Portside storage, which is then ignited by an available ignition	It is recommended that Portside Storage ensure that the storage and handling of combustible liquids (biodiesel and tallow) on the site are compliant with the relevant legislation, Australian Standards and codes of Practise including but not limited to: - AS 1940 Storage and Handling of Flammable and Combustible Liquids - Workplace Health and Safety Act 2011 - Workplace Health and Safety Regulation 2011 It is also recommended that the Emergency Response Procedures (both for the Ethylene Storage Facility and the Portside Storage facility) include specific

Receptors of interest	Description of potential impacts of a catastrophic tank failure	Recommendations to manage the Risk
	source, there is the potential for a flash fire to occur in the vicinity of the bulk liquid tanks. In the case there is a flash fire, structures and objects inside the cloud will be subjected, for a short time, to the burning portion of the gas cloud. Combustible parts of the structure will catch fire. This may also lead to secondary fires. It is therefore recommended that both ignition sources and the amount of combustible materials stored at the Portside Storage Site area kept to a minimum. A flash fire in the vicinity of the bulk liquid storage tanks could potentially result in an incident where the combustible liquids (biodiesel and tallow) are exposed to such flash fires. However, it is understood that the bulk liquid storage tanks are stored in compliance with the requirements of AS1940 Storage and Handling of Flammable and Combustible Liquids, including separation to other dangerous goods areas, such as the ethylene storage area and control of ignition sources. Appropriate LPG storage requirements may also include screen walls used in accordance with Dangerous Goods Regulations and Standards. Screen walls will act as a barrier between the LPG cylinders and heat radiation of any potential Flash Fires. Accordingly, the risk of knock on effects between the AN storage and the ethylene storage at Portside Storage due to a travelling gas cloud is considered low.	response procedures for the unlikely event of a loss of containment of ethylene and potential travelling gas cloud.

Scenario 2: Major ISO tank failure (50NB release size)

The results in Table 4 below are the worst case scenario distances to the LFL (i.e. the potential flash fire impact zone) due to major ISO tank failure involving the loss of containment of ethylene from a 50mm aperture, this being the diameter of the outlet pipework from the ISO tank. This event could be caused by dropping of the tank during lifting operations, mechanical failure of pipework or isolation valve.

Table 4 Ethylene Loss of Containment through pipeline or valve failure

Atmospheric conditions	Discharge rate (kg/s)	LFL maximum downwind distance (m)	LFL maximum lateral distance from axis (m)	Comments
B3.6	4.4	55	2.5	Choked discharge. Very little hydrocarbon in the dispersing jet (~13kg). Potential jet fire on immediate ignition. Flash fire possible with subsequent jet fire.
D3.1	4.4	54	2.6	
F2.4	4.4	52	3.0	

A discussion of the on-site and off-site impacts of an ISO tank piping (50NB) and/or valve major failure leading to 50mm aperture is presented in Table 5.

Table 5 Discussion of Results - Impacts of major failures on-site and off-site

Receptors of interest	Description of potential impacts of a major tank failure (50NB release size)	Recommendations to manage the Risk
Discussion of likely impacts of flash fires on AN storage facilities at Port Alma.	For the worst case meteorological conditions, it is estimated that the LFL impact distances for a flammable ethylene cloud resulting from a major failure can reach up to a maximum downwind distance of 52m during night conditions (i.e. stability-wind class F2.4) and up to 55m during day conditions (i.e. stability-wind class D3.6) as show in table 8. The AN storage on the vessel and on the dock at Port Alma are outside the worst case scenario flash fire impact zone for a major failure of the ISO tank during day (B3.1 and D3.6) and night (F2.4) conditions. Therefore, there is not considered to be a risk of a flash fire adjacent to the AN storage areas at the port due to a major failure of the ISO tank.	It is recommended that appropriate risk mitigation measures are implemented including ensuring that the storage and handling of AN at Port Alma is compliant with relevant Australian Standards and Regulations.
Discussion of the likely impacts of a potential ethylene incident on the explosive storage at Port Alma.	The storage areas for explosives at Port Alma Port are outside the worst case scenario flash fire impact zone for a major failure of the ISO tank during day (B3.1 and D3.6) and night (F2.4) conditions. Therefore there is not considered to be a risk of a flash fire adjacent to the Class 1s and munitions storage areas at the port due to a major failure of the ISO tank.	It is recommended that the storage and handling of all explosives is compliant with relevant Australian Standards and Regulations.
Discussion of the likely impacts of a	There is a LPG cylinder storage area on the portside storage facility adjacent to the ethylene storage area. Based on the site layout drawings provided by Orica,	It is recommended that Portside Storage and Orica ensure that the storage and

Receptors of interest	Description of potential impacts of a major tank failure (50NB release size)	Recommendations to manage the Risk
potential ethylene incident on the LPG storage located at the Portside Storage site.	the LPG storage is located approximately 110m from the ethylene ISO container storage area. Therefore, the LPG cylinders are not located within the worst case scenario flash fire impact zone during both day (D3.1) and night (F2.4) conditions. Therefore, there is not considered to be a risk of a potential flash fire adjacent to the bulk liquid storage tanks due to a major failure of the ISO tank.	handling of all LPG cylinders on the Portside Storage site is compliant with relevant regulations and Australian Standards.
Discussion of the likely impacts of an ethylene incident on the bulk liquids stored at Portside Storage such as tallow and bio diesel.	It is understood that there are bulk liquids storage tanks at the Portside storage facility containing combustible liquids (bio diesel and tallow). Based on the site layout drawings provided by Orica, the bulk liquids tanks are located approximately 120m from the ethylene ISO container storage area. Therefore, the bulk liquids storage tanks are not located within the worst case scenario flash fire impact zone during both day (D3.1) and night (F2.4) conditions. Therefore, there is not considered to be the potential for a flash fire adjacent to the tallow and bio diesel storage areas due to a major failure of the ISO tank.	It is recommended that Portside Storage and Orica ensure that the storage and handling of all combustible liquids at the Portside Storage site is compliant with relevant regulations and Australian Standards.

Scenario 3: Jet Fire due to immediate ignition of ethylene from 50NB release size

There is a possibility that on release from containment direct ignition will generate a jet fire which can have thermal radiation impacts on people and nearby assets. Using the discharge rates from Scenario 2 (i.e. 50NB release size), thermal radiation predictions were made using an implementation of the Shell "Thornton" jet fire model (see TNO 1997)3. Figure 3 below shows the results of potential jet fires arising from ignition of high velocity discharge of ethylene from ISO tank pipework failures.

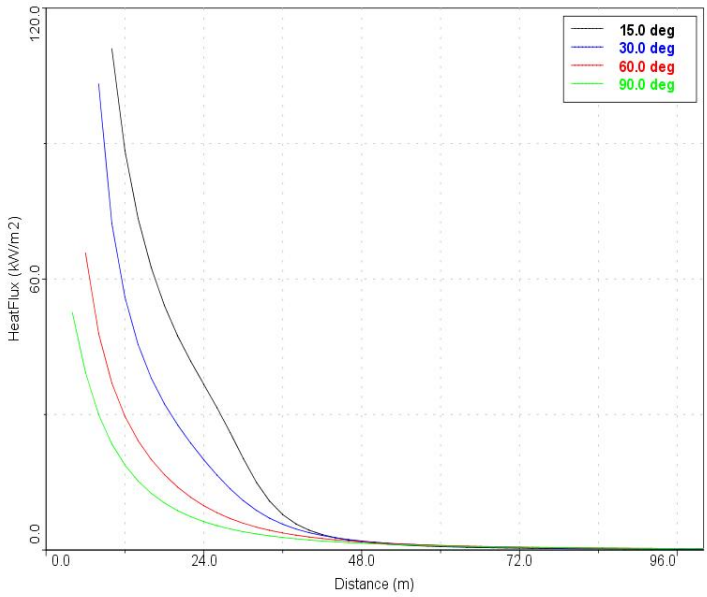


Figure 3 50mm release: Jet fire thermal radiation

A discussion of the on-site and off-site impacts of an ISO tank piping (50NB) and/or valve major failure leading to 50mm aperture with immediate ignition resulting in a potential jet fires is presented in Table 6.

Table 6 Discussion of results - Impacts of Jet Fires on-site and off-site

Receptors of interest	Description of potential impacts due to jet fires (i.e. immediate ignition of a release of size 50NB)
Discussion of the likely impacts of a potential ethylene incident on the LPG storage located at the Portside Storage site.	Based on the site layout drawings provided by Orica, the LPG storage is located approximately 110m from the ethylene ISO container storage area. From the results of the consequence model of a jet fire resulting from the immediate ignition of a high momentum release, (presented in Figure 3), show the thermal radiation levels are zero at a distance of 75m. Therefore, the LPG cylinders are not located within the worst case scenario jet fire impact zone.
Discussion of the likely impacts of an ethylene incident on the bulk liquids stored off-site in the area such as tallow and bio diesel.	Based on the site layout drawings provided by Orica, the bulk liquids storage tanks are located approximately 120m from the ethylene ISO container storage area. From the results of the consequence model of a jet fire resulting from the immediate ignition of a high momentum release, (presented in Figure 3), show the thermal radiation levels are zero at a distance of 75m. Therefore, the bulk liquids storage tanks are not located within the worst case scenario jet fire impact zone.

[3] TNO, 1997, Methods for the calculation of physical effects, 3rd Edition, Voorburg, ISBN 90-12-08497-0

Scenario 4: BLEVE due to sustained, uncontrolled fire and ultimate tank rupture

Figure 4 below shows the results of a ISO tank BLEVE incident due to sustained, uncontrolled fire and ultimate tank rupture. The BLEVE model derived from TNO (1997)[4] was used for the thermal radiation predictions.

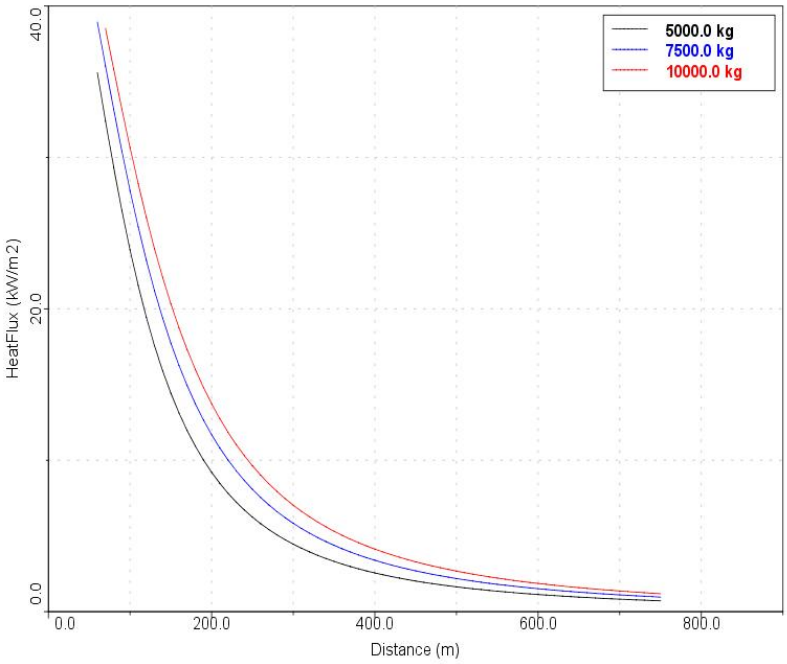


Figure 4 BLEVE of ISO tank: thermal radiation vs inventory

For the case of 10,000kg of ethylene:

- The fireball size was 128m diameter with a fire duration of 9.3 seconds.
- The heat radiation level intensity of 4.7 KW/m^2 was calculated at a radius of approximately 385m.
- The heat radiation level intensity of 12.6 KW/m^2 was calculated at a radius of approximately 300m.
- The heat radiation level intensity of 23 KW/m^2 was calculated at a radius of approximately 140m.

A discussion of the on-site and off-site impacts from a potential BLEVE is presented in Table 7.

Table 7 Discussion of results - Impacts of BLEVES on-site and off-site

Receptors of interest	Description of potential impacts of a BLEVE
Discussion of the likely impacts of a potential ethylene incident on the LPG storage located at the Portside Storage site.	It is estimate the LPG storage area is located 110 m from the ethylene storage area. For the case of 10,000kg of ethylene, with a fireball size was 128m diameter with fire duration of 9.3 seconds, the heat radiation effects experienced at the LPG storage area due to a BLEVE can potentially reach up to 23KW/m^2 as seen in Figure 4. Weakening of steel structures occurs after 15 - 20 minutes exposure to a heat radiation intensity of 23KW/m^2. Heat radiation levels of 23kW/m^2 as the result of fire incidents at a hazardous plant may affect a neighbouring installation to the extent that unprotected steel may suffer thermal stress, potentially resulting in structural failure. This may trigger a hazardous event unless protection measures are adopted. However, due to the short duration of a BLEVE event with a fireball estimated to last only 9.3 seconds, there is not expected to be an exposure long enough to cause

[4] TNO, 1997, Methods for the calculation of physical effects, 3rd Edition, Voorburg, ISBN 90-12-08497-0

Receptors of interest	Description of potential impacts of a BLEVE
	weakening of steel structures at the LPG Storage Area.
Discussion of the likely impacts of an ethylene incident on the bulk liquids stored off-site in the area such as tallow and bio diesel.	The combustible liquids storage areas (Biodiesel and Tallow) are assumed to be at a distance of 120m from the ethylene storage area. For the case of 10,000kg of ethylene, with a fireball size was 128m diameter with a fire duration of 9.3 seconds, the heat radiation effects experienced at the combustible liquids storage area due to a BLEVE can potentially reach up to 23KW/m^2 as per the results in Figure 4. Weakening of steel structures occurs after 15 - 20 minutes exposure to a heat radiation intensity of 23KW/m^2. Heat radiation levels of 23kW/m^2 as the result of fire incidents at a hazardous plant may affect a neighbouring installation to the extent that unprotected steel may suffer thermal stress, potentially resulting in structural failure. This may trigger a hazardous event unless protection measures are adopted. However, due to the short duration of a BLEVE event with a fireball estimated to last only 9.3 seconds, there is not expected to be an exposure long enough to cause weakening of steel structures at the Combustible Liquids Tanks storage area.

Impact of an AN incident on the Ethylene Storage Area

In addition to assessing the potential impacts of the Ethylene Storage on the AN storage area at Port Alma, AECOM also assessed the potential impacts associated with two AN explosion scenarios to the surrounding areas.

An AN storage facility may be established at Port Alma with up to a total of 5,000t of AN stored in stacks. It is understood that the AN will be stored in compliance with relevant Australian Standards, Legislative Requirements and Codes of Practise which includes limiting the maximum stack size of AN to 500t. The standards and Codes of Practice also require storage stacks to be separated from each other in a manner that will prevent sympathetic detonation.

It is also understood that there may also be up to 8,000 tonne on the ships docked at the northern end of the unloading berth at Port Alma.

The proposed storage for the ammonium nitrate on the dock is approximately 550m form the ethylene storage facility, and the ship will be stationed approximately 700m from the ethylene facility.

Ammonium nitrate is a strong oxidising agent that will support combustion of organics and metal powders as it produces oxygen as one of its decomposition products. When subjected to heat, AN undergoes a series of complex decomposition reactions that produce low levels of toxic nitrogen oxides (namely nitrous oxide) at atmospheric pressure. If the reaction is confined and the gases are maintained at the temperature at which they were formed, further gas phase reactions can occur giving off nitric acid oxide and nitrogen dioxide gases.

The sensitivity of AN to detonation is largely dependent on three variables; high temperature, confinement and contamination. Without any one of these being present, AN would require a strong initiation charge (i.e. high explosives) to detonate at all.

Variable in the calculation of overpressure consequences from an AN explosion include the proportions of material present that is sensitised to detonation, the proportion of the sensitised material that actually detonates in the explosion (efficiency), and an equivalency of the sensitised material to that of TNT (equivalency). This technique is used because of the significant quantity of information on the consequences of explosions involving TNT and the scarcity of reliable information on the explosive nature of other materials.

In this analysis, the impact criteria presented in the Table below were used to define respective overpressure consequence distances, as referenced by the HIPAP No. 4.

Explosion Overpressure	Effects
3.5 kPa (0.5 psi)	90% glass breakage. No fatality and very low probability of injury
7 kPa (1 psi)	Damage to internal partitions and joinery but can be repaired. Probability of injury is 10%. No fatality.
14 kPa (2 psi)	Houses uninhabitable and badly cracked.
21 kPa (3 psi)	Reinforced structures distort. Storage tanks subject to failure. 20% chance of fatality for a person in a building. 10% chance of fatality for a person outdoors.
35 kPa (5 psi)	House uninhabitable. Wagons and plant items overturned. Threshold of eardrum damage. 50% chance of fatality for a person in buildings and 15% chance of fatality for a person in open.
70 kPa (10 psi)	Threshold of lung damage. 100% chance of fatality for a person in a building or in the open. Complete demolition of houses.

In the context of Land Use safety Planning, the overpressure effects of interest are from 21 kPa to 70 kPa. Accordingly, the consequence distances associated with these overpressure levels were calculated.

AN Explosion Events:

As previously described, two explosion scenarios were considered:

- 500 tonne Storage on the Dock at Port Alma
- 8,000 tonne on a ship

In order to determine the impacts due to an explosion, it is necessary to convert the storage quantity to an equivalent mass of TNT. The Queensland Guidance Note 4 (which references the COAG Guidelines), specifies an overall Net Explosive Quantity (NEQ) of 32% to be used for AN Prill. Therefore, the equivalent TNT mass for the two postulated scenarios are as follows:

- 160 tonne (at the dock); and
- 2,560 tonne (on the ship).

The consequence distances associated with these two postulated scenarios were calculated using the US Military TNT overpressure equation as detailed below. This equation is based on a robust empirical relationship and is appropriately conservative for the level of detail required in this study.

Overpressure vs. Distance Model

Using the efficiency and equivalence factors, a mass of Ammonium Nitrate is equated to a mass of TNT. The distances to defined overpressures of interest are calculated using the TNT overpressure vs. scaled distance relationship. This method was first discovered by Hopkinson in 1915 [Bulson 1997] and has proven since then to be a robust method of explosive consequence prediction [Ref 32]. An Overpressure vs. Scaled Distance relationship can take the form of an equation or graph. In this case an equation is used which is sourced from the US Army [Bulson 1997] and has the form:

$$p_o = \frac{4120}{Z^3} - \frac{105}{Z^2} + \frac{39.5}{Z}$$

$$where:\ 2 < p_o < 160\ psi\ gauge$$

$$Z = \frac{R}{W^{1/3}} \quad and \quad 3 < Z < 20\ ft/lbs^{1/3}$$

1. Convert the explosive quantity of interest into an equivalent mass of TNT in pounds (W).
2. Choose the overpressure of interest in psi (p_o).
3. Solve the equation for R, the distance in feet the overpressure is felt at.

The following consequence distances were calculated for the overpressure of interest:

	Overpressure		
	21 kPa	35 kPa	70 kPa
Distance (8,000 tonne)	870m	645m	460m
Distance (500 tonne)	350m	260m	180m

The detonation of 8,000 tonne of AN (worst case scenario) was conservatively calculated to give overpressure levels (21 kPa) sufficient to cause death of 10% of outdoor human personnel and potential to cause storage tank failure at the proposed ethylene storage facility.

The storage of 500 tonne of AN does not pose significant threats to the proposed ethylene storage location, however does impact on the existing Portside Storage tank farm.

IXOM

Port Alma Ethylene Storage Site ERP

Prepared by: Nathan Cook

Date: 15 February 2024

Revision: G

1 Emergency Telephone Numbers

Site Emergency Numbers
(Mobile Numbers available 24 hours)

NAME	POSITION	PHONE CONTACTS
Carl Byron	Ixom Site Manager	Mobile: 0482 610 984
Nathan Cook	Ixom Regional Support Manager	Mobile: 0423 784 472
Greg Lott	Portside Storage Owner/Manager	Mobile: 0428 638 818
Kerry Rennie	Centurion Training & Compliance Manager	Mobile: 0477 836 212
Russell Gill	Queensland Gas Services Manager	Mobile: 0407 126 993
Ixom ERS		1800 033 111
Bob Young	CFT Security	Mobile: 0408 130 530

Emergency Services (24 hours)

Fire Brigade, Ambulance or Police	000

Ixom Services (24 hours)

Manager, Corporate Affairs (Media Liaison)	0418 101 127
Ixom Emergency Response Service	1800 033 111

Local Services and Authorities

HICB	(07) 3738 5010
Gladstone Ports Corporation, Gavin Munro	0409630977
Rockhampton City Council	(07) 4932 9000
Department of Transport Main Roads	131940
Rockhampton Coast Guard (Fisherman)	(07) 4921 2266 0417 617 389

Recovery Services (24 hours)

Soervice	Supplier	Phone Number
Ethylene Detector Service	Drager	1800 372 437
Site cameras & security systems	MST	04277 22 077

NEIGHBOURS	PHONE CONTACTS
East – Portside Storage, Greg Lott	0428 638 818
East – Fishermen Residence	Nil, must be visited in person to raise alarm
East – Stolthaven Fuel Terminal	03 9931 1880 0407 725 892
West - Olossons/Pacific Salt, Robert Logan	0419702897

Table of Contents

2 Document Distribution List

The Site Manager controls the distribution of this plan to the recipients identified below.

All copies of this plan are distributed electronically and are considered uncontrolled. Printed copies of the plan kept onsite are controlled to ensure the latest version is being used.

The controlled version of the Emergency Response Plan is readily accessible on IXOM DMS.

Title	Position	Location
Carl Byron	Site Manager	Brisbane, QLD
Nathan Cook	Regional Support Manager	Brisbane, QLD
Sergio Claus	Regional Manufacturing Manager	Melbourne, VIC
Craig Clarke	QA/Regulatory Affairs Manager	Melbourne, VIC
Scott Tanner	SHE Advisor	Melbourne, VIC
Kerrie Rennie	Centurion Compliance Manager	Gladstone, QLD

Additional copies are stored in the following areas:

- Ixom Emergency Response Service
- Local copy kept in Equipment Container on site

3 Document Amendment Record

This Emergency Response Plan will be revised annually. Reviews will be the responsibility of the Site Manager.

Revisions to any of the pages will be completed using the document control system established for this purpose.

Proposal for amendments to this plan should be forwarded to:

Name Carl Byron
Job Title Site Manager QLD
Mobile +61 (0)482 610 984
Email Carl.byron@ixom.com

Revision	Author	Date	Amendment Description
A	Nathan Cook	02/01/20	First draft.
B	Nathan Cook	20/03/20	Minor changes to contacts.
C	Nathan Cook	09/02/21	Minor changes to contacts.
D	Nathan Cook	15/6/21	Update to site map with increased storage
E	Nathan Cook	19/1/23	Update to include shipping operations
F	Nathan Cook	27/11/23	Minor changes to contacts.
G	Nathan Cook	15/4/24	Updates to contacts

4 Introduction

4.1 Facility Description

This plan has been prepared for the Port Alma Site.

The site is located at Lot 46, Port Alma–Bajool Rd, Port Alma, QLD.

The site stores up to 12 ISO containers of ethylene.

The site is unmanned except for:
- Regular monitoring of ISO container pressure
- Transfer of ISO container (loading/unloading)
- Emergency response

The aim of this plan is to provide a source of information and procedures to be followed in the event of an emergency involving the site and external emergency services.

It also provides a coordinating link between this procedure and shared site and external emergency services.

4.2 Definitions of Emergency

An emergency is any hazardous or potentially hazardous situation where there is danger to personnel, property or the environment generally. It may also be described as a situation which cannot be immediately brought under control by staff on duty using available resources, where serious injury or death could be incurred, where property damage could occur or where serious environmental consequences could result.

Note: If there is any doubt as to whether any hazardous situation constitutes an emergency, **then it must be treated as an emergency.**

LEVEL 1	LEVEL 2	LEVEL 3
Minor Leak: - can be contained quickly by onsite-trained staff; - does not threaten the safety of staff or the public; - will not harm the environment; and - will not disrupt operations. **OR** **Minor Emergency** A situation, with a degree of potential danger, which is a sudden departure from usual operations, but which can be immediately or quickly	**Significant Leak:** - cannot be contained quickly by onsite trained staff; and/or - threatens people's safety; and/or - has potential to harm the environment; and/or - has potential to disrupt the operations. **OR** **Site Emergency** A site emergency comes into being when, in the judgement of the discoverer, and/or his supervisor, resources beyond those immediately to hand are	**Major Emergency** A major emergency is one when site services or the neighbourhood are potentially in danger. It could be a localised emergency which has developed into a site emergency and then poses a threat to the neighbourhood or part of another plant, e.g. major ethylene leak affecting nearby neighbours.

brought under control using resources at hand or readily available in the storage site.	needed to contain control and rectify the situation and, as a result, the site alarm is activated. Site emergency is a term that can cover a number of things or events. It could be a localised emergency which, contrary to initial assessment, has given rise to an increase in potential danger.	
Emergency Services **MAY BE REQUIRED**	Emergency Services **SHOUD BE REQUIRED**	Emergency Services **WILL BE REQUIRED**
<u>Minor Emergency examples</u>: - Elevated ISO container pressure. - Small fire not impacting ISO container. - Minor injury. - Minor accident on/beyond the site.	<u>Site Emergency examples:</u> - Loss of containment from pipe/valves. - Serious fire not impinging on ethylene ISO container. - Damaged ISO container with no loss of containment. - Possible weather threat (cyclone/flood/earthquake). - Danger to personnel safety. - Medical emergency/injury. - Industrial accident on/beyond the site.	<u>Major Emergency examples:</u> - Ethylene fire/explosion. - Major loss of containment. - Bomb threat/terrorism. - Serious injuries/fatalities. - Security breach. Severe weather threat (cyclone/flood/earthquake). - Significant media attention

5 Aims and Objectives

5.1 Aim

This plan has been prepared for Ixom's ethylene storage facility at Port Alma, QLD. It also extends to the Port Alma wharf when undertaking shipping operations.

The aim of this plan is to provide a source of information, and procedures to be followed in the event of an ethylene emergency.

It also provides a coordinating link between this procedure and shared site and external emergency services.

5.2 Objectives

In all cases of emergency the main objectives of in order of priority are:

1. Evacuation of personnel.

2. Management and treatment of injured personnel and rescue.

3. To control or limit any effect that an emergency or potential emergency may have to site personnel and neighbouring areas.

4. To ensure a coordinated response to an ethylene gas emergency situation for the site and to provide for appropriate assistance from the site and external emergency services (fire brigade, police, and ambulance).

5. To ensure communication of all vital information as soon as possible.

6. Facilitate resumption of normal operations when appropriate.

7. Provide a basis of training personnel in the handling of emergencies.

8. To provide a basis for updating and reviewing emergency procedures.

6 Hazardous Materials Manufactured, Stored, or Used On Site

Hazardous materials handled in significant quantities on the site are listed in Table 1 below. Safety Data Sheets (SDS) containing details of these hazardous materials are held in file.

Safety Data Sheets contain a range of information including:

- Physical properties, chemical reactivity.
- Health Considerations, toxicity, first aid, advice to Doctor.
- General hazard statement, fire/explosion hazards.
- Leaks, Storage and Transport handling.
- Personal protection recommendations.

The following is a list of dangerous goods stored or used in quantities which could conceivably be a subject of concern in an emergency.

Table 1

Description	DG Class	HAZCHEM Code	UN No.	Quantity
Ethylene Refrigerated ISO	2.1	2SE	1038	8.5 tonne (each) 102 tonne (max)

7 Types of Emergencies

This section considers the following emergencies and their potential impact on the site.

OVER-PRESSURISATION: Pressure inside ISO container exceeding 18 barg.

FIRE: Fire emergencies may occur on the site.

ETHYLENE LEAKS: Vapour/liquid leaks of ethylene may occur at the site where ethylene is stored.

MEDICAL EMERGENCY: An illness or injury occurring on site regardless of any related incident.

CIVIL DISTRURBANCE: Demonstration against the chemical industry, LNG industry, IXOM. Demonstration due to industrial dispute.

BOMB THREAT: Bomb threat or other activity of terrorism nature.

SEVERE WEATHER: Weather conditions in local and surrounding area that may impinge of on the safety of the site and the product contained within.

8 Response

8.1 Initial Response

Emergency Commander

The site is organised such that, in an emergency situation, it is under the direct control of the First Responder (i.e. the person who attended the scene first), who becomes the Emergency Commander.

The First Responder will assume the role of Emergency Commander until relieved by the Team Leader or a more Senior Manager or Emergency Services personnel.

The responsibilities of Emergency Commander include the following:

- Liaise with other stakeholders – in person, by mobile and/or UHF radio
- Develop an effective Emergency Response Plan coordinate the planning and operation of declared Emergency Responses
- Provide leadership determine what actions are required
- Ensure all emergency nominated positions are covered at all times, whether it is due to absenteeism or personnel being away on a permanent or temporary basis
- Ensure there are processes in place for emergency response access, traffic control / management for movements of emergency response activities and ensuring other traffic movements are restricted so not to endanger / expose people, vehicles and product to risk of involvement in the emergency

Hand Over Control

After arrival of the Fire Brigade, the company Emergency Commander hands over control to the senior Fire Brigade officer. The Company Emergency Commander then maintains a close liaison, providing advice and directing company personnel as required.

