Environmental Assessment, Expansion and Associated Upgrades for the Kansai Plascon Paint Manufacturing Facility

PROPORTIO DIVINA
environmental services

May 2023

Draft Basic Assessment Report

DEDEAT Reference Number: ECm1/C/LN1/34/22-2023

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Province of the
EASTERN CAPE
ECONOMIC DEVELOPMENT,
ENVIRONMENTAL AFFAIRS & TOURISM

BASIC ASSESSMENT REPORT

(For official use only)

File Reference Number:	
NEAS Number:	
Date Received:	

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014 as amended, promulgated in terms of the National Environmental Management Act, 1998(Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 as amended and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for. This report is current as of 1 OCTOBER 2022. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority

2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.

3. Where applicable **tick** the boxes that are applicable or **black out** the boxes that are not applicable in the report.

4. An incomplete report may be returned to the applicant for revision.

5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.

6. This report must be handed in at offices of the relevant competent authority as determined by each authority **unless indicated otherwise by the Department**.

7. No faxed or e-mailed reports will be accepted **unless indicated otherwise by the Department**.

8. The report must be compiled by an independent environmental assessment practitioner (EAP). The EAP must satisfy conditions 11 below.

9. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.

10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.

11.1 The Environmental Assessment Practitioner (EAP) must be registered in terms of S24H Regulations with the Registration Authority EAPASA as from 8 August 2022.

11.2. S24H (14) states that "only a person registered as an Environmental Assessment practitioner may perform tasks in connection with an application for an environmental authorisation contemplated in

(a)Chapter 5 of the Act read with the Environmental impact Assessment Regulations.

(b)Section 24G of the Act

(c) Chapter 5 of the National Environmental Management Waste Act 2008 (Act No 59 of 2008) read with the Environmental Impact Assessment Regulations

11.3. Tasks in regulation 14 may only be conducted by an EAP that is registered

11.4. Regulations 20 of S24H indicates the offences and penalties as indicated below:

"*20. Offences and penalties*

(1) A person is guilty of an offence if that person-

(a) contravenes regulation 14 of the Regulations; or

(b) pretends to be a registered environmental assessment practitioner or registered candidate environmental assessment practitioner.

(2) A person convicted of an offence in terms of subregulation (1) is liable to the penalties contemplated in section 49B(3) of the Act.".

Section 49B(3) of the Act states:

"A person convicted of an offence in terms of section 49A(1)(h), (l), (m), (n), (o) or (p) is liable to a fine or to imprisonment for a period not exceeding one year, or to both a fine and such imprisonment.".

PART 1: SUMMARY REPORT

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1. Introduction

Proportio Divina Environmental Services (PDES) have been appointed by Axalta Plascon to undertake an environmental assessment for the upgrade of their existing automotive paint facility to include the production of solvent-based paint. The site is located on erf 2602, Korsten in Gqeberha (see Figure 3).

Axalta Plascon, who operates at the location in a Joint Venture with Kansai Plascon and who makes use of the facilities under a lease agreement, intends to make use of the existing facilities that is present on site, and which is owned by Kansai Plascon, but to fund modifications to the infrastructure to allow for the additional production of solvent based clearcoat paint. Kansai Plascon is therefore the applicant as the owner of the facility.

The proposed activity upgrade triggers listed activity 34 in terms of Listing Notice 1 (Government Gazette notice R983) of the EIA Regulations (2014, as amended). This necessitates that a Basic Assessment process needs to be followed in order to obtain environmental authorisation, a pre-requisite to applying for an Atmospheric Emissions License (AEL).

Activity 34 reads as follows: - *"**The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for** a permit or licence or **an amended permit or licence in terms of national or provincial legislation governing the release of emissions**, effluent or pollution, …"*

Kansai Plascon, as the owners of the site (within the Joint Venture) and in possession of an AEL, therefore intends on applying for a variation to the Kansai Plascon AEL which requires the addition of an emissions point source for the release of volatile organic compounds.

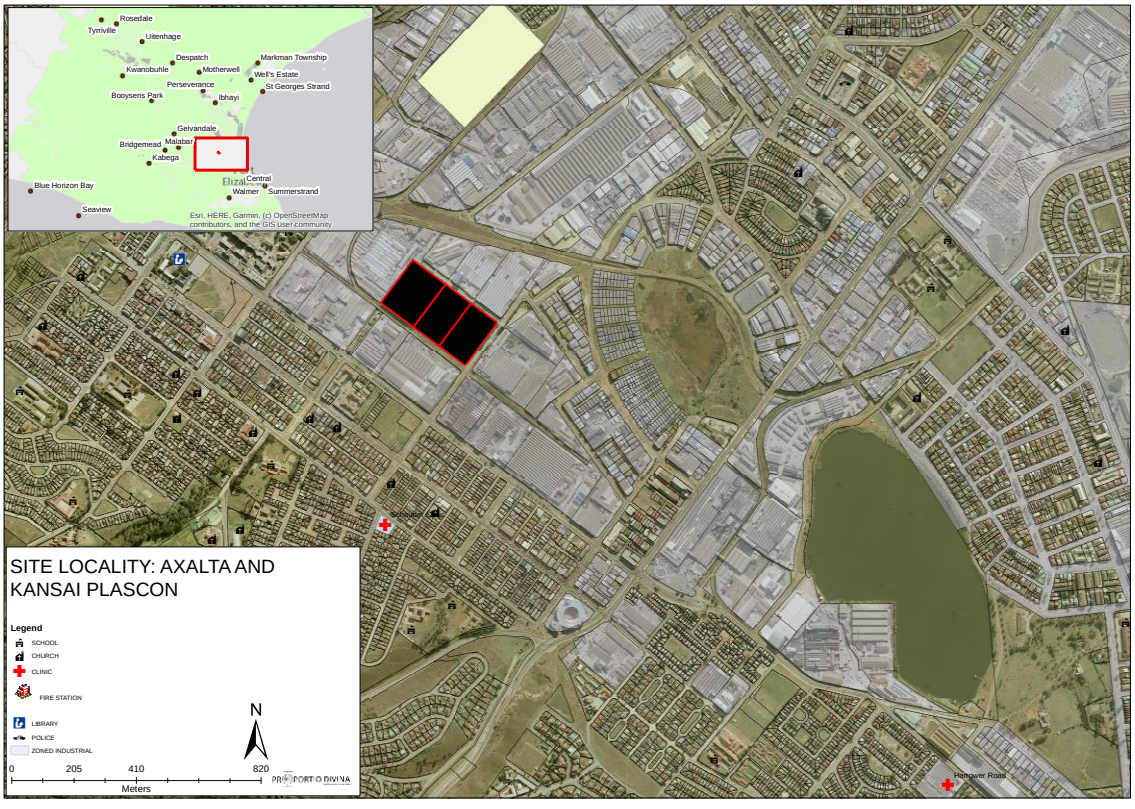

Figure 1: Site Locality

1.1 Applicant Details

The applicant details are as follow:

Organisation Name	**Kansai Plascon**
Contact Person	Mokhete Zondo
Tel	+27 (0) 41 401 1505
Address	2-4 Bedford Street, Neave Township, Port Elizabeth, 6001
Town	Gqeberha
Province	Eastern Cape

1.2 Purpose of this Report

The Basic Assessment Report will give context to the proposed development through providing the following information: -

- Comprehensive description of the envisaged activities.
- The identification of environmental impacts.
- Identification of appropriate alternatives and mitigation measures for reduction of negative impacts.
- Provide stakeholders with an opportunity to comment on the development activities.
- Communication of outcome of study to CA and stakeholders to facilitate decision making.

1.3 Assumptions and Limitations

The report findings are subject to the following:

- The information provided by the applicant and specialists are accurate.
- The technical assumptions made as part of the development proposal are accurate.
- This assessment is not intended to re-assess the facilities on site, but only considers the increases over and above the existing facility components.

2. The Project Team

The EIA regulations require that the Environmental Assessment Practitioner (EAP) who is appointed, be registered with the Environmental Assessment Practitioners Association of South Africa as a registered EAP. In this regard, PDES fulfils this role by the appointment of the EAP as per the details in **Table 1**. The EAP was supported by a candidate EAP, Ms Abigail Bahindwa.

