

# QENOS ALTONA SAFETY CASE SUMMARY 2018

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# FOREWORD

The purpose of this document is to provide a summary to the community of the Safety Case submitted to the Victorian Government regarding the management of process safety at the *Qenos Altona Facilities*.

The Safety Case was submitted by Qenos to the Victorian Government as a requirement of the licensing requirements of Major Hazard Facilities under the Occupational Health and Safety Regulations.

Qenos operates three major hazard manufacturing facilities in Victoria; *Qenos Olefins*, *Qenos Plastics* and *Qenos Resins*. Qenos Altona has one (1) MHF licence and this was successfully granted in November 2017 after a detailed assessment process. For Qenos Altona, this the fourth MHF licence, with a Safety Case Report revision and submission required every five (5) years.

The submission of the Safety Case provides an ideal opportunity to inform the community about the operation of the Qenos facilities and provide assurance that Qenos has the necessary trained personnel, equipment and systems to operate these major hazard facilities safely and in accordance with statutory requirements.

Should you require more information, or if there are any questions in relation to information contained in this document, please contact:



Andrew Lake  
Qenos: 613 9258 7333  
Or contact can also be made via  
the 24 hour Community Hotline  
1800 025 138

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EVERYONE AT QENOS HAS  
A ROLE IN PROTECTING THE  
SAFETY AND HEALTH OF OUR  
EMPLOYEES, CONTRACTORS,  
CUSTOMERS, THE COMMUNITY  
AND THE ENVIRONMENT.



# A MESSAGE FROM THE CEO

At *Qenos* we believe that all injuries, occupational illnesses and environmental incidents are preventable. Everyone at *Qenos* has a role in protecting the safety and health of our employees, contractors, customers and the community, as well as protecting the environment. Safety, health and environment are not just business aims, they are absolute requirements.

At *Qenos* we use advanced manufacturing to transform Australia's natural resources into polymers that our customers convert into a wide range of products for everyday use by all Australians. The main raw material (or feedstock) used in our process is ethane gas, a co-product of natural gas processing that would otherwise be burnt as a fuel.

For nearly 60 years, *Qenos*, and its antecedent companies have operated the manufacturing facilities in Botany (NSW) and Altona (Vic). Our operation and investment in Australia has had many flow-on benefits to Australia's workforce, knowledge and skill base. Today we contribute more than \$1 billion to the Australian economy annually, and are an integral part of the communities in which we operate.

*Qenos* continues to invest significantly in new equipment to improve the safety of its plants. Each year, multiple cross functional teams of technicians and specialist engineers review the

design of equipment and systems to identify opportunities to improve operational safety.

Training is an important part of operating our plants safely. Employees and contractors complete regular training programs to maintain and enhance their skills and knowledge.

The leadership we show in health and safety contributes to continual improvement in safety across the industry in Australia and overseas. Since 2007 we have been taking our safety expertise to China through a knowledge exchange program with 22 of our shareholder's manufacturing plants. This program involves *Qenos* providing education and training to Chinese subsidiaries aimed at improving safety management systems and operational practices.

At *Qenos* we understand that the world in which we operate is focused on driving towards greater safety. We aspire to be part of the solution by putting in place equipment and systems aimed at preventing all injuries, occupational illnesses and environmental incidents and sharing our knowledge and experience.



**Stephen Bell**  
Chief Executive Officer

# MAJOR HAZARD FACILITIES REGULATIONS

## OCCUPATIONAL HEALTH AND SAFETY REGULATIONS

**Major Hazard Facilities are regulated under the Victorian Occupational Health and Safety Regulations, Part 5.2 Major Hazard Facilities. These regulations can be obtained from the Victorian WorkSafe website ([www.worksafe.vic.gov.au/laws](http://www.worksafe.vic.gov.au/laws))**

The Qenos Altona manufacturing facilities are registered under these regulations as an MHF due to the quantities of hydrocarbons and other hazardous materials, such as liquefied petroleum gas and flammable liquids, stored and processed at the site.

Note: WorkSafe requested, for the November 2017 licence renewal and submission, Qenos Altona submit a Safety Case under the 2007 regulations even though new regulations came into force in June 2017.

The objective of the Major Hazard Facilities regulations is to provide for the safe operation of major hazard facilities in order to:

- Identify potential Major Incidents
- Reduce the likelihood of these Major Incidents occurring
- Reduce the consequences to health, safety and damage to property in the event of a Major Incident.

The operator of a Major Hazard Facility must inform the local community and municipal councils about the safety of the facility's operations. Clause 394 (*Information to local community*) of the 2017 regulations, outlines in detail the information to be provided.

This *Safety Case Summary* document fulfils this requirement in respect to the Qenos Altona Facilities and provides the local community with a description of the facilities' operations, the major incidents that could occur and the control measures that are in place to prevent or minimise the consequences of any major incident.