The handover briefing will include:
(a) Location, nature & status of the emergency
(b) Details of personnel injured or trapped
(c) Action taken to date
(d) Location of all personnel involved
(e) Details of product(s) involved
(f) Details of other known hazards
(g) Any other relevant information

Handover checklist is available in Appendix D.

8.2 Internal Emergency Resources

The following emergency resources are available at the Port Alma site:

See Map in section 19 for location of:

- First aid kit
- Safety Data Sheets
- Goods Manifest
- Windsock
- 3 x 4.5kg CO_2 fire extinguisher
- Fixed gas detectors
- Safety Shower
- Duress/Evacuation Alarm

Warning signs (including exit signs and firefighting equipment use instruction signs) are also at the appropriate locations.

8.3 Emergency Services Incident Management Plans

It is essential that complete co-operation is achieved between emergency services such as Fire Brigade, Police and Ambulance and the site personnel managing any emergency.

After arrival of the Fire Brigade, the company Emergency Commander hands over control to the senior Fire Brigade officer. The Company Emergency Commander then maintains a close liaison, providing advice and directing company personnel as required.

Road access to the site must be maintained so that large emergency service vehicles have easy of entry. There are no alternative site access points for large vehicles as the site is surrounded by salt flats.

Technical and general advice about chemical/toxic/fire hazards must be given. Material safety data sheet information will be made available to the Emergency Services.

The current procedure establishes the Senior Fire Brigade Officer at the scene, as the Emergency Commander. In his/her absence the Senior Police Officer will fulfil the role.

The **Emergency Commander** (**Senior Fire Brigade Officer on Site**) takes charge of:

- Firefighting
- Spillage control
- Identification
- Containment
- Make safe
- Rescue
- Clean Up

The **Police Forward Commander** is in charge of:

- Ground Control
- Traffic Control
- Perimeter Control
- Evacuation (neighbours)
- Disaster victim registration/identification
- Investigation (Coronial/Criminal)
- Property Security
- Support to Fire Brigade
- Co-ordination

The **Ambulance Commander** is in charge of:

- Treating victims
- Rescue and transport

9 Activation of an Alarm or Raising the Alarm

Description of Alarms

FIRE/DISTRESS ALARM
This will be announced manually using a siren located at the Site Equipment Container.

INTRUDER ALARM
This will be announced automatically, when activated, using a siren located at the Site Equipment Container.

EVACUATION ALARM
This will be announced manually using a siren located at the Site Equipment Container.

LOCAL GAS DETECTOR ALARM

Routine attended monitoring of the ISO containers is the primary means of detecting flammable gas leaks, through early detection of small leaks.

The secondary fixed gas detection consists of:
Line of sight detectors fixed along the east and west boundaries of isotainer storage area. These are connected to a centralised control unit on-site fitted with Audio-Visual alarms and SMS alert system.

If Ethylene gas is detected, or one of the above alarms are triggered, neighbours will be alerted by audio alarms and a strobe beacon located on site. The SMS system will send an alert to Ixom Emergency Response Service via the mobile phone network.

If SMS alert is received, procedure is:

- Site manager and/or ERS to check cameras remotely.
- If during normal hours, Portside Storage can view the site from distance. If intruder is seen, do not approach, follow intruder response scenario.
- If after hours, contact CFT Security who will inspect site using local patrol.

9.1 Raising the Alarm

Any person who observes or discovers an emergency situation must immediately alert the relevant personnel by:

- calling emergency services on 000, or
- calling ERS on 1800 033 111, and/or
- alerting the emergency contact person/s (see Appendix 1)

The person initiating an emergency (includes Contractors as well as Centurion and Portside Storage personnel) must advise the emergency contact person/s by phone, of the exact location, type and (where possible) size of the emergency.

Response to the Alarm

The on duty emergency contact will act as the Emergency Coordinator and initiate emergency response, until such times as the Emergency Commander arrives at the scene and can be briefed.

9.2 Notification of Authorities and Adjacent Facilities

Emergency services such as Fire Brigade, Police, and Ambulance must be contacting by dialling 000.

Provide information to the 000 operator as follow:

a) Location
b) Type of emergency
c) Casualties
d) Assistance required
e) Hazards
f) Telephone Number
g) Name

For site emergency or external emergency, the neighbours of the site must be notified as soon as practicable. List on page 2.

9.3 Management of Local Gas Detector Alarms

In the event of gas detector alarms being generated with personnel on-site, refer to Section 12.

In the event of a gas detector alarm being generated whilst personnel are offsite:

1. Assess whether a gas leak is actually occurring - This is evidenced by multiple alarms going off
    - If it is determined that a gas leak is occurring, refer to Section 12.
2. If a single alarm is generated which resets itself, investigate during next site attendance.
3. If a single alarm is generated which does not reset itself, arrange for a visit to the site ASAP.
    - It is unlikely that a gas leak is occurring; however proceed to site with caution.

In the event of an alarm fault, contact the vendor for further instructions.

Under all scenarios, the system should be inspected by either an Ixom engineer or the vendor.

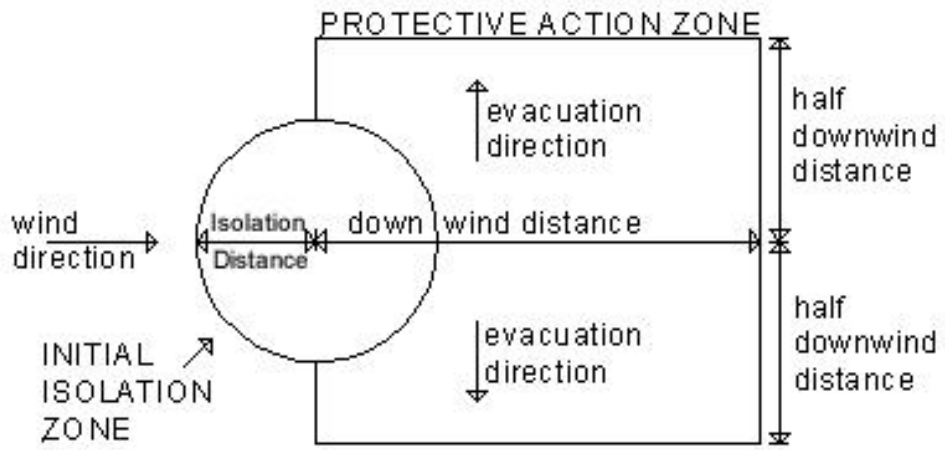
10 Evacuation

In the event of an evacuation, there are three muster points in which personnel should meet up:

- Outside the emergency exit gate on the northern fence line.
- Outside the emergency exit gate along the western fence line.
- Outside the main entry/exit gate on Port Alma-Bajool Rd.

If it becomes necessary to clear an area downwind of an ethylene leak, personnel should be moved across-wind until clear of the gas-laden air, then upwind to a position of greater safety.

Beware of shifts in wind direction. Do not panic. Do not run.



11 Rescue / Treatment of Injured Personnel

11.1 Hazards of Ethylene Gas

Ethylene, Refrigerated Liquid: Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail and by the IMDG code for marine transport Classification of the substance or mixture: Class 2.1 Flammable Gases, UN number 1038.

Ethylene has a very low boiling point of -104°C. Over time ethylene will vaporize and build internal pressure in the container. Pressure build up is normally slow, but pressures may rise more rapidly if, for example, the ISO containers are damaged in transit. To prevent uncontrolled release of ethylene via the pressure relief valve (PSV), ISO containers can be manually vented to lower its pressure. If venting is required it should be performed in an approved, controlled and safe environment in accordance with the venting procedure.

Ethylene presents a significant fire hazard based on its physical properties and has an extremely broad flammability range from 2.7% - 34% in air. This means that any uncontrolled releases present a significant threat to its surroundings, i.e. the safety of the operators or physical integrity of structures.
Refrigerated ethylene is stored and transported in insulated pressure vessels, ISO containers.

Each ISO container contains 8.5 tonne of ethylene. The maximum design pressure of the ISO container is 19 barg with a maximum allowable working pressure (MAWP) of 18 barg.

11.2 Rescue

Note that any rescue attempts must be made with another person (buddy system or work in pairs). NEVER go in alone.

Material is an asphyxiant and therefore displaces/dilutes oxygen in air. To protect rescuer, use air-supplied respirator. Be aware of possible explosive atmospheres.

When undertaking rescue, always consider the following:

- Is it safe to go in?
- What are the risks involved?
- What PPE do you need? (see Section 11.0 for details).
- Are all the required PPE available?
- Have a search plan (eg. where are you going to search, how many victims to search for)

11.3 First Aid

If the incident results in any injuries to staff or visitors to the site, the victims must be moved from the area and upwind. Take precautions to ensure rescuer is not overcome. Material is an asphyxiant and therefore displaces/dilutes oxygen in air. To protect rescuer, use air-supplied respirator. Be aware of possible explosive atmospheres. The appropriate PPE must be worn (see Section 11.0 for details).

Medical assistance must be sought promptly by calling an ambulance or site first aider (if available).

First aid actions include but not limited to the following:

- Remove contaminated clothing
- Seek fresh air
- Rest and keep in comfortable position
- If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical assistance.
- For cold burns in eye, immediately wash in and around the eye area with large amounts of lukewarm water for at least 15 minutes. Eyelids to be held apart. Remove clothing if contaminated and wash skin. Urgently seek medical assistance.
- For skin burns, immediately flood burnt area with plenty of lukewarm water and then cover with a clean, dry dressing. Do not use hot water. Seek immediate medical assistance.

12 Ethylene Emergency Procedures

Ethylene liquid and vapour is very cold: -70 to -80 degree C would be typical. Appropriate personal protective equipment (PPE) will be worn by trained technicians to investigate and repair minor leaks.

Leaks involving liquid ethylene are the most hazardous to correct and also the most urgent given the size of the vapour cloud that could develop.

Tightening nuts and bolts on flanges to stop or reduce gasket leaks requires the use of spark proof tools.

During any mitigation activities, the followings are to be observed:

- No source of ignition in the surrounding area within a radius of 10 metres.
- Portable gas detector must be worn by the technician.
- A fire extinguisher shall be readily available.
- In the event of skin contact with liquid, re-warm the affected area in a bath of water between 40-42 degrees Celsius with the aim of minimising tissue loss and reducing chemical irritation.
    - It is important to achieve this temperature range, as lower temperatures are less beneficial to tissue survival, whilst higher temperatures may produce a burn wound and compound the injury
    - Activate motion whilst rewarming is recommended
    - Avoid massaging the affected area
    - After rewarming area should be gently covered with sterile material
    - Do not break any blisters

- Everyone to evacuate the area in the event of uncontrolled loss of containment, i.e. major accident resulting in liquid ethylene being released at high flow rate.

NB: Do not address an ethylene leak alone – A second person, with appropriate safety equipment, must be present when you enter the leak area to fix the problem.

PPE requirement

PPE required when working with ethylene is listed on the appropriate SDS, which should be consulted before dealing with a leak.

Specific PPE that must be used onsite for a leak include the following:
• Anti-static clothing
• Safety glasses and face shield
• Safety boots
• Hearing protection
• Cryogenic gloves
• Personal gas monitor
• Long sleeve shirt and long pants

PPE and equipment required for ISO container maintenance is stored in Site Equipment Container.

12.1 ISO Container Over-Pressurisation

The maximum allowable design pressure for ethylene ISO containers stored on this site is 18 barg. If the ISO pressure reading reaches 15 barg, the pressure level is to be dropped to 5 barg as per the instructions outlined in Section 12.2.

Picture 11.1 End view of ISO container

Picture 11.2 Side view of ISO container

Picture 11.3 Location of manual vent valve V6 on Chart tanks, V4 on Cryovat tanks.

Picture 11.4 Location of pressure gauges on the ISO container

Picture 11.5 Location of vent

Picture 11.6 Vacuum reading

12.2 ISO Container Over-Pressurisation

<table>
<tr><th colspan="2">ISO CONTAINER OVER-PRESSURISATION</th></tr>
<tr><th>POTENTIAL CAUSE</th><th>CONSEQUENCE</th></tr>
<tr><td rowspan="2">Poor vacuum
Damage to outer shell or vacuum relief valve
Excessive number of days since filling due to delays
Fire or heat impact
Excessive inert gas in ISO container during filling</td><td>Pressure rise may cause relief valves to lift automatically
Gas cloud from vent pipe may ignite
Affect personnel</td></tr>
<tr><td>ESCALATIONS
Venting ethylene ignites
Vent valve V6 “ices up” and cannot be closed</td></tr>
<tr><th colspan="2">RESPONSE</th></tr>
<tr><td colspan="2">1. Raise the alarm by calling: ERS 1800 033 111.
2. Classify the emergency as either:
Level 1
Level 2
Level 3
3. If the ISO container has reached high pressure much earlier than would normally be expected, check the vacuum pressure. If the vacuum pressure is above 10 microns (1.3 Pa) – see Picture 11.6, then decant the ISO if safe to do so, otherwise vent the container to reduce pressure.
4. If the ISO container has reached high pressure at the end of its shelf life, vent the container to reduce pressure.
5. Assess need to contact the Emergency Services.
6. Notify – Location, severity, current situation and /or Potential situation - ON Site or Off Site - to
ERS 1800 033 111
Emergency Services 000
7. If possible, delay depressurisation until the wind is in a favourable direction (onsite this is from the south).
8. Clear the area of all personnel.
9. Shut down any ignition sources on the site and prevent all vehicle movements.
10. Ensure vent is free from immediate obstruction.
11. Put on the required PPE.
12. Gradually crack open valve V6 by turning it anti-clockwise to vent ethylene to the atmosphere. Fully open the valve only if it is safe to continue. See Pictures 11.3 to 11.5.
13. Monitor the pressure gauge as shown in Figure 6-5. The pressure drops approximately 0.1 – 0.15 barg every 5 minutes while the release valve is fully open. The aim is to drop the ISO pressure to approximately 5 barg. This should take about 10-15 minutes from 7 barg.
14. When desired pressure is reached (5 barg), shut valve V6 by turning it clockwise until it cannot be turned further.
15. Once this is completed, monitor the pressure gauge and ensure that no ethylene is still being released from the ISO container.
16. Wait 10 minutes then re-check valve V6 is fully closed. Formation of ice can prevent full closure of the valve.
17. Liaise with relevant stakeholders, plan, implement and enact recovery.
18. Report and investigate incident, review incident response.</td></tr>
</table>

<table>
<tr><th colspan="2">SUPPRESSION/MITIGATION</th></tr>
<tr><td colspan="2">MITIGATION
Control all on site ignition sources
Limit manual venting to periods when winds are favourable (from south)
Maintain the detectible gas cloud concentration to 0.7% v/v or lower by adjusting V6, check using portable gas detector</td></tr>
<tr><th>PERSONAL SAFETY</th><th>DECONTAMINATION & RECOVERY</th></tr>
<tr><td>NEVER walk through a flammable gas cloud, if the meter alarms back away.

The mandatory PPE for the venting of ISO container include:
• Anti-static clothing
• Safety glasses and face shield
• Safety boots
• Hearing protection
• Cryogenic gloves
• Personal gas monitor
• Long sleeve shirt and long pants.</td><td>Assess pressure rise rate once venting complete and confirm vacuum in the annular space.
The vacuum may need to be re-established in the annular space.
Notify SSB for support with re-vacuum process (if required). Preference is to consume the contents of the ISO container ASAP</td></tr>
</table>

12.3 Ethylene Leak

Leak Detection

Routine attended monitoring of the ISO containers is the primary means of detecting flammable gas leaks, through early detection of small leaks. Ethylene liquid and vapour leaking to atmosphere can be identified in several ways:

- The flammable gas detector system may be indicating an alarm,
- The pressurised ethylene may emit a noise at the point of leakage,
- Frosting may be visible at the leak point,
- Pressure or vacuum anomalies may exist on one of the ISO containers and this would be a good candidate for priority inspection.

The secondary fixed gas detection consists of:
Fixed line of sight gas detectors installed along the east and west boundaries of the isotainer storage area. These are connected to a centralised control unit on-site fitted with Audio-Visual alarms and SMS alert system.

12.4 Vapour Leak from Valve Stem/Piping

VAPOUR LEAK FROM VALVE STEM / PIPING	
POTENTIAL CAUSE	**CONSEQUENCE**
• Valve gland packing not correctly installed • Gasket leak • Flange bolts loosened • Mechanical impact • Overpressure	• Ethylene gas cloud forms from the leak point • Affect personnel in gas path • Potential fire if ignited quickly • Potential flash fire if ignition delayed • Possible off-site effect
	ESCALATIONS
	• Fire at leak point in piping impacts adjacent piping causing failure

RESPONSE

1. Check severity and location (whether it is a current or potential emergency)
2. Raise the alarm by calling: ERS 1800 033 111
3. Classify the emergency as either:
   - Level 1
   - Level 2
   - Level 3
4. Assess need to contact the Emergency Services
5. If the leak is likely to have effect outside the site boundary (Level 3) note the current wind direction.
6. Notify – Location, severity, current situation and /or Potential situation - ON Site or Off Site - to
   - ERS 1800 033 111
   - Emergency Services 000
7. If the leak is large (white fogging gas cloud), evacuate the area and assist with traffic control
8. Move to a safe location by walking across and upwind of the site
9. Clear area of all personnel
10. Put on the required PPE
11. Isolate the leak by shutting valves or tightening bolts with spark free tools – IF trained and safe to do so
12. Communicate with nominated Emergency Services Officer for requests, updates and assistance with information
13. Isolate site. Restrict access to emergency responders only.
14. Take precautionary measures against static charges. Remove other hazards (vehicles, property, product) – IF safe to do so
15. Liaise with relevant stakeholders, plan, implement and enact recovery
16. Report and investigate incident, review incident response

<u>Note for Emergency Services:</u>

17. Evacuate to communication tower approx. 1 kilometres (1000 metres) west of site.
18. Complete testing with a gas (ethylene) monitor to establish safe distance and levels

19. PPE includes anti-static and protective clothing, safety glasses and face shield, safety boots, cryogenic gloves, personal gas monitor.
20. Avoid skin or eye contact. Frost bite can occur.
21. Ethylene is an asphyxiant.

SUPPRESSION/MITIGATION

SUPPRESSION

- Determine if an upstream valve can be closed more tightly.
- Attempt to nip up all bolts on the flange using spark proof tools.

MITIGATION

- If leak is large, evacuate the area (see Section 11.2.1)
- Activate emergency response plan (ERP)
- Depressurise ISO container as much as possible using the manual vent valve V6
- If leak persists, attempt to seal the leak using Mastic

PERSONAL SAFETY	DECONTAMINATION & RECOVERY
NEVER walk through a flammable gas cloud, if the meter alarms back away. The required PPE include: • Anti-static clothing • Safety glasses and face shield • Safety boots • Hearing protection • Cryogenic gloves • Personal gas monitor • Long sleeve shirt and long pants.	• If leak cannot be isolated, consider allowing product to be released into the atmosphere (site must be evacuated). • Neighbours must be informed and gas concentrations monitored at all times.

12.5 Liquid Leak from Valve Stem/Piping

LIQUID LEAK FROM VALVE STEM / PIPING	
POTENTIAL CAUSE	**CONSEQUENCE**
• Valve gland packing not correctly installed • Gasket leak • Flange bolts loosened • Mechanical impact • Overpressure	• Ethylene gas cloud generated from vaporising liquid • Affect personnel in gas path • Potential fire if ignited quickly • Potential flash fire if ignition delayed • Possible off-site effect
	ESCALATIONS
	• Large ethylene gas cloud generated if leak not controlled • Increased off-site effect • Fire at leak point in piping impacts adjacent piping causing failure

RESPONSE

1. Check severity and location (whether it is a current or potential emergency)
2. Raise the alarm by calling: ERS 1800 033 111
3. Classify the emergency as either:
   - Level 1
   - Level 2
   - Level 3
4. Assess need to contact the Emergency Services
5. If the leak is likely to have effect outside the site boundary (Level 3) note the current wind direction.
6. Notify – Location, severity, current situation and /or Potential situation - ON Site or Off Site - to
   - ERS 1800 033 111
   - Emergency Services 000
7. If the leak is large (white fogging gas cloud), evacuate the area and assist with traffic control
8. Move to a safe location by walking across and upwind of the site
9. Clear area of all personnel
10. Put on the required PPE
11. Isolate the leak by shutting valves or tightening bolts with spark free tools – IF trained and safe to do so
12. Communicate with nominated Emergency Services Officer for requests, updates and assistance with information
13. Isolate site. Restrict access to emergency responders only.
14. Take precautionary measures against static charges. Remove other hazards (vehicles, property, product) – IF safe to do so
15. Liaise with relevant stakeholders, plan, implement and enact recovery
16. Report and investigate incident, review incident response

<u>Note for Emergency Services:</u>

22. Evacuate to communication tower approx. 1 kilometres (1000 metres) west of site.
23. Complete testing with a gas (ethylene) monitor to establish safe distance and levels
24. PPE includes anti-static and protective clothing, safety glasses and face shield, safety boots, cryogenic gloves, personal gas monitor

25. Avoid skin or eye contact. Frost bite can occur
26. Ethylene is an asphyxiant

SUPPRESSION/MITIGATION

SUPPRESSION

- Determine if an upstream valve can be closed more tightly.
- Attempt to nip up all bolts on the flange using spark proof tools.

MITIGATION

- If leak is large, evacuate the area (see Section 11.2.1)
- Activate emergency response plan (ERP)
- Depressurise ISO container as much as possible using the manual vent valve V6
- If leak persists, attempt to seal the leak using Mastic

PERSONAL SAFETY	DECONTAMINATION & RECOVERY
NEVER walk through a flammable gas cloud, if the meter alarms back away. The required PPE include: • Anti-static clothing • Safety glasses and face shield • Safety boots • Hearing protection • Cryogenic gloves • Personal gas monitor • Long sleeve shirt and long pants.	• If leak cannot be isolated, consider allowing product to be released into the atmosphere (site must be evacuated) • Neighbours must be informed and gas concentrations monitored at all times.

12.6 Vapour or Liquid Leak from Gauges

VAPOUR / LIQUID LEAK FROM GAUGES	
POTENTIAL CAUSE	**CONSEQUENCE**
• Faulty seals • Connection leak • Mechanical impact • Hydrostatic expansion • Excessive pressure	• Very small liquid ethylene leak from tubing • Affect personnel on site (cold burns) **ESCALATIONS** • Small fire at leak point

RESPONSE

1. Check severity and location (whether it is a current or potential emergency)
2. Raise the alarm by calling: ERS 1800 033 111
3. Classify the emergency as either:
   - Level 1
   - Level 2
   - Level 3
4. Assess need to contact the Emergency Services
5. If the leak is likely to have effect outside the site boundary (Level 3) note the current wind direction.
6. Notify – Location, severity, current situation and /or Potential situation - ON Site or Off Site - to
   - ERS 1800 033 111
   - Emergency Services 000
7. If the leak is large (white fogging gas cloud), evacuate the area and assist with traffic control
8. Move to a safe location by walking across and upwind of the site
9. Clear area of all personnel
10. Put on the required PPE
11. Isolate the leak by shutting valves V14 and V15 – IF trained and safe to do so
12. Communicate with nominated Emergency Services Officer for requests, updates and assistance with information
13. Isolate site. Restrict access to emergency responders only.
14. Take precautionary measures against static charges. Remove other hazards (vehicles, property, product) – IF safe to do so
15. Liaise with relevant stakeholders, plan, implement and enact recovery
16. Report and investigate incident, review incident response

<u>Note for Emergency Services:</u>

27. Evacuate to communication tower approx. 1 kilometres (1000 metres) west of site.
28. Complete testing with a gas (ethylene) monitor to establish safe distance and levels
29. PPE includes anti-static and protective clothing, safety glasses and face shield, safety boots, cryogenic gloves, personal gas monitor
30. Avoid skin or eye contact. Frost bite can occur
31. Ethylene is an asphyxiant

<table>
<tr><th colspan="2">SUPPRESSION/MITIGATION</th></tr>
<tr><td colspan="2">SUPPRESSION
• Close isolation needle valves

MITIGATION
• Analyse vapour cloud concentration using portable gas detector
• Note distance to 25% LEL (0.7% v/v)</td></tr>
<tr><th>PERSONAL SAFETY</th><th>DECONTAMINATION & RECOVERY</th></tr>
<tr><td>NEVER walk through a flammable gas cloud, if the meter alarms back away.

The required PPE include:
• Anti-static clothing
• Safety glasses and face shield
• Safety boots
• Hearing protection
• Cryogenic gloves
• Personal gas monitor
• Long sleeve shirt and long pants</td><td>• Consider replacing the leaking gauge
• If leak cannot be isolated, consider allowing product to be released into the atmosphere (site must be evacuated)
  • Neighbours must be informed and gas concentrations monitored at all times.</td></tr>
</table>

12.7 ISO Container Dropped

ISO CONTAINER DROPPED (DURING LIFTING)	
POTENTIAL CAUSE	**CONSEQUENCE**
• Mechanical/equipment issues during loading/unloading.	• Damage to ISO container. • Damage to site. • Disruption to site access and egress. • Road closures.
	ESCALATIONS
	• If damage is significant, ethylene gas containment may be jeopardised. • If there is a leak, potential fire if ignited quickly. • If there is a leak, potential flash fire if ignition delayed.

RESPONSE

1. Check severity and location (whether it is a current or potential emergency)
2. Raise the alarm by calling: ERS 1800 033 111
3. Classify the emergency as either:
4. Level 1
5. Level 2
6. Level 3
7. Assess need to contact the Emergency Services
8. If the drop has caused significant damage to the ISO container and a leak is likely to have effect outside the site boundary (Level 3), note the current wind direction
9. Notify – Location, severity, current situation and /or Potential situation - ON Site or Off Site - to
10. ERS 1800 033 111
11. Emergency Services 000
12. If the leak is large (white fogging gas cloud), evacuate the area and assist with traffic control
13. Move to a safe location by walking across and upwind of the site
14. Clear area of all personnel
15. Put on the required PPE
16. Isolate the leak by shutting valves or tightening bolts with spark free tools – IF trained and safe to do so
17. Communicate with nominated Emergency Services Officer for requests, updates and assistance with information
18. Isolate site. Restrict access to emergency responders only.
19. Take precautionary measures against static charges. Remove other hazards (vehicles, property, product) – IF safe to do so
20. Liaise with relevant stakeholders, plan, implement and enact recovery
21. Report and investigate incident, review incident response

<u>Note for Emergency Services:</u>

22. Evacuate to communication tower approx. 1 kilometres (1000 metres) west of site.
23. Complete testing with a gas (ethylene) monitor to establish safe distance and levels
24. PPE includes anti-static and protective clothing, safety glasses and face shield, safety boots, cryogenic gloves, personal gas monitor
25. Avoid skin or eye contact. Frost bite can occur

26. Ethylene is an asphyxiant.

SUPPRESSION/MITIGATION

SUPPRESSION

- Determine if an upstream valve can be closed more tightly.
- Attempt to nip up all bolts on the flange using spark proof tools.

MITIGATION

- If leak is large, evacuate the area (see Section 11.2.1)
- Activate emergency response plan (ERP)
- Depressurise ISO container as much as possible using the manual vent valve V6

PERSONAL SAFETY	DECONTAMINATION & RECOVERY
NEVER walk through a flammable gas cloud, if the meter alarms back away. The required PPE include: • Anti-static clothing • Safety glasses and face shield • Safety boots • Hearing protection • Cryogenic gloves • Personal gas monitor • Long sleeve shirt and long pants	• If leak cannot be isolated, consider allowing product to be released into the atmosphere (site must be evacuated) • Neighbours must be informed and gas concentrations monitored at all times.

13 Fire Related Incidents

Fire Response

An important principle in reacting to flammable gas fires is to allow the flame to continue to burn until the supply of fuel can be isolated or is exhausted. This is the only safe way to extinguish the flame.

Extinguishing the flame using standard fire control methods such as water spray, or extinguishers must be avoided or the leaking gas could accumulate into a dangerous cloud with explosive potential.

As ethylene has a wide flammable range, no ignition sources should be near ethylene discharge.

In the case of major loss of containment, it should be noted that large gas cloud could form and may result in flash fires, jet fires, Unconfined Vapour Cloud Explosion (UVCE) and upon failure of ISO container, Boiling Liquid Expanding Vapour Explosion (BLEVE) may result.

Ethylene flash fire will burn back to the release point and continue to burn there. Flames at the leak point will be allowed to burn. If the flame is extinguished externally there is the possibility of a vapour cloud explosion.