Table 1: EAP Details

EAP:	Evert Jacobs		
Professional affiliation/registration:	1. South African Council For Natural Scientific Professions 2. Environmental Assessment Practitioners Association of South Africa		
Contact person (if different from EAP):	Evert Jacobs		
Company:	Proportio Divina Environmental Services		
Postal code:	6045	Cell:	069 808 1431
Telephone:	087 702 5996	Fax:	
E-mail:	admin@proportiodivina.co.za		

3. Project Description

3.1 Project Location

The proposed project area is situated on erf 2602 in Korsten, at 4 Bedford Street, Neave Township, Gqeberha, 6001, measuring approximately 3.74 ha. The site is situated in the Neave Industrial area of Gqeberha (this is in terms of the Spatial Development framework (SDF) of the Nelson Mandela Bay Municipality (NMBM), where the topography is flat.

The erf is zoned industrial 2 in terms of the Port Elizabeth Zoning Scheme and the project activity is in line with the vision that the NMBM has for the area and aligns to the character of the surroundings. The site is surrounded by other industrial and commercial activities.

The site can be accessed via Standford Road Arterial (which runs in a south easterly direction relative to the site) and then via New Bolt Rd and Bedford Rd. Entrance to the site can be either through New Bolt road or through three entrances in Bedford road.

*The sections of the existing facility that will be re-furbished to incorporate the additional solvent-based infrastructure is located at the GPS co-ordinates as provided in**Table 2**.*

Table 2: Location (coordinates) of stack and mixing areas.

Stack Location	**33°55'39.67"S** **25°34'43.39"E**
Mixing Area	33°55'39.61"S 25°34'41.95"E

3.2 Project Description

Kansai Plascon produces automotive paint for the vehicle manufacturing industry in Gqeberha. Solvent based paints are already produced on site by Kansai Plascon, however Axalta Plascon only produces water-based paints at present. Paint produced on site is stored on the premises and then later sold to customers. Kansai Plascon intends to include into their current facilities, the ability to be able to increase the production of solvent-based paints, at an approximate capacity of 4000 tons per year in addition to their existing water-based paint production and over and above the solvent-based paints produced. This additional infrastructure will be operated by Axalta Plascon under a JV agreement.

Due to the current activities, Kansai Plascon is the holder of an approved Air Emission License [19/2/9/2/1/2/ NMBM AEL 20/60] for 'Category 6: Organic Chemical Industry' activities for the site which applies to their solvent-based paint production activities. The current Kansai Plascon facility is also considered to be an approved Major Hazardous Installation due to the nature of the products and chemicals handled on site which has the potential to ignite and result in fires or explosions if stored incorrectly. The need for the AEL arose from the use or production of organic chemicals onsite which requires ventilation into the atmosphere.

The National Environmental Management: Air Quality Act (NEM:AQA) includes a "List of Activities Which Result in Atmospheric Emissions" as published in Government Notice 893 on 22 November 2013

(GN893) and which requires to be operated under an AEL. The proposed increase in solvent-based paint production at the site necessitates the need to amend the AEL operated under by Kansai Plascon. An additional emissions point source will be added to the existing AEL held by Kansai Plascon for the release of volatile organic compounds.

3.3 Proposed changes to the site development plan

The current water-based production plant area includes, amongst others:

- a material store where input materials are stored.
- a production store where product is stored.
- two production plants.

Figure 2 shows a detailed site layout plan illustrating the main facilities that comprise the water-based plant at Kansai Plascon as well as the Axalta Plascon plant as it currently operates. The new solvent-based paint plant is planned for the existing water-based plant production area, as identified in **Figure 3**. The additional facilities will make use of two existing storage vessels (both at a capacity of 10 000 litres each) that are currently used at the water-based plant, to be used for storage of the proposed solvent-based plant. The offices that are currently located in Production Area (North), as indicated in Figure 1, will be demolished and this area will be used as a staging area. To contain any spills, the planned solvent-based production plant will be cordoned off and equipped with a sump spillage containment measure and includes concrete surfaces. A stack will be added above the storage tanks in the plant. The tanks will be equipped with nitrogen blanks to protect the product from vapour.

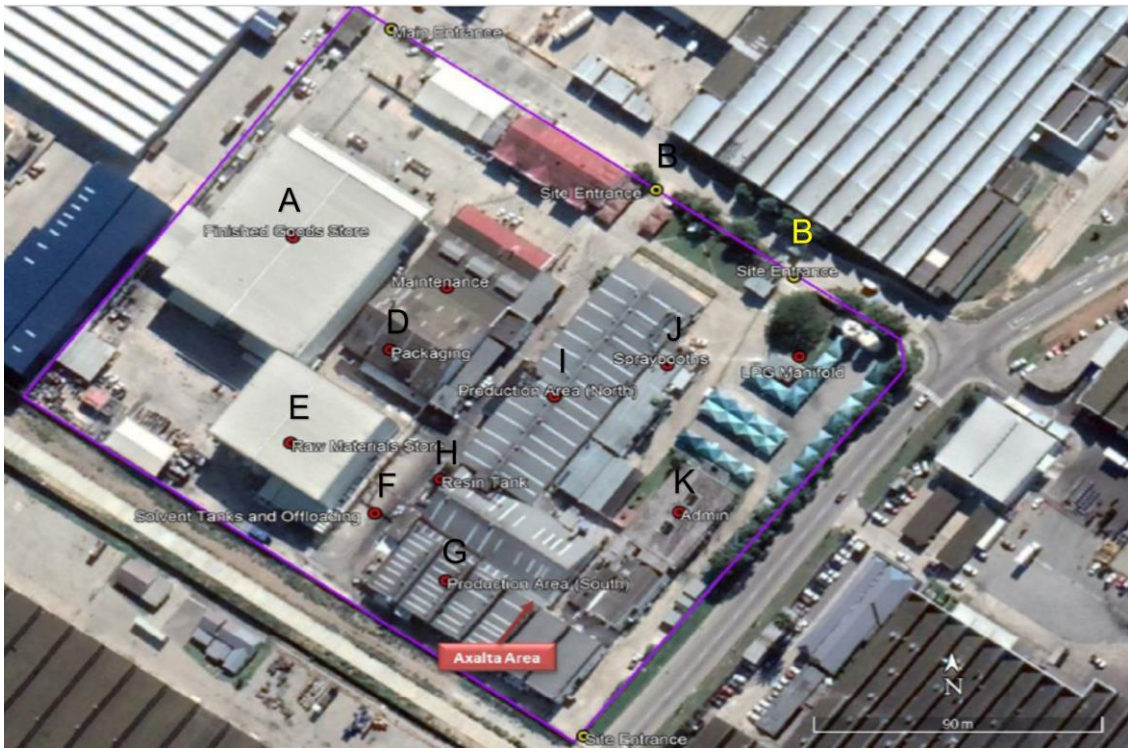

Figure 2: Existing site layout plan of the Plascon operated water-based facilities, where A is the Finished Goods store, B is the Site Entrance, C is Maintenance, D is Packaging, E is the Raw Material Store, F is the Solvent Tanks Offloading, G is the Production

The proposed facilities to be constructed and installed at the site will include the following:

- To control spills and leaks during the manufacturing process, containment facilities in the form of a bund with a sump will be installed around above-ground storage containers/storage areas.
- A stack will be constructed to allow for ventilation and to neutralize the vapours produced during the mixing process.
- Nitrogen, stored on site in 2x 11kg cylinders, and due to its inert nature, will be used as a barrier to insulate the product from vapours.
- Nitrogen will be brought to the mixing area through either a pipeline or by installation of smaller nitrogen tanks at strategic locations;
- Tanks are cleaned using solvents and the resultant effluent are distilled on site for storage and re-use. The associated distillation, handling and storage facilities will form part of this expansion. These facilities are existing but will be expanded.
- Facilities for the temporary waste handling and storage will be required for the resultant sludge that is produced in the cleaning process. These are existing facilities but the volumes will be increased.