## SCHEDULED 14 MATERIALS AT MAJOR HAZARD FACILITIES

People regularly deal with materials that are potentially hazardous if handled incorrectly. For example, propane used in BBQs, is a potential hazard because it can ignite and catch fire if released to the atmosphere.

Schedule 14 of the 2017 OHS Regulations defines the potentially hazardous materials that must be considered in the scope of a Safety Case. Materials that fall within this definition are called "Scheduled 14 Chemicals". Note: For the 2017 Safety Case Submission, issued through the 2007 OHS regulations these were defined as Schedule 9 materials.

## MAJOR HAZARD FACILITIES

A Major Hazard Facility has Schedule 14 Chemicals present in quantities that exceed a threshold quantity. Examples of Major Hazard Facilities include oil refineries, chemical manufacturing sites, and some warehouses and transport depots.

All Major Hazard Facilities are required to be licensed by Victorian WorkSafe. The Qenos Altona facilities have been a licensed Major Hazard Facility since 2002 when it was granted the first five year licence.



## MAJOR INCIDENT

A Major Incident is an occurrence that:

- a) involves, Schedule 14 materials, and
- b) exposes a person to a serious and immediate risk to health and safety.

Refer to the definition in the OHS regulations.

## SAFETY CASE


To obtain a licence, each Major Hazard Facility is required to submit a report (called the Safety Case) to the regulator that demonstrates that the operator of the facility has a comprehensive Safety Management System in place to ensure the facility has:

- Identified all hazards and threats that could result in a Major Incident at the facility
- Identified all potential Major Incident scenarios relating to operation of the facility
- Conducted a comprehensive and systematic safety assessment of identified potential Major Incidents
- Identified and implemented control measures to eliminate or reduce risk to health and safety of the local community and its employees to “So Far as Reasonably Practicable”
- Implemented an emergency plan to control and minimise any Major Incident with potential on-site and/or off-site effects
- Made arrangements to secure the facility

The Safety Case has to be prepared with the involvement of, and in consultation with its employees.



Qenos CEO Stephen Bell with Paul Kennedy, Process Safety Engineer signs off on the Qenos Safety Case submission to WorkSafe.



### Licence to operate a Major Hazard Facility

Occupational Health and Safety Act 2004  
Occupational Health and Safety Regulations 2017

This licence is issued to the operator

Qenos Pty Ltd  
471-513 Kororoit Creek Road  
Altona  
Victoria 3018  
ACN: 054 196 771

and authorises the facility located at

471-513 Kororoit Creek Road  
Altona Victoria 3018  
(comprising the manufacturing sites known as Olefins, Plastics & Resins)

to operate as a Major Hazard Facility.

The Schedule 9 materials present or likely to be present at the facility are specified in Attachment 1.

Licence Number	Date Granted	Effective Date	Expiry Date
MHL 016/05	25 October 2017	24 November 2017	27 November 2022

Conditions:

No Conditions.

Michael Coffey

Head of Hazardous Industries & Industry Practice

16 November 2017

MHL016/05  
PCN 8.492 / 16 August 17

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## QENOS PTY LTD

Qenos is Australia's exclusive manufacturer of polyethylene and a valued supplier of a diverse range of specialty polymers. These are the essential inputs to our local industries such as food and beverage, construction, mining and energy, agriculture and water conservation, plus many more.

These industries deliver products Australians rely on every day. Thanks to the ingenious transformation of naturally occurring resources by the team of process and maintenance technicians, engineers and scientists at Qenos.

Qenos multiplies the value of Australia's Bass Strait and Cooper Basin gas fields by sustainably harnessing ethane and liquid petroleum gas for local conversion. Then, using advanced technologies at our world-class production facilities in Melbourne's Altona and Sydney's Botany Bay, these gases are expertly transformed into safe, clean polyethylene.

Qenos directly contributes more than \$1 billion a year to the Australian economy. Our operations in Sydney and Melbourne employ approximately 650 people directly and we supply industries that employ hundreds of thousands of people.





The Qenos polyethylene product range includes High Density Polyethylene (HDPE), Low Density Polyethylene (LDPE) and Linear Low Density Polyethylene (LLDPE) for use in blow moulding, pipe extrusion, rotational moulding, film extrusion, extrusion coating and injection moulding processes.

Qenos is a key supplier across several industries.

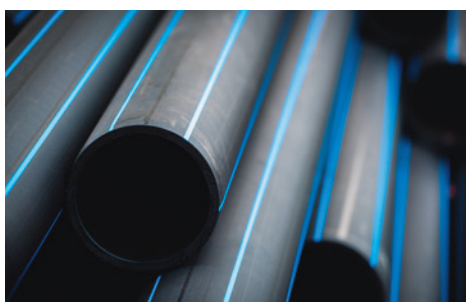


## BLOW MOULDING

Qenos manufactures blow moulding grades for use in a variety of applications, including containers for juice, milk, detergent and pharmaceuticals, industrial drums and intermediate bulk containers, beverage, consumer and industrial product applications.