13.1 Major Leak, Fire, or Explosion

<table>
<tr><th colspan="2">MAJOR LEAK / FIRE / EXPLOSION</th></tr>
<tr><th>POTENTIAL CAUSE</th><th>CONSEQUENCE</th></tr>
<tr><td rowspan="3">• Major loss of containment followed by ignition.</td><td>• Ethylene burning at release point.
• Large gas cloud forms and ignites with a resulting flash fire
• Large gas cloud forms resulting in Unconfined Vapour Cloud Explosion (UVCE)
• ISO container bursts with resulting fireball (BLEVE)
• Likely off-site effects</td></tr>
<tr><th>ESCALATIONS</th></tr>
<tr><td>• Knock-on ISO containers.
• Increased duration of event.</td></tr>
<tr><th colspan="2">RESPONSE</th></tr>
<tr><td colspan="2">1. Raise the alarm by calling: ERS 1800 033 111
2. Move to a safe location by walking across and upwind of the site.
3. Classify the emergency as either:
4. Level 2
5. Level 3
6. If the leak/fire is likely to have effect outside the site boundary (Level 3), note the current wind direction.
7. Notify – Location, severity, current situation and /or Potential situation - ON Site or Off Site - to
8. ERS 1800 033 111
9. Emergency Services 000
10. Clear area of all personnel
11. Communicate with nominated Emergency Services office for requests, updates and assistance with information
12. Isolate site. Restrict access to emergency responders only.
13. Liaise with relevant stakeholders, plan, implement and enact recovery
14. Report and investigate incident, review incident response

<u>Note for Emergency Services:</u>

15. Evacuate to communication tower approx. 1 kilometres (1000 metres) west of site.
16. Complete testing with a gas (ethylene) monitor to establish safe distance and levels
17. PPE includes anti-static and protective clothing, safety glasses and face shield, safety boots, cryogenic gloves, personal gas monitor.
18. Avoid skin or eye contact. Frost bite can occur.
19. Ethylene is an asphyxiant.
20. The only safe way to extinguish flame is to allow it to continue to burn until the supply of fuel can be isolated or is exhausted.</td></tr>
</table>

<table>
<tr><th colspan="2">SUPPRESSION/MITIGATION</th></tr>
<tr><td colspan="2">SUPPRESSION

• Do NOT attempt fire suppression.

MITIGATION

• Notify Emergency Services
• Activate emergency response plan (ERP)</td></tr>
<tr><th>PERSONAL SAFETY</th><th>DECONTAMINATION & RECOVERY</th></tr>
<tr><td>• Evacuate to a safe location across and upwind of the site.
• Do not put yourself at risk.</td><td>• Emergency Services will take control.
• Neighbours must be informed and gas concentrations monitored at all times.</td></tr>
</table>

13.2 Other Fire Incidents

The planned response to other fire incidents for the ISO container storage facility are summarised in the table below.

<table>
<tr><th colspan="2">OTHER FIRE INCIDENTS</th></tr>
<tr><th>POTENTIAL CAUSE</th><th>CONSEQUENCE</th></tr>
<tr><td rowspan="2">Fire on vehicle (tyres, breaks).
Bush fire or neighbouring building fire causes ember attack.
Leak of diesel from diesel generator or vehicle.
Fire caused by source of ignition onto pool of leaked fuel.
Electrical fault causing fire.</td><td>Equipment damage.
Threat to personnel in vicinity of fire.</td></tr>
<tr><td>ESCALATIONS
Impact on ethylene ISO containers.
Toxic fume hazards from burning PVC (electrical fire).</td></tr>
<tr><th colspan="2">RESPONSE</th></tr>
<tr><td colspan="2">1. Raise the alarm by calling: ERS 1800 033 111
2. Classify the emergency as either:
• Level 1
• Level 2
• Level 3
3. Assess need to contact the Emergency Services
4. Notify – Location, severity, current situation and /or Potential situation - ON Site or Off Site - to
• ERS 1800 033 111
• Emergency Services 000
5. Isolate power supply to fire areas/equipment
6. Clear area of all personnel
7. Fire extinguishers located at site emergency exits
8. Apply dry chemical fire extinguishers to fire
9. Communicate with nominated Emergency Services office for requests, updates and assistance with information
10. Liaise with relevant stakeholders, plan, implement and enact recovery
11. Report and investigate incident, review incident response</td></tr>
<tr><th colspan="2">SUPPRESSION/MITIGATION</th></tr>
<tr><td colspan="2">SUPPRESSION
Isolate power supply to fire areas/equipment.
Use portable fire extinguishers (Suitable extinguishing media: normal foam, dry agent (carbon dioxide, dry chemical powder).
MITIGATION
Activate emergency response plan (ERP)</td></tr>
<tr><th>PERSONAL SAFETY</th><th>DECONTAMINATION & RECOVERY</th></tr>
<tr><td>Site area PPE.
Do not put yourself at risk.</td><td>Cleaning and restoration of PPE & other equipment (fire extinguishers).
Isolate electrical supply (for electrical fires).
Neighbours must be informed and gas concentrations monitored at all times.</td></tr>
</table>

14 Other Incidents

14.1 Medical Emergency

<table>
<tr><th colspan="2">MEDICAL EMERGENCY</th></tr>
<tr><th>POTENTIAL CAUSE</th><th>CONSEQUENCE</th></tr>
<tr><td rowspan="3">• An illness or injury occurring on site regardless of any related incident.</td><td>• Injury to personnel.
• First aid assistance must be provided as soon as possible.</td></tr>
<tr><th>ESCALATIONS</th></tr>
<tr><td>• An illness or injury of a life-threatening nature.</td></tr>
<tr><th colspan="2">RESPONSE</th></tr>
<tr><td colspan="2">1. Assess the severity and location (whether it is a current or potential emergency). When the illness or injury is of a life-threatening nature, contact Emergency Services immediately by dialling 000.
2. Raise the alarm by calling: ERS 1800 033 111
3. Notify – Location, severity, current situation and /or Potential situation - ON Site or Off Site - to
• ERS 1800 033 111
• Emergency Services 000
4. Isolate incident. Check for additional hazards and/or risks to yourself and the injured person (electrical, chemical, mechanical, or other).
5. Give assistance if safe to do so and qualified. Assess whether medical evacuation will be required
6. First aid kit available at site entrance
7. Clear area of all personnel
8. Review injured person’s medical history
9. Meet Emergency Services and direct them to the injured person
10. Brief Emergency Services upon arrival with the following:
• Injured person’s medical issues and history.
• Current area hazards/risks and any potential hazards/risks.
11. Communicate with nominated Emergency Services office for requests, updates and assistance with information
12. Liaise with relevant stakeholders, plan, implement and enact recovery
13. Report and investigate incident, review incident response</td></tr>
<tr><th colspan="2">SUPPRESSION/MITIGATION</th></tr>
<tr><td colspan="2">SUPPRESSION
• First aider should be summoned immediately
• First aider to treat minor injuries and commence CPR if required.
MITIGATION
• Activate emergency response plan (ERP)
• A person should stand-by at the road to direct ambulance upon arrival.</td></tr>
<tr><th>PERSONAL SAFETY</th><th>DECONTAMINATION & RECOVERY</th></tr>
<tr><td>• Site area PPE.
• Do not put yourself at risk.
• First aid kit at site entrance</td><td>• Cleaning and restoration of PPE & other equipment.</td></tr>
</table>

14.2 Off-Site Impact

BOMB THREAT	
POTENTIAL CAUSE	**CONSEQUENCE**
• Fire on neighbouring property • Collapsed building or equipment on neighbouring property • Medical emergency on neighbouring site • Major incident on neighbouring site	• Failure of ethylene ISO container. • Possible serious injury to people and major damage to property. **ESCALATIONS** • More than one ethylene ISO container impacted.

RESPONSE

1. Ensure personal safety
2. Determine and assess nature of neighborhood incident
3. If threat is imminent make site safe and evacuate.
4. Gather at muster point furthest away from neighbor being impacted.
5. Raise the alarm by dialing 000 (if required)
6. Notify – Location, severity, current situation and /or Potential situation - ON Site or Off Site - to
   - ERS 1800 033 111
   - Implement traffic management for site access (Police)
7. Do not allow re-entry to the site until declared safe by Police
8. On arrival of Police transfer control of the emergency
9. Assist the emergency authorities if requested
10. Communicate with nominated Emergency Services Officer for requests, updates and assistance with information
11. Liaise with relevant stakeholders, plan implement, and enact Recovery
12. Report and Investigate incident review incident response

NOTE: Statements to media may only be made by authorised company spokesperson.

SUPPRESSION/MITIGATION

SUPPRESSION

- Isotainers stored away from neighbouring boundary
- Limited amount of combustible materials on site
-

MITIGATION

- Activate emergency response plan (ERP)

PERSONAL SAFETY	DECONTAMINATION & RECOVERY
• Site area PPE. • Do not put yourself at risk.	• Await instructions from neighbours and emergency services

14.3 Site Security/Civil Disturbance/Demonstration

<table>
<tr><th colspan="2">SITE SECURITY / CIVIL DISTURBANCE / DEMONSTRATION</th></tr>
<tr><th>POTENTIAL CAUSE</th><th>CONSEQUENCE</th></tr>
<tr><td rowspan="3">• Demonstration against the chemical industry, LNG industry, or IXOM.
• Demonstration due to industrial dispute.
• Vandalism/malicious intent.</td><td>• Demonstrators seeking publicity for their cause (they don't usually seek to place people/property at risk).
• Actions of vandals or demonstrators may inadvertently create a risk.</td></tr>
<tr><td>ESCALATIONS</td></tr>
<tr><td>• Damage to ISO containers leading to leak of ethylene.</td></tr>
<tr><th colspan="2">RESPONSE</th></tr>
<tr><td colspan="2">1. Lock gates to not allow entry to the site until assured that demonstrators will not attempt site entry.
2. Raise the alarm by calling: ERS 1800 033 111
3. Notify – Location, severity, current situation and /or Potential situation - ON Site or Off Site - to
4. ERS 1800 033 111
5. Emergency Services 000
6. Ask the group or individual whom they wish to speak to.
7. Assess whether any action is likely to create a safety risk to any personnel or property and request the group or individual to limit their action.
8. Assess need to contact the Emergency Services
9. If there is an imminent threat to safety, discontinue all operations and make safe.
10. Liaise with relevant stakeholders, plan, implement and enact recovery
11. Report and investigate incident, review incident response

NOTE: Statements to media may only be made by authorised company spokesperson.</td></tr>
<tr><th colspan="2">SUPPRESSION/MITIGATION</th></tr>
<tr><td colspan="2">SUPPRESSION
• Lock gates to not allow entry to site
• Contact Emergency Services

MITIGATION
• Activate emergency response plan (ERP)</td></tr>
<tr><th>PERSONAL SAFETY</th><th>DECONTAMINATION & RECOVERY</th></tr>
<tr><td>• Site area PPE.
• Do not put yourself at risk.</td><td></td></tr>
</table>

14.4 Bomb Threat

BOMB THREAT	
POTENTIAL CAUSE	**CONSEQUENCE**
• Bomb threats are normally issued by telephone call - record details on AFP checklist (see Appendix 2). • All threats should be treated seriously.	• Failure of ethylene ISO container. • Possible serious injury to people and major damage to property.
	ESCALATIONS
	• More than one ethylene ISO container impacted.

RESPONSE

1. Check severity and location (whether it is a current or potential emergency).
2. Raise the alarm by dialing 000
3. If threat is imminent make site safe and evacuate.
4. Notify – Location, severity, current situation and /or Potential situation - ON Site or Off Site - to
5. ERS 1800 033 111
6. Implement traffic management for site access (Police)
7. Do not initiate site search or attempt to check any suspect items until arrival of emergency services.
8. If bomb has been detonated and consequence is rupture of ethylene ISO container then contact 000 and recommend that the State Emergency Response Plan be implemented immediately.
9. Do not allow re-entry to the site until declared safe by Police
10. Bomb threats usually come in one of the following forms:

Written threat Telephone threat Suspicious package/object

11. Written Threat: Suspicious mail items
12. Keep the document and items associated with the written threat, (envelope/ container)
13. Cease all unnecessary handling of these items, to preserve the evidence.
14. Place all items into a plastic envelope/sleeve to preserve the items.
15. Telephone Threat:
16. The person receiving the bomb threat must not hang up, engage the caller in conversation
17. Treat the call as a real threat and record all information
18. Record all information using the Bomb Threat Checklist (see Appendix 2)
19. Suspicious Package/Object (A suspiciously labelled object)
20. Notify the manager of the package / object and determine if it is a threat
21. Deem the package a threat if suspicious or placed where it should not be
22. Keep the area clear of occupants immediately upon deeming the package a threat
23. Communications System

There may be a requirement for UHF radios and not mobile phones to not be used during the evacuation or searching. The police will advise if this is the case upon their arrival, as the use of these devices may set off the bomb.

24. On arrival of Police transfer control of the emergency
25. Assist the emergency authorities with a search of the premises
26. Communicate with nominated Emergency Services Officer for requests, updates and assistance with information

27. Liaise with relevant stakeholders, plan implement, and enact Recovery
28. Report and Investigate incident review incident response

NOTE: Statements to media may only be made by authorised company spokesperson.

Note for Emergency Services:

29. Evacuate to communication tower approx. 1 kilometres (1000 metres) west of site.
30. Complete testing with a gas (ethylene) monitor to establish safe distance and levels
31. PPE includes anti-static and protective clothing, safety glasses and face shield, safety boots, cryogenic gloves, personal gas monitor
32. Avoid skin or eye contact. Frost bite can occur
33. Ethylene is an asphyxiant.
34. The only safe way to extinguish flame is to allow it to continue to burn until the supply of fuel can be isolated or is exhausted.

SUPPRESSION/MITIGATION

SUPPRESSION

- Do not hang up the phone where the threat was received
- Record call details on AFP checklist (see Appendix 2)
- Contact 000 and request Police presence. Advise them that there has been a bomb threat

MITIGATION

- Activate emergency response plan (ERP)

PERSONAL SAFETY	DECONTAMINATION & RECOVERY
• Site area PPE. • Do not put yourself at risk.	• Cleaning and restoration of site & other equipment.

14.5 Severe Weather

<table>
<tr><th colspan="2">SEVERE WEATHER</th></tr>
<tr><th>POTENTIAL CAUSE</th><th>CONSEQUENCE</th></tr>
<tr><td rowspan="3">• Weather conditions in local and surrounding area.</td><td>• Damage to ISO container.
• Damage to site.
• Disruption to site access and egress.
• Road closures.</td></tr>
<tr><th>ESCALATIONS</th></tr>
<tr><td>• Possible serious injury to people and major damage to property.
• More than one ethylene ISO container impacted.</td></tr>
</table>

RESPONSE

1. Check severity and location (whether it is a current or potential emergency)
2. Raise ALARM Dial 000
3. Notify – Location, severity, current situation and /or Potential situation to
   - ERS 1800 033 111
   - Implement Traffic Management for site access (Police)
4. External Emergencies may take the form of severe weather and / or natural disasters
   - Storms / Cyclones
   - Flood / Storm Surge
   - Earthquake
5. Warnings may be issued by authorities in relation to the above in which case appropriate preparations can be made. For example:
   - Transport/road conditions: closures, traffic movements, accidents
   - Weather/storms: secure items to prevent them becoming missiles
   - Check drains are not blocked
   - Check items in low lying storage areas that may need to be raised
6. Response
   - Portside Storage to discuss with Ixom contacts and other stakeholders as to how work can continue. The site may be closed for the duration of the emergency.
7. Decisions based on the information available will be implemented
8. Review scheduling of deliveries and loading. **No operations if lightning present within 15kms.**
9. Implement a watch for further information
10. Obtain information on possible storm surge
11. Cease operations at the site
12. Remove loose debris from site and secure all loose items on site
13. Lower windsock
14. Inspect storage site for security of ISO containers and site perimeter
15. Vacate storage site notify neighbouring businesses of preparation status for site
16. Establish communication channels for monitoring the situation as further developments occur
17. <u>DURING the Severe Weather occurrence</u>
    - Monitor weather and news reports keep up to date with impacts and pending impacts for Flooding, tide surges, winds, services, road conditions, utilities,
    - Liaise with Police, other Emergency Services, and SES
    - Maintain communication channels

- Provide updates to all stakeholders

18. FOLLOWING the severs weather occurrence

- Assess and report on site accessibility
- Report on site damage
- Advise of plan for resumption of operations

SUPPRESSION/MITIGATION	
SUPPRESSION • Loose items on site are put away or secured **MITIGATION** • Activate emergency response plan (ERP)	
PERSONAL SAFETY	**DECONTAMINATION & RECOVERY**
• Site area PPE. • Do not put yourself at risk.	• Cleaning and restoration of PPE & other equipment.

14.6 Breach of Physical Security

<table>
<tr><th colspan="2">Breach of Physical Security</th></tr>
<tr><th>POTENTIAL CAUSE</th><th>CONSEQUENCE</th></tr>
<tr><td rowspan="3">• Break-in
• Thieves</td><td>• Damage to ISO container.
• Damage to site.
• Disruption to site access.</td></tr>
<tr><th>ESCALATIONS</th></tr>
<tr><td>• Possible serious injury to people and major damage to property.
• More than one ethylene ISO container impacted.</td></tr>
<tr><th colspan="2">RESPONSE</th></tr>
<tr><td colspan="2">Background:

In the event of a physical security breach the safety of personnel is paramount. No attempt should be made to confront suspected intruders. The first response to a suspected breach of security is to call the police. There are two possible scenarios:
• Signs of a security breach discovered on arrival at site
• Security breach during working hours
• On finding signs of a security breach, the Chief Warden or most senior person available should be contacted immediately.
• If it is possible that intruders are still in the vicinity, the police should be contacted by ringing 000.
• The most senior person available will assume control of the incident as Chief Warden.
○ Note - on arrival, the police will assume control of any ongoing incident
• The Chief Warden will aid the police in any way necessary, in determining any damage, what is missing, etc.
• If a security breach causes a secondary incident, such as a chemical spillage, the Chief Warden will initiate the appropriate response
• Once the police commander has confirmed that the initial security breach has ended, and in particular that there are no intruders on site, control of the situation will revert back to the Chief Warden
• The Chief Warden will organise any work required to make the site secure, and complete any clean-up operation.
• The Chief Warden will terminate the incident, give the all clear, and prepare and submit an incident report.</td></tr>
<tr><th colspan="2">SUPPRESSION/MITIGATION</th></tr>
<tr><td colspan="2">SUPPRESSION
• Site is secured with fencing
• No valuables left on site
• CCTV camera as a deterrent
MITIGATION
• Activate emergency response plan (ERP)</td></tr>
<tr><th>PERSONAL SAFETY</th><th>DECONTAMINATION & RECOVERY</th></tr>
<tr><td>• Do not put yourself at risk.</td><td>• Assess site for damage and instigate repairs</td></tr>
</table>

15 Terminating an Emergency

The Emergency Commander will carefully consider the overall situation and arrange for any outstanding actions to be completed.

The Emergency Commander will announce the "all clear" and declare the emergency complete.

The declaration of the end of the emergency will be made by emergency radio AND by sounding the ALL CLEAR SIREN.

RECOMMENCING OPERATIONS

Resumption of normal operations will depend on damage to property, removal of debris, repair or replacement of machinery and the need to preserve evidence (see section 13.2).

The decision to resume operations will be made by the Site Manager or his/her deputy when he/she is satisfied it is safe to do so.

16 Administration

16.1 Public Relations and Debriefing

Incident debriefs are to be held in accordance with Company policy within four weeks of the incident investigation being closed.

Media statements must only be made by Senior Management.

16.2 Statutory Investigation

Various types of Statutory Investigations may follow any emergency.

CORONIAL INQUIRY

Will be held in the case of any fatality and may be held in the case of fire. In these cases preservation of evidence is highly important.

The Emergency Commander will ensure that there is no cleaning up, repairs or movement of bodies, apart from that necessary to control the emergency, without approval of the senior Police officer on site.

The Police will manage all aspects of the coronial inquiry. There must be no interference with the scene or with evidence that may be used in the inquiry. Every co-operation should be given to the investigating police.

OTHER DEPARTMENTAL INVESTIGATIONS

Other relevant Government authorities may decide to investigate an emergency eg. HICB. They will be directed in the first instance to Site Manager.

It is essential that these visitors are escorted on site but only when safe conditions exist or hazards have been defined.

16.3 Incident Report and Review of Plan Post-Incident

Immediately after the emergency is over the Site Manager will arrange for an investigation and written report of the incident to be prepared. The investigation will include a detailed review of the sequence of events, communications and actions taken immediately prior to, during, and after the emergency situation. Where available instrument charts, maintenance logs, pressure monitoring logs, etc. will be examined carefully and retained. In most cases photographs taken immediately after the emergency will be of value to the investigators. Those present at the emergency situation will be interviewed by the investigating committee as soon as practical after the emergency.

The report will include a review of the emergency procedures and recommend changes as required.

Normally the report will be produced by the investigating committee and should be completed within one month of the emergency.

The report will contain the following information:

1. Objectives of Report
2. Summary
3. Conclusions
4. Recommendations
5. Main body of the report should include brief, relevant facts, findings, discussion and analysis of findings, relevant operating data.
6. Appendices including photographs, diagrams, maps etc.

16.3.1 Follow-up and Corrective Actions

The Emergency Commander shall record information about the incident as appropriate:

- SHE issues and actions system.
- Incident and Emergency Log.
- Incident Notification Form.
- Incident Investigation Form.
- Debrief Report Form.
- Incident and Emergency Manager Handover Brief.
- Incident Report.

If injuries occurred as a result of the incident, record details on the documents:

- SHE Incident Register
- SHE Incident Form

The Site Manager is responsible for carrying out or delegating the following tasks:

- Undertake appropriate remediation measures to clean up the site.
- Prepare reports as required for external regulators.
- Determine the cause of the leak and take the necessary action to prevent recurrence.
- Review the risk assessment documents relevant to the incident and update them with new information gained.

17 Training and Evaluation

Training is an essential part of this plan.

Training will be arranged for personnel as appropriate to their duties. This will include:

1. Induction Safety Training for all personnel including: CPR, simple firefighting.

2. Specialised training for operational personnel in ethylene storage facilities.

3. Ongoing training as relevant to their duties in firefighting, first aid etc.

4. Emergency response training.

5. Advance fire training as required.

Evaluation of the plan will be conducted through emergency exercises. These will be simulated emergencies involving the site personnel and other groups as deemed appropriate. These exercises may start with table top exercise leading to a walk-through exercise before full simulation.

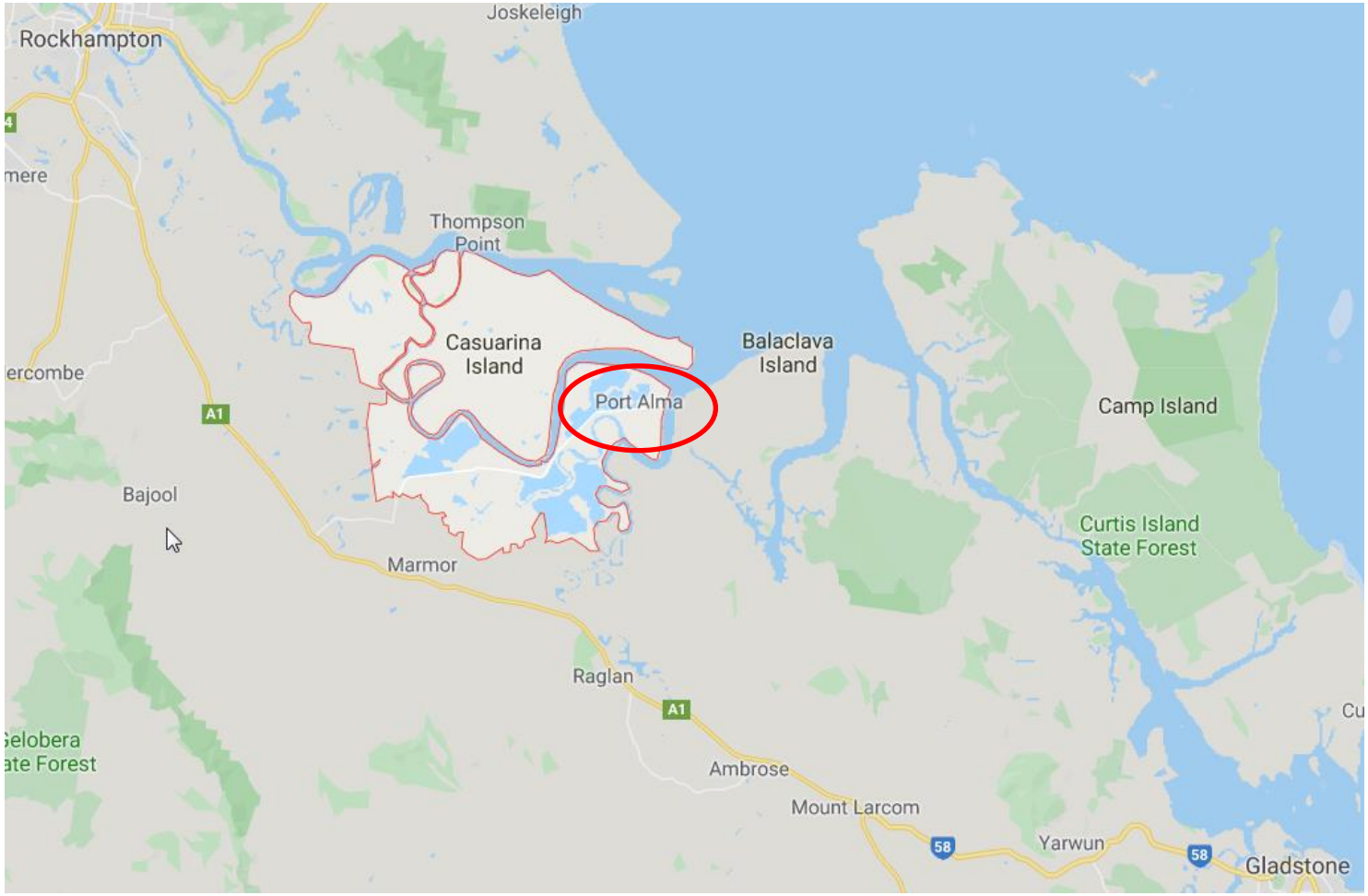
One exercise will be conducted annually. Coordination of the exercise is the responsibility of the Site Manager. Some of the simulated emergencies will involve the external emergency services.

Records will be kept of all exercises, inspections, audits and maintenance activities.

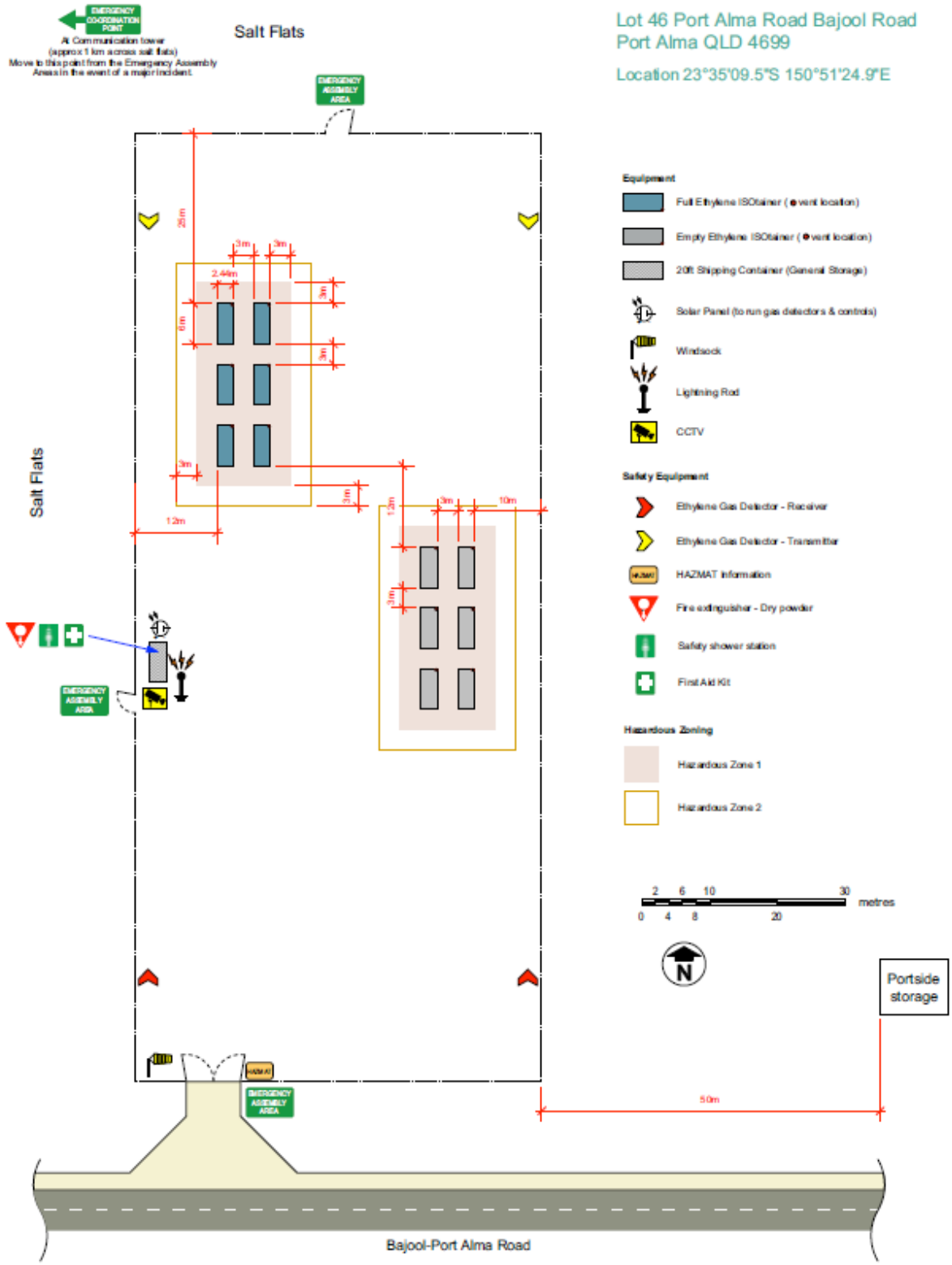
Minimum frequency of review / testing:

Testing Requirements	Frequency
Emergency Response Plan	Annually Following any incident Following any changes to operation procedures
Testing of gas detectors	12 months
Testing of Alarms	Quarterly
Emergency Equipment	Quarterly Audit
Practical or Desk Top Exercise	Annually

18 Site Location Map



19 Site Layout Plan



IXOM Operations - Port Alma Storage Facility - Site Layout Plan | 1:500 | N18018 | A

20 Ixom Emergency Response Service (ERS)

PURPOSE

The Emergency response Service (ERS) is a service provided by Ixom to facilitate communication with the company in an emergency, and the provision of expert assistance. The single number operates 24 hours a day from anywhere in Australia, and is a free call.