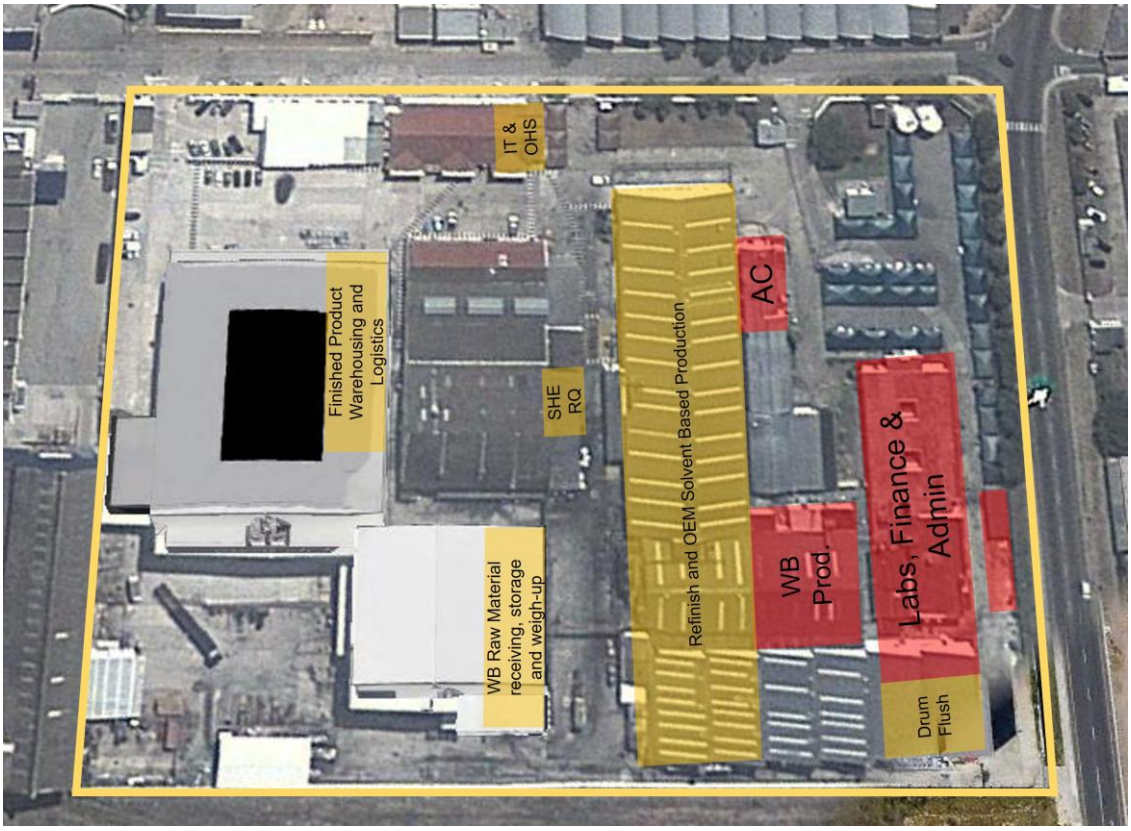

Figure 3: A revised site layout plan for the facility that will be changed to incorporate the production of solvent-based paint.

3.4 The production process of solvent-based paints

A Bulk Mix process, as used at Kansai Plascon, will be used to produce solvent-based paint, including two additional material inputs to achieve the correct composition. This production process is illustrated in **Figure 4**, and involves the mixing of solvents, resins, and other substances to produce the final product. Gaseous emissions, in the form of vapours, may result from the mixing process due to the nature of the solvents and volatile chemicals that release vapour that require ventilation. A stack will be

added above the storage tanks in the plant to extract the vapours. The tanks will be equipped with nitrogen blanks to protect the product from vapour.

The production process of solvent-based paint therefore is summarised as follows: -

1. The ingredients of the solvent-based paint are delivered to the site and stored in existing underground tanks.
2. A manual operated diaphragm is used to load the solvent-based paint ingredients (resins, solvents, and additions) into the mixing containers.
3. The mixing of ingredients is undertaken by an operator.
4. Colouration and tinting of the product take place as required by the paint specifications.
5. Testing of the product is done in terms of the quality control requirements.
6. Approved product is transferred to containers with approved product for sale.
7. Storage and transportation of filled containers occur on site until such time as it is transported to clients.

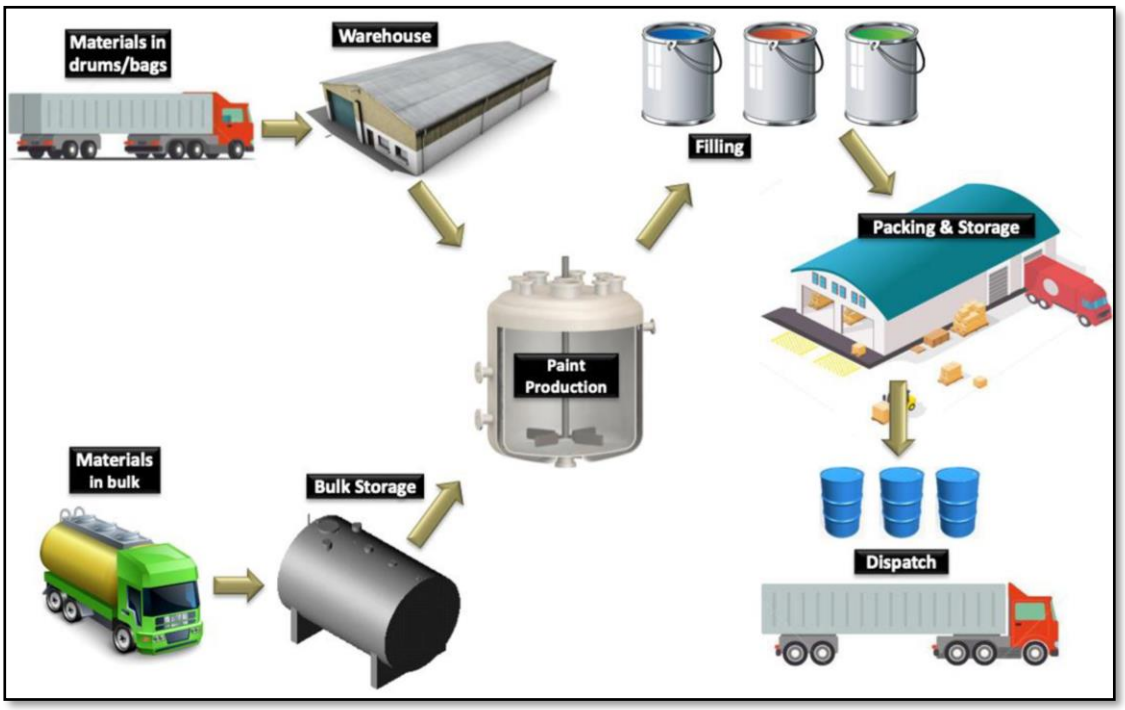

Figure 4: A schematic illustration of the production process (WKC 2021).

3.5 Changes to the material stored on-site

The solvent-based production process will use mainly the same input materials as currently being used for the water-based paint production process. The solvent-based process however requires two additional input products. The raw input materials used in the production of solvent-based paint are stored on site, however a greater storage volume of 90 tonnes per month will be required to be able to make provision for the sorted products and to include the 10% containment area. The estimated volume of solvent-based paint product that will be produced and stored in the product store is 30 tonnes per month.

Table 3: Material inputs indicating new products and volumes stored (Draper and Blanche 2021).

	Ingredient Designation	Ingredient Name	Material Inputs (t/y)
Existing Inputs Stored	176-16050	W-10031 HAPS Compliant Acrylic Dispersion	1.69
	VMS46561	UVA Screener / HALS Solution	4.42
	VM-1940	DDBSA / DIPA Solution – HAPS Compliant	1.12
	RCS47670	Low Tg Urethane Oligomer	7.04
	RCS47606	Acrylic Copolymer Flow Additive	0.23
	RCS37919	Dual Function Resin for SHS Clear	3.94
	RCS29899	Dual Functional Acrylosilane Polymer	19.97
	RCP 1888	Clearcoat NAD	13.19
	RCH72716	NAD Resin	3.51
	RC-7126	HAPS Compliant High Solids Acrylic Resin	1.69
	H-948	Trimethyl Orthoacetate	2.34
	H-883	Ethyl 3-Ethoxy Propionate	0.59
	H-12	N-Butyl Alcohol	3.80
	G-1600	Hindered Amine	0.23
	G-1307	Melamine Resin	6.70
	G-1270	Melamine Formaldehyde Resin	1.86
New	***RCS47626***	***Silated Oligomer***	***3.85***
	RCR35197	***Sag Control Agent for NAAB***	***3.85***
	Total		**80.00**

4. Study Approach

The changes proposed to the existing facility, to increase the volume of solvent-based clearcoat paint at the Kansai Plascon site, triggers an activity listed in terms of the Environmental Impact Assessment Regulations, 2014, as amended. This means that, before commencing with this activity, authorisation must be sought from the Department of Forestry, Fisheries, and the Environment (DFFE) through undertaking an environmental assessment. Listing notices 1, 2 and 3 (Government Gazette notices R983, R984 and R985, as amended in 2017), inform which environmental authorisation process must be undertaken. Activities listed in Listing Notice 2 require a full Scoping and Environmental Impact Assessment Process, whereas activities listed in Listing Notices 1 & 3 requires a simplified Basic Assessment Process. The proposed activity is listed in terms of activity number 34 of Listing notice 1 so therefore a basic assessment process (see **Figure 5** for an illustration of the BA process) must be followed. The activity reads as follows:-

"The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution, …"

Appendix 1 of the EIA Regulations (2014, as amended) outlines the objectives of the BA process and the scope and content of a Basic Assessment Report (BAR). The content requirements of a BAR, in accordance with Appendix 1, will be outlined at the start of the document as well as providing cross-references to where the relevant information is located in this document (see Table #).