## PIPE EXTRUSION

Qenos makes high performance PE100 pipe grades for water supply, irrigation, waste management, mining and gas.



## ROTATIONAL MOULDING

Rotational moulding grade range is used for the manufacture of water tanks ("slimline" urban through to large agricultural tanks), marine floats, traffic barriers, canoes, small boats, and almost any hollow, enclosed or open ended shape.



## FILM EXTRUSION

Qenos produces film grades for a wide range of industries including food and beverage, building and construction, personal care and agriculture.

## EXTRUSION COATING

Extrusion coating grades are commonly used in aseptic liquid packaging, flexible packaging, shade cloths, and paperboard packaging applications.



## INJECTION MOULDING

Qenos produces injection moulding grades for caps, pails, crates, sealant cartridges, mobile garbage bins and produce bins.

# QENOS PRODUCTS

# QENOS ALTONA (VIC)

The Qenos Altona manufacturing facilities are located approximately 15km South West of Melbourne on Kororoit Creek Road and Maidstone Street, Altona, in the City of Hobsons Bay.

## OVERVIEW OF PLANT OPERATIONS

Qenos operates three manufacturing facilities at Altona, identified as Olefins, Plastics and Resins to manufacture ethylene and polyethylene.

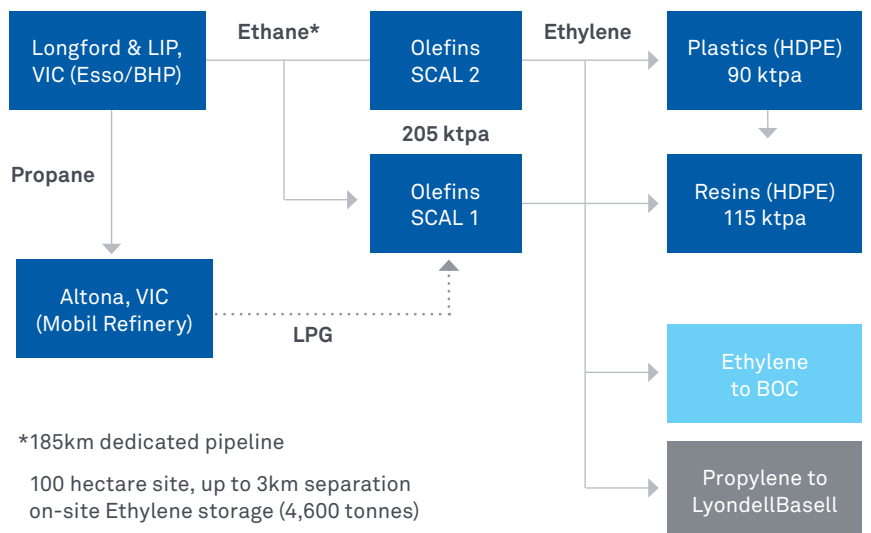
The Olefins site covers approximately 44.7 hectares and is bordered by Kororoit Creek Road and light industry on the north, Maidstone Street on the west, and a railway easement and light industry on the south.

The Plastics Facility covers approximately 18 hectares and is bordered by a Qenos pipeline easement on the north, Maidstone Street on the east, a Victorian Railways easement and light industry zone on the south.

The Resins Facility covers approximately 15 hectares and is bordered by Kororoit Creek Road on the north, Air Liquide on the west, a transport distribution facility on the south and south-west, and semi vacant industrial land on the on the east.

## SCHEDULE 14 CHEMICALS

All Schedule 14 Chemicals at Qenos are processed and stored in equipment specifically designed for that material. The operating and maintenance procedures are also designed to ensure that the operation is within the mechanical design of the equipment. Emergency shutdown and pressure relief systems are installed where necessary.



## OLEFINS PLANT OVERVIEW

### MAIN OUTPUT

The *Olefins facility* processes ethane feedstock sourced from Esso Long Island Point into 205ktpa of ethylene per year for the two downstream polyethylene plants Qenos Plastics and Qenos Resins.

### TECHNOLOGY EMPLOYED

The *Olefins Plant* produces ethylene using steam cracking technology used by 117 companies in 55 countries. The *Olefins* original facility began production in 1961 using vacuum oil from the local Mobil Altona Refinery. This unit was converted in 2006, to use ethane feed with supplementary LPG. A second facility, using ethane feedstock was commissioned in 1970.

### SCHEDULE 14 CHEMICALS

Ethane: a colourless, odourless, flammable gas supplied via underground pipeline. It is the main feedstock to the *Olefins Plant*.

Propane: a colourless, flammable gas or liquid. It is a supplementary feedstock to the *Olefins Plant* and is supplied by the Mobil Altona Refinery via an above ground pipeline.

Butane: a colourless, flammable gas or liquid. It is a supplementary feedstock to the *Olefins Plant* and is supplied by the Mobil Altona Refinery via an above ground pipeline.