Specialist information and advice can be provided to the caller. This helps the company to meet its legal obligation when transporting dangerous goods in bulk. However, the service has been extended beyond this, to providing specialist information and advice (including medical advice) in emergencies associated with the use, storage or transport of Ixom products or raw materials.

The ERS can also provide communications and co-ordination support for company personnel involved in responding to an emergency.

ASSISTANCE AVAILABLE FROM THE ERS

The ERS can assist by:

- Providing first aid advice over the telephone.
- Providing technical advice to mitigate risks before emergency services arrives.
- Locating company doctors and facilitating contact between them and treating doctors. This is to ensure that injured employees receive the best possible medical care.
- Contacting site management, senior management, defined plant personnel and media relations personnel.
- Notifying neighbours of incident at site, such that evacuation can be underway promptly.
- Liaising with government authorities and emergency services personnel.
- Locating product experts.
- Participating in simulated emergencies.
- Participating in the development of site specific ERS standing instructions. This is designed to streamline the provision of assistance to plants during incidents.

CONTACTING THE ERS

Ring the Ixom ERS on 1800 033 111
Inform the duty Emergency Response Coordinator that the incident has occurred.
Supply basic details:

- Name
- Site
- Plant
- Contact Telephone Number
- Name of product involved (if any)
- Action taken so far
- Action required of Emergency Response Coordinator

-= End of Document =-

Appendix A AFB Bomb Threat Checklist

AFP
AUSTRALIAN FEDERAL POLICE
AUSTRALIAN BOMB DATA CENTRE

PHONE BOMB-THREAT CHECKLIST
Remember to keep calm

Important questions to ask

Where did you put it?

When is the bomb going to explode?

What does it look like?

Exact wording of threat

Threat:

General questions to ask

How will the bomb explode?

or

How will the substance be released?

Did you put it there?

Why did you put it there?

Bomb threat questions

What type of bomb is it?

What is in the bomb?

What will make the bomb explode?

Chemical/biological threat questions

What kind of substance is in it?

How much of the substance is there?

How will the substance be released?

Is the substance a liquid, powder or gas?

PHONE BOMB-THREAT CHECKLIST
Remember to keep calm

Other questions to ask

What is your name?

Where are you?

What is your address?

Notes for after the call

CALLER'S VOICE

Accent (specify):

Any impediment (specify):

Voice (loud, soft, etc):

Speech (fast, slow, etc):

Dictation (clear, muffled):

Manner (calm, emotional, etc):

Did you recognise the caller?

If so, who do you think it was?

Was the caller familiar with the area?

THREAT LANGUAGE

Well spoken:

Incoherent:

Irrational:

Taped:

Message read by caller:

Abusive:

Other:

BACKGROUND NOISES

Street noises:

House noises

Aircraft:

Voices:

Music:

Machinery:

Local call noise:

STD:

OTHER

Sex of the caller: Estimated age:

CALL TAKEN

Duration of call: Number called:

ACTION (Obtain details from supervisor)

Report call immediately to:

Phone number:

Who received the call

Name (print):

Telephone number:

Date call received:

Time received:

Signature:

Appendix B Manifest of Dangerous Goods

(see other attachment titled Dangerous Goods Manifest.docx)

Appendix C Safety Data Sheets

Safety Data Sheets (SDS) are issued by Ixom. The SDS contain information on the properties, handling and storage of the chemical in question.

Site Manager is responsible for ensuring that the SDS is maintained and updated.

The copies attached in this document are not controlled and may not be the latest issue.

Appendix D Incident Handover Checklist

	Incident Controller (or First Responder): Day and Date: Time:
GAS LEAK	Container type: Size: When did leak start: What happened: Point of leak (from container): Leak size: Ignition sources: Weather: Wind direction: People/Neighbours: ❑ No risk ❑ At risk ❑ Evacuated Leak control and PPE: Fire Brigade: ❑ At scene ❑ Contacted ❑ Not required Anyone exposed: ❑ No ❑ Yes ⇨ *Any injuries or casualty?*
LIQUID LEAK	How much: Incompatible material: Waterways: ❑ No risk ❑ May enter ❑ Has entered - Details: Weather: Wind direction: People/Neighbours: ❑ No risk ❑ At risk ❑ Evacuated Spill control and PPE available: Fire Brigade: ❑ At scene ❑ Contacted ❑ Not required Anyone exposed: ❑ No ❑ Yes ⇨ *Any injuries or casualty?*

FIRE	Location on site: Power isolated (if safe to do): ❑ Yes ❑ No ❑ Not required Flammable materials isolated (if safe to do): ❑ Yes ❑ No ❑ Not required Fire extinguisher used (if competent and safe to do): ❑ Yes ❑ No ❑ Not required Evacuation necessary: ❑ No ❑ Yes ⇨ *where to:* ⇨ *alternative contact number:* Neighbours alerted: ❑ Yes ❑ No ❑ Not required Wind direction (if threat to neighbours/community): Anyone else notified/any other action taken:
INJURY OR CASUALTY	Nature of injury or fatality (how?): Name of deceased or injured: <u>Injury</u>: ❑ First aid provided ❑ Further treatment required? <u>Major Injury</u>: ❑ Ambulance called ❑ Family informed? ❑ Counselling required? <u>Fatality</u>: ❑ Police called ❑ Family informed by police *(not by company personnel)* ❑ Counselling required?
NOTES	Handed over to (Name, Position Title): Day and Date: Time: Notes:

DA Form 1 – Development application details

Approved form (version 1.4 effective 15 December 2023) made under section 282 of the Planning Act 2016.

This form **must** be used to make a development application **involving code assessment or impact assessment**, except when applying for development involving only building work.

For a development application involving **building work only**, use *DA Form 2 – Building work details*.

For a development application involving **building work associated with any other type of assessable development (i.e. material change of use, operational work or reconfiguring a lot)**, use this form (*DA Form 1*) **and** parts 4 to 6 of *DA Form 2 – Building work details.*

Unless stated otherwise, all parts of this form **must** be completed in full and all required supporting information **must** accompany the development application.

One or more additional pages may be attached as a schedule to this development application if there is insufficient space on the form to include all the necessary information.

This form and any other form relevant to the development application must be used to make a development application relating to strategic port land and Brisbane core port land under the *Transport Infrastructure Act 1994*, and airport land under the *Airport Assets (Restructuring and Disposal) Act 2008.* For the purpose of assessing a development application relating to strategic port land and Brisbane core port land, any reference to a planning scheme is taken to mean a land use plan for the strategic port land, Brisbane port land use plan for Brisbane core port land, or a land use plan for airport land.

Note: *All terms used in this form have the meaning given under the Planning Act 2016, the Planning Regulation 2017, or the Development Assessment Rules (DA Rules).*

PART 1 – APPLICANT DETAILS

1) Applicant details	
Applicant name(s) (*individual or company full name*)	IXOM Operations Pty Ltd C/- Gideon Town Planning
Contact name *(only applicable for companies)*	Gideon Genade
Postal address *(P.O. Box or street address)*	PO Box 450
Suburb	Rockhampton City
State	QLD
Postcode	4700
Country	Australia
Contact number	07 4806 6959
Email address *(non-mandatory)*	info@gideontownplanning.com.au
Mobile number *(non-mandatory)*	
Fax number *(non-mandatory)*	
Applicant's reference number(s) *(if applicable)*	GTP 2413

2) Owner's consent
2.1) Is written consent of the owner required for this development application?
☒ Yes – the written consent of the owner(s) is attached to this development application ☐ No – proceed to 3)

PART 2 – LOCATION DETAILS

3) Location of the premises *(complete 3.1) or 3.2), and 3.3) as applicable)*

***Note**: Provide details below and attach a site plan for any or all premises part of the development application. For further information, see DA Forms Guide: Relevant plans.*

3.1) Street address and lot on plan

☒ Street address **AND** lot on plan (a*ll lots must be listed*), ***or***

☐ Street address **AND** lot on plan for an adjoining or adjacent property of the premises *(appropriate for development in water but adjoining or adjacent to land e.g. jetty, pontoon. All lots must be listed).*

a)	Unit No.	Street No.	Street Name and Type	Suburb
			Bajool Port Alma Road	Port Alma
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4699	46	DS438	Rockhampton Regional Council
b)	Unit No.	Street No.	Street Name and Type	Suburb
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)

3.2) Coordinates of premises *(appropriate for development in remote areas, over part of a lot or in water not adjoining or adjacent to land e.g. channel dredging in Moreton Bay)*

***Note**: Place each set of coordinates in a separate row.*

☐ Coordinates of premises by longitude and latitude

Longitude(s)	Latitude(s)	Datum	Local Government Area(s) *(if applicable)*
		☐ WGS84 ☐ GDA94 ☐ Other:	

☐ Coordinates of premises by easting and northing

Easting(s)	Northing(s)	Zone Ref.	Datum	Local Government Area(s) *(if applicable)*
		☐ 54 ☐ 55 ☐ 56	☐ WGS84 ☐ GDA94 ☐ Other:	

3.3) Additional premises

☐ Additional premises are relevant to this development application and the details of these premises have been attached in a schedule to this development application

☒ Not required

4) Identify any of the following that apply to the premises and provide any relevant details

☒ In or adjacent to a water body or watercourse or in or above an aquifer

Name of water body, watercourse or aquifer:	Coral Sea

☐ On strategic port land under the *Transport Infrastructure Act 1994*

Lot on plan description of strategic port land:	
Name of port authority for the lot:	

☒ In a tidal area

Name of local government for the tidal area *(if applicable)*:	Rockhampton Regional Council
Name of port authority for tidal area *(if applicable)*:	Gladstone Ports Corporation

☐ On airport land under the *Airport Assets (Restructuring and Disposal) Act 2008*

Name of airport:	

☒ Listed on the Environmental Management Register (EMR) under the *Environmental Protection Act 1994*	
EMR site identification:	12564
☐ Listed on the Contaminated Land Register (CLR) under the *Environmental Protection Act 1994*	
CLR site identification:	

5) Are there any existing easements over the premises?

Note: Easement uses vary throughout Queensland and are to be identified correctly and accurately. For further information on easements and how they may affect the proposed development, see DA Forms Guide.

☐ Yes – All easement locations, types and dimensions are included in plans submitted with this development application

☒ No

PART 3 – DEVELOPMENT DETAILS

Section 1 – Aspects of development

6.1) Provide details about the first development aspect

a) What is the type of development? *(tick only one box)*

☒ Material change of use ☐ Reconfiguring a lot ☐ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

☒ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

☐ Code assessment ☒ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots)*:

Medium Impact Industry

e) Relevant plans

***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms guide: Relevant plans.*

☒ Relevant plans of the proposed development are attached to the development application

6.2) Provide details about the second development aspect

a) What is the type of development? *(tick only one box)*

☐ Material change of use ☐ Reconfiguring a lot ☐ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

☐ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

☐ Code assessment ☐ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots)*:

e) Relevant plans

***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms Guide: Relevant plans.*

☐ Relevant plans of the proposed development are attached to the development application

6.3) Additional aspects of development

☐ Additional aspects of development are relevant to this development application and the details for these aspects that would be required under Part 3 Section 1 of this form have been attached to this development application

☒ Not required

Section 2 – Further development details

7) Does the proposed development application involve any of the following?	
Material change of use	☒ Yes – complete division 1 if assessable against a local planning instrument
Reconfiguring a lot	☐ Yes – complete division 2
Operational work	☐ Yes – complete division 3
Building work	☐ Yes – complete *DA Form 2 – Building work details*

Division 1 – Material change of use

***Note**: This division is only required to be completed if any part of the development application involves a material change of use assessable against a local planning instrument.*

8.1) Describe the proposed material change of use			
Provide a general description of the proposed use	Provide the planning scheme definition *(include each definition in a new row)*	Number of dwelling units *(if applicable)*	Gross floor area (m^2) *(if applicable)*
Ethylene Storage	Medium Impact Industry		N/A

8.2) Does the proposed use involve the use of existing buildings on the premises?
☒ Yes
☐ No

Division 2 – Reconfiguring a lot

***Note**: This division is only required to be completed if any part of the development application involves reconfiguring a lot.*

9.1) What is the total number of existing lots making up the premises?

9.2) What is the nature of the lot reconfiguration? *(tick all applicable boxes)*	
☐ Subdivision *(complete 10))*	☐ Dividing land into parts by agreement *(complete 11))*
☐ Boundary realignment *(complete 12))*	☐ Creating or changing an easement giving access to a lot from a constructed road *(complete 13))*

10) Subdivision				
10.1) For this development, how many lots are being created and what is the intended use of those lots:				
Intended use of lots created	Residential	Commercial	Industrial	Other, please specify:
Number of lots created				

10.2) Will the subdivision be staged?	
☐ Yes – provide additional details below ☐ No	
How many stages will the works include?	
What stage(s) will this development application apply to?	

11) Dividing land into parts by agreement – how many parts are being created and what is the intended use of the parts?				
Intended use of parts created	Residential	Commercial	Industrial	Other, please specify:
Number of parts created				

12) Boundary realignment			
12.1) What are the current and proposed areas for each lot comprising the premises?			
Current lot		Proposed lot	
Lot on plan description	Area (m^2)	Lot on plan description	Area (m^2)
12.2) What is the reason for the boundary realignment?			

13) What are the dimensions and nature of any existing easements being changed and/or any proposed easement? *(attach schedule if there are more than two easements)*				
Existing or proposed?	Width (m)	Length (m)	Purpose of the easement? *(e.g. pedestrian access)*	Identify the land/lot(s) benefitted by the easement

Division 3 – Operational work

***Note**: This division is only required to be completed if any part of the development application involves operational work.*

14.1) What is the nature of the operational work?		
☐ Road work	☐ Stormwater	☐ Water infrastructure
☐ Drainage work	☐ Earthworks	☐ Sewage infrastructure
☐ Landscaping	☐ Signage	☐ Clearing vegetation
☐ Other – please specify:		
14.2) Is the operational work necessary to facilitate the creation of new lots? *(e.g. subdivision)*		
☐ Yes – specify number of new lots:		
☐ No		
14.3) What is the monetary value of the proposed operational work? *(include GST, materials and labour)*		
$		

PART 4 – ASSESSMENT MANAGER DETAILS

15) Identify the assessment manager(s) who will be assessing this development application
Rockhampton Regional Council
16) Has the local government agreed to apply a superseded planning scheme for this development application?
☐ Yes – a copy of the decision notice is attached to this development application
☐ The local government is taken to have agreed to the superseded planning scheme request – relevant documents attached
☒ No

PART 5 – REFERRAL DETAILS

17) Does this development application include any aspects that have any referral requirements?
***Note**: A development application will require referral if prescribed by the* Planning Regulation 2017.

☐ No, there are no referral requirements relevant to any development aspects identified in this development application – proceed to Part 6

Matters requiring referral to the **Chief Executive of the *Planning Act 2016*:**

☐ Clearing native vegetation
☐ Contaminated land *(unexploded ordnance)*
☐ Environmentally relevant activities (ERA) *(only if the ERA has not been devolved to a local government)*
☐ Fisheries – aquaculture
☐ Fisheries – declared fish habitat area
☐ Fisheries – marine plants
☐ Fisheries – waterway barrier works
☒ Hazardous chemical facilities
☐ Heritage places – Queensland heritage place *(on or near a Queensland heritage place)*
☐ Infrastructure-related referrals – designated premises
☐ Infrastructure-related referrals – state transport infrastructure
☐ Infrastructure-related referrals – State transport corridor and future State transport corridor
☐ Infrastructure-related referrals – State-controlled transport tunnels and future state-controlled transport tunnels
☐ Infrastructure-related referrals – near a state-controlled road intersection
☐ Koala habitat in SEQ region – interfering with koala habitat in koala habitat areas outside koala priority areas
☐ Koala habitat in SEQ region – key resource areas
☐ Ports – Brisbane core port land – near a State transport corridor or future State transport corridor
☐ Ports – Brisbane core port land – environmentally relevant activity (ERA)
☐ Ports – Brisbane core port land – tidal works or work in a coastal management district
☐ Ports – Brisbane core port land – hazardous chemical facility
☐ Ports – Brisbane core port land – taking or interfering with water
☐ Ports – Brisbane core port land – referable dams
☐ Ports – Brisbane core port land – fisheries
☐ Ports – Land within Port of Brisbane's port limits *(below high-water mark)*
☐ SEQ development area
☐ SEQ regional landscape and rural production area or SEQ rural living area – tourist activity or sport and recreation activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – community activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – indoor recreation
☐ SEQ regional landscape and rural production area or SEQ rural living area – urban activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – combined use
☐ SEQ northern inter-urban break – tourist activity or sport and recreation activity
☐ SEQ northern inter-urban break – community activity
☐ SEQ northern inter-urban break – indoor recreation
☐ SEQ northern inter-urban break – urban activity
☐ SEQ northern inter-urban break – combined use
☐ Tidal works or works in a coastal management district
☐ Reconfiguring a lot in a coastal management district or for a canal
☐ Erosion prone area in a coastal management district
☐ Urban design
☐ Water-related development – taking or interfering with water
☐ Water-related development – removing quarry material *(from a watercourse or lake)*
☐ Water-related development – referable dams
☐ Water-related development –levees *(category 3 levees only)*
☐ Wetland protection area

Matters requiring referral to the **local government:**

☐ Airport land

☐ Environmentally relevant activities (ERA) (*only if the ERA has been devolved to local government)*

☐ Heritage places – Local heritage places

Matters requiring referral to the **Chief Executive of the distribution entity or transmission entity:**

☐ Infrastructure-related referrals – Electricity infrastructure

Matters requiring referral to:

- The **Chief Executive of the holder of the licence**, if not an individual
- The **holder of the licence**, if the holder of the licence is an individual

☐ Infrastructure-related referrals – Oil and gas infrastructure

Matters requiring referral to the **Brisbane City Council:**

☐ Ports – Brisbane core port land

Matters requiring referral to the **Minister responsible for administering the *Transport Infrastructure Act 1994*:**

☐ Ports – Brisbane core port land *(where inconsistent with the Brisbane port LUP for transport reasons)*

☐ Ports – Strategic port land

Matters requiring referral to the **relevant port operator**, if applicant is not port operator**:**

☐ Ports – Land within Port of Brisbane's port limits *(below high-water mark)*

Matters requiring referral to the **Chief Executive of the relevant port authority:**

☐ Ports – Land within limits of another port *(below high-water mark)*

Matters requiring referral to the **Gold Coast Waterways Authority:**

☐ Tidal works or work in a coastal management district *(in Gold Coast waters)*

Matters requiring referral to the **Queensland Fire and Emergency Service:**

☐ Tidal works or work in a coastal management district *(involving a marina (more than six vessel berths))*

18) Has any referral agency provided a referral response for this development application?

☐ Yes – referral response(s) received and listed below are attached to this development application

☒ No

Referral requirement	Referral agency	Date of referral response

Identify and describe any changes made to the proposed development application that was the subject of the referral response and this development application, or include details in a schedule to this development application *(if applicable).*

PART 6 – INFORMATION REQUEST

19) Information request under Part 3 of the DA Rules

☒ I agree to receive an information request if determined necessary for this development application

☐ I do not agree to accept an information request for this development application

***Note**: By not agreeing to accept an information request I, the applicant, acknowledge:*

- *that this development application will be assessed and decided based on the information provided when making this development application and the assessment manager and any referral agencies relevant to the development application are not obligated under the DA Rules to accept any additional information provided by the applicant for the development application unless agreed to by the relevant parties*
- *Part 3 of the DA Rules will still apply if the application is an application listed under section 11.3 of the DA Rules.*

Further advice about information requests is contained in the DA Forms Guide.

PART 7 – FURTHER DETAILS

20) Are there any associated development applications or current approvals? *(e.g. a preliminary approval)*

☐ Yes – provide details below or include details in a schedule to this development application
☒ No

List of approval/development application references	Reference number	Date	Assessment manager
☐ Approval ☐ Development application			
☐ Approval ☐ Development application			

21) Has the portable long service leave levy been paid? *(only applicable to development applications involving building work or operational work)*

☐ Yes – a copy of the receipted QLeave form is attached to this development application
☐ No – I, the applicant will provide evidence that the portable long service leave levy has been paid before the assessment manager decides the development application. I acknowledge that the assessment manager may give a development approval only if I provide evidence that the portable long service leave levy has been paid
☒ Not applicable *(e.g. building and construction work is less than $150,000 excluding GST)*

Amount paid	Date paid (dd/mm/yy)	QLeave levy number (A, B or E)
$		

22) Is this development application in response to a show cause notice or required as a result of an enforcement notice?

☐ Yes – show cause or enforcement notice is attached
☒ No

23) Further legislative requirements

Environmentally relevant activities

23.1) Is this development application also taken to be an application for an environmental authority for an **Environmentally Relevant Activity (ERA)** under section 115 of the *Environmental Protection Act 1994*?

☐ Yes – the required attachment (form ESR/2015/1791) for an application for an environmental authority accompanies this development application, and details are provided in the table below
☒ No

***Note**: Application for an environmental authority can be found by searching "ESR/2015/1791" as a search term at www.qld.gov.au. An ERA requires an environmental authority to operate. See www.business.qld.gov.au for further information.*

Proposed ERA number:		Proposed ERA threshold:	
Proposed ERA name:			

☐ Multiple ERAs are applicable to this development application and the details have been attached in a schedule to this development application.

Hazardous chemical facilities

23.2) Is this development application for a **hazardous chemical facility**?

☐ Yes – *Form 69: Notification of a facility exceeding 10% of schedule 15 threshold* is attached to this development application
☒ No

***Note**: See www.business.qld.gov.au for further information about hazardous chemical notifications.*

Clearing native vegetation

23.3) Does this development application involve **clearing native vegetation** that requires written confirmation that the chief executive of the *Vegetation Management Act 1999* is satisfied the clearing is for a relevant purpose under section 22A of the *Vegetation Management Act 1999*?

☐ Yes – this development application includes written confirmation from the chief executive of the *Vegetation Management Act 1999* (s22A determination)

☒ No

***Note**: 1. Where a development application for operational work or material change of use requires a s22A determination and this is not included, the development application is prohibited development.*

2. See https://www.qld.gov.au/environment/land/vegetation/applying for further information on how to obtain a s22A determination.

Environmental offsets

23.4) Is this development application taken to be a prescribed activity that may have a significant residual impact on a **prescribed environmental matter** under the *Environmental Offsets Act 2014*?

☐ Yes – I acknowledge that an environmental offset must be provided for any prescribed activity assessed as having a significant residual impact on a prescribed environmental matter

☒ No

***Note**: The environmental offset section of the Queensland Government's website can be accessed at www.qld.gov.au for further information on environmental offsets.*

Koala habitat in SEQ Region

23.5) Does this development application involve a material change of use, reconfiguring a lot or operational work which is assessable development under Schedule 10, Part 10 of the Planning Regulation 2017?

☐ Yes – the development application involves premises in the koala habitat area in the koala priority area

☐ Yes – the development application involves premises in the koala habitat area outside the koala priority area

☒ No

***Note**: If a koala habitat area determination has been obtained for this premises and is current over the land, it should be provided as part of this development application. See koala habitat area guidance materials at www.des.qld.gov.au for further information.*

Water resources

23.6) Does this development application involve **taking or interfering with underground water through an artesian or subartesian bore, taking or interfering with water in a watercourse, lake or spring, or taking overland flow water under the *Water Act 2000***?

☐ Yes – the relevant template is completed and attached to this development application and I acknowledge that a relevant authorisation or licence under the *Water Act 2000* may be required prior to commencing development

☒ No

***Note**: Contact the Department of Natural Resources, Mines and Energy at www.dnrme.qld.gov.au for further information.*

DA templates are available from https://planning.dsdmip.qld.gov.au/. If the development application involves:

- *Taking or interfering with underground water through an artesian or subartesian bore: complete DA Form 1 Template 1*
- *Taking or interfering with water in a watercourse, lake or spring: complete DA Form1 Template 2*
- *Taking overland flow water: complete DA Form 1 Template 3.*

Waterway barrier works

23.7) Does this application involve **waterway barrier works?**

☐ Yes – the relevant template is completed and attached to this development application

☒ No

DA templates are available from https://planning.dsdmip.qld.gov.au/. For a development application involving waterway barrier works, complete DA Form 1 Template 4.

Marine activities

23.8) Does this development application involve **aquaculture, works within a declared fish habitat area or removal, disturbance or destruction of marine plants?**

☐ Yes – an associated *resource* allocation authority is attached to this development application, if required under the *Fisheries Act 1994*

☒ No

***Note**: See guidance materials at www.daf.qld.gov.au for further information.*

Quarry materials from a watercourse or lake

23.9) Does this development application involve the **removal of quarry materials from a watercourse or lake** under the *Water Act 2000?*

☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development
☒ No

***Note**: Contact the Department of Natural Resources, Mines and Energy at www.dnrme.qld.gov.au and www.business.qld.gov.au for further information.*

Quarry materials from land under tidal waters

23.10) Does this development application involve the **removal of quarry materials from land under tidal water** under the *Coastal Protection and Management Act 1995?*

☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development
☒ No

***Note**: Contact the Department of Environment and Science at www.des.qld.gov.au for further information.*

Referable dams

23.11) Does this development application involve a **referable dam** required to be failure impact assessed under section 343 of the *Water Supply (Safety and Reliability) Act 2008* (the Water Supply Act)?

☐ Yes – the 'Notice Accepting a Failure Impact Assessment' from the chief executive administering the Water Supply Act is attached to this development application
☒ No

***Note**: See guidance materials at www.dnrme.qld.gov.au for further information.*

Tidal work or development within a coastal management district

23.12) Does this development application involve **tidal work or development in a coastal management district**?

☐ Yes – the following is included with this development application:
- ☐ Evidence the proposal meets the code for assessable development that is prescribed tidal work *(only required if application involves prescribed tidal work)*
- ☐ A certificate of title

☒ No

***Note**: See guidance materials at www.des.qld.gov.au for further information.*

Queensland and local heritage places

23.13) Does this development application propose development on or adjoining a place entered in the **Queensland heritage register** or on a place entered in a local government's **Local Heritage Register**?

☐ Yes – details of the heritage place are provided in the table below
☒ No

***Note**: See guidance materials at www.des.qld.gov.au for information requirements regarding development of Queensland heritage places.*

Name of the heritage place:		Place ID:	

Brothels

23.14) Does this development application involve a **material change of use for a brothel**?

☐ Yes – this development application demonstrates how the proposal meets the code for a development application for a brothel under Schedule 3 of the *Prostitution Regulation 2014*
☒ No

Decision under section 62 of the *Transport Infrastructure Act 1994*

23.15) Does this development application involve new or changed access to a state-controlled road?

☐ Yes – this application will be taken to be an application for a decision under section 62 of the *Transport Infrastructure Act 1994* (subject to the conditions in section 75 of the *Transport Infrastructure Act 1994* being satisfied)
☒ No

Walkable neighbourhoods assessment benchmarks under Schedule 12A of the Planning Regulation

23.16) Does this development application involve reconfiguring a lot into 2 or more lots in certain residential zones (except rural residential zones), where at least one road is created or extended?