The purpose of the BAR is to provide a comprehensive description of the project activities, the receiving biophysical and socio-economic environment and to explain how the preferred development option was determined, through the identification and assessment of alternatives and impacts.

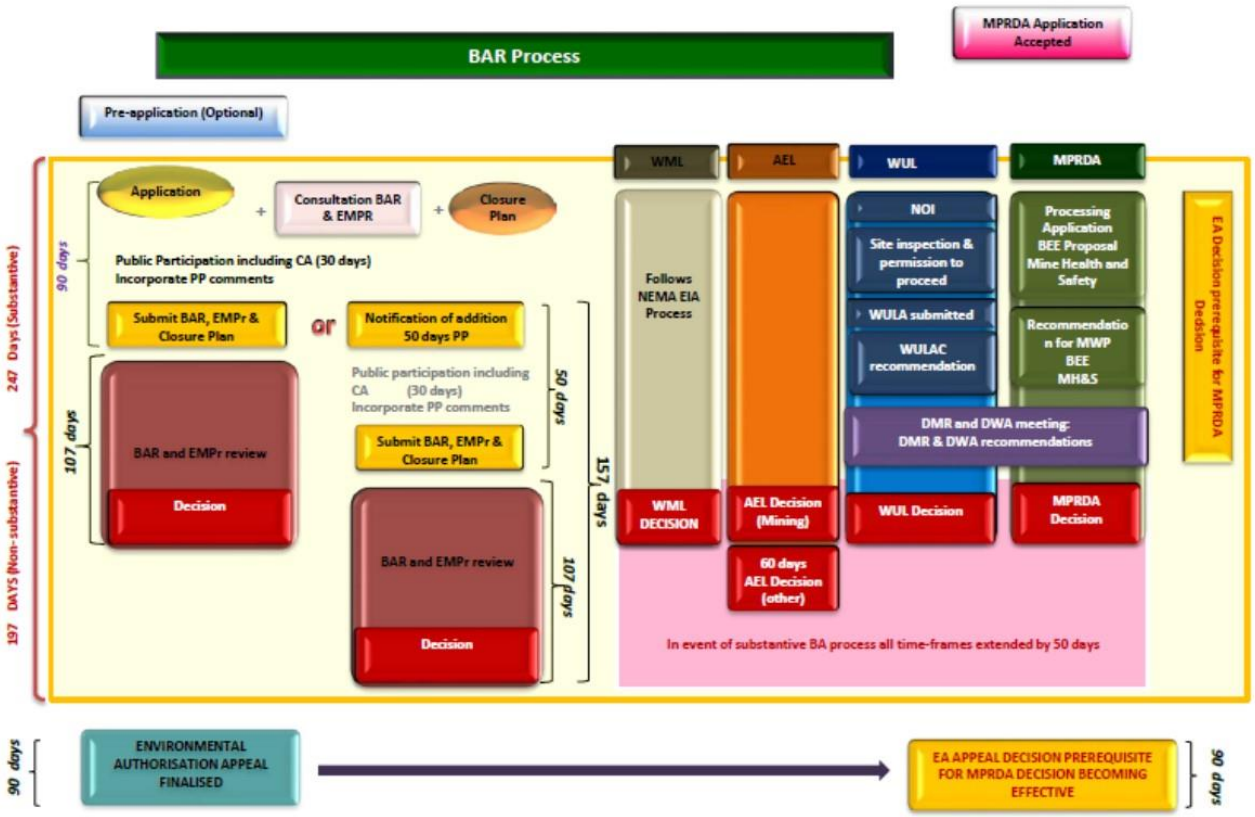

Figure 5: An illustration outlining the Basic Assessment process with timeframes as per the EIA Regulations (2014 as amended) and published by DFFE.

The BA process commenced with the placement of newspaper advertisements and the delivery of printed Background Information Documents on 10 March 2023. The application form has been completed and the Draft BAR (this document) has been drafted. A pre-application meeting has been undertaken with the authorities on the 3 March 2023. The Draft BAR will be subject to a public participation process that will take place from the 9 June 2023 to the 10 July 2023. Comments received on the Draft BAR will be responded to by the project team and will be incorporated in the Final BAR before submission to the authorities. The final BAR will be made available to registered stakeholders.

The Basic Assessment process comprised the following steps: -

1. Screening/ Pre-application process – complete.
2. Scoping process (Specialist studies, Needs and Desirability, Alternatives, public participation) – complete.
3. Impact assessment and evaluation of significant impacts – complete.
4. Public Consultation and review of the Draft BAR – **Current Activity**.

5. Review and decision making by competent authority – not started.

4.1 Screening / Pre-application Phase

This stage is the first step in the assessment where the 'mitigation hierarchy' is applied to choose the most sustainable development option, where impacts are avoided upfront through a risk averse approach and where environmental sensitivities and risks are identified. The screening phase includes negotiating with landowners (where land is required), undertaking a site visit, pre-application meetings with DEDEAT and key stakeholders, developing comprehensive understanding of the biophysical and socio-economic elements of the site and identifying risks/impacts and alternatives to facilitate impact avoidance. DFFE has included a screening stage whereby generic data can be used to conduct a screening exercise in the planning of the Environmental Assessment process. In this regard, PDES completed the screening using the DFFE tool, and the findings of the report are summarised below as well as the observation on site against the findings of the DFFE screening tool. It is important to note that the DFFE screening tool is high level collation of data sets with generic inputs and the outputs are intended to guide the assessment. Ground truthing and confirmation of the accuracy of the generic data included in the screening tool is required to determine the actual studies required.

Following the completion of the DFFE screening tool, a site visit was undertaken on the 13th March 2023 to confirm the site features the proposed development and to observe any existing impacts that may be present on the receiving environment.

The DFFE tool gathers available relevant desktop information that intersects with the proposed site and assigns a sensitivity rating ("Very high" sensitivity, "Low" sensitivity, etc.) to various themes ("Aquatic Biodiversity" theme, "Civil Aviation" theme, etc.). A copy of the Screening Tool Report is attached as Appendix G. Table # outlines the different themes with their respective sensitivity ratings that intersect with the site as well as comments on whether the sensitivity rating is confirmed or disputed.

Table 4: DFFE Screening Tool outcomes and subsequent site confirmation of sensitivities.

Theme	Sensitivity	Verified/disputed sensitivity	Confirmed
Agriculture Theme	Very High	Disputed	No agricultural activities are present within at least 5km of the site boundaries.
Animal Species Theme	Medium	Disputed	The site and general surroundings are built up and within an industrial area, no biodiversity features are present on or immediately adjacent to the site.
Aquatic Biodiversity Theme	Very High	Disputed	A wetland area is located approximately 700 meters from the site, however this site is buffered by several other industrial land uses and the site will not have a direct influence on the wetland.
Archaeological and Cultural Heritage Theme	Low	Disputed	No archaeological features were observed on site. Buildings on site are mainly industrial related specific to the nature of the site. The title deed shows that Kansai Plascon attained the site in 1990 whereafter modifications were made.

Paleontology Theme	Very High	Disputed	The area is mostly paved for road use or industrial uses.
Civil Aviation Theme	Very High	Disputed	The nature of the site is not such that it will influence any aviation features in the region within 5 kilometres.
Defence Theme	Very High	Disputed	The nature of the site is not such that it will have an influence on defence features.
Plant Species Theme	Low	Disputed	No plant species occur within the area of influence.
Terrestrial Biodiversity Theme	Low	Disputed	An aquatic area is located approximately 700 meters from the site boundaries and receives stormwater from the area which includes a number of industrial inputs of which this development would be a fraction of the overall inputs. This aquatic area is also buffered by several other industries that are located between the development site and the aquatic site.