Ethylene: a colourless, flammable gas or liquid. It is the main product of the Olefins Plant and is the feedstock for the Qenos Plastics and Resins facilities. Gaseous ethylene is transferred to the polyethylene plants by interconnecting pipelines.

Propylene: a colourless gas or liquid. It is a byproduct and is used by LyondellBasell, Geelong, as a feedstock for polypropylene manufacture.

Pyrolysis Gasoline: a colourless flammable liquid. It is a by-product of the ethylene process and is exported into Southeast Asia. It is used as a gasoline blending mixture due to its high octane number.



### PROCESS DESCRIPTION

Ethane is the main feedstock to the *Olefins Plant*. It is supplied via a dedicated pipeline from Esso Long Island Point. Additional LPG feedstock of butane and propane is sourced from the Mobil Altona Refinery.

The ethane feedstock is diluted with steam and thermally cracked in tubular pyrolysis furnaces to yield a mixture, termed “cracked gas”, of ethylene, ethane, propylene, butadiene, gasoline, fuel gas and fuel oil. Residual ethane is recycled and re-cracked; other materials leave as products. The gases leaving the furnaces are rapidly cooled and quenched with circulating oil and then water cooled to condense the heavier products. The furnace effluent gas is quenched, washed with caustic to remove acid gases and then condensed prior to cryogenic distillation which separates the various components of the cracked gas.

Ethylene vapour, recovered at a purity of greater than 99.9%, is used in the Qenos polyethylene plants (*Plastics and Resins*). The ethylene product can be liquefied and stored on the Olefins site. Liquid propylene product is also stored on site. Liquid ethylene, propylene and gasoline are trucked offsite.



## RESINS PLANT OVERVIEW

### MAIN OUTPUT

The *Resins facility* produces up to 115kt annually of High Density Polyethylene (HDPE).

### TECHNOLOGY EMPLOYED

The *Resins' Plant* uses Hoechst slurry phase polyethylene technology. Production originally began in 1967. There are 25 sites around the world that employ a similar process.

### PROCESS DESCRIPTION

Polyethylene polymer resin or powder slurry is produced batch-wise in agitated reactors with a hydrocarbon carrier-liquid or solvent where ethylene gas is mixed and reacted with hydrogen gas, catalyst and comonomer hydrocarbon liquid (butene or pentene). The reaction is exothermic and a cooling loop through cooling water exchangers maintains temperature. The polyethylene powder slurry product is discharged and passes through stages of free hydrocarbon removal. The comonomer is involved in the reaction to modify the polymer properties. The hydrocarbon liquid solvent is recovered and recycled.

The polyethylene powder is pelletised by a compounder extruder which extrudes the powder through a die-face cutter producing small pellets or granules. To provide the required user properties for the different polyethylene grades, additives are mixed in the compounding step with the powder. The final product granules are stored in silos and are then dispatched to customers in bulk containers.



### SCHEDULE 14 CHEMICALS

Ethylene: a colourless, flammable gas supplied by pipeline from the *Olefins Plant*. It is the main feedstock to manufacture polyethylene.

Hydrocarbon liquid solvent: a colourless flammable liquid used as the solvent or carrier-liquid in the reaction process.

Butene: an LPG type material used in the reaction process.

Pentene: a colourless flammable liquid used in the reaction process.

Hydrogen: a colourless, odourless, flammable gas supplied by pipeline from BOC.

Titanium-tetra-chloride: what is termed a metal halide, used as a catalyst in the reaction process.

Isoprenyl Aluminium (IPRA): what is termed an alkyl, used as a catalyst in the reaction process.



QENOS DELIVER PRODUCTS AUSTRALIANS RELY ON EVERY DAY, THANKS TO THE INGENUOUS TRANSFORMATION OF NATURALLY OCCURRING RESOURCES.



## PLASTICS PLANT OVERVIEW

### MAIN OUTPUT

The *Plastics facility* manufactures 90kt of polyethylene product known as High Density Polyethylene (HDPE).

### TECHNOLOGY EMPLOYED

The *Plastics facility* employs *Unipol™ Low Pressure, Fluidised Bed Technology*. The *Unipol™* process is licensed from Univation. There are over 100 reactor lines in 25 countries producing polyethylene using the *Unipol™* process. The *Plastics facility* started production in 1972.

### PROCESS DESCRIPTION

A polymerisation reaction takes place in a fluidised bed reactor. The process is continuous. Ethylene gas, hydrogen gas, and catalyst are injected. The catalyst type can be solid or a liquid mixture. Depending on the required polyethylene grade type, a comonomer of hexene can be added. Isopentane can also be added to assist the reaction. As the reaction is exothermic, a recycle gas flow is used to cool the reactor and is maintained by a gas compressor and heat exchanger. The powder product (also known as 'fluff') is continuously discharged, free hydrocarbon is purged out, and then conveyed into storage bins.