☐ Yes – Schedule 12A is applicable to the development application and the assessment benchmarks contained in schedule 12A have been considered

☒ No

***Note**: See guidance materials at www.planning.dsdmip.qld.gov.au for further information.*

PART 8 – CHECKLIST AND APPLICANT DECLARATION

24) Development application checklist	
I have identified the assessment manager in question 15 and all relevant referral requirement(s) in question 17 ***Note**: See the Planning Regulation 2017 for referral requirements*	☒ Yes
If building work is associated with the proposed development, Parts 4 to 6 of *DA Form 2 – Building work details* have been completed and attached to this development application	☐ Yes ☒ Not applicable
Supporting information addressing any applicable assessment benchmarks is with the development application ***Note**: This is a mandatory requirement and includes any relevant templates under question 23, a planning report and any technical reports required by the relevant categorising instruments (e.g. local government planning schemes, State Planning Policy, State Development Assessment Provisions). For further information, see DA Forms Guide: Planning Report Template.*	☒ Yes
Relevant plans of the development are attached to this development application ***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms Guide: Relevant plans.*	☒ Yes
The portable long service leave levy for QLeave has been paid, or will be paid before a development permit is issued (*see 21*)	☐ Yes ☒ Not applicable

25) Applicant declaration

☒ By making this development application, I declare that all information in this development application is true and correct

☒ Where an email address is provided in Part 1 of this form, I consent to receive future electronic communications from the assessment manager and any referral agency for the development application where written information is required or permitted pursuant to sections 11 and 12 of the *Electronic Transactions Act 2001*

***Note**: It is unlawful to intentionally provide false or misleading information.*

Privacy – Personal information collected in this form will be used by the assessment manager and/or chosen assessment manager, any relevant referral agency and/or building certifier (including any professional advisers which may be engaged by those entities) while processing, assessing and deciding the development application. All information relating to this development application may be available for inspection and purchase, and/or published on the assessment manager's and/or referral agency's website.

Personal information will not be disclosed for a purpose unrelated to the *Planning Act 2016*, Planning Regulation 2017 and the DA Rules except where:

- such disclosure is in accordance with the provisions about public access to documents contained in the *Planning Act 2016* and the Planning Regulation 2017, and the access rules made under the *Planning Act 2016* and Planning Regulation 2017; or
- required by other legislation (including the *Right to Information Act 2009*); or
- otherwise required by law.

This information may be stored in relevant databases. The information collected will be retained as required by the *Public Records Act 2002.*

PART 9 – FOR COMPLETION OF THE ASSESSMENT MANAGER – FOR OFFICE USE ONLY

Date received: | Reference number(s):

Notification of engagement of alternative assessment manager	
Prescribed assessment manager	
Name of chosen assessment manager	
Date chosen assessment manager engaged	
Contact number of chosen assessment manager	
Relevant licence number(s) of chosen assessment manager	

QLeave notification and payment *Note: For completion by assessment manager if applicable*			
Description of the work			
QLeave project number			
Amount paid ($)		Date paid (dd/mm/yy)	
Date receipted form sighted by assessment manager			
Name of officer who sighted the form			

GIDEON
TOWN PLANNING

TOWN PLANNING REPORT

MATERIAL CHANGE OF USE FOR A MEDIUM IMPACT INDUSTRY

LOT 46 on DS438
BAJOOL PORT ALMA ROAD, PORT ALMA

IXOM Operations Pty Ltd

DOCUMENT CONTROL SHEET

Report Details	
Document Title:	Planning Report
Author:	L Saunders
Client:	IXOM Operations Pty Ltd
Reference:	GTP2413

Document Status			
Revision No	**Date**	**Author**	**Reviewer**
Draft 1	18/06/2024	LS	GHG
Final	16/07/2024	-	GHG

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

This Planning Report has been prepared on behalf of IXOM Operations Pty Ltd in support of a Development Application for a Material Change of Use for a Medium Impact Industry at Bajool-Port Alma Road, Port Alma, on land described as Lot 46 on DS438.

In accordance with the *Rockhampton Region Planning Scheme 2015* (Planning Scheme), and pursuant to the *Planning Act 2016*, the proposed development constitutes Assessable Development in the Rural Zone requiring a Development Permit for Medium Impact Industry (Impact Assessment).

The development proposal is to formally establish and increase the number of ethylene storage containers on-site from twelve (12) to eighteen (18), resulting in an increase in capacity from 114 tons to 171 tons. No additional buildings or extensions to existing buildings are proposed. The development will retain existing access arrangements.

It is considered that the proposal is consistent with the overall outcomes of the Rural Zone, based on:

- The proposed development is for the expansion of compatible land uses on the subject site, which is not suitable for an urban area and is dependent on its location in relation to Port Alma;
- The proposed development will not pose any additional noise, air, or odour impacts on the site or surrounding areas; and
- The nature and scale of the operations align with existing onsite land use activities, as well as the surrounding land uses.

This report addresses the relevant Codes and Policies of the Planning Scheme and relevant State planning instruments. Supporting information is provided to identify compliance with the acceptable outcomes of the applicable planning scheme codes and demonstrate planning merit for the proposed development.

The proposed development is considered to satisfy the relevant requirements of the regional, state, and local planning instruments. It accords with the relevant Planning Scheme Codes and maintains the outcomes sought for the Rural Zone. The proposal has merit and warrants favourable consideration by the Council.

2.0 PROJECT OVERVIEW

2.1 Site Details

Property Address:	Bajool-Port Alma Road, Port Alma
Property Description:	Lot 46 on DS438
Encumbrances:	N/A
Registered Owner:	Portside Storage Pty Ltd (Refer to *Appendix B – Title Search*)
Site Area:	45,856 m^2

2.2 Application Details

Applicant:	**IXOM Operations Pty Ltd** c/- Gideon Town Planning
Approval Type:	Development Permit for Material Change of Use
Description of proposal	Medium Impact Industry
Local Government Area:	Rockhampton Regional Council
Assessment Manager:	Rockhampton Regional Council
Planning Scheme:	Rockhampton Region Planning Scheme 2015
Zoning:	Rural Zone
Precinct:	N/A
Overlays:	• Acid Sulfate Soils - Land above 5m AHD and below 20m AHD - Limit of known or potential acid sulphate soils • Coastal Protection – Erosion Prone Area • Flood Hazard – Floodplain Investigation Area • Defined Storm Tide Event Level – Extreme Storm Surge Potential • Road Hierarchy – State-controlled Road
Level of Assessment:	Impact Assessment
Relevant Code:	• Rural Zone Code • Access, Parking and Mobility Code • Landscape Code • Stormwater Management Code • Waste Management Code • Water and Sewer Code Overlay Codes: • Acid Sulfate Soils Overlay Code • Coastal Protection Overlay Code • Flood Hazard Overlay Code
Regional Plan:	Central Queensland Regional Plan 2013
Referrals	State Assessment and Referral Agency • Hazardous Chemical Facilities

3.0 CHARACTERISTICS OF SITE AND SURROUNDING AREA

3.1 Site Details and Location

The subject site is located within the locality of Port Alma, approximately 60km southeast of Rockhampton, an area that is predominantly made up of industrial uses.

Figure 1 Site Location Context
Source: Queensland Globe

3.2 Site Characteristics

3.2.1 Area & Configuration

The subject site has a total site area of 45,856m^2, fronts Bajool Port Alma Road and is adjacent to both rural land and other industrial uses. An unnamed and unconstructed road is located to the east of the site. However, it is not utilised by the operation.

3.2.2 Existing Improvement

The subject site accommodates existing storage facilities made up of various structures and operational areas.

3.2.3 Property History

The subject site was managed by the Gladstone Ports Corporation (GPC) until becoming *Freehold on 3 October 2008*. GPC is a statutory Queensland Government-owned corporation that maintains the dredging, security, berths, and operations at the port (Port Alma).

The subject site has a historical approval (DA/2008/08) issued by GPC for an MCU for an Environmentally Relevant Activity (ERA) 7B (chemical storage facility). Following legislative changes, the ERA was later reclassified into two separate ERAs as follows:

- ERA 8(3) - *Chemical storage more than 500m^3 of dangerous goods Class 3 or Class C1 or C2 combustible liquids under AS 1940.*

- ERA 50 - *Mineral and bulk material handling 2 - Loading or unloading 100t or more of bulk materials in a day, other than loading or unloading mentioned in item 3, or storing bulk materials.*

The ERAs are conducted under the approval of environmental authority (EA) EPPR00426913.

Development approval for Material Change of Use for Utility Installation (Storage and Processing of Used Cooking Oils), D/158-2022, was approved over the subject site on 3 April 2023. The approved use included the acceptance of Used Cooking Oil (UCO), undertaking basic processing to remove contaminants (including filtering and heating) and despatch it as a resource either overseas or domestically to customers that will then use it to manufacture biodiesel.

3.2.4 Vegetation and Topography

The subject site is generally flat, with minimum vegetation.

3.2.5 Vehicle Access

Vehicle access is provided via an existing driveway along Bajool-Port Alma Road.

3.2.6 Services

The subject site is in a rural area outside the council infrastructure catchment areas. The existing building has an onsite septic system, water, and stormwater infrastructure. The site also has access to electricity and telecommunication services.

3.2.7 Easements

The subject site does not contain any easements.

3.3 Surrounding Area

Being located within the existing rural footprint of Port Alma, the subject site is surrounded by special purposes land uses (Figure 2).

Despite the subject site being within the GPC locality, it is not regulated under the GPC Land Use Plans. Refer to *Appendix K – Gladstone Ports Corporation Map*.

Figure 2 Zone Map
Source: RRC Interactive Mapping

4.0 PROPOSED DEVELOPMENT

4.1 Proposal Description

The development proposal aims to formally establish and increase the quantity of ethylene storage at the subject site. The fully fenced and secure storage facility is located over the western portion of the site, utilising approximately 8285m² of the total site area. Although located on the same site as Port Side Storage's operations, the ethylene storage facility operates and functions independently from Port Side Storage. IXOM Operations Pty Ltd (IXOM), the facility operator, has approval from the Office of Industrial Relations to store twelve (12) ISO containers at the site, each with a capacity of 9.5 tons, totalling 114 tons of ethylene. The proposed development seeks to add six (6) additional ISO containers of the same capacity, thereby increasing the total storage capacity to eighteen (18) ISO containers, equating to 171 tons.

Figure 3 Site Plan
Source: Appendix D – Proposal Plans

Ethylene Storage		
	Current Operations	**Proposed Operations**
Storage Units	12 ISO containers, each with a capacity of 9.5 tons	18 ISO containers, each with a capacity of 9.5 tons
Total Capacity	114 tons	171 tons

Table 1 Ethylene Storage Capacity

4.1.1 Transport and Storage Details

The filled ISO containers arrive via cargo ships at Port Alma and are transported from the port to the subject site for storage. They remain at the facility until transported to Curtis Island for use as a refrigerant in LNG liquefaction plants.

The bulk ISO containers are double-walled and vacuum-jacketed, with insulation material between the inner and outer tanks, significantly reducing heat transfer and ensuring the cryogenic ethylene remains in a liquid state and stable. The tanks are arranged side-by-side horizontally on the subject site.

Figure 4 ISO Container – Side View
Source: IXOM Operations Pty Ltd

Figure 5 ISO Container – End View
Source: IXOM Operations Pty Ltd

4.1.2 Security and Monitoring

The facility is securely fenced and locked, including electronic code access and alarms. It is also fitted with onsite lighting. The site is unmanned except for regular monitoring of ISO container pressure, transfer of ISO containers (loading/unloading), and emergency response. Other than a single general storage container (20-foot shipping container) located along the western boundary and perimeter fencing, no permanent buildings or structures are proposed.

4.1.3 Safety and Compliance

Ethylene Classification:	Dangerous Goods Class 2.1(Flammable Gases)
Total Proposed Storage Quantity:	171 tons
Regulatory Threshold:	*Workplace Health and Safety Regulation 2011* • The proposed storage quantity is below the threshold limit for major hazardous facilities, which is 200 tons, per the Workplace Health and Safety Regulation 2011.

	Environmental Protection Regulations 2019 • The proposed storage containers, being less than $10m^3$, and the total storage volume being less than $200t/200m^2$, the activity does not constitute an Environmentally Relevant Activity
Storage Container Specifications:	International Organization of Standardization (ISO) Container. Double-walled, vacuum-jacketed tanks at -1Bar (vacuum), with a maximum capacity of 9.5ton
Safety Measures	• Installation of gas detector transmitters • Secure perimeter fencing, including barbed wire, around the facility; security monitored and alarmed

Table 2 Safety and Compliance

The application is supported by a Hazard and Risk Assessment (Appendix E), which reviews individual fatality risk in relation to land use planning. The assessment found that the individual fatality risks are low outside the facility and meet the acceptance criteria for industrial sites within the property boundary.

According to Australian industry guidelines for land-use safety planning, individual fatality risk levels of interest range from 50 pmpa (probability of fatality per million per annum) to 0.5 pmpa. A risk level of 50 pmpa is acceptable for industrial land uses, while 0.5 pmpa is acceptable for schools, hospitals, and other sensitive areas.

The risk modeling software identified risk levels as low as 0.1 pmpa, 0.05 pmpa, and 0.01 pmpa, which are extremely low and suitable for all land uses in this context.

4.1.4 Access and Parking

The existing access in the south-western corner along Bajool-Port Alma Road will be retained. Due to the nature of onsite activities, no formally designated onsite parking is provided. Access is restricted to staff, and there is sufficient onsite space for staff parking.

4.1.5 Services

The site is not connected to any urban infrastructure. It is serviced by onsite solar electrical infrastructure that includes battery storage. The site also has mobile telecommunication connectivity.

5.0 PLANNING FRAMEWORK

5.1 Rockhampton Region Planning Scheme 2015

5.1.1 Planning Scheme Definition

Under *the Rockhampton Region Planning Scheme 2015*, the proposal has been defined as:

Medium Impact Industry *means the use of premises for an industrial activity—*

(a) that is the manufacturing, producing, processing, repairing, altering, recycling, storing, distributing, transferring or treating of products; and

(b) that a local planning instrument applying to the premises states is a medium impact industry; and

(c) that complies with any thresholds for the activity stated in a local planning instrument applying to the premises, including, for example, thresholds relating to the number of products manufactured or the level of emissions produced by the activity.

Table SC1.1.2.1 Industry Thresholds
Medium Impact Industry

4. Facility, goods yard or warehouse for storage and distribution of dangerous goods not involving manufacturing processes and not a major hazard facility under the Work Health and Safety Act 2011

The proposal, as described in Section 4, is consistent with the above land use definition.

5.1.2 Planning Scheme Zone

The subject site is located within the Rural Zone under the *RRPS 2015.*

5.1.3 Level of Assessment

In accordance with Table 5.4.6.4 – Rural Zone, the proposed Warehouse/Medium Impact Industry is Impact Assessable under the Rockhampton Region Planning Scheme 2015.

5.1.4 Planning Scheme Overlays and Codes

The site is affected by the following Planning Scheme Overlays.

Table 3 Planning Scheme Overlays and Codes

Overlays	Relevant Code	Comment
Acid Sulfate Soils • Land above 5m AHD and below 20m AHD • Limit of known or potential acid sulphate soils	Acid Sulfate Soils Overlay Code	The proposed development does not include significant excavation; therefore, this overlay is not further addressed as part of the development application.
Coastal Protection – Erosion Prone Area	Coastal Protection Overlay Code	The development is consistent with the purpose of the Coastal Protection Overlay Code. An assessment of the proposal against the relevant code is included in *Appendix I – RRPS 2015 Code Assessment*.
Flood Hazard – Floodplain Investigation Area	Flood Hazard Overlay Code	While the development is mapped as a floodplain investigation area, it is inconsequential to the development. Therefore, the overlay code will not be further addressed as part of the application.

Defined Storm Tide Event Level – Extreme Storm Surge Potential	N/A	It is noted that the subject site is mapped as storm surge – Port Alma from extreme potential. The development does not involve any new buildings and the 6 additional storage containers will not impact the severity of storm surges.
Road Hierarchy Overlay – State-Controlled Road	N/A	It is noted that part of Bajool-Port Alma Road is a State Controlled Road.

5.1.5 Other Planning Scheme Codes

The following other Planning Scheme Codes have been identified as being relevant to the assessment of proposed development:

Table 4 Other Planning Schemes Codes

Code	Comment
Rural Zone Code	The proposed development is consistent with the purpose of the Rural Zone Code. An assessment of the proposed development against the Code is included in *Appendix I – RRPS 2015 Code Assessment.*
Access, Parking and Mobility Code	The proposed development is consistent with the purpose of the Access, Parking and Mobility Code. An assessment of the proposed development against the Code is included in *Appendix I – RRPS 2015 Code Assessment.*
Landscape Code	The proposal does not propose an increase in landscaping and therefore, it is not deemed necessary to address the Code in full.
Stormwater Management Code	The proposal will not increase stormwater discharge. The proposal will not negatively influence the existing stormwater management regime. It is, therefore not deemed necessary to address the Code in full.
Waste Management Code	All existing waste management practices will be retained throughout the site, with little amounts of waste generated from the development. It is, therefore not deemed necessary to address the Code in full.
Water and Sewer Code	The subject site is located within the Rural zone with no connection to council water or sewer systems. It is, therefore, not deemed necessary to address the Code in full.

5.1.5.1 Rural Zone

The purpose of the Rural Zone code is to:

(a) ensure that land with productive capacity is maintained for a range of existing and emerging rural uses that are significant to the economy of the planning scheme area;
(b) recognise that different types of rural land are suited to specific uses such as animal industries, horticulture, cropping, intensive animal industries, intensive grazing and extractive industries;
(c) prevent the establishment of development which may limit the productive capacity of the land;
(d) provide for diversification of rural industries where impacts can be managed; and
(e) maintain the environmental values of all rural land.

Of the overall outcomes for the Rural Zone Code, the following are of particular relevance:

(a) development in the zone accommodates predominantly rural uses;
(b) development:
  (i) does not detract from the scenic landscape features of rural land including the Fitzroy River, floodplains, lagoons, wetlands, salt pans, mountains and ridges and the coastline;

(ii) is responsive to the environmental characteristics and constraints of the land, and minimises impacts on natural features such as waterways, wetlands and remnant vegetation;
(iii) has legal and practical access to the road hierarchy;
(iv) is serviced by infrastructure that is commensurate with the needs of the use; and
(v) maximises energy efficiency and water conservation;

(c) non-rural uses may be appropriate where they do not detract from the productivity or residential amenity of rural areas and can demonstrate:
(i) a direct relationship with the rural use in the immediate locality; or
(ii) the potential to make a contribution to primary production or the diversification of rural industries; or
(iii) a need to be remote from urban uses as a result of their impacts; or
(iv) they cannot be located in an urban area (for example, due to land area requirements);

(e) development does not alienate or impact on the productive agricultural capacity of rural areas and agricultural land is protected from incompatible development;

While the development is for a non-rural use in the Rural Zone, it is similar in nature to the existing land uses conducted on the subject site. The development does not include any new buildings, with the only changes being the addition of the six (6) ISO tanks in the western portion of the site. Therefore, the development will not detract from the scenic features of rural land and will not pose any further environmental impacts.

The development will retain the existing vehicle access point to Bajool - Port Alma Road and will retain all existing connections to infrastructure and services.

Given the subjects site's location in relation to the local port, the extent of established onsite operations, and the lack of rural land use activities onsite and on the surrounding land, which is primarily located within the Special Purpose zone, the proposal does not conflict with the intent of the Zone.

5.1.6 Planning Scheme Policies

The *RRPS 2015* contains twenty Planning Scheme Policies. The planning scheme policies apply to development throughout the Rockhampton Regional Council planning scheme area.

5.1.7 Strategic Framework

The strategic framework sets the policy direction for the planning scheme. It forms the basis for ensuring appropriate development occurs within the planning scheme area for the life of the planning scheme.

The strategic framework of the *RRPS 2015* further contains the strategic and policy intent, which is further reflected through themes and elements. In accordance with the Strategic Framework Mapping, the subject site is located within the Strategic Port Land as a S*pecific Use place*. Refer to *Appendix F – Strategic Framework Map.*

The Specific use places are large single use or single focus places which do not fit into other place types. These places include the following:
- *provide significant employment and services to the planning scheme area.*
- *The further development is supported, provided that amenity impacts upon nearby sensitive land use(s) can be avoided.*
- *Development within specific use areas does not detract from the role and viability of centres.*

5.1.7.1 Settlement Pattern – Specific Use

Table 5 Settle Pattern

Element	*Comment*
Natural conservation, open space and natural corridor or link	The development proposal does not relate to or impact this element.
Township	The development proposal does not relate to or impact this element.
Rural residential	The development proposal does not relate to or impact this element.
Rural	The proposed development, being the expansion of an existing use, does not negatively impact the productive agricultural capacity of the rural area. In addition, due to the subject site being located adjacent to the Port Alma operations, the proposed development integrates seamlessly with the nearby uses.
Industrial	The development proposal does not relate to or impact this element.
Urban and new urban	The development proposal does not relate to or impact this element.
Future urban	The development proposal does not relate to or impact this element.
Urban Infill and intensification	The development proposal does not relate to or impact this element.
Centres	The proposal will not compromise the role and function of designated centres.
Specialised centres	The development proposal does not relate to or impact this element.
Specific Use	The subject site is located within the strategic port land (Port Alma), identified as a large single-use or single-focus place that does not fit into other place types. Due to the nature of the development, the proposal does not detract from the role and viability of centres. On the contrary, the proposed development integrates with the surrounding uses while boosting employment and avoiding negative impacts on sensitive land uses.

5.1.7.2 Natural environment and hazards

Table 6 Natural environment and hazards

Element	Comment
Areas of environmental significance	Although the subject site is in close proximity to coastal areas, the proposed development does not include any additional buildings or extensions to existing buildings. The only additions are 6 ISO containers, which will not further impact any areas of environmental significance.
Natural hazards and climate change	The development proposal does not relate to or impact this element.
Coastal environment	The development proposal minimises impacts on natural physical coastal processes.
Water resources, catchment management and healthy waters	The proposed development does not negatively impact the environmental values or the coastal land. Development does not increase the risk of erosion.
Landscape and scenic amenity	The development proposal does not relate to or impact this element.
Air, noise and hazardous materials	The health, well-being, amenity and safety of communities and individuals are protected from the impacts of air, noise and odour emissions, and hazardous materials.
Waste	Development minimises the generation of solid and liquid waste and the impacts of waste on the natural environment. The proposed development is consistent with the best practice environmental standards.

5.1.7.3 Community identity and diversity

Table 7 Community Identity and Diversity

Element	Comment
Housing diversity, safe communities and equitable access	The development proposal does not relate to or impact this element.
Community identity	The development proposal does not relate to or impact this element.
Heritage and character	The development proposal does not relate to or impact this element.

Sport and recreation and open space	The development proposal does not relate to or impact this element.
Social, arts and cultural infrastructure	The development proposal does not relate to or impact this element.

5.1.7.4 Access and Mobility

Table 8 Access and Mobility

Element	Comment
Public and active transport	The development proposal does not relate to or impact this element.
Road network	The development site is located adjacent to a State Controlled road, making the site highly accessible and compatible to accommodate the traffic generated by the proposed land use. The proposed development does not impact the capacity and safety of the state-controlled road.
Rail network	The development proposal does not relate to or impact this element.
Freight network and key logistics hub	The subject site is located within the multi-modal freight hub of Port Alma, a strategic network that includes sea and road freight with good links to the railway siding at Bajool. The proposed development does not impact the capacity and safety of the freight network.
Air transport	The development proposal does not relate to or impact this element.
Sea transport	The proposed development does not pose any impediment to maintaining the long-term viability of the port and its continued potential to transfer explosives. As such, the development does not compromise the current uses or planned future development of Port Alma by the Gladstone Ports Corporation.

5.1.7.5 Infrastructure and Services

Table 9 Infrastructure and Services

Element	Comment
Inter-regional networks	The development proposal does not impact this element.
Local area networks	The development proposal does not impact this element.

5.1.7.6 Natural Resources and Economic Development

Table 10 Natural Resources and Economic Development

Element	Comment
Protection of key assets	The development supports the continued growth of the port infrastructure at Port Alma Strategic Port Land.
Industrial development	The development proposal does not relate to or impact this element.
Rural land	The proposed development is for the expansion of an existing use within the subject site. Therefore, the development will not impact the rural capacity of the land.
Extractive and mineral resources	The development proposal does not relate to or impact this element.
Forestry	The development proposal does not relate to or impact this element.
Marine resources	The development proposal does not relate to or impact this element.
Tourism	The development proposal does not relate to or impact this element.

The proposed development does not conflict with the Strategic Framework of the *Rockhampton Region Planning Scheme 2015.*

5.2 State Government Planning Framework

5.2.1 Central Queensland Regional Plan 2013

The subject site is not identified as being within the Priority Living Area (PLA) of the Central Queensland Regional Plan 2013 (CQRP). The PLA safeguards areas required for the growth of towns in the regions while providing for resource activities to locate within these areas where it meets communities' expectations as determined by the relevant local government.

The subject site is located in the locality of Port Alma. According to the CQRP:

> *"Port Alma is located south-east of Rockhampton (throughput 421 000 tones 2011–2012) and* ***focuses on the import and export of niche market products, including ammonium nitrate, general cargo****,* ***salt and frozen beef.*** *Port Alma also provides essential support to the defence industry and in particular the operations at Shoalwater Bay Military Training Area north of Yeppoon." P.21.*

6.0 REFERRALS

The Planning Regulation 2017 identifies triggers and thresholds for development requiring referral to a State Agency.

The proposed development triggers a referral to the State Assessment and Referral Agency (SARA) for the following matters.

6.1 Hazardous Chemical Facilities (Schedule 10, Part 7)

Schedule 10, Part 7, Division 3, Table 1, Item 1 – Assessable Development – Material Change of Use for a Hazardous Chemical Facility

"Hazardous Chemical Facility means the use of premises for a facility at which a prescribed hazardous chemical is present or likely to be present in a quantity that exceeds 10% of the chemical's threshold quantity under the Work Health and Safety Regulation, schedule 15".
Schedule 24 of the Planning Regulations.

The proposed quantity of 171 tons of ethylene exceeds 10% of the threshold volumes listed in Schedule 15 for the storage activity. An assessment of the proposed development against the State Development Assessment Provision (SDAP) - State Code 21: Hazardous Chemical Facilities is also included within the report. Refer to *Appendix H – SDAP – State Code 21.*

The following is noted:

- *Workplace Health and Safety Regulation 2011*
  The proposed storage quantity is below the threshold limit for major hazardous facilities, which is 200 tons, per the Workplace Health and Safety Regulation 2011. The activity does not constitute a major hazardous facility.

- *Environmental Protection Regulations 2019*
  The proposed storage containers, being less than 10m3, and the total storage volume being less than 200t/200m^2, therefore the activity does not constitute an Environmentally Relevant Activity

7.0 CONCLUSION

This Planning Report has been prepared on behalf of IXOM Operations Pty Ltd in support of a Development Application for a Material Change of Use for a Medium Impact Industry at Bajool-Port Alma Road, Port Alma on land described as Lot 46 on DS438.

It is considered that the proposal is consistent with the overall outcomes of the Rural Zone, based on:

- The proposed development is for the expansion of compatible land uses on the subject site, which is not suitable for an urban area and is dependent on its location in relation to Port Alma;
- The proposed development will not pose any additional noise, air, or odour impacts on the site or surrounding areas; and
- The nature and scale of the operations align with existing onsite land use activities, as well as the surrounding land uses.

The proposed development is considered to satisfy the relevant requirements of the regional, state, and local planning instruments. It accords with the relevant Planning Scheme Codes and maintains the outcomes sought for the Rural Zone. The proposal has merit and warrants favourable consideration by the Council.

APPENDIX A

DA Form 1

APPENDIX B

Title Search

APPENDIX C

Owners Consent

APPENDIX D

Proposal Plans

APPENDIX E

Hazard and Risk Assessment

APPENDIX F

Memorandum (Summary of Preliminary Hazard Assessment)

APPENDIX G

Emergency Response Plan

APPENDIX H

SDAP - State Code 21

APPENDIX I

RRPS 2015 Code Assessment

APPENDIX J

Overlay Mapping – RRPS 2015

APPENDIX K

Gladstone Ports Corporation Map

APPENDIX L

SARA Pre-lodgment Record

Current Title Search

Queensland Titles Registry Pty Ltd
ABN 23 648 568 101

Title Reference:	**50739343**	**Search Date:**	10/07/2024 13:18
Date Title Created:	03/10/2008	**Request No:**	48618597
Previous Title:	40057188		

ESTATE AND LAND

Estate in Fee Simple

LOT 46 CROWN PLAN DS438
Local Government: ROCKHAMPTON

REGISTERED OWNER

Dealing No: 711962868 03/10/2008

PORTSIDE STORAGE PTY LTD A.C.N. 076 253 695

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 40057188 (Lot 46 on CP DS438)

2. LEASE No 720125942 29/06/2020 at 11:24
IXOM OPERATIONS PTY LTD A.C.N. 600 546 512
OF LEASE A ON SP275146
TERM: 01/04/2020 TO 31/03/2025 OPTION NIL

ADMINISTRATIVE ADVICES

NIL

UNREGISTERED DEALINGS

NIL

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

Requested by: D-ENQ TITLES QUEENSLAND

1 LOCALITY PLAN

1 : 9000 @ A3

GENERAL LEGEND

APPROX EXISTING BOUNDARY LINE
(APPROX 45,856m²)

GENERAL NOTE:
ALL BOUNDARIES, LOCATIONS AND DIMENSIONS ARE APPROXIMATES

GENERAL NOTE:
- THESE DRAWINGS ARE PART OF A TOWN PLANNING APPROVAL APPLICATION AND SHOULD NOT BE USED FOR ANY OTHER REASON
- THESE DRAWINGS ARE APPROXIMATE AND HIGHLY CONCEPTUAL
- REFER TO TOWNPLANNING APPLICATION AND OPERATIONAL WORKS DOCUMENTATION WHEN VIEWING THESE PLANS.

project:

IXOM OPERATIONS Pty Ltd

drawing title:

LOCATION PLAN

location:

IXON PORT ALMA ROAD (Lot 46 DS438)

client:

---

drawing no:

SK-001

N

REVISIONS

REVISION	DESCRIPTION	DATE
1	PRELIMINARY	17/06/2024
2	PRELIMINARY	16/07/2024

ISSUED FOR
PRELIMINARY

scale

As indicated

A3 DRAWING

NOTED SCALES RELATE TO A3 DRAWINGS

project no: GTP-007

date: JUN 24

drawn: SV

rev: 2

16/07/2024 8:52:54 PM

2 OVERALL SITE PLAN

1 : 1200 @ A3

GENERAL LEGEND

- APPROX EXISTING BOUNDARY LINE (APPROX 45,856m²)
- PROPOSED MEDIUM IMPACT INDUSTRY ACTIVITY (APPROX 8285m²)

GENERAL NOTE:
- THESE DRAWINGS ARE PART OF A TOWN PLANNING APPROVAL APPLICATION AND SHOULD NOT BE USED FOR ANY OTHER REASON
- THESE DRAWINGS ARE APPROXIMATE AND HIGHLY CONCEPTUAL
- REFER TO TOWNPLANNING APPLICATION AND OPERATIONAL WORKS DOCUMENTATION WHEN VIEWING THESE PLANS.