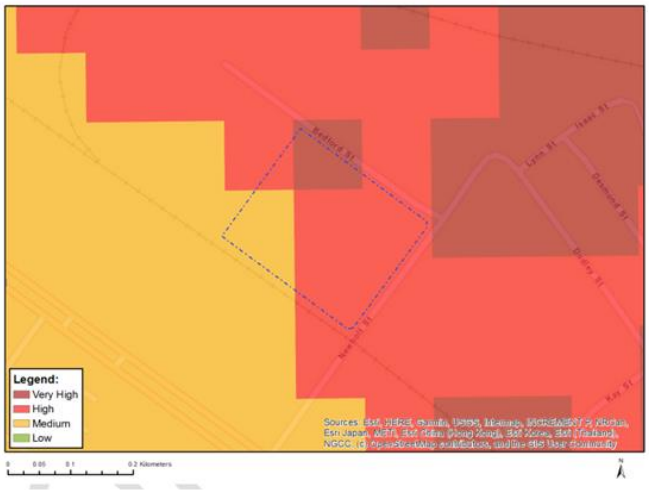

Figure a. Map illustrating the Agricultural Theme Sensitivity relative to the site.

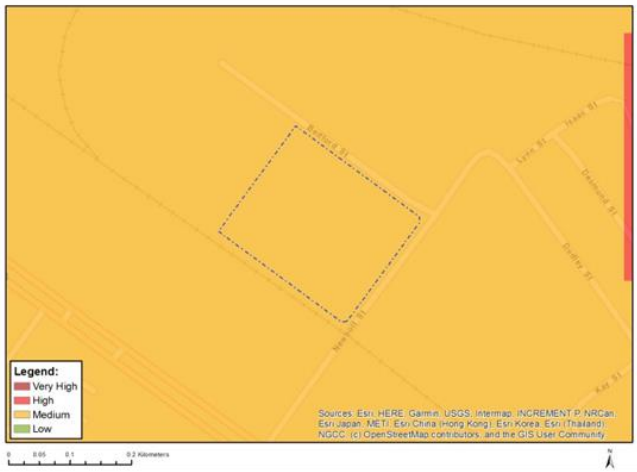

Figure b. Map illustrating the Animal Species Theme Sensitivity relative to the site.

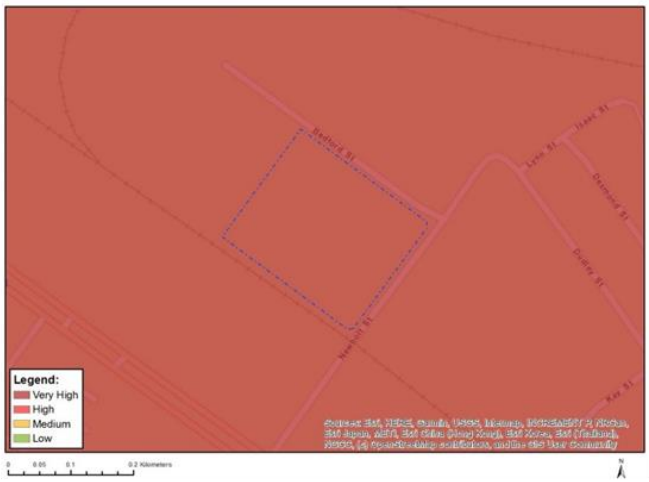

Figure c. Map illustrating the Aquatic Biodiversity Theme Sensitivity relative to the site.

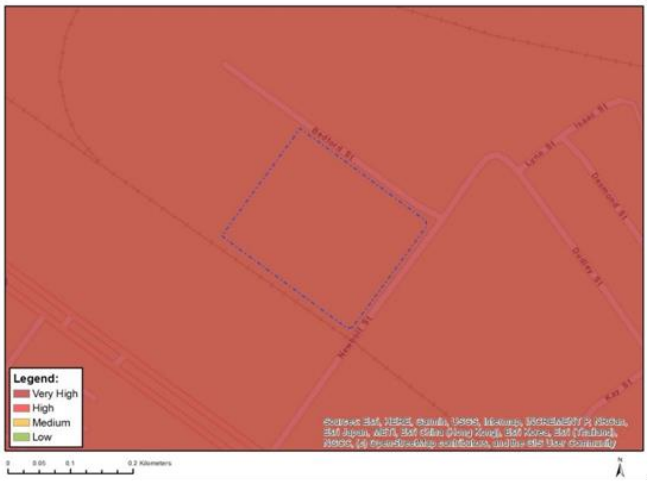

Figure d. Map illustrating the Civil Aviation Theme Sensitivity relative to the site.

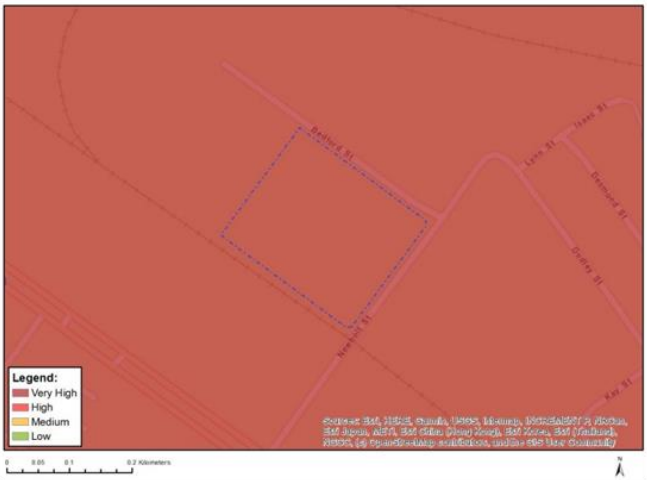

Figure #. Map illustrating the Defense Theme Sensitivity relative to the site.

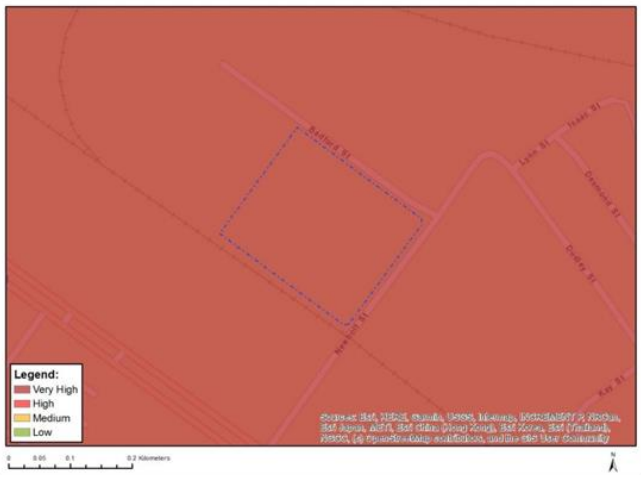

Figure #. Map illustrating the Palaeontology Theme Sensitivity relative to the site.

Figure 6: DEFF Screening Tool outcomes for the location indicating theoretical sensitivities.

4.2 Scoping process

The aim of the Scoping Process is to identify impacts related to the proposed development, identify relevant specialist studies, develop ToRs for specialist studies based on Protocol requirements, undertaking public participation, investigate the "Need and Desirability" of the project, consider alternatives to come up with a sustainable development proposal that has the most sustainable development option. The outcome of the scoping process is to determine which specialist studies to conduct and which impacts to assess.

4.3 Specialist Studies

Specialist inputs are required in environmental assessments when key issues identified through the process cannot be addressed by available information. Specialists analyse both positive and negative impacts of project alternatives and provide useful mitigation measures that will improve the overall benefit of the development and reduce impacts to the environment.

The Screening Tool Report indicated that several potential specialist studies that may be required, however, as indicated in **Table 4**, the high-risk items have been considered against the observed site, and the following specialist studies have been undertaken to inform this assessment:

1. Air Quality Impact Assessment – to determine impacts as a result of emissions from the additional facilities.
2. Risk Assessment – To assess the risks associated with the handling and storage of various chemical compounds on site.