The polyethylene powder is pelletised by a compounder extruder which extrudes the powder through a die-face cutter producing small pellets or granules. To provide the required user properties for the different polyethylene grades, additives are mixed in the compounding step with the powder. The final product granules are stored in silos and are then dispatched to customers in bulk containers.

### SCHEDULE 14 CHEMICALS

Ethylene: a colourless, flammable gas supplied by pipeline from the Olefins Plant. It is the main feedstock to manufacture polyethylene.

Hydrogen: a colourless, odourless, flammable gas supplied by pipeline from BOC.

Hexene: a flammable liquid.

Isopentane: a flammable liquid.





# SAFETY CASE SUMMARY

The Occupational Health and Safety, Major Hazard Facilities Regulations, require operators of Major Hazard Facilities to prepare and regularly update a Safety Case.

The Qenos Safety Case demonstrates that the site is being managed to ensure that health and safety risks are being reduced “so far as is reasonably practicable”.

In developing the Safety Case, Qenos has used the following approach:

- Identify all hazards that may lead to a potential Major Incident
- Assess the likelihood and consequences of the potential Major Incident
- Identify the controls in place that reduce the risk of a potential Major Incident to “so far as is reasonably practicable”
- Ensure that the Safety Management System maintains the integrity of the controls and monitors these control measures and risks
- Ensure the emergency plan addresses the potential Major Incidents.

The assessments were carried out by Qenos personnel and included process and maintenance technicians, specialist engineers.

The Safety Case includes the following main components:

- **Facility Description:**  
Details the processes in the MHF installation
- **Risk Assessment:**  
Details the process used to identify and assess the risk of a Major Incident
- **Safety Management System:**  
Describes how the Safety Management System maintains operational integrity
- **Emergency Response Plan:**  
Details action to be taken in the event of a Major Incident.

Offsite risks to the nearby community who could be impacted by a potential Major Incident are also examined in the Safety Case.



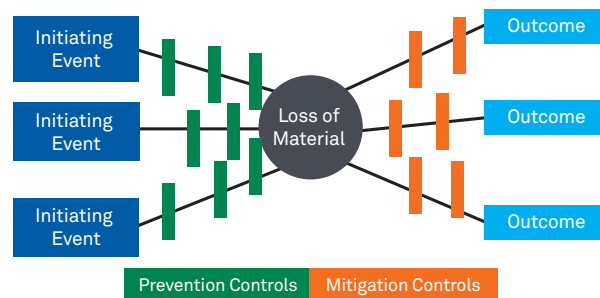
## SAFETY ASSESSMENT

The focus of the safety assessment is to comprehensively investigate the scenarios that may lead to potential Major Incidents. All aspects of risk to health and safety and damage to property associated with potential Major Incidents are considered in the safety assessment. The objective of the safety assessment is to reduce the risk to “So Far As is Reasonably Practicable”.

The safety assessment starts by identifying the Schedule 14 Chemicals that exist in the facility. The safety assessment then identifies the scenarios where these materials could be released from their containment system. These scenarios can include over pressuring of equipment, over-filling of tanks, equipment failure, corrosion, failure of operating or maintenance procedures, mechanical impact or fatigue.

In order to ensure the Major Incidents are adequately controlled and to determine if additional controls are deemed necessary; a Layers of Protection Analysis is conducted for each identified Major Incident scenario. This involves a thorough analysis of all existing controls and identifies any need for additional controls. This analysis is a systematic way of reviewing the control measures to ensure they are linked to the causes and hazards that make up a Major Incident as well as the consequences of the Major Incident.

The Layers of Protection Analysis can be represented as a bowtie diagram, as shown below:



The layers of controls on the left hand side of the diagram are the *preventative controls* in place to prevent a loss of material from occurring. Controls on the right-hand side of the diagram are the *mitigating controls* in place to prevent or reduce the consequences of the Major Incident scenario after the material has been lost.

Hence, the Layers of Protection Analysis represents a review that focuses on the preventative and mitigating controls and examines the risk control measures that are currently in place, ensuring a robust systematic approach to identify if the controls are sufficient and effective or where the inclusion of additional controls or changes in the existing controls will reduce the risk associated with the Major Incident to “so far as is reasonably practicable”.

## CONTROL MEASURES

Control measures are the equipment, systems and procedures that reduce the risk of a Major Incident.

Preventative controls are designed to stop a potential Major Incident from occurring. Examples of preventative controls include: equipment design specifications, instrumented control systems, emergency shutdown systems, pressure relief systems, equipment inspection strategies and schedules, operating procedures, vessel isolation procedures, maintenance procedures, permit to work procedures, and training.

Mitigating controls are designed to reduce the severity of the consequences. These are control measures that ensure that if there is a loss of material, it is detected and controlled quickly to minimise the likelihood that it will escalate and become serious. Examples of mitigating controls include the following: site layout and equipment separation, gas detection systems, site alarms, fireproofing, automated water deluge systems, fixed firefighting systems, firefighting foam injection facilities and emergency response procedures.