GENERAL NOTE:
ALL BOUNDARIES, LOCATIONS AND DIMENSIONS ARE APPROXIMATES

project:

IXOM OPERATIONS Pty Ltd

drawing title:

PROPOSED SITE PLAN

location:

IXON PORT ALMA ROAD (Lot 46 DS438)

client:

---

drawing no:

SK-002

N

REVISIONS

REVISION	DESCRIPTION	DATE
1	PRELIMINARY	17/06/2024
2	PRELIMINARY	16/07/2024

ISSUED FOR
PRELIMINARY

scale

As indicated

A3 DRAWING

NOTED SCALES RELATE TO A3 DRAWINGS

project no: GTP-007 | date JUN 24 | drawn SV | rev 2

16/07/2024 8:52:55 PM

Permit

Environmental Protection Act 1994

Environmental authority EPPR00426913

This environmental authority is issued by the administering authority under Chapter 5 of the Environmental Protection Act 1994.

Environmental authority number: EPPR00426913

Environmental authority takes effect on 20 March 2023 **.**

Environmental authority holder(s)

Name(s)	Registered address
Gregory John Lott	36 Fairfield Avenue NORMAN GARDENS QLD 4701

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
ERA 55 - Other waste reprocessing or treatment - 2(a) - Operating a facility for receiving and either reprocessing or treating, in a year, the following quantity of category 2 regulated waste - 5,000t or less	46/DS438
ERA 08 - Chemical Storage - 3 - Storing more than 500 cubic metres of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c)	46/DS438
ERA 50 - Mineral and bulk material handling - 2 - Loading or unloading 100t or more of bulk materials in a day, other than loading or unloading mentioned in item 3, or storing bulk materials	46/DS438

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority (EA) is issued is a restatement of the ERA as defined by legislation at the time the EA is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an EA as to the scale, intensity or manner of carrying out an ERA, the conditions prevail to the extent of the inconsistency.

ABN 46 640 294 485

An EA authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the EA specifically authorises environmental harm.

A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

Contaminated land

It is a requirement of the EP Act that an owner or occupier of contaminated land give written notice to the administering authority if they become aware of the following:

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days)

that is causing, or is reasonably likely to cause, serious or material environmental harm.

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term 'duty to notify'.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority - on the nominated day; or

b) if the authority states a day or an event for it to take effect-on the stated day or when the stated event happens; or

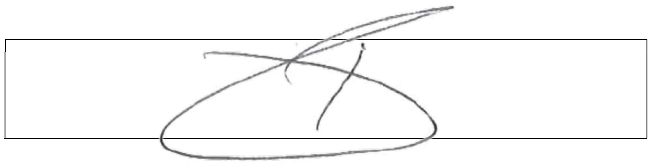
c) otherwise on the day the authority is issued.

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Planning Act 2016* or an SDA Approval under the *State Development and Public Works Organisation Act 1971*), this EA will not take effect until the additional authorisation has taken effect.

If this EA takes effect when the additional authorisation takes effect, you must provide the administering authority written notice within 5 business days of receiving notification of the related additional authorisation taking effect.

The anniversary day of this environmental authority is the same day each year as the original take effect date unless you apply to change the anniversary day. The payment of the annual fee will be due each year on this day. An annual return will be due each year on 01 April.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without the additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating without a valid environmental authority.



Signature

20 March 2023

Date

Tristan Roberts
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
Energy and Extractive Resources
GPO Box 2454, BRISBANE QLD 4001
Phone: (07) 3330 5737
Email: EnergyandExtractive@des.qld.gov.au

Privacy statement

Pursuant to section 540 of the EP Act, the Department is required to maintain a register of certain documents and information authorised under the EP Act. A copy of this document will be kept on the public register. The register is available for inspection by members of the public who are able take extracts, or copies of the documents from the register. Documents that are required to be kept on the register are published in their entirety, unless alteration is required by the EP Act. There is no general discretion allowing the Department to withhold documents or information required to be kept on the public register. For more information on the Department's public register, search 'public register' at www.qld.gov.au. For queries about privacy matters please email privacy@des.qld.gov.au or telephone 13 74 68.

Obligations under the *Environmental Protection Act 1994*

In addition to the requirements found in the conditions of this environmental authority, the holder must also meet their obligations under the EP Act, and the regulations made under the EP Act. For example, the holder must comply with the following provisions of the Act:

- general environmental duty (section 319)
- duty to notify environmental harm (section 320-320G)
- offence of causing serious or material environmental harm (sections 437-439)
- offence of causing environmental nuisance (section 440)
- offence of depositing prescribed water contaminants in waters and related matters (section 440ZG)
- offence to place contaminant where environmental harm or nuisance may be caused (section 443)

Other permits required

This permit only provides an approval under the *Environmental Protection Act 1994*. In order to lawfully operate you may also require permits / approvals from your local government authority, other business units within the department and other State Government agencies prior to commencing any activity at the site. For example, this may include permits / approvals with your local Council (for planning approval), the Department of Transport and Main Roads (to access state controlled roads), the Department of Resources (to clear vegetation), and the Department of Agriculture and Fisheries (to clear marine plants or to obtain a quarry material allocation).

Obligations under the *Mining and Quarrying Safety and Health Act 1999*

If you are operating a quarry, other than a sand and gravel quarry where there is no crushing capability, you will be required to comply with the *Mining and Quarrying Safety and Health Act 1999*. For more information on your obligations under this legislation contact Mine Safety and Health at https://www.rshq.qld.gov.au/, or phone 13 QGOV (13 74 68) or your local Mines Inspectorate Office.

Development Approval

This permit is not a development approval under the *Planning Act 2016*. The conditions of this environmental authority are separate, and in addition to, any conditions that may be on the development approval. If a copy of this environmental authority is attached to a development approval, it is for information only, and may not be current. If you are unsure that you have the most current version of the environmental authority relating to this site please visit https://apps.des.qld.gov.au/env-authorities/ to access all environmental authorities currently approved.

Conditions of environmental authority

Agency interest: General	
Condition number	**Condition**
G1	Activities under this environmental authority must be conducted in accordance with the following limitations: 1. The only category 2 regulated waste to be reprocessed or treated is used cooking oil.
G2	All reasonable and practicable measures must be taken to prevent or minimise environmental harm caused by the activities.
G3	Any breach of a condition of this environmental authority must be reported to the administering authority as soon as practicable within 24 hours of becoming aware of the breach. Records must be kept including full details of the breach and any subsequent actions taken.
G4	Other than as permitted by this environmental authority, the release of a contaminant into the environment must not occur.
G5	Environmental monitoring results must be kept until surrender of this environmental authority. All other information and records that are required by the conditions of this environmental authority must be kept for a minimum of five (5) years. All information and records required by the conditions of this environmental authority must be provided to the administering authority**, or** nominated delegate upon request**,** within the required timeframe and in the specified format.
G6	An appropriately qualified person(s**)** must monitor, record and interpret all parameters that are required to be monitored by this environmental authority and in the manner specified by this environmental authority.
G7	All analyses required under this environmental authority must be carried out by a laboratory that has National Association of Testing Authorities (NATA) certification, or an equivalent certification, for such analyses. The only exception to this condition is the in situ monitoring of turbidity, pH, electrical conductivity and dissolved oxygen.
G8	When required by the administering authority, monitoring must be undertaken in the manner prescribed by the administering authority, to investigate a complaint of environmental nuisance arising from the activity. The monitoring results must be provided within 10 business days to the administering authority upon its request.
G9	The activity must be undertaken in accordance with written procedures that: 1. identify potential risks to the environment from the activity during routine operations, closure and an emergency 2. establish and maintain control measures that minimise the potential for environmental harm 3. ensure plant, equipment and measures are maintained in a proper and effective condition 4. ensure plant, equipment and measures are operated in a proper and effective manner 5. ensure that staff are trained and aware of their obligations under the *Environmental*

	Protection Act 1994 6. ensure that reviews of environmental performance are undertaken at least annually.
G10	Chemicals and fuels in containers of greater than 15 litres must be stored within a secondary containment system.
G11	Measures for detecting seepage and/or leaks from storage tanks must be installed and implemented. Any detection of a leak or seepage must be reported to the administering authority within 10 business days.
Agency interest: Waste	
Condition number	**Condition**
W1	All waste generated in carrying out the activity must be reused, recycled or removed to a facility that can lawfully accept the waste.
Agency interest: Air	
Condition number	**Condition**
A1	Odours or airborne contaminants which are noxious or offensive or otherwise unreasonably disruptive to public amenity or safety must not cause nuisance to any sensitive place or commercial place.
A7	Dust and particulate matter emissions must not exceed the following concentrations at any sensitive place or commercial place: a) dust deposition of 120 milligrams per square metre per day, when monitored in accordance with Australian Standard AS 3580.10.1 (or more recent editions), or b) a concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM10) suspended in the atmosphere of 50 micrograms per cubic metre over a 24 hour averaging time, when monitored in accordance with Australian Standard AS 3580.9.6 (or more recent editions) or any other method approved by the administering authority.
Agency interest: Land	
Condition number	**Condition**
L1	Contaminants must not be released to land.
L2	Before applying to surrender this environmental authority, the site must be rehabilitated to achieve a safe, stable, non-polluting landform.

Agency interest: Acoustic	
Condition number	**Condition**
N1	Other than as permitted within this environmental authority, noise generated by the activity must not cause environmental nuisance to any sensitive place or commercial place.
N2	Generation of substantial low frequency noise is not permitted.
Agency interest: Water	
Condition number	**Condition**
WA1	Contaminants must not be released to waters.
WA2	Stormwater that is not contaminated by the activity must be diverted away from areas where it may become contaminated by the activity. Stormwater that is contaminated by the activity must be directed to a treatment system.

Definitions

Key terms and/or phrases used in this document are defined in this section. Where a term is not defined, the definition in the *Environmental Protection Act 1994*, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.

Activity means the environmentally relevant activities, whether resource activities or prescribed activities, to which the environmental authority relates.

Administering authority means the Department of Environment and Science or its successor or predecessors.

Appropriately qualified person(s) means a person or persons who has professional qualifications, training, skills or experience relevant to the EA requirement and can give authoritative assessment, advice and analysis in relation to the EA requirements using the relevant protocols, standards, methods or literature.

Commercial place means a place used as a workplace, an office or for business or commercial purposes and includes a place within the curtilage of such a place reasonably used by persons at that place.

Environmental nuisance as defined in Chapter 1 of the *Environmental Protection Act 1994*.

Groundwater means water that occurs naturally in, or is introduced artificially into, an aquifer.

Land means any land, whether above or below the ordinary high-water mark at spring tides (i.e. includes tidal land).

Measures has the broadest interpretation and includes:

- Procedural measures such as standard operating procedures for dredging operations, environmental risk assessment, management actions, departmental direction and competency expectations under relevant guidelines
- Physical measures such as plant, equipment, physical objects (such as bunding, containment systems etc.), ecosystem monitoring and bathymetric surveys.

NATA means National Association of Testing Authorities.

Nominated delegate means another government agency that provides services to the administering authority.

Noxious means harmful or injurious to health or physical well-being.

Offensive means causing offence or displeasure; is unreasonably disagreeable to the senses; disgusting, nauseous or repulsive.

Prescribed water contaminants means contaminants listed within Schedule 10 of the Environmental Protection Regulation 2019.

Records include breach notifications, written procedures, analysis results, monitoring reports and monitoring programs required under a condition of this authority.

Release of a contaminant into the environment means to:

1. deposit, discharge, emit or disturb the contaminant
2. cause or allow the contaminant to be deposited, discharged, emitted or disturbed
3. fail to prevent the contaminant from being deposited, discharged emitted or disturbed
4. allow the contaminant to escape
5. fail to prevent the contaminant from escaping.

Secondary containment system means a system designed, installed and operated to prevent any release of contaminants from the system, or containers within the system, to land, groundwater, or surface waters.

Sensitive place includes the following and includes a place within the curtilage of such a place reasonably used by persons at that place:

1. a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential

premises; or
2. a motel, hotel or hostel; or
3. a kindergarten, school, university or other educational institution; or
4. a medical centre or hospital; or
5. a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 2004* or a World Heritage Area; or
6. a public park or garden; or
7. for noise, a place defined as a sensitive receptor for the purposes of the Environmental Protection (Noise) Policy 2019.

Stormwater that is not contaminated by the activity includes stormwater runoff from external or undisturbed catchments.

Substantial low frequency noise means a noise emission that has an unbalanced frequency spectrum shown in a one-third octave band measurement, with a predominant component within the frequency range 10 to 200 Hz. It includes any noise emission likely to cause an overall sound pressure level at a sensitive place exceeding 55 dB(Z).

Waters includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water, natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.

You means the holder of the environmental authority

END OF ENVIRONMENTAL AUTHORITY

Gladstone Ports Corporation

Growth, Prosperity, Community.

DECISION NOTICE – DA 2008/08

INTEGRATED PLANNING ACT 1997 S 3.5.15

Application:	**Material Change of Use for Environmentally Relevant Activity (ERA) 7B - Chemical Storage**
Applicant Name and address:	**Portside Storage Pty Ltd PO BOX 5127 Central Queensland Mail Centre QLD 4702**
Owner:	**Portside Storage Pty Ltd**
Subject Land:	**Lot 46 on DS437**
Location:	**Bajool-Port Alma Road, Port Alma**
Present Zoning	**Strategic Port Land**
Existing Use:	**Tallow Storage**
Proposed Use:	**Biodiesel Storage**
Area:	**4.5ha**
Application Received:	**4 July 2008**

This development application was assessed on: 20 February 2009

1. Details Of The Approval

Development Permit: Material Change of Use for Environmentally Relevant Activity (ERA) 7b – Chemical Storage

2. Assessment Manager's Conditions

a) Gladstone Ports Corporations Health, Safety, Environment, and Security Manager is to be notified as soon as practicable after becoming aware of any release of contaminants not in accordance with any of the environmental conditions (including the Environmental Protection Agencies conditions) set out in this approval.

b) Staff are to be familiar with the Gladstone Ports Corporation environmental policy, of which a copy is to be kept on site.

c) Any spillage of wastes, contaminants or other materials must be cleaned up as quickly as practicable. Such spillage must not be cleaned up by hosing, sweeping or otherwise releasing such wastes, contaminants or material to any external storm water drainage system, roadside gutter or waters. To remove any doubt this condition does not apply to hosing, sweeping, etc of areas and oily materials that drain to an oily-water management system.

d) The spillage of bulk products being loaded or unloaded, wastes, contaminants or other materials that are on Port infrastructure such as roads or wharves must be cleaned up as quickly as practicable. Such spillage must not be cleaned by hosing, sweeping or otherwise releasing such wastes, contaminants or materials to any storm water drainage system, roadside gutter or waters.
e) Spill kits are to be located where any loading/unloading of fuel is to occur. All personnel involved with this activity are to be trained and competent in the proper use of these spill kits.
f) All reasonable and practicable measures must be undertaken to prevent the spillage of bulk products from the ship loaders into harbour waters.
g) Prior to any release, any storm water captured within the containment system must be free from contaminants or wastes that may cause environmental harm.
h) Washing, degreasing, servicing or other maintenance of vehicles, plant, or other equipment must not occur on the licensed place in any area where resulting contaminants will or may be released to any external storm water drain, land or waters.
i) All disposal of waste generated in carrying out the authority must be to a proper and appropriate facility that accepts that waste. Regulated waste, if removed from the site, must only be reprocessed, recycled, stored, incinerated or disposed at a licensed regulated waste facility.
j) Prior to the shipment of any product associated with this licence the proponent is requested to consult with the Port Infrastructure Asset Manager, Owen Barton to ensure that appropriate wharf bunding has been implemented.
k) The proponent must clear all pipes and equipment from the wharf deck when directed by GPC.
l) The proponent must perform regular integrity tests on all operational pipe work in accordance with the Australian Standards. Records of these tests must be forwarded to GPC.
m) The proponent must supply the Port with detailed plans in both hard and electronic format which illustrates all infrastructure on Port land which is associated with your site (i.e. pipelines, electrical route, etc.)
n) As the subject site is located within an approved explosives limit at Port Alma, all activities undertaken by the proponent must be satisfactory to the Ports current and future operations, therefore the site will be subject to the requirements of the *Explosives Act 1999,* the Explosives Regulations and Australian Standard (AS) 3846 : Handling and transport of dangerous cargoes at port – 2005.

3. Referral Agency Conditions –

Environmental Protection Agency
The Decision Notice conditions of the Environmental Protection Agency acting as a Concurrence Agency are as per their letter dated 14 November 2008 attached to this notice.

Hazardous Industries and Chemicals Branch
The recommendations of the Hazardous Industries and Chemicals Branch acting as a Third Party Advice Agency are as per their letter dated 21 January 2009 attached to this notice.

4. The Approved Plans –

The approved plans and/or documents forming part of this decision notice are listed in the following table:

Document Reference	Plan / Document Name	Date
Figure: 4	Port Alma Terminal, Port Alma, Queensland	-
Ref: 080167-01	Risk Contours for Portside Storage Facility over Lot 46 on DS438	09.09.08

Documentation forming part of the Decision Notice is as follows:

Portside Storage P\L "*Port Alma Terminal, Quality Assurance Manual*", Site Based Management Plan, 27 November 2008.

5. When The Development Approval Takes Effect —

If the application is approved, or approved subject to conditions, the decision notice, or if a negotiated decision notice is given, the negotiated decision notice, is taken to be the development approval and has effect—

(a) if there is no submitter and the applicant does not appeal the decision to the court, from the time—

(i) the decision notice is given; or

(ii) if a negotiated decision notice is given - the negotiated decision notice is given; or

(b) if there is a submitter and the applicant does not appeal the decision to the court, the earlier of the following—

(i) when the submitter's appeal period ends;

(ii) the day the last submitter gives the assessment manager written notice that the submitter will not be appealing the decision; or

(c) if an appeal is made to the court, subject to section 4.1.47(2) and the decision of the court under section 4.1.54— when the appeal is finally decided.

This approval will lapse unless –

(i) for a material change of use, the use is substantially started within the relevant period stated in section 2 of this decision notice;

(ii) for a reconfiguration, a plan for the reconfiguration is not given to the local government within the relevant period stated in section 2 of this decision notice;

(iii) for a development approval other than a material change of use or reconfiguration, the development does not substantially start within the relevant period stated in section 2 of this decision notice.

Note that in the case of a development approval for a material change of use for a reconfiguring a lot, if there is 1 or more subsequent related approvals the relevant period for the material change of use or reconfiguration will restart from the date of the related approval. Please refer to section 3.5.21 of IPA for further information.

Development may start when a development permit for the development takes effect (IPA s3.5.21).

6. The Relevant Period for the Approval

Under Section 3.5.21 of the Integrated Planning Act, this development approval lapses (expires) as follows:

Material Change of Use of Premises

If the first change of use under the approval does not happen within the following period (the relevant period): 4 (four) years starting the day the approval takes effect.

General

The relevant period begins when the approval takes effect. Before the relevant period lapses an applicant may apply to the Corporation to extend the relevant period as per Section 3.5.22 of the Integrated Planning Act 1997.

7. Other Necessary Development Permits

There are no other development permits that are necessary to allow the development to be carried out.

8. IDAS Referral Agencies (Concurrence and Advice Agencies)

The IDAS referral agencies applicable to this application are:

Referral Trigger	Agency Name	Status	Address
Material Change of use for an Environmentally Relevant Activity	Environmental Protection Agency	Concurrence	Ecoaccess Customer Service Unit PO Box 15155 CITY EAST QLD 4002
Adjacent to Major Hazardous Facilities	Hazardous Industries and Chemicals Branch	Third Party Advice	Hazardous Industries and Chemicals Branch GPO Box 1425 BRISBANE QLD 4001

9. Appeal Rights

Attached is an extract from the Integrated Planning Act 1997 which details your appeal rights regarding this decision.

10. Further Information for Applicant

Port Alma is classified as a Hazardous Facility, due to the amount of Explosives that are handled at the terminal. As a result of the quantities of this cargo there are certain restrictions placed on the operational aspects of the terminal as set out in the relevant Legislation and Australian Standards.

The requirements for the handling of explosives, emphasises on ensuring that the minimum number of people are exposed to the risk of an explosive event. The advice provides a distance to be used based on the possible consequences of an event occurring. Note that

this event is a low probability if all safety mitigations are in place and effective (in those circumstances a low risk but high consequence event).

Therefore to ensure that there are appropriate mitigation measures and evacuation procedures in place to minimise the effect of an explosive incident, GPC is committed to engaging a qualified person to assess and make recommendations on the implementation of alternative safety measures for each port user. It should also be noted that the outcome of this risk assessment, may have an impact on certain aspects of your operations.

11. Assessment Manager Certification

Geoff White
Corporate Services Manager
20 February 2009

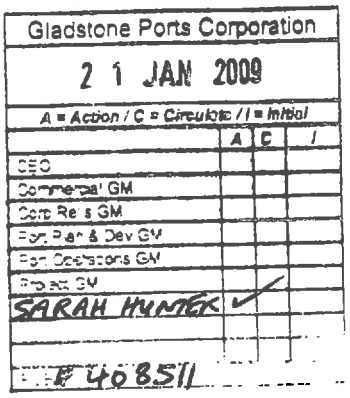
Enc: Appeal provisions

Cc: Referral Agencies

Queensland Government

Our Ref: 09/000027

Department of
Employment and Industrial Relations



Ms Sarah Hunter
Planning Officer
Gladstone Ports Corporation Ltd
Port of Gladstone
PO Box 259
GLADSTONE QLD 4680

Dear Ms Hunter

Re –Proposal for storing Biodiesel at Portside Storage Facility, Port Alma

Background

Hazardous Industries and Chemicals Branch (HICB), Department of Employment and Industrial Relations (DEIR), formerly known as Chemical Hazards and Emergency Management (CHEM) Services, has received and reviewed the following documents related to this proposal in emails received on 9 January 2009.

1. Port Alma Quality Assurance Manual.zip;
2. Letter to Portside storage.pdf;
3. Portside storage letter.pdf;
4. Portside Storage Letter + Attachments.zip;

Current Issues

HICB provides the following comment on the documents provided:

Compliance with standards

The documents indicate that bund capacity is equal to or greater than the capacity of the largest tank. AS 1940 – The storage and handling of flammable and combustible liquids section 5.8 indicates that bunding capacity should also include an allowance for 20 minutes of fire water. Discussion with the site manager, Greg Lot on 13 January 2009 indicates that this requirement will be met by the existing bund capacity.

Compliance with relevant standards has not been clearly stated however no other specific concerns are apparent. This may be adequately checked by local council at inspection.

Notification and Legislative requirements

For the volumes of materials intended to be stored, the facility is expected to meet the requirements for a large dangerous goods location under the Dangerous Goods Safety Management Act 2001. It is a requirement that large dangerous goods locations notify this department for tracking purposes. The relevant notification form (Form 1) can be found at the following web location.

.../2

http://www.emergency.qld.gov.au/chem/forms/default.asp

As a large dangerous goods location, there are specific responsibilities placed on the occupier and can be found in the Dangerous Goods Safety Management Act 2001, regulation, various guidance notes and other publications available at our website. http://www.emergency.qld.gov.au/chem/publications/default.asp. This should include providing a suitable safety management system, emergency response plan, markings and placarding.

Consequence and risk modelling

The proposal includes some consequence and risk modelling conducted by a consultant that seems to indicate large risk and consequence zones that extend as far as the port. HICB was concerned that these marked consequence zones appear larger than expected and HICB has discussed the hazards and techniques used for modelling consequences with both the consultant and the site manager. These discussions have confirmed that the event modelled is appropriate, being for the unlikely scenario of a full tank rupture that fills the large site bund and then catches fire. However, HICB consequence modelling indicates that the heat radiation at 4.7kW/m2 is much less extensive and will likely not effect any neighbouring structures.

The risk contours provided have no clear basis and are likely to be much closer to the site boundaries that represented in the proposal. Despite this information, HICB considers that the development is likely to fulfil the risk criteria for land use safety planning defined in Hazardous Industry Planning Advisory Paper No.4.

DME Consultation

HICB has not considered the consequences or risk of an explosion of materials at the port. HICB recommends that the Port Authority consult with the Department of Mines and Energy, Explosives Inspectorate for assistance in regard to this.

Recommendations

HICB considers that the proposed development is likely to satisfy the risk criteria for land use safety planning. If the application is approved, HICB recommends that this advice be provided to the proponent to assist in fulfilling their legislative requirements.

Should further information be required or you wish to discuss any issues associated with this project, please contact me on telephone number 3247 8213 and I will be pleased to assist.