4.4 Public participation

The Public Participation process is done in terms of the the requirements of Regulation 41 of the EIA Regulations, 2014. The process broadly incapsulates the following activities that were undertaken:-

- Advertise the proposed development in two regional newspapers;
- Display site notices at the site that are visible to the public;
- Delivered Background Information Documents to all neighbours;
- Consult relevant stakeholders in Nelson Mandela Bay Municipality (NMBM);
- Allow 30-day registration on Background Information Document (BID) and advertisements;
- Allow 30-day comment period on Draft BAR; and
- Incorporate public comments into the Final BAR.

5. Need and Desirability

The EIA Regulations (2014, as amended) requires that the "need for and desirability of the activity" must be considered in an environmental assessment. This means that the 'need' and 'desirability' of the proposed development must be assessed separately where the 'need' relates to the 'timing' and 'desirability' to 'place'. It also relates to the "nature, scale and the location of the development is proposed, as well as the wise use of the land". Evaluating the 'needs and desirability' of a proposed development allows the authorities to understand if sustainability (social, environmental, and financial) issues have been considered in the proposed development.
The need and desirability concept in relation to the proposed development has been deliberated as follows: -

5.1 Need (Timing) of the proposed development

The automotive industry accounts for more than 50% of the manufacturing sector in Gqeberha which accounts for more than half (58%) of Gqerberha's Gross Value Add (GVA). Automotive related companies, like Kansai Plason, are benefitting from the demand created by companies like the VW Motor Plant, the NMB Logistical Park, the new automotive manufacturer (FAW) plant at the Coega Industrial Development Zone (IDZ) etc. Kansai Plascon has an existing facility where solvent-based paints are produced, stored, and sold to various industries, inclusive of the automotive industry. Given that there is an existing demand for this paint, Kansai Plascon intends to upgrade its current facility to produce additional volumes of solvent-based paints.

5.2 Desirability of the development

The project area/site is an existing automotive paint manufacturing facility that produces solvent and water-based paints. The site is located in the Neave Township in Gqeberha and the Spatial Development Framework of the Nelson Mandela Bay Municipality identifies Neave Township as a light industrial area. It is zoned as industrial 2 in terms of the NMBM zoning scheme which means that the proposed development is in line with the NMBM's vision for that area in Gqeberha.

5.3 Benefits to society

Kansai Plascon produces top quality paint products for the industrial and automotive sectors which forms a substantial part of the local economy. Plascon has integrated sustainability issues into their business strategy by striving to reduce their carbon emissions, their electricity use, water consumption and waste production. They have done this to ensure that they have a positive impact on the communities that they operate in. They believe that a healthy business is rooted in healthy societies, communities and labour forces. The facility also provides job continuation and economic benefits to the local automotive industry, and the additional capital spend will further contribute to this.

5.4 Benefits to the local community

Indirect employment opportunities could benefit local communities through the role it plays as part of the business community, resulting in strengthening of Gqeberha's economy through the proposed development.

Local employment will be created during the construction and operational phases of the activity.

The upgrading of the facility will provide a few employment opportunities for the surrounding community as follows: -.

- Two new skilled employment opportunities during the construction phase of the development;
- Three new skilled employment opportunities during the operational phase of the development; and
- Six new skilled employment opportunities during the operational phase of the development.
- An important factor in the development is the fact that the continuation of the operations supports the sustained operations of the facility and products that are produced locally, and sold locally to the vehicle manufacturing industry maintains economic activity in the local surroundings.

6. Consideration of alternatives

The EIA Regulations (2014, as amended) require that alternatives (activity, technology, location and no-go) to the proposed activity must be considered. Alternatives are different ways of meeting the objectives of the proposed activity. The consideration of alternatives are important because it ensures that the process did not bias one way of meeting the objectives of the project activity.

No project alternatives were considered or the following reasons: -

- Location alternative:- Kansai Plascon already manufactures solvent- and water-based paints at their automotive paint plant. All the raw materials required to produce the solvent-based paints are already stored on site. They are currently purchasing solvent-based paints abroad and are selling it locally. Extensive upgrades to the facility are not required to produce solvent-based paints.
- Technology alternative:– Kansai Plascon already uses industry standard technologies to produce paint.
- No-go alternative: -The automotive industry would be significantly affected if the facility is not upgraded and the solvent-based paints are not produced because solvent-based paints would have to be procured abroad at significant prices. Also the employment opportunities for local communities would be lost.

An assessment of available alternatives is provided in the BAR template in **Table 24** in Part 3 of this document.

7. Affected Environment

The receiving environment has been described using a combination of on-site observations and published literature and datasets obtained from the South African Weather Service through their Eastern Cape offices.

8.1 Climate

The climate of the Eastern Cape is complex, it spans over the confluence of several climatic regimes, most importantly the temperate and subtropical regions. The climate of NMBM is warm temperate, mild, and temperature fluctuations are not extreme. Monthly average temperatures and rainfall is shown in **Error! Reference source not found.** with the temperature data for the last 30 years measured over the N MBM area and rainfall extremes shown in

Table 5.

	AVERAGE OF DAILY TEMPERATURE				TOTAL RAIN PER MONTH / YEAR			
Month	MAX	MIN	MEAN	RANGE	MAX	YEAR	MIN	YEAR
Jan	25,7	17,4	21,6	8,3	112,2	2000	8,2	2018
Feb	26,1	17,6	21,9	8,5	154,0	2000	4,2	1998
Mar	25	16,2	20,6	8,8	129,3	1998	6,9	1993
Apr	23,3	13,6	18,5	9,7	132,0	2014	3,6	2018
May	22,1	11	16,6	11,1	165,0	2007	2,7	1996
Jun	20,6	8,3	14,5	12,3	183,0	2012	2,0	2000
Jul	20,2	7,9	14,1	12,3	202,0	2012	1,6	2005
Aug	20	9,1	14,6	10,9	247,5	2006	3,0	2019
Sep	20,4	10,7	15,6	9,7	110,3	1993	11,0	2007
Oct	21,4	12,8	17,1	8,6	204,2	2012	9,2	2002
Nov	22,7	14,2	18,5	8,5	238,1	1996	6,9	2003
Dec	24,4	16	20,2	8,4	182,0	1994	5,4	2000
YR	**22,6**	**12,9**	**17,8**	**9,7**	**247,5**	**2006**	**1,6**	**2005**

The weather patterns in the region are substantially influenced by the sea and surrounding topography which is flat with low mountain rainges. The Nelson Mandela Bay area, which includes Despatch, has a bimodal rainfall pattern, with peaks in Spring and Autumn. Rainfall for the metropolitan area can range between 400 mm to 800 mm in a year with regular cycles of wet and dry periods. Although the majority of the rainfall events occur in Spring and Autumn, rainfall occurs throughout the year as a result of convective summer rain and winter rain associated with the passage of frontal troughs.

Prevailing winds along the coast tend to follow the coastline and the winds in the Port Elizabeth area are typically from the West-South West and East-North East. **Error! Reference source not found.** shows t he wind rose for the NMBM area generated by LAQS as part of the air quality specialist study for 2022 showing that the dominant prevailing winds are west to south-south westerly (> 50 % of the time) occasionally changing to east or north easterly winds < 15 % of the time. East to east north easterly winds prevail during the summer months (December to February). Light winds are more variable in direction due to topographical influences and cold air drainage at night, especially in winter.