Both preventative and mitigating controls are designed to recognised Corporate, Australian and International Standards and are subject to regular performance assessment and ongoing auditing to ensure they are effective, reliable and robust.



## SAFETY MANAGEMENT SYSTEM

A Safety Management System provides a systematic way to identify hazards and control risks while maintaining assurance that these risk controls are effective. The Safety Management System at Qenos is called *SHEOS* (Safety, Health and Environment Operating System).

*SHEOS* is an integrated operating system used by Qenos to address all its Safety Health and Environment obligations including the ongoing prevention and mitigation of Major Incidents.

*SHEOS* is made up of 21 components or practices, *SHEOPs* (Safety, Health and Environment Operating Practices), to provide a comprehensive Safety Management System fit for purpose for a Major Hazard Facility.

The following is a summary of the *SHEOPs* which have a direct impact upon the prevention of Major Incidents.

### **SHEOP 1.1 Leadership, Management, Commitment & Accountability**

This *SHEOP* outlines a philosophy that acknowledges that management provides the perspective, establishes the framework, sets the expectations and provides the resources for successful operations. It is formally acknowledged that the assurance of operations integrity requires management and leadership that is visible to the organisation and accountable at all levels.

### **SHEOP 2.1 Risk Analysis, Assessment & Management**

This *SHEOP* aims to ensure that all the safety, health and environmental hazards associated with the operation of Qenos are identified and actions taken to reduce the risk associated with these hazards will be reduced to “so far as is reasonably practicable”. *SHEOP 2.1* provides the structure for comprehensive risk analyses by providing the essential programs, tools and information for risk assessment and management for existing facilities and new projects.

### **SHEOP 3.1 Facilities Design & Construction**

This *SHEOP* covers projects from design to start-up, controlling hazards associated with new equipment and facilities. The purpose of *SHEOP 3.1* is to ensure facilities are developed, designed, constructed and handed over to Operations in accordance with company and regulatory requirements and standards.

### **SHEOP 4.1 Process and Facilities Information/ Documentation**

This *SHEOP* prescribes accessibility, accuracy and validity requirements for engineering drawings, design data and equipment records. The *SHEOP* arises from an appreciation that current information on the configuration and capabilities of process and facilities, properties of materials handled, safety, health and environmental hazards and regulatory requirements are essential in the management of risk and compliance with statutory requirements.

### **SHEOP 5.1 Personnel Safety**

This *SHEOP* focuses on the interface between people and their work environment. It establishes systems that actively monitor behaviour and workplace conditions and which take steps to prevent potential injuries. Important aspects of this *SHEOP* include the continued raising of awareness of hazards, safety analysis of specific job tasks, proper use of personal protective equipment and employee recognition.

### **SHEOP 5.3 Personnel**

This *SHEOP* is designed so the site has the necessary processes in place for the selection, placement and ongoing assessment of employees in key Safety, Health and Environmental positions.

### **SHEOP 5.4 Training and Competence**

This *SHEOP* ensures that Qenos has in place the necessary training programs to ensure that all employees and contractors have the skills and knowledge to perform their job safely, and in an environmentally responsible manner.





### **SHEOP 6.1 Operations and Maintenance Procedures & Alarm Management**

This SHEOP ensures adequate procedures are in place for normal and abnormal operations.

### **SHEOP 6.2 Work Permits**

A work permit system is necessary to ensure that jobs are adequately planned and that work is performed safely.

This SHEOP covers the procedures for obtaining work permits and the training needed to ensure that equipment is properly prepared, jobs are planned and executed, and equipment returned to service.

### **SHEOP 6.3 Inspections and Maintenance Requirements**

This SHEOP defines the inspection, maintenance and monitoring requirements for various types of equipment including: fixed, rotating, electrical, instrumentation, mobile, hoses, tools, and rigging equipment. These activities include the definition and execution of quality control and quality assurance of materials and workmanship on equipment covered by this SHEOP.

### **SHEOP 6.4 Reliability and Control of Defeat of Critical Systems and Devices**

The objective of this SHEOP is to ensure that all Qenos plants have a structured approach to the identification, maintenance and testing of safety, health and environment (SHE) critical equipment and no SHE Critical device/system is defeated unless alternative protection has been implemented to manage the risk.

### **SHEOP 6.6 Regulatory Compliance**

This SHEOP covers all applicable legislation with obligations on Qenos affecting Safety, Health and Environment of all personnel at Qenos, the community and the environment.

### **SHEOP 7.1 Management of Change**

This SHEOP established the requirements for the management of change. The manufacturing process is designed to safely function within specified operational and equipment limits. A change occurs each time Qenos alters documentation, facilities, operating mode, materials or personnel responsible for these areas. Making changes can invalidate previous risk assessments and / or create new risks. To maintain acceptable risk levels all changes are reviewed by appropriately qualified personnel and the implementation of changes must be managed.