Yours sincerely

DAVID JONES
Senior Safety Advisor (Major Hazards)
Hazardous Industries and Chemicals Branch
Workplace Health and Safety Queensland
16/1/2009

PORTSIDE STORAGE P/L

PORT ALMA TERMINAL

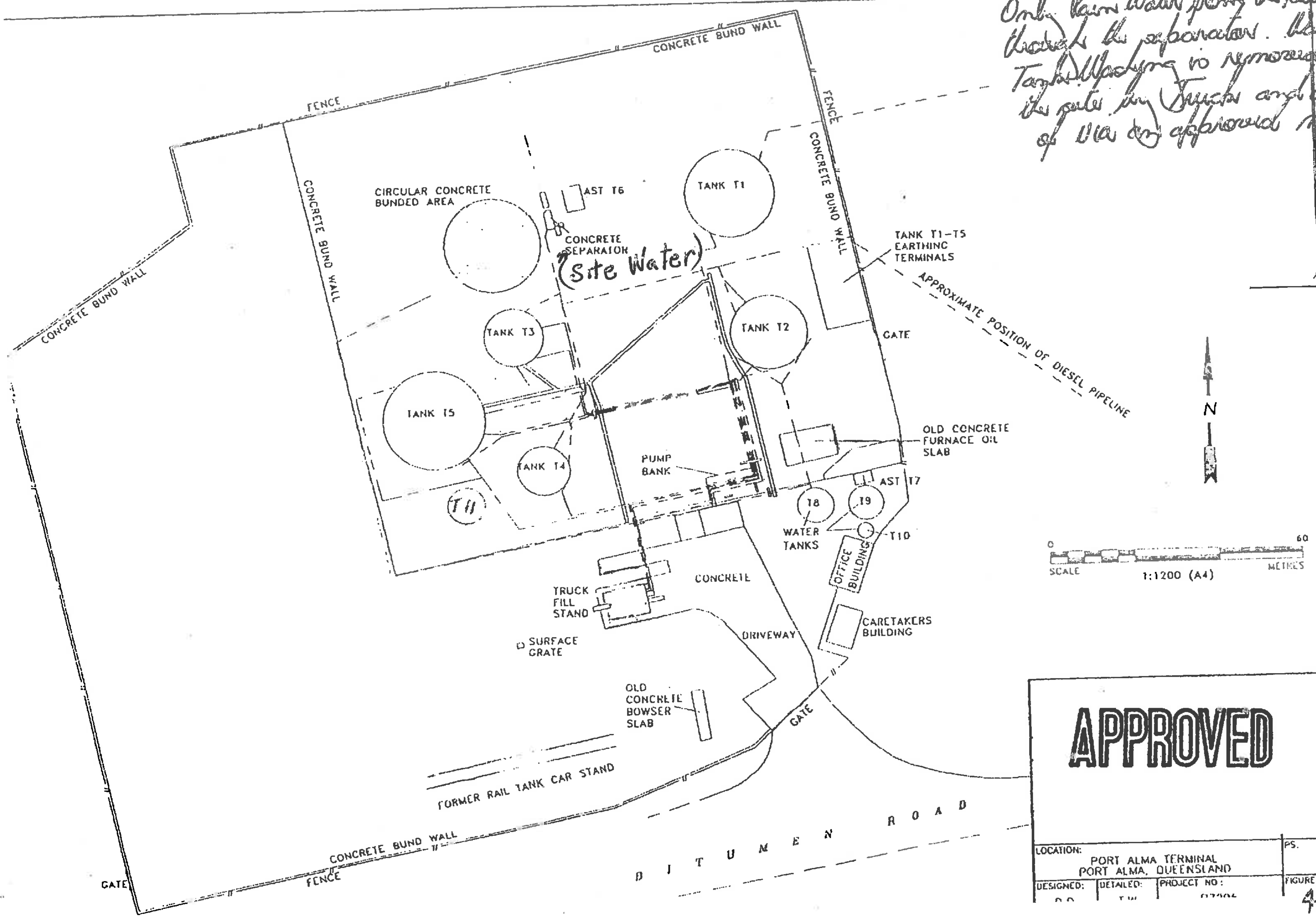
Quality Assurance Manual

International Standards Organisation Format

Environmental Protection Agency

Site Based Management Plan

APPROVED



APPROVED

LOCATION: PORT ALMA TERMINAL, PORT ALMA, QUEENSLAND			PS.
DESIGNED: D.D.	DETAILED: T.W.	PROJECT NO: 07206	FIGURE: 4

Only Rain Water from the site passes through the separator. Water from Tank Washing is removed from the site by Trucks and disposed of via an approved manner

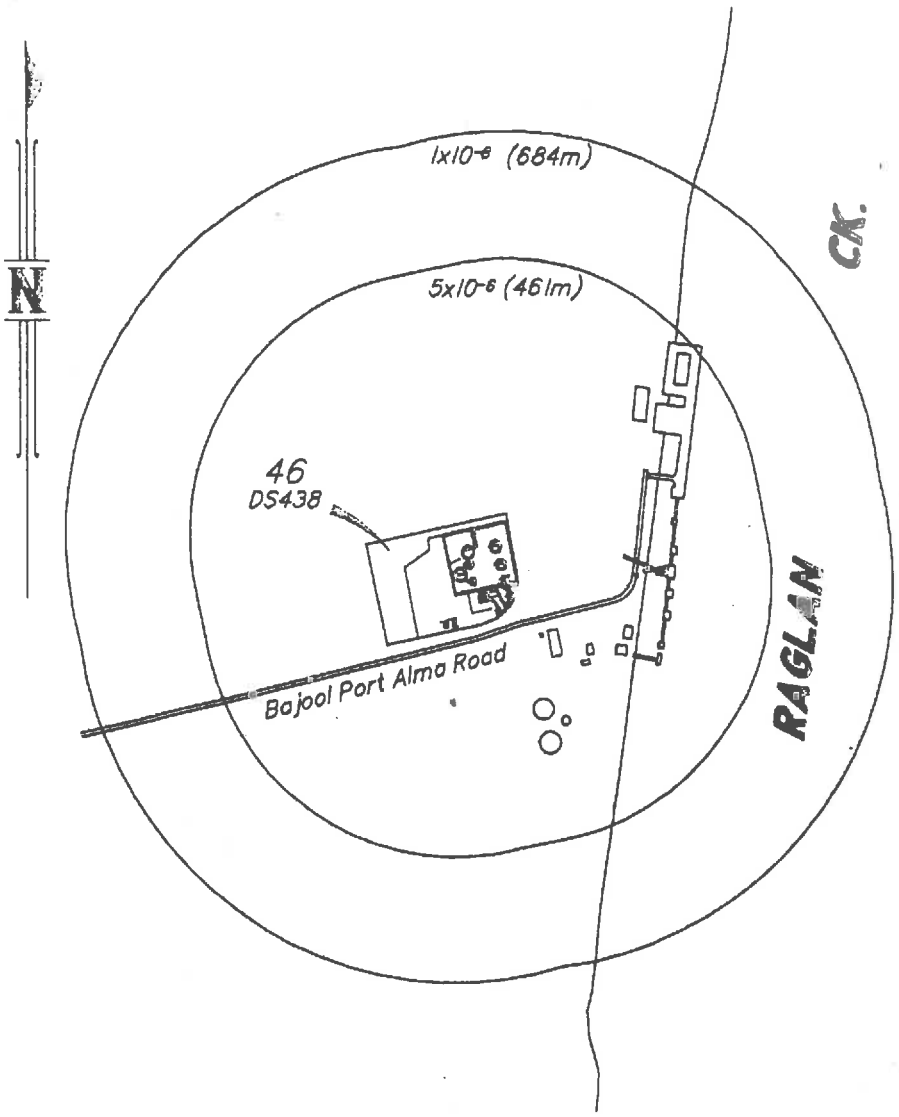


Table of Risk Criteria, New Plants

Fatality risk to Sensitive uses, hospitals, schools, aged care.	0.5x10⁻⁶ per year
Fatality risk to residential and hotels.	1.0x10⁻⁶ per year
Fatality risk to commercial areas, offices, retail centres, warehouses.	5.0x10⁻⁶ per year
Fatality risk to sporting complexes & active open spaces.	10x10⁻⁶ per year
Fatality risk to be contained within the boundary of an industrial site.	50x10⁻⁶ per year
Propagation due to fire – exceed radiant heat levels of 23 kW/m².	50x10⁻⁶ per year

Taken from Department of Urban Affairs & Planning (NSW) Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning

Note: The 5x10⁻⁶ contour is based on the 10Kw/m² isotherm, with the contour calculation based on data from the US EPA's "OSWERHCHAP Handbook of Chemical Hazard Analysis Procedures". The 1x10⁻⁶ contour is based on the 5kW/m² isotherm which was modelled using data from the US EPA's "Risk Management Program Guidance for Offsite Consequence Analysis",(1999). No contour has been calculated for the 23kW/m² isotherm due to the dynamics of large pool fires restricting oxygen availability for combustion therefore limting surface emissive power to 20kW/m² (Shewring ,D.2008). However if their is a tank top fire on either tank 1 or 5 a surface emissive power of 35kW/m2 could occur. By using the view factor model an 23kW/m² isotherm of 3 to 5 metres from the tanks could be created. However there would be a small increase in the probability of a fatality, but not of the scale to warrant a 10x10⁻⁶ risk contour. Satistical Data for the Risk Contours was taken from a report prepared by Lake & Novo which examined the probability of pool fires involving Bio Diesel in bulk stroage facility. Lake and Novo findings were supported by data from the Office of the Australian Safety and Compensation Council.

Scale 1:14000 – Lengths are in Metres.

100 0 100 300 500 700 900 1100 1300 1500 1700 1900 2100

Plan of:

Risk Contours for Portside Storage Facility over Lot 46 on plan DS438

Prepered by:-
Arron Norman Setnik, Environmental Science Undergradate (CQU)
and
Sital S.H.P. Govind BBMS with Distinction (CQU)

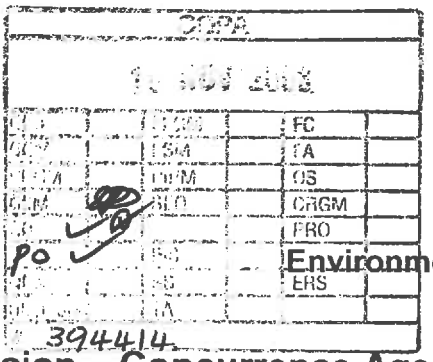
Note:- This plan was prepared to accompany an application to the Central Queensland Ports Authority and should not be used for any other purpose. The dimensions and areas shown hereon are subject to field survey and also to the requirements of council and any other authority which may have requirements under any relevant legislation. In particular, no reliance should be placed on the information on this plan for any financial dealings involving the land. This note is an integral part of this plan.

GSPC
(Gracemere Surveying and Planning Consultants Pty Ltd)
ABN: 40 124 780 445
PO Box 379 Gracemere QLD 4702
120 William St Rockhampton QLD 4702
PH: (07) 4922 7033 email: admin@gspc.com.au FAX: (07) 4922 7044

APPROVED

Drawn: SETNIK	Scale: 1:14000
Date: 9-09-08	Parish: CASUARINA
AutoCad Scale: 1:500	County: Deas Thompson
	Ref: 080167-01

ecoaccess
environmental licences and permits



Notice

Environmental Operations

Notice of Decision – Concurrence Agency Response

This notice is issued by the Environmental Protection Agency pursuant to section 3.3.16 and Section 3.3.18 of the *Integrated Planning Act 1997* to advise of a decision or action.

Geoff White
Gladstone Ports Corporation
PO Box 259 Gladstone QLD 4680

Cc:
Greg Lott
28 Brookside Avenue
North Rockhampton QLD 4701

Your reference:

Our reference: ROK4319

Attention: Corporate Services Manager, Geoff White

Re: Application for Material Change of Use for ERA 7B

The EPA has assessed the application received on 14 October 2008 and wishes to advise you of the following decision(s):

Activity (Referral trigger)	Approval type	Decision	EPA Approval Number
Material Change of Use for Environmentally Relevant Activity 7(b) - Chemical Storage select select	Development Approval	Granted	IPCE01232708

A corresponding Concurrence Agency Response is attached for each assessable development type that includes any stated conditions applying to an approval or gives the basis for refusing an application. Please retain this documentation for your records.

Please note that it is a requirement under Section 3.5.15 of the *Integrated Planning Act 1997* that a copy of the final Decision Notice (which includes the Agency's concurrence conditions) for this application issued by Gladstone Ports Corporation, be forwarded to each referral agency.

Environmental Protection Agency
www.epa.qld.gov.au ABN 87 221 158 786

Queensland Government
Environmental Protection Agency
Queensland Parks and Wildlife Service

ecoaccess
environmental licences and permits

Concurrence Agency Response

Section 3.3.18 *Integrated Planning Act 1997*

EPA Permit[1] number: IPCE01232708

EPA Permit[1] number:	IPCE01232708
Assessment Manager reference:	
Date application received by EPA:	14-OCT-2008
Permit[1] Type:	Concurrence Response for a MCU involving an ERA
Date of Decision:	12-NOV-2008
Decision:	decided that conditions must be attached to any development approval.
Relevant Laws and Policies:	*Environmental Protection Act 1994* and any subordinate legislation
Jurisdiction:	Item 1 in Table 2 of Schedule 2 of the *Integrated Planning Regulation 1998*

Development Description

Property	Lot/Plan	Aspect of Development
Port Alma, BAJOOL QLD 4699	Lot 46 Plan DS438	ERA 7(b) Chemical storage - storing chemicals (other than crude oil, natural gas and petroleum products), including ozone depleting substances, gases, dangerous goods under the dangerous goods code in containers having a design storage volume of more than 1 000 m3.

Reasons for inclusion of development conditions

In accordance with section 3.3.18(8) of the Integrated Planning Act 1997 and section 27B of the Acts Interpretation Act 1954, the reasons for the inclusion of development conditions are:

1) The Environmental Protection Agency is a concurrence agency under the Integrated Planning Regulation 1998 for the purposes of the Environmental Protection Act 1994.

[1] Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation administered by the Environmental Protection Agency and the Queensland Parks and Wildlife Service

Environmental Protection Agency
www.epa.qld.gov.au ABN 87 221 158 786

Queensland Government
Environmental Protection Agency
Queensland Parks and Wildlife Service

2) Any development conditions placed on this permit1 for an environmentally relevant activity are in accordance with section 73B of the Environmental Protection Act 1994.

Additional comments or advice about the application

N/A

Additional information for applicants

Contaminated Land

It is a requirement of the *Environmental Protection Act 1994* that if an owner or occupier of land becomes aware a Notifiable Activity (as defined by Schedule 2 of the *Environmental Protection Act 1994*) is being carried out on the land or that the land has been affected by a hazardous contaminant, they must, within 30 days after becoming so aware, give notice to the Environmental Protection Agency.

Environmentally Relevant Activities

The aforementioned description of any environmentally relevant activity (ERA) for which this permit is issued is simply a restatement of the ERA as prescribed in the legislation at the time of issuing this permit. Where there is any conflict between the abovementioned description of the ERA for which this permit is issued and the conditions specified herein as to the scale, intensity or manner of carrying out of the ERA, then such conditions prevail to the extent of the inconsistency.

This permit authorises the ERA. It does not authorise environmental harm unless a condition within this permit explicitly authorises that harm. Where there is no such condition, or the permit is silent on a matter, the lack of a condition or silence shall not be construed as authorising harm.

In addition to this permit, the person to carry out the ERA must be a registered operator under the Environmental Protection Act 1994. For the person to become a registered operator, they must apply for a registration certificate under section 73F of the Environmental Protection Act 1994.

Don Arnold
Delegate
Environmental Protection Agency
12-NOV-2008

CONDITIONS OF APPROVAL

Schedule A – Activity

(A1-1) **Prevent and/or minimise likelihood of environmental harm.**

In carrying out an ERA to which this approval relates, all reasonable and practicable measures must be taken to prevent and / or to minimise the likelihood of environmental harm being caused.

(A2-1) **Maintenance Of Measures, Plant and Equipment.**

The operator of an ERA to which this approval relates must:
(a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this approval; and
(b) maintain such measures, plant and equipment in a proper and efficient condition; and
(c) operate such measures, plant and equipment in a proper and efficient manner.

(A3-1) **Site Based Management Plan.**

From commencement of an ERA to which this approval relates, a site based management plan (SBMP) must be implemented. The SBMP must identify all sources of environmental harm, including but not limited to the actual and potential release of all contaminants, the potential impact of these sources and what actions will be taken to prevent the likelihood of environmental harm being caused. The SBMP must also provide for the review and 'continual improvement' in the overall environmental performance of all ERAs that are carried out.

The SBMP must address the following matters:
(a) Environmental commitments - a commitment by senior management to achieve specified and relevant environmental goals.
(b) Identification of environmental issues and potential impacts.
(c) Control measures for routine operations to minimise likelihood of environmental harm.
(d) Contingency plans and emergency procedures for non-routine situations.
(e) Organisational structure and responsibility.
(f) Effective communication.
(g) Monitoring of contaminant releases.
(h) Conducting environmental impact assessments.
(i) Staff training.
(j) Record keeping.
(k) Periodic review of environmental performance and continual improvement.

(A4-1) The site based management plan must not be implemented or amended in a way that contravenes any condition of this approval.

END OF CONDITIONS FOR SCHEDULE A

Schedule B - Air

(B1-1) **Nuisance.**

The release of noxious or offensive odours or any other noxious or offensive airborne contaminants resulting from the activity must not cause a nuisance at any nuisance sensitive or commercial place.

(B2-1) **Dust Nuisance.**

The release of dust and/or particulate matter resulting from the ERA must not cause an environmental nuisance at any nuisance sensitive or commercial place.

END OF CONDITIONS FOR SCHEDULE B

Schedule C - Water

(C1-1) Contaminants other than settled/treated stormwater runoff waters must not be released from the site to surface waters or the bed or banks of surface waters.

(C2-1) **Stormwater Management.**

There must be no release of stormwater runoff that has been in contact with any contaminants at the site to any waters, roadside gutter or stormwater drain.

END OF CONDITIONS FOR SCHEDULE C

Schedule D - Noise

(D1-1) **Noise Nuisance.**

Noise from the ERA must not cause an environmental nuisance at any nuisance sensitive place or commercial place.

END OF CONDITIONS FOR SCHEDULE D

Schedule E - Waste

(E1-1) Regulated waste is not permitted to be released from any vehicle or any container transported by that vehicle other than at a proper and appropriate place that can lawfully accept such waste.

END OF CONDITIONS FOR SCHEDULE E

Schedule F - Land

(F1-1) **Preventing Contaminant Release To Land.**

Contaminants must not be released to land.

(F2-1) Spillage of all chemicals and fuels must be contained within an on-site containment system and controlled in a manner that prevents environmental harm.
NOTE: All petroleum product storage's must be designed, constructed and maintained in accordance with AS 1940 - Storage and Handling of Flammable and Combustible Liquids.

END OF CONDITIONS FOR SCHEDULE F

Schedule G - General

(G1-1) **Notification.**

Telephone the EPA's Pollution Hotline or local office as soon as practicable after becoming aware of any release of contaminants not in accordance with the conditions of this approval.

END OF CONDITIONS FOR SCHEDULE G

Schedule H - Social

(H1-1) **Complaint Response.**

The operator of the ERA must record the following details for all complaints received and provide this information to the administering authority on request:

a) Time, date, name and contact details of the complainant;
b) reasons for the complaint;
c) any investigations undertaken;
d) conclusions formed; and
e) any actions taken.

END OF CONDITIONS FOR SCHEDULE H

END OF CONDITIONS

Confirmation Notice

PLANNING ACT 2016, PART 1 OF THE DEVELOPMENT ASSESSMENT RULES

Application number:	**D/91-2024**	*For further information regarding this notice, please contact:*	Sophie Muggeridge
Date application properly made**:**	**25 July 2024**	Phone:	07 4936 8099

1. APPLICANT DETAILS

Name:	**IXOM Operations Pty Ltd C/- Gideon Town Planning**		
Postal address:	**PO BOX 450** **ROCKHAMPTON CITY QLD 4700**		
Contact number:	(07) 4806 6959	Email:	info@gideontownplanning.com.au

2. PROPERTY DESCRIPTION

Street address:	Lot 46 Bajool - Port Alma Road, Port Alma
Real property description:	Lot 46 on DS438

3. OWNER DETAILS

Name:	Portside Storage Pty Ltd
Postal address:	PO BOX 5127 RED HILL ROCKHAMPTON QLD 4701

4. DEVELOPMENT APPROVAL SOUGHT

Development Permit for a Material Change of Use for a Medium Impact Industry

5. APPLICATION TYPE

	Development Permit	Preliminary Approval
Development assessable under the planning scheme, a temporary local planning instrument, a master plan or a preliminary approval which includes a variation approval	☒	☐

6. REFERRAL AGENCIES	**YES**

Based on the information accompanying the lodged application, in accordance with the *Planning Regulation 2017,* referral to the following Referral Agencies is required.

For an application involving	Name of agency	Role of Agency	Contact Details
HAZARDOUS CHEMICAL FACILITIES			
Schedule 10, Part 7, Division 3, Table 1 - Assessable development under s13			

Development application for a material change of use that is assessable development under section 13, unless the chief executive is the prescribed assessment manager	The chief executive of the department in which the *Planning Act 2016* is administered: State Development, Infrastructure, Local Government and Planning (State Assessment and Referral Agency Department)	Concurrence	In person: Level 2, 209 Bolsover Street, Rockhampton City Online lodgement using MyDAS2: https://prod2.dev-assess.qld.gov.au/suite/ Email: RockhamptonSARA@dsdilgp.qld.gov.au Postal: PO Box 113 Rockhampton Qld 4700

It is the responsibility of the applicant to give within 10 business days each referral agency a copy of -

- the application (including application form and supporting material);
- this confirmation notice; and
- any applicable concurrence agency application fee (refer to the *Planning Regulation* to confirm the applicable referral agencies).

The applicant must provide written advice to Council (as the Assessment Manager) of the day on which this action was completed.

7. IMPACT ASSESSMENT

Will Impact Assessment be required?	**YES**
The whole of the application must be publicly notified under the provisions of Part 4 of the Development Assessment Rules by:	
- Publishing a notice at least once in a newspaper circulating generally in the locality of the premises which are the subject of the application; and - Placing a notice on the premises which are the subject of the application. The notice must remain on the premises for the period of time up to and including the stated day; and - Giving a notice to all owners of any lots adjoining the premises which are the subject of the application.	

8. PUBLIC NOTIFICATION DETAILS

The application requires public notification which must be undertaken in accordance with Section 53 of the *Planning Act 2016* and Part 4 of the Development Assessment Rules.

9. INFORMATION REQUEST

A further information request may be made by the assessment manager. Regardless of this advice, any concurrence agency for the application may make an information request.

10. SUPERSEDED PLANNING SCHEME

Is the application to be assessed under a Superseded Planning Scheme?	**NO**

You are further advised that the truth and accuracy of the information provided in the application form and accompanying information is relied on when assessing and deciding this application. If you find an INACCURACY in any of the information provided above or have a query or seek clarification about any of these details, please contact Council's Development Assessment Unit.

11. ASSESSMENT MANAGER

Name:	**Sophie Muggeridge** **PLANNING OFFICER**	Signature:		Date:	25 July 2024

Queensland Government

Our reference: 2407-41599 SRA
Your reference: -

2 August 2024

IXOM Operations Pty Ltd
PO Box 450
ROCKHAMPTON QLD 4700
gg@gideontownplanning.com.au

Attention: Gideon Genade

Dear IXOM Operations Pty Ltd

Referral confirmation notice
(Given under section 7 of the Development Assessment Rules)

The development application described below is taken to be properly referred to the State Assessment and Referral Agency (SARA) under Part 2: Referral of the Development Assessment Rules.

Location details

Street address:	Bajool - Port Alma Road, Port Alma
Real property description:	46DS438
Local government area:	Rockhampton Regional Council

Application details

Development permit	Material change of use for Medium Impact Industry - Ethylene Storage

The referral confirmation period ended on 2 August 2024. The SARA assessment will be under the following provisions of the Planning Regulation 2017:

- 10.7.3.1.1 Hazardous chemical facilities

For further information please contact Carl Porter, Principal Planning Officer, on 07 4924 2918 or via email RockhamptonSARA@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely

Anthony Walsh
Manager Planning

cc Rockhampton Regional Council, enquiries@rrc.qld.gov.au

Fitzroy/Central regional office
Level 2, 209 Bolsover Street,
Rockhampton
PO Box 113, Rockhampton QLD 4700

Queensland Government

SARA reference: 2407-41599 SRA
Applicant reference: -
Council reference: D/91-2024

9 August 2024

IXOM Opertions Pty Ltd
PO Box 450
ROCKHAMPTON QLD 4700
gg@gideontownplanning.com.au

Attention: Gideon Genade

Dear IXOM Opertions Pty Ltd

SARA information request - Bajool - Port Alma Road, Port Alma

(Given under section 12 of the Development Assessment Rules)

This notice has been issued because the State Assessment and Referral Agency (SARA) has identified that information necessary to assess your application against the relevant provisions of the State Development Assessment Provisions has not been provided.

Hazardous Chemical Facility	
1.	**Issue:** The application does not provide adequate information to assess compliance with PO10 of State Code 21. The assessment of storm tide and cyclone risk is incomplete, and the applicant made no commitment to implementing the recommendations from the hazard and risk assessment. **Action:** To demonstrate compliance with PO10 of State Code 21, provide: **1.** information about the design basis of the raised pad of ground / embankment and whether this is adequate to mitigate the risk of the defined storm tide inundation event. **2.** a detailed emergency plan that demonstrates ethylene containers can be safely moved to a safe location if a storm tide inundation event is forecast. The plan should address the following points: a. The safe location is defined and is demonstrated to be always available and approved for emergency use.

Fitzroy/Central regional office
Level 2, 209 Bolsover Street,
Rockhampton
PO Box 113, Rockhampton QLD 4700

	b. The safe location is sufficiently separated from incompatible land use/s. c. IXOM has the personnel and resources (e.g. trucks) to move all of the ethylene containers in time. **3.** Information about the container design wind speed and whether this is adequate to prevent overturning / damage during a foreseeable cyclone. **4.** Specify which of the recommendations in *Appendix E_Hazard and Risk Assessment_Port Alma Ethylene Storage.pdf* table 8 will be implemented. If any will not be implemented give reasons and specify alternative actions.

How to respond

You have three months to respond to this request and the due date to SARA is 11 November 2024**.** You may respond by providing either: (a) all of the information requested; (b) part of the information requested; or (c) a notice that none of the information will be provided. Further guidance on responding to an information request is provided in section 13 of the Development Assessment Rules (DA Rules).

It is recommended that you provide all the information requested above. If you decide not to provide all the information requested, your application will be assessed and decided based on the information provided to date.

You are requested to upload your response and complete the relevant tasks in MyDAS2.

As SARA is a referral agency for this application, a copy of this information request will be provided to the assessment manager in accordance with section 12.4 of the DA Rules.

If you require further information or have any questions about the above, please contact Carl Porter, Principal Planning Officer, on 0749242918 or via email RockhamptonSARA@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely

Anthony Walsh
Manager Planning

cc Rockhampton Regional Council, enquiries@rrc.qld.gov.au

Development details	
Description:	Development permit Material change of use for Medium Impact Industry - Ethylene Storage
SARA role:	Referral agency
SARA trigger:	Schedule 10, part 7, division 3, table 1, item 1 (Planning Regulation 2017) Development application for a material change of use for a Hazardous chemical facility
SARA reference:	2407-41599 SRA
Assessment criteria:	SDAP v3.0: - State code 21: Hazardous chemical facilities

Queensland Government

SARA reference: 2407-41599 SRA
Applicant reference: -
Council reference: D/91-2024

9 August 2024

IXOM Opertions Pty Ltd
PO Box 450
ROCKHAMPTON QLD 4700
gg@gideontownplanning.com.au

Attention: Gideon Genade

Dear IXOM Opertions Pty Ltd

SARA information request - Bajool - Port Alma Road, Port Alma

(Given under section 12 of the Development Assessment Rules)

This notice has been issued because the State Assessment and Referral Agency (SARA) has identified that information necessary to assess your application against the relevant provisions of the State Development Assessment Provisions has not been provided.

Hazardous Chemical Facility	
1.	**Issue:** The application does not provide adequate information to assess compliance with PO10 of State Code 21. The assessment of storm tide and cyclone risk is incomplete, and the applicant made no commitment to implementing the recommendations from the hazard and risk assessment. **Action:** To demonstrate compliance with PO10 of State Code 21, provide: **1.** information about the design basis of the raised pad of ground / embankment and whether this is adequate to mitigate the risk of the defined storm tide inundation event. **2.** a detailed emergency plan that demonstrates ethylene containers can be safely moved to a safe location if a storm tide inundation event is forecast. The plan should address the following points: a. The safe location is defined and is demonstrated to be always available and approved for emergency use.

Fitzroy/Central regional office
Level 2, 209 Bolsover Street,
Rockhampton
PO Box 113, Rockhampton QLD 4700

	b. The safe location is sufficiently separated from incompatible land use/s. c. IXOM has the personnel and resources (e.g. trucks) to move all of the ethylene containers in time. **3.** Information about the container design wind speed and whether this is adequate to prevent overturning / damage during a foreseeable cyclone. **4.** Specify which of the recommendations in *Appendix E_Hazard and Risk Assessment_Port Alma Ethylene Storage.pdf* table 8 will be implemented. If any will not be implemented give reasons and specify alternative actions.

How to respond

You have three months to respond to this request and the due date to SARA is 11 November 2024**.** You may respond by providing either: (a) all of the information requested; (b) part of the information requested; or (c) a notice that none of the information will be provided. Further guidance on responding to an information request is provided in section 13 of the Development Assessment Rules (DA Rules).

It is recommended that you provide all the information requested above. If you decide not to provide all the information requested, your application will be assessed and decided based on the information provided to date.

You are requested to upload your response and complete the relevant tasks in MyDAS2.

As SARA is a referral agency for this application, a copy of this information request will be provided to the assessment manager in accordance with section 12.4 of the DA Rules.

If you require further information or have any questions about the above, please contact Carl Porter, Principal Planning Officer, on 0749242918 or via email RockhamptonSARA@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely

Anthony Walsh
Manager Planning

cc Rockhampton Regional Council, enquiries@rrc.qld.gov.au

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Queensland Government

SARA reference: 2407-41599 SRA
Applicant reference: -
Council reference: D/91-2024

9 August 2024

IXOM Operations Pty Ltd
PO Box 450
ROCKHAMPTON QLD 4700
gg@gideontownplanning.com.au

Attention: Gideon Genade

Dear IXOM Operations Pty Ltd

SARA advice notice - Bajool - Port Alma Road, Port Alma

(Advice notice given under section 35 of the Development Assessment Rules)

The State Assessment and Referral Agency (SARA) advises that your development application has not adequately demonstrated compliance with the State Development Assessment Provisions.

SARA has reviewed your application material and in conjunction with the information request issued on 9 August 2024, and as indicated in the phone message to you on 9 August 2024, the following issue(s) with the proposed development have been identified:

Hazardous Chemical Facility	
1.	**Issue:** The application does not demonstrate compliance with PO5 (dangerous dose to the built environment) of State Code 21. The application material indicates that a dangerous dose to the built environment will be exceeded at the site boundary for potential hazard scenarios e.g. container BLEVE, major leak flash fire envelope. This is a non-compliance with State Code 21 PO5. **Action:** Demonstrate compliance with PO5 of State Code 21 or provide information that demonstrates that the purpose statement of State Code 21 can be met. It is advised that one way to address the non-compliance with State Code 21 PO5 and for the purpose statement to be met is for the implementation of risk assessment actions and the application of conditions. Not limiting any additional or alternative actions by the applicant, the application of the following conditioned actions will assist in meeting the purpose statement:

Fitzroy/Central regional office
Level 2, 209 Bolsover Street,
Rockhampton
PO Box 113, Rockhampton QLD 4700

	1. Within the site boundary, locate the containers as far as possible away from the southern and eastern boundaries (away from existing fuel/LPG tanks). 2. Comply with AS1596 for container spacing. 3. Space and arrange containers to minimise the risk of end-to-end impact in the event of BLEVE. 4. Install perimeter gas detection set at 10% of Lower Flammability Limit. The gas detection shall trigger an alarm that is audible to personnel at the potentially affected adjoining sites. 5. The perimeter gas detection alarm shall notify an emergency responder at all times (this will also satisfy the requirements of State Code 21 PO6 as an alternative to fire detection). 6. The emergency plan shall include actions to take in the event of gas detection alarm. 7. The applicant shall inform potentially affected neighbours of actions they should take on activation of the gas detection alarm. 8. Confirm by inspection / survey the integrity of the raised pad / embankment e.g., actual height vs design, integrity of embankment walls.