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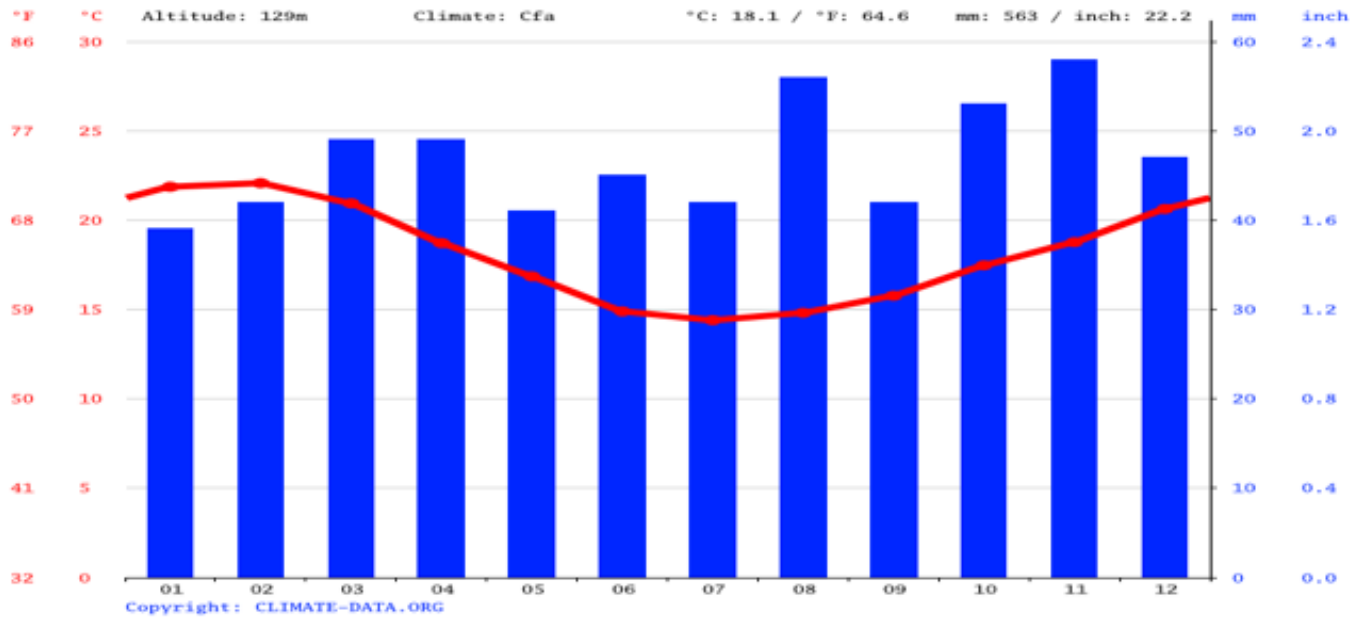


Figure 7: Rainfall and temperatures for the general NMBM area (climate-data.org).

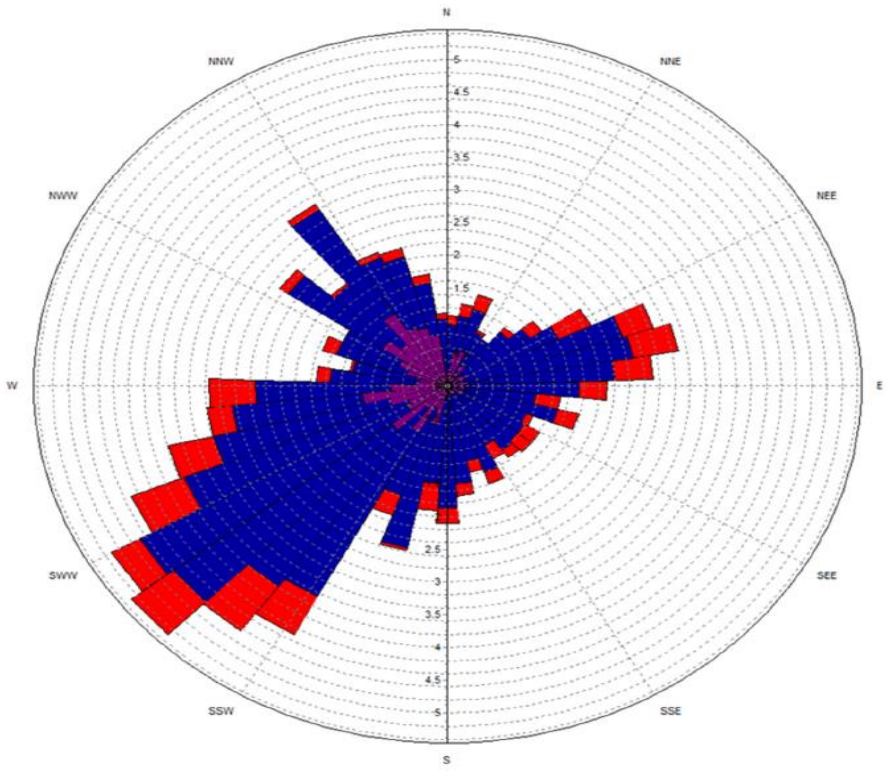


Figure 8: Wind rose as generated in the air quality assessment.

Table 5: Annual temperature showing seasons marked by shaded cells (Weather SA data).

	AVERAGE OF DAILY TEMPERATURE				TOTAL RAIN PER MONTH / YEAR			
Month	MAX	MIN	MEAN	RANGE	MAX	YEAR	MIN	YEAR
Jan	25,7	17,4	21,6	8,3	112,2	2000	8,2	2018
Feb	26,1	17,6	21,9	8,5	154,0	2000	4,2	1998
Mar	25	16,2	20,6	8,8	129,3	1998	6,9	1993
Apr	23,3	13,6	18,5	9,7	132,0	2014	3,6	2018
May	22,1	11	16,6	11,1	165,0	2007	2,7	1996
Jun	20,6	8,3	14,5	12,3	183,0	2012	2,0	2000
Jul	20,2	7,9	14,1	12,3	202,0	2012	1,6	2005
Aug	20	9,1	14,6	10,9	247,5	2006	3,0	2019
Sep	20,4	10,7	15,6	9,7	110,3	1993	11,0	2007
Oct	21,4	12,8	17,1	8,6	204,2	2012	9,2	2002
Nov	22,7	14,2	18,5	8,5	238,1	1996	6,9	2003
Dec	24,4	16	20,2	8,4	182,0	1994	5,4	2000
YR	**22,6**	**12,9**	**17,8**	**9,7**	**247,5**	**2006**	**1,6**	**2005**

8.2 Terrestrial Environment

The site is irreversibly modified, i.e., it is fully developed, and no natural elements exist on the site. It is therefore not necessary to undertake a Terrestrial Biodiversity Impact Assessment as well as Plant Species and Animal Species Assessments.

8.3 Aquatic Environment

The closest wetland (east of the site, **Figure 9**) is located approximately 700m away from the project site. This feature is buffered by industrial development and receives stormwater from the industrial areas surrounding it.

Figure 9: Distribution of wetlands around the site, the Korsten Dry Lake which serves as a stormwater retention feature is the closest to the site.

8.4 Groundwater

The site is located within the Coega Table Mountain Group Aquifer groundwater Strategic Water Source Area (SWSA), refer to **Figure 10**. This aquifer is deep lying aquifer located within the rock environment.

Although this is an important strategic aquifer, the aquifer is not readily accessible to surface activities. The TMG Aquifer occurs at significant depth and is protected by an aquiclude. The upper levels, overlying the TMG, is expected to contribute flow towards the Paapenkuils drainage

areas which is a highly transformed surface water canal running north of the site receiving surface and groundwater inflows from the surrounding industrial areas.

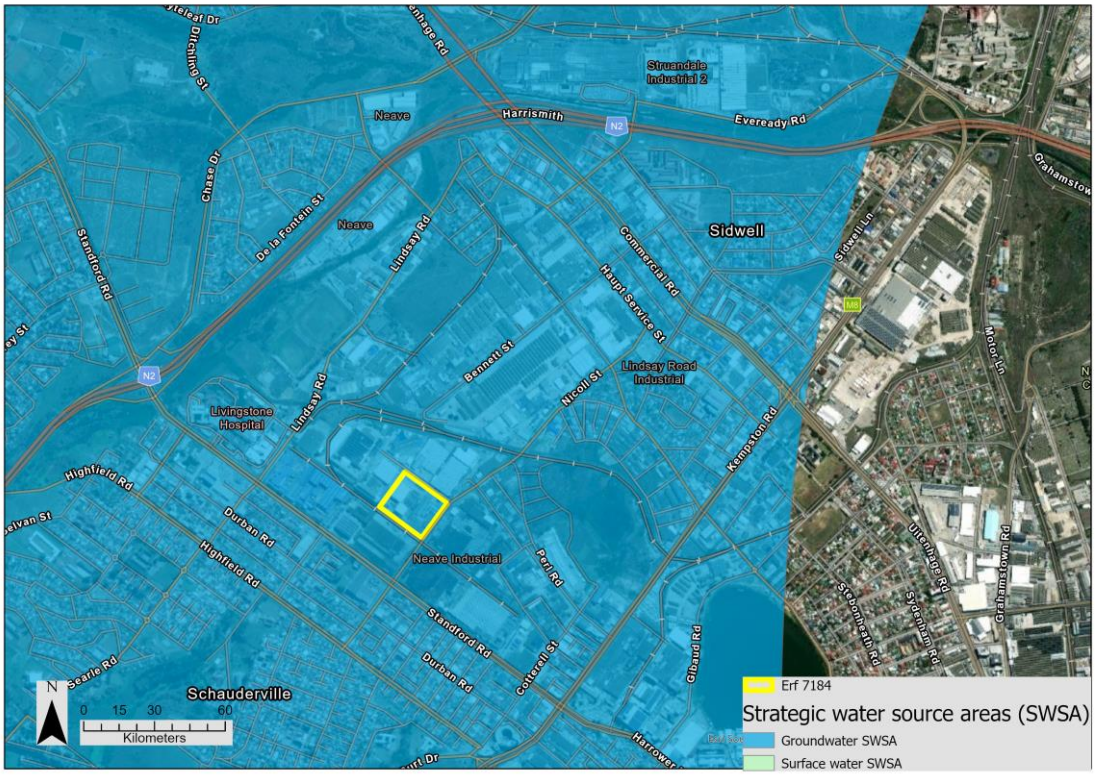


Figure 10: Strategic groundwater resources in the area.