### **SHEOP 8.1 Third Party Services**

This SHEOP covers contractors doing work on Qenos' behalf, understanding pertinent Qenos Safety, Health and Environmental requirements and carry out such work in accordance with those requirements.

### **SHEOP 9.1 Incident Reporting, Analysis and Follow Up**

This SHEOP requires the recording and analysis of data relating to SHE incidents in order to identify root causes and to implement effective corrective actions to prevent recurrence.

### **SHEOP 10.1 Emergency Preparedness**

This SHEOP is built on the precept that emergency planning and preparedness are essential to ensure that, in the event of an incident, all necessary actions are taken for the protection of the public, company personnel, contractors, the environment and assets.

### **SHEOP 10.2 Community Awareness**

This SHEOP recognises that Employee and Community awareness is a key factor in maintaining public trust and confidence in the integrity of operations. Trust and confidence are earned through open communications with employees and the local community regarding the company's performance. Qenos maintains an ongoing commitment to provide opportunities for, and encouragement to, employees to participate in the communication of activities within the community, including those regarding the community's Safety, Health and Environmental concerns about operations.

### **SHEOP 11.1 Assessment and Improvement**

This SHEOP covers self-assessments and verification assessments at Qenos. Performance indicators are developed and maintained within the system for each SHEOP. The objective is to assess the degree to which the SHEOP Requirements are met and to support the continuous improvement of SHEOS. Effective assessment of the performance of SHEOS is essential in order to improve performance, maintain accountability and ensure operational integrity. *SHEOP 11.1 Assessment and Improvement*, ensures each SHEOP is regularly audited to check its status and effectiveness This provides 'QUALITY ASSURANCE' through continuous improvement.



# INCIDENT PREPAREDNESS AND RESPONSE

## EMERGENCY RESPONSE EQUIPMENT AND FACILITIES

**Qenos is well prepared to handle Major Incidents. The controls and training in place ensure any potential for offsite consequence is minimised.**

Emergency response resources to respond to incidents and work with the emergency services to manage incidents include:

- Onsite shift teams trained in emergency response
- Emergency communications – plant radios, internal and external land lines, and emergency plant alarms (fire alarms relayed to MFB)
- Each site has dedicated fire protections systems including fire water and foam provision. Hydrocarbon gas detectors are also provided
- Fire water systems – each site has a fire water tank with automatic pumping control stations supplying fire water through a fire ring main to fixed fire monitors, hydrants and deluges and sprinklers
- Booms and absorbents for chemicals spills to protect waterways
- Shift teams perform simulated exercises.

## PLANT ALARM SIRENS

Plant Alarm Sirens at Qenos are to alert on-site workers and initiate an on-site emergency response if needed. Emergency Services are responsible for informing the community.

All plants conduct regular testing of alarm systems and leak detection systems to ensure they are available and in good working order. Neighbours may hear the routine testing of alarms or other times when, simulated emergency training exercises are performed.



.....  
QENOS HAS RIGOROUS AND ROBUST SYSTEMS IN PLACE TO PREVENT AND MANAGE EMERGENCY EVENTS



## FLARES

Flares are a key safety and environment control system used in refineries and petrochemical facilities. They will safely burn flammable gases which cannot be recovered or recycled in the processing plants. Flares are also used to safely burn process gas when a plant is shutdown, this ensures that the integrity of the plant and the safety of the community are ensured.

Qenos Olefins and Plastics facilities have flare systems.

The use of flares is minimised to the extent that is possible. This is to reduce any impacts the flaring has on the community and to maximise the efficiency of operations. Examples of when the flares need to be used include:

- Taking the process plants off line for maintenance
- Starting the process plants up following maintenance
- When safety shutdowns activate
- Purging of gases during plant operations
- Utility interruptions such as power failures.

The flares can have the following impacts off site:

- Light/Flames
- Smoke
- Noise
- Emissions/odours.

The elevated flare is very noticeable and from some locations it may appear that there is a large uncontrolled fire. Members of the community may sometimes become concerned when large flares are visible and may mistake them for a fire or emergency at the plant. This is not the case; the flare provides a controlled combustion of the gases to ensure the safe operation of the facility.

## INSPECTION AND TESTING PROGRAMS

An on-going program of inspection, testing, maintenance and replacement is in place to ensure that all emergency response equipment and facilities are effective when called on for use.

A training program is established and stewarded. Simulated exercises identify opportunities for improvement.

## TRAINING

Incident preparedness and response training is designed and implemented to equip relevant personnel with the knowledge and skills required. Training schedules are developed to ensure effective implementation occurs across all areas of Qenos which includes:

- Simulated Emergencies aligned with potential incidents and combatting strategies
- Simulated exercises with the MFB and local council
- Personnel to be trained in the specifics aligned to emergency response roles e.g. first aid, breathing apparatus, emergency shutdown and isolation of plant, evacuation.