Please note that unlike an information request, assessment timeframes do not stop when advice is provided by SARA.

How to respond

It is recommended that you address these issues promptly and provide a response to SARA before or at the time of your response to the SARA information request of 9 August 2024**.** If you decide not to respond, your application will be assessed and decided based on the information provided to date.

Under the Development Assessment Rules (DA Rules), the issuing of advice does not stop the assessment timeframes. If you intend to provide additional information, it should be provided in a timely manner to allow sufficient time for the information to be considered. As such, you are strongly encouraged to consider using the 'stop the clock' provisions under s32 of the DA rules, to allow sufficient time for you to consider and respond to SARA's advice; and for SARA to consider any new or changed material provided.

If you wish to utilise the 'stop the clock' provisions, you should give notice to the assessing authority (assessment manager or referral agency) whose current period you wish to stop. This can be done through MyDAS2 or via correspondence.

You are requested to upload your response using the 'manage documents' function in MyDAS2.

If you require further information or have any questions about the above, please contact Carl Porter, Principal Planning Officer, on 07 4924 2918 or via email RockhamptonSARA@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely

Anthony Walsh
Manager Planning

cc Rockhampton Regional Council, enquiries@rrc.qld.gov.au

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SARA reference:	2407-41599 SRA
Assessment criteria:	SDAP v3.0: - State code 21: Hazardous chemical facilities

11 September 2024

GIDEON
TOWN PLANNING

Rockhampton Regional Council
PO BOX 1860
Rockhampton QLD 4700

Attention: Sophie Muggeridge
Via Email: general.enquiries@rrc.qld.gov.au

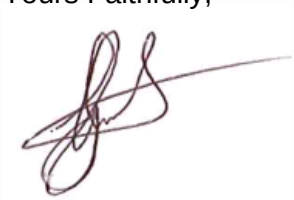
Dear Sophie,

RESPONSE TO INFORMATION REQUEST AND FURTHER ADVICE REQUEST – DEVELOPMENT APPLICATION D/91-2024 FOR A MATERIAL CHANGE OF USE FOR MEDIUM IMPACT INDUSTRY - SITUATED AT LOT 46 BAJOOL – PORT ALMA ROAD, PORT ALMA – DESCRIBED AS LOT 46 ON DS 438

On behalf of our client **IXOM Operations**, and in accordance with part 3, section 13 of the Development Assessment Rules, we provide a response to all items included in the Information Request issued by Rockhampton Regional Council on 31 July 2024 and the Further Advice Request issued on 7 August 2024.

Should Council require any further discussion on this matter, please do not hesitate to contact me on 07 4806 6959 or info@gideontownplanning.com.au.

Yours Faithfully,



Gideon Genade
Principal Town Planner

Encl.: Appendix A – Response to Information Request
Appendix B – IXOM Ethylene Training Part 1 and Part 2
Appendix C – Engineers Certificate Port Alma Ethylene Storage Containers RevB

APPENDIX A

Response to Information Request

1.0 PLANNING REQUIREMENTS

1.1 The subject site is located within the flood plain investigation area and does not comply with performance outcome 7 of the flood hazard overlay code. Please demonstrate how the proposed development complies with PO 7.

RESPONSE:

- PO 7 states: *Development avoids the release of hazardous materials into floodwaters*.
- The product is a liquified gas stored in double-walled vacuum-insulated ISO containers designed for refrigerated gases. The attached training modules contain information on the ISO containers. At ambient temperatures, ethylene is a gas. The gas has a boiling point of minus 104 degrees Celsius.
- The emergency response plan has scenarios for adverse weather (page 44) and states that evacuation of the site must be considered. If the removal of containers is required, the primary transport company involved in the transport of ethylene is Centurion (formally Rocky's Transport), based in Rockhampton. Other transport companies (Chemtrans and Qube) are also approved for the transport of the product and could be called upon at short notice to transport the ISO containers to another site at short notice in the event of an emergency.
- The tare weight of an ISO container is approximately 8 tonnes plus approximately 9 tonnes of ethylene, so the total weight of a container is 17 tonnes. The frame of the ISO containers is open-sided (see photos in *Appendix B – IXOM Ethylene Training Part 1 and Part 2*). Therefore, the risk of the ISO containers being moved is very low due to their weight and shape.
- The storage site is within a very large and flat coastal area (> 10km x 20km in size) and is elevated approximately 1m above the surrounding flat coastal area. Therefore, the risk of flooding impacting the site is very low.
- The product is a gas at ambient temperature. If there were a loss of containment, the ethylene would dissipate in the atmosphere and not contaminate floodwaters.

The risk of flood impacting and moving an ISO container is very low due to the storage site being on an elevated hardstand within a very large and flat coastal area. The shape and very heavy weight of the ISO containers would further reduce the risk of flood impacting the ISO containers. In the event of a significant flood event being predicted, the site emergency response plan includes adverse weather scenarios that may require evacuation. Approved transport companies are located near Rockhampton and could transport the containers to an alternative site at short notice. A loss of containment would not result in contamination of flood waters, as the ethylene is stored within double-walled ISO containers, and the product is a gas with an ambient temperature with a boiling point of minus 104 degrees Celsius.

1.2 PO 5 - Coastal dependent development minimises the risk to people and property from adverse coastal erosion impacts by:

1. **installing and maintaining coastal protection works; or**
2. **locating, designing and constructing relevant buildings or structures to withstand coastal erosion impacts; or**

3. **allowing for natural fluctuations of the coast to occur, including appropriate allowance for climate change and sea level rise, and avoids the need for additional coastal protection work.**

RESPONSE:

The only permanent structure, being site storage and equipment, is secured to the ground. The rest are all relocatable as outline as in item 1 of the information request response.

An engineering inspection of the existing pavement was undertaken by Front Engineering (refer to *Appendix C – Engineers Certificate Port Alma Ethylene Storage Containers RevB*), that concluded that it is fit for purpose. Rock armouring was also installed as per the recommendations from the engineer. Refer to Image 1 below, depicting the established pavement and rock armouring around the subject site.

Image 1 – Rock Armouring

APPENDIX B

IXOM Ethylene Training Part 1 and Part 2

APPENDIX C

Engineers Certificate Port Alma Ethylene Storage Containers RevB

FROST ENGINEERS PTY LTD
ABN 89 719 076 855
PO BOX 5477
GLADSTONE QLD 4680
Telephone: (07) 4972 3577
Facsimile: (07) 4972 4577
Email: admin@frostengineers.com.au
Web: www.frostengineers.com.au

26 March 2015
Our Reference: 1594

Orica Australia Pty Ltd
1 Nicholson Street
Melbourne VIC 3000

CIVIL ENGINEERING INSPECTION CERTIFICATE FOR PAVEMENT FOR STORAGE OF ETHYLENE ISO STORAGE TANKS LOT 46 ON DS438 BAJOOL, PORT ALMA ROAD, PORT ALMA QLD

This civil engineering certificate certifies that the existing pavement on Lot 46 on DS438 Port Alma Road, Port Alma QLD has been inspected and tested and deemed fit for purpose for the storage of ethylene ISO containers (no stacking) are per the following properties:

Ethylene ISO Container Properties:

- 20’ Long x 6’ Wide x 6’ High;
- Tare Weight of 8 Metric Tonnes; and
- Gross Weight of 16.5 Metric Tonnes.

It is recommended that rock armoring with geotextile underlay be installed on external batters to protect from rainfall wash out.

It is also expected that routine maintenance work on the pavement will be required from time to time after heavy rainfall to ensure the pavement remains level and free of soft spots.

Hammer H19 Sideloader Trucks with maximum 8 tonne Working Load Limit (WLL) outriggers can be used on the pavement provided that structurally rated stacked hardwood timber packing is placed under each outrigger to effectively distribute the point load onto the pavement.

The alternative storage site has also been inspected and would require significant earthworks and placement of fill to achieve a suitable profile pavement due to the existing low spot on the site.

Certified and Approved

Mark Frost
Civil/Structural Design Engineer
RPEQ 9017
Frost Engineers

Ethylene Awareness and Operator Training Program

Part 1.
March 2024

Contents

Ethylene Awareness and Operator Training Program

AIMS

At the completion of this Training Program you will be able to:

Part 1- Ethylene Awareness

Understand the hazards of working with Ethylene

Respond appropriately in the case of an Ethylene leak

Part 2 – Monitoring, Venting, Maintenance & Transferring of ISO's

Monitoring Ethylene ISO's

Vent Ethylene ISO's

Contents

ETHYLENE Definition

ETHYLENE from **IXOM** is gas **PRESSURISED** to form a:
CRYOGENIC LIQUID (-104C)
and is **100% ETHYLENE**

ETHYLENE has the formula C2H4

Contents

Manufacturing Ethylene

Ethylene (Ethene) is the most important organic chemical, by tonnage, that is manufactured in the world. Current world production is 156Mtpa.

It is produced by ‘steam cracking’ oil and gas fractions during the oil refining process.

What is Ethylene used for?

Ethylene is used in:

Refrigeration – CSG Plants

Manufacturing plastics – Polyethylene, PVC

Manufacturing other organic chemicals

Preservation??

Contents

Ethylene Properties

Cryogenic Liquid that will form Gas when exposed to air/heat

COLOUR:

- Colourless at all concentrations.
- But you may see vapour cloud in the event of a leak.
- Do not Assume you are Safe because you cannot see it.

ODOUR:

- Faint slightly sweet odour.
- Threshold 270 – 660ppm
- Do not Assume you are Safe because you cannot smell it.

BOILING POINT: -104C

EXPANSION: 1 volume of liquid produces approx 600 volumes of gas.

Ethylene Properties

FLAMMABILITY:

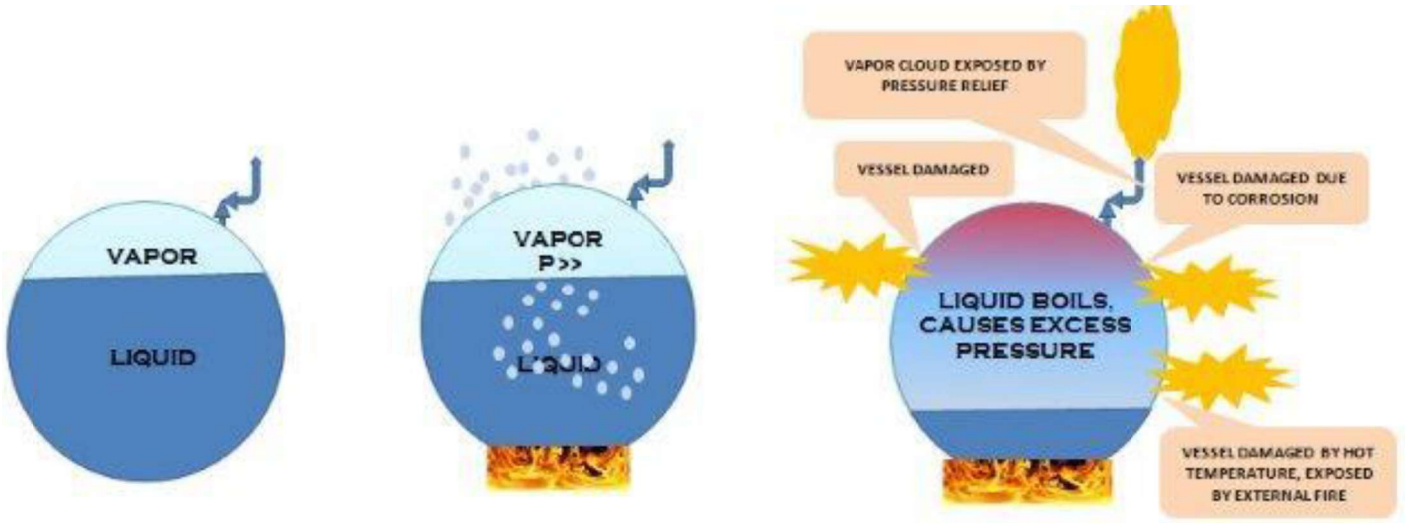
- Extremely flammable
- Explosive Limits:
  - LEL = lower explosive limit = 2.7%
  - UEP = upper explosive limit = 36%
- Auto-ignition Temperature, 450 – 490C

EVAPORATION:

- Ethylene is stored as a boiling liquid @ -104C
- Any heat input with cause some liquid to evaporate to gas

Boiling Liquid Expanding Vapor Explosion (BLEVE)

- Any liquid at or near its boiling point and above a certain pressure will vaporise extremely rapidly if suddenly released due to failure of the pressure relief system
- **BLEVE** is highly unlikely to occur on Ethylene installation because of the design of the tank and other cryogenic equipment.



Ethylene Properties

SPILLS OF ETHYLENE:

- Intense boiling followed by decreased rate of evaporation
- Rate of evaporation dependent on ambient temperature

DENSITY:

- Cold Ethylene Gas is heavier than air – can sink into Pits & Basements.
- At ambient temperature, Relative vapour density of Ethylene is less than 1, Air = 1.
- ‘Fog Cloud’ result of liquid vaporisation.
- Ethylene can extend up to 1km beyond visible fog from the source.

Contents

Chemical Reactions

ETHYLENE + WATER = Not Soluble

Emergency response may use water fog to disperse gas cloud.

Not recommended for contact with a large liquid leak as it will rapidly increase temperature and therefore rate of gas production resulting in explosion.

https://www.youtube.com/watch?v=h-EY82cVKuA

ETHYLENE + IGNITION SOURCE = BURN &/OR REACT EXPLOSIVELY

Combustion engine, lit cigarette, faulty lighting

Contents

Ethylene Toxicity & Symptoms

Asphyxiant

- Ethylene Gas is non toxic but will act as an asphyxiant by displacing air.
- Oxygen deficiency causes:
  - Drowsiness
  - Headaches
  - Muscular weakness
  - Dizziness
  - Unconciousness and/or suffocation by asphyxiation.

About 15% Oxygen – Mentally incapable of diagnosing the situation, loss of coordination, errors in judgement, may be masked by state of 'euphoria'.

About 8-12% Oxygen – Possible unconsciousness after exposure period without warning and without person realising.

About 6-8% Oxygen – Unconsciousness with a few minutes, resuscitation possible if person is immediately moved to normal atmosphere.

About 6% Oxygen – Immediate unconsciousness, breathing stops but the heart may continue to beat for a few minutes.

Ethylene Toxicity & Symptoms

Carcinogen

- Ethylene is **NOT** listed as a carcinogen by the International Agency for Research on Cancer.

Cryogenic Liquid

- Ethylene is transported as a cryogenic liquid.

- Exposure to skin and eyes with venting gas or cryogenic liquid may result in frostbite.

- Ingestion of liquid or gas may cause frostbite.

Contents

First Aid - Asphyxiation

The extent of the symptoms will depend to a great degree on the duration of exposure and the concentration of the gas to which the person has been exposed to.

PROTECT YOURSELF

- USE S.C.B.A.
- PUT ON PROTECTIVE PPE & CRYOGENIC GLOVES

REMOVE PATIENT TO FRESH AIR

- DISCOURAGE PHYSICAL ACTIVITY

IF CONSCIOUS ALLOW PATIENT TO SIT UP

- THIS WILL AID RESPIRATION

IF UNCONSCIOUS

- TREAT THE PATIENT AS IF SUFFERING FROM DROWNING
- CPR IF NECESSARY
- TRAINED PERSONNEL MAY ADMINISTER OXYGEN OR VENTALIN

TREAT FOR SHOCK - KEEP WARM

SEEK MEDICAL ATTN IF EXPOSURE IS MORE THAN MINOR

First Aid – Cryogenic Burns

The extent of the symptoms will depend to a great degree on the duration of exposure and the concentration of the gas/liquid to which the person has been exposed to.

PROTECT YOURSELF

- USE S.C.B.A.
- PUT ON PROTECTIVE PPE & CRYOGENIC GLOVES

REMOVE PATIENT AWAY FROM ETHYLENE SOURCE

- DISCOURAGE PHYSICAL ACTIVITY

TREAT FROSTED AREAS

- THAW WITH LUKE WARM WATER, DO NOT RUB AFFECTED AREA

TREAT FOR SHOCK - KEEP WARM

RECOVERY

- SEEK MEDICAL ATTENTION FOR FROSTBITE BURNS.

Contents

Handling Emergency - Discuss ER Plan

RAISE ALARM

WARN PEOPLE NEARBY TO MOVE ACROSS AND UPWIND
CALL FOR ASSISTANCE
POLICE AND FIREBRIGADE ON '000'
Whenever involved in an accident or have a leak
Provide information
Where you are, weather conditions and wind direction
Situation with containers, still on trailer, fallen off
IXOM 1800 033 111 and your company emergency number

ASSESS SEVERITY

- MINOR LEAK
  UNLIKELY TO EFFECT TO ANYONE MORE THAN A FEW METRES FROM THE LEAK.

- MAJOR LEAK
  LARGE GAS LEAK OR LIQUID VISIBLE. COULD CAUSE DANGER TO PEOPLE IN SURROUNDING AREA

Emergency Response – Self Help

PROTECT YOURSELF

STAY UPWIND

DO NOT ENTER AN ETHYLENE ATMOSPHERE

- UNLESS PROTECTED BY S.C.B.A.

IF CAUGHT IN AN ETHYLENE ATMOSPHERE

- STAND UPRIGHT
- SHALLOW BREATHING (USE A WET HANDKERCHIEF)
- WALK ACROSS WIND (DO NOT RUN) THEN
- WALK UPWIND OF THE LEAK

IF TRAPPED INDOORS BY AN ETHYLENE LEAK OUTSIDE

- STAY INDOORS
- TURN OFF AIR CONDITIONING
- SHUT DOORS AND WINDOWS
- SEAL GAPS WITH CLOTH ETC

Handling Emergency

Gas Leaks

Raise the alarm within your premises.

If the size of the leak is known, report this to IXOM Emergency Response.

They can decide what extra measures need to be taken.

Arrange the evacuation of people likely to be in any danger.

Handling Emergency

Gas Leaks – Discuss Gas Alarm Response

Please supply the following information:

Location with Complete address (giving any special details regarding access to the area)

Name of contact (who must stay near the telephone)

Telephone number

Is ethylene still escaping?

How bad is it?

Slight nuisance
Bad in local area (or)
Widespread escape

Where is the leak on the ISO if possible to see?

Have the police or fire brigade been notified?

Handling Emergency

Liquid Leaks

A liquid leak is more serious than a gas leak occurring through the same size hole.

Contact IXOM and give the information outlined before.

Raise the alarm (as before)

Arrange evacuation (as before)

Breathing apparatus and protective clothing (Cryogenic PPE must be worn).

Isolate from rest of plant (as before)

Handling Emergency

Liquid Leaks

Wearing breathing apparatus and full cryogenic protective clothing, prevent spread of liquid by use of sand or soil to build barriers.

Initially the boil off rate will be relatively high but will decline as heat is extracted from the surrounding area.

Use fog nozzles to disperse gas.

DO NOT allow any water to fall onto a pool of liquid ethylene - heat of reaction will boil off more ethylene, making the gas cloud worse and in extreme cases can cause explosion.

Handling Emergency

Evacuation of Areas Affected by Ethylene Gas

If it becomes necessary to clear an area downwind of an Ethylene leak, personnel should be moved across-wind until clear of the gas-laden air, then up wind to a position of greater safety.

Ethylene can affect areas up to 1km from its source.

Beware of shifts in wind direction.

Do not panic.

Do not run.

Handling Emergency

Fires in Ethylene Installations

The main danger with a fire in an Ethylene storage area is that a major escape may occur by rupture of the Ethylene ISO's at high temperatures, or (more likely) by holes forming where local hot spots lead to accelerated corrosion.

Isolate Ethylene supplies leading to the fire area

If possible remove ISO's

Keep ISO's cool by spraying water on them

If containers cannot be kept cool, ensure that all fire brigade personnel remain at a safe distance.

Emergency Placard

UN No:	1038
Transport Hazard Class:	2.1 Flammable Gas
Proper Shipping Name or Technical Name:	ETHYLENE, REFRIGERATED LIQUID
Hazchem or Emergency Action Code:	2YE

ETHYLENE Personal Protective Equipment

Self Contained Breathing Apparatus

- Emergency Response

With all PPE Training is essential before use

ETHYLENE - EMERGENCY PROCEDURES

REMEMBER IF IN DOUBT

RAISE THE ALARM

EVACUATE THE AREA

LEAVE IT ALL TO EXPERIENCED PERSONNEL

RING POLICE & FIREBRIGADE ON 000

CONTACT IXOM EMERGENCY SERVICE FOR FURTHER ADVICE - 1800 033 111

SUMMARY

Ethylene is a Dangerous Chemical

It Can be Handled Safely

It is a cryogenic liquid and as a gas is an asphyxiant

It is Extremely Flammable

Emergency Planning Saves Lives

IXOM is prepared to advise when required

Ethylene Awareness and Operator Training Program

Part 2.
March 2024

Ethylene Awareness and Operator Training Program

AIMS

At the completion of this Training Program you will be able to:

Part 1- Ethylene Awareness

Understand the hazards of working with Ethylene

Respond appropriately in the case of an Ethylene leak

Part 2 – Monitoring, Venting, Maintenance & Transferring of ISO's

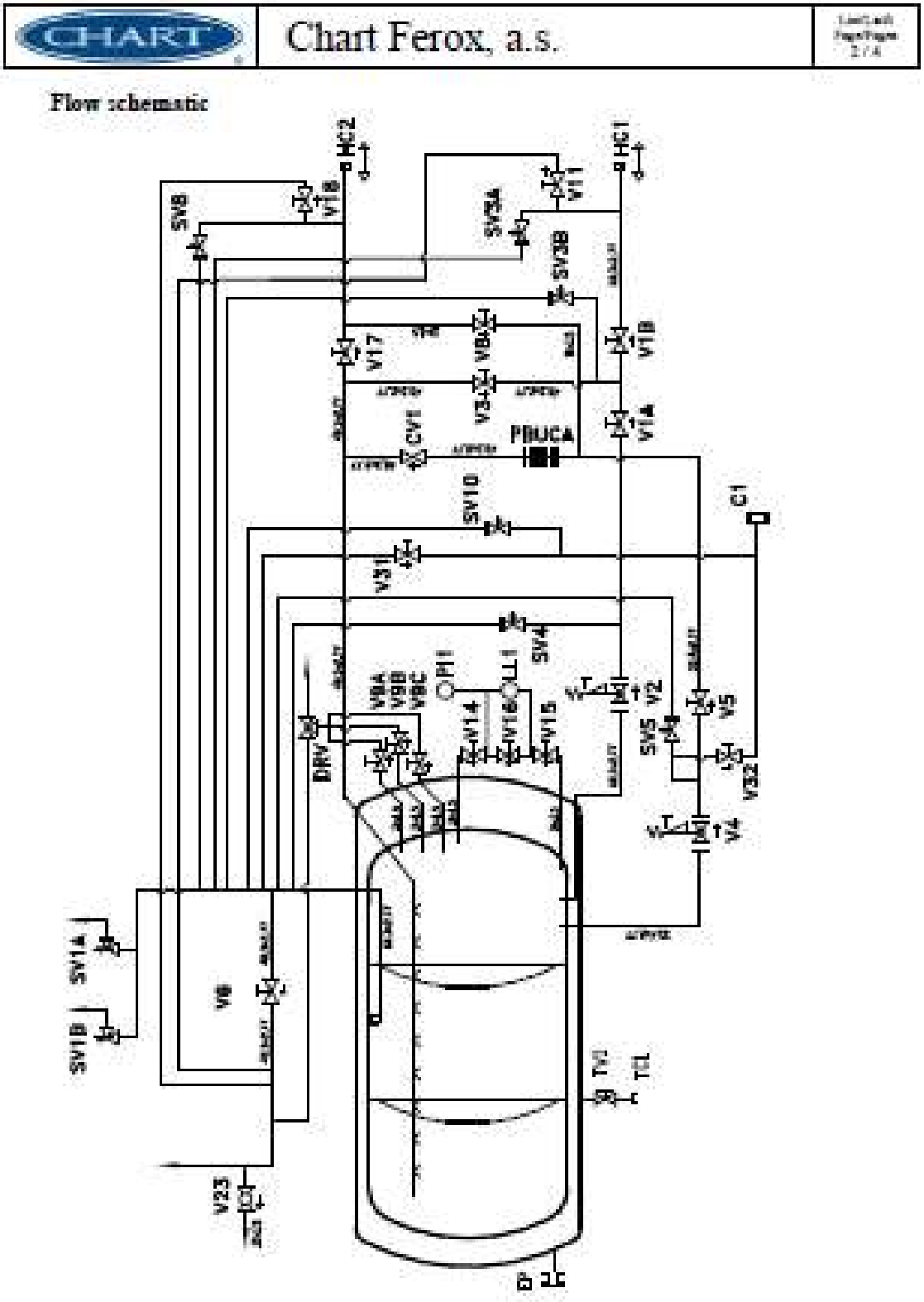
Monitoring Ethylene ISO's

Vent Ethlyene ISO's

Contents

Contents

Ethylene ISO P&ID



Ethylene ISO

Construction of ISO

Inner Tank – contains Ethylene

Outer Tank – contains Vacuum (maintains temperature of Ethylene)

Outside Vacuum are more layers of insulation.

Ethylene ISO – Under the Cabinet

Ethylene ISO – Filling in Korea

Ethylene ISO – Backside, Pressure build up fins for discharge

Contents

Ethylene ISO Monitoring – Discuss Checklists

PPE – Non sparking/anti static clothes

Personal Gas Monitor

No ignition sources – mobile phones, cigarette lighters

Observe wind direction to know best direct for escape if required

The following slides involve looking at various parts of the ISO.
Whilst doing this, listen also for leaks.

Ethylene ISO Monitoring – Pressure & Level Indicators

Level Indicator

Pressure Indicator

Pressure – Full ISO's

- Filling in Korea, 0.2-0.3bar
- Expected to receive in Brisbane/Port Alma, 4 – 5bar
- Maximum pressure QLD customers will accept, 7bar
- Requires controlled venting to lower pressure, 15-17bar
- Safety Relief Valve setting, 18bar

Empty ISO should still have 0.5 – 1.0bar Pressure

Ethylene ISO Monitoring – Vacuum Observations

Vacuum Jacket Relief

If cap is observed off, indicates total loss of vacuum. Ethylene will be heating up in this situation, report immediately.

Ethylene ISO Monitoring – Icing indicates leak

Ethylene ISO Monitoring – Icing indicates leak

Contents

Ethylene ISO – Manual Venting

If Ethylene ISO Pressure is above 1500kPa, pressure must be reduced to a safe level.

If ISO is at the end of its ‘shelf life’ and the vacuum has been maintained the product cannot be cooled and there is no point transferring to another empty ISO. The only option is to vent.

To vent:
•Clear the area and ensure no personnel are at the end of the ISO where the vent is located.
•Follow procedure including wearing hearing protection and gas detector.
•Gradually open vent valve and vent to atmosphere.
•Monitor pressure, do not leave area whilst venting. When desired pressure is reached, shut Vent Valve.

13 September 2024

Rockhampton Regional Council
PO Box 1830
ROCKHAMPTON QLD 4700

GIDEON
TOWN PLANNING

ATTENTION: Sophie Muggeridge

Via Email**:** DevelopmentAdvice@rrc.qld.gov.au

RE: NOTICE OF INTENTION TO COMMENCE PUBLIC NOTIFICATION – D/91-2024 FOR MATERIAL CHANGE OF USE FOR A MEDIUM IMPACT INDUSTRY – SITUATED AT LOT 46 BAJOOL-PORT ALMA ROAD, PORT ALMA – DESCRIBED AS LOT 46 ON DS438.

In accordance with section 17.2 of the Development Assessment Rules, I intend to start the public notification required under section 17.1 on Monday 16th September 2024.

At this time, I can advise that I intend to:

☒ Publish a notice in: **CQ Today (hardcopy version)** on **Saturday 14 September 2024.**

And

☒ Place a notice on the premises in the way prescribed under the Development Assessment Rules on **Friday 13 September 2024.**

And

☒ Notify the owners of all lots adjoining the premises the subject of the application on **Friday 13 February 2024.**

If you wish to discuss this matter further, please contact me details below.

Yours faithfully,

Gideon Genade
Principal Town Planner

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PO Box 450, Rockhampton QLD 4700 ABN 849 2892 5088