## POTENTIAL MAJOR INCIDENTS

- ..... The potential Major Incidents identified at Qenos are extremely unlikely to have offsite consequences.
- ..... Potential Major Incidents and their worst case consequences that may occur due to the release of a Schedule 14 Chemical is summarised in the table below.

Hazards	Potential Major Off-Site Incident	Magnitude	Potential Consequences
Flammable gas or liquid release	Fire/explosion	Expected to only have onsite impact; but could impact nearby residential and commercial operations depending upon wind direction and strength.	<ul style="list-style-type: none"> <li>• Injuries as a result of damage to windows or other building damage resulting from an explosion</li> <li>• Exposure to smoke may cause respiratory difficulty</li> <li>• Other impacts may include                             <ul style="list-style-type: none"> <li>• Visible flaring</li> <li>• Noise</li> <li>• Odour</li> </ul> </li> <li>• Public disruption (e.g. actions by emergency services such as road closure or evacuation)</li> </ul>
Combustible liquid release	Fire	Expected to only have onsite impact.	<ul style="list-style-type: none"> <li>• Exposure to smoke may cause respiratory difficulty</li> <li>• Other impacts may include                             <ul style="list-style-type: none"> <li>• Visible flaring</li> <li>• Noise</li> <li>• Odour</li> </ul> </li> <li>• Public disruption (e.g. actions by emergency services such as road closure or evacuation)</li> </ul>
Toxic or odorous vapour	Significant release on a Qenos site	Expected to only have onsite impact but in extreme circumstances, offsite impacts may be occur.	<ul style="list-style-type: none"> <li>• Exposure may cause respiratory difficulty or other health impacts</li> <li>• Public disruption – request to perform ‘Shelter-In-Place’ action</li> <li>• Public disruption (e.g. actions by emergency services such as road closure or evacuation)</li> <li>• Qenos facility response may include                             <ul style="list-style-type: none"> <li>• Visible flaring</li> <li>• Noise</li> </ul> </li> </ul>



## WHAT TO DO IN EMERGENCY

### How will you know if there is an Emergency?

You may see it, hear it on the radio or you may get an emergency alert on your phone.

**Emergency Alert** is the national telephone warning system used by the emergency services to send emergency alert messages to landlines and mobile phones within a defined area about likely or actual emergencies. In the case of an emergency, you may receive a voice message on your landline or a text message on your mobile phone.

### In an Altona emergency you may?

- Hear a siren/alarm, loud explosion or emergency vehicles
- Smell smoke or chemical odour
- See a large fire or smoke
- Receive an Emergency Alert

*In this type of emergency the first thing you should do is:*

- Close windows and shut curtains and blinds
- Take shelter indoors – sheltering inside your home or a building in an emergency provides immediate protection
- Monitor for emergency services advice via Radio 97.4, ABC Channel 2 or Emergency phone alerts
- Cooperate fully with emergency service instructions or Emergency phone alerts.

Once the “all clear” has been given it is safe to move outdoors

### Genos Alarms

Genos has site alarms which do not require any response from the community. These site alarms which may occasionally be heard in the community are tested on Tuesday mornings at 8:30 am.



**Consequence**

The outcome of a Major Incident.

**Control Measures**

The equipment, programs and procedures used to prevent or reduce the potential consequence of a Major Incident.

**Hazard**

A chemical or physical condition that has the potential for causing harm to people, property, or the environment.

**HDPE**

High Density Polyethylene.

**LDPE**

Low Density Polyethylene.

**LLDPE**

Linear Low Density Polyethylene.

**LOPA**

Layers of Protection Analysis – a risk assessment technique used in the safety assessment to assess the likelihood of a Major Incident.

**Major Incident**

An uncontrolled incident involving a Schedule 14 chemical exposing or potentially exposing a person to an imminently serious risk to safety or health.

**MHF**

Major Hazard Facility.

**MHF Regulations**

Part 5.2 of the *VIC Occupational health and Safety Regulations 2017*.

**Risk**

The product of the likelihood of a potential Major Incident and the severity of the consequences.

**Safety Assessment**

A comprehensive and systematic investigation of hazards that may lead to potential Major Incidents.

**Safety Case**

A report prepared under Part 5.2 of the *Occupational health and Safety Regulations 2017*.

**Safety Management System**

A comprehensive management system to identify hazards and control risk and ensure risk controls are effective.

**WorkSafe Victoria**

The VIC regulator responsible for the licencing of Major Hazard Facilities.

**Schedule 14 Chemicals**

The hazardous chemicals and their threshold quantity as defined in the *VIC Occupational Health and Safety Regulations 2017*, to identify a Major Hazard Facility.

**SHE**

Safety, Health & Environment.

**SHEOP**

Safety Health & Environment Operating Practice.

**SHEOS**

Safety Health & Environment Operating System. The name of the Qenos Safety Management System.

**So Far As is Reasonably Practicable**

Reasonably practicable means doing what is reasonably able to be done to ensure the health and safety of workers and others.



# GLOSSARY

**Disclaimer**

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