8.5 Topography

The topography of the site is flat, situated at 35m above sea level. The area surrounding the site slopes the east and southeast relative to the site. Two wetlands, Korsten Dry Lake and North End Lake Wetlands situated at the 20m contour levels respectively (see Figure #).

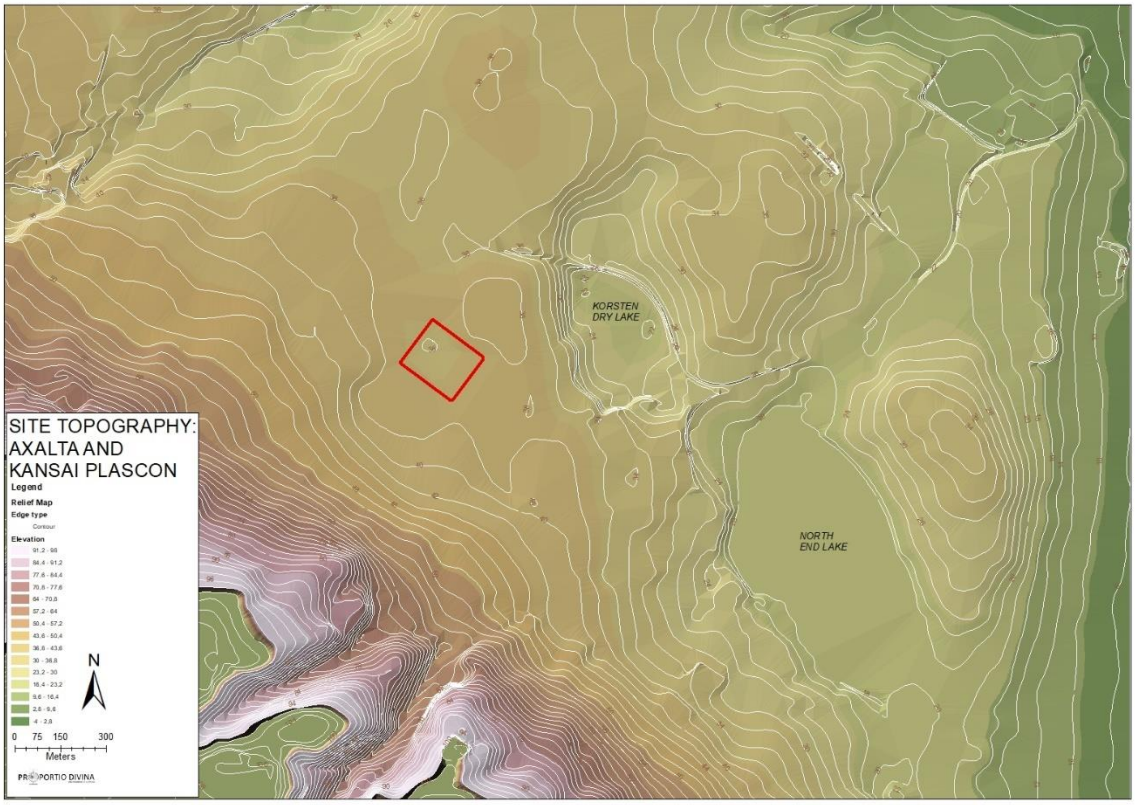


Figure 11: Topography of the site.

8.6 Air quality

According to the NMBM Air Quality Management Plan (NMBM 2010) historically, very little data or information on the quality of the ambient air in the municipal area is available. Due to the industrial nature of the area, the Department of Environmental Affairs and Tourism (DEAT) rates the air quality in the area as “poor” which is a category for areas observing large numbers of exceedances.

There is also a limited amount of data available about air pollutant emissions in general, specifically from automotive and residential sources. While huge gaps exist in industrial emission data, current information shows that significant quantities of particulate matter, sulphur dioxide, nitrogen oxides, carbon monoxide and greenhouse gases (mainly carbon dioxide) are emitted by industries on an annual basis.

An introductory emission inventory has shown that some areas exist where the concentration of air pollutants may be higher than expected, but no interpretation of potential risks can be determined due to a lack of credible air quality information.

There is, therefore, a dire need to obtain relevant and representative air quality data in some locations within the municipal district before any remedial steps can be taken.

8.7 Social and Economic Environment

The investment, employment and income generation potential linked to the project will positively contribute to the socio-economic development objectives of the broader area.

According to the General Household Survey (2021) Gqeberha's population is estimated at 1,263 861 people. The unemployment rate for Gqeberha is 33.6% in terms of STATS SA Quarterly Labour Force Survey under in Q3/2022. Approximately 27.2% of households in the city receive government grants and lists it as their main source of income (STATS SA General Household Survey (2021)). The site itself is located in an industrial area with low income areas located in close proximity.

8. Public Participation Process

The Public Participation Process is currently under way and commenced 9 June 2023. IAPs have until 10 July 2023 to submit comment on the report and the process followed or raise any general concerns or issues.

8.1 Process Followed

The Public Participation Process (PPP) that has been undertaken to obtain public inputs into the environmental process are as follows: -

1. The PP process commenced on the 13 March 2023 and ended on the 13 April 2023.
2. A Background Information Document (BID) was developed and distributed to relevant stakeholders over the course of this period. A 30-day registration period was instituted to register Interested and Affected Parties (I&APs).
3. BIDs were hand delivered to all direct neighbours on the 13 March 2023 and details of landowners collected through enquiry.
4. A pre-application meeting was held with DEDEAT and the air quality officials from the NMBM on 3 March 2023.
5. All relevant government departments will be informed of the availability of the Draft BAR on 26 May 2023.
6. A site notice (see **Figure 12**) was developed and attached to the fence at the entrance gate and reception entrance of the site on the 13 March 2023;
7. Newspaper advertisements were placed in the following newspapers (**Figure 13**):-

a. An advertisement was placed in the Eastern Cape Herald on Monday 13 March 2023.
b. A second advertisement was placed in the Port Elizabeth Express on the 15th March 2023.

8. The Draft BAR (this document) will be submitted to the competent authorities following completion of the public comment period.
9. A 30-day commenting period will be extended to stakeholders and I&APs to provide inputs on the documents.
10. All public comments will be addressed and incorporated in the Final BAR.
11. The Final BAR will be made available to stakeholders once finalised.

Figure 12: Site notices placed at the entrance gates and reception entrance.

Figure 13: The advertisements placed in the Eastern Cape Herald (left) and Port Elizabeth Express (Right).

8.2 Comments Received

No comments received to date, major landowners and tenants in the vicinity did not raise any issues in formal discussions and noted no issues with the applicant. Comments received from authorities consulted to date are included in
Table 6.

Table 6: Comments Received

Theme	Commenter	Comment	Response
Specialist Study – Air Quality / AEL	NMBM	Please consider inclusion of a map showing a 5km radius around the site.	A Map has been included in the specialist assessment report.
Specialist Study – Air Quality / AEL	NMBM	Process flow diagrams for both operations should be included in the specialist report.	Process flow diagrams have been included into the specialist assessment report.
Specialist Study – Air Quality / AEL	NMBM	Impacts on the environment and human health need to be included in the report.	Impacts on the environment and human health are addressed in the Basic Assessment Report.

9. Impact Assessment

This section provides an assessment of the anticipated impacts. It is important that readers utilise the assessment methodology to understand how the rating of an impact has been determined as provided in **Table 7** and **Table 8**.

9.1 Methodology of Assessment of Impacts

In consideration of regulation 31(2)(l) of the National Environmental Management Act, Act 107 of 1998 as amended which states that "An Environmental Assessment report must contain all the information that is necessary for the competent authority to consider the application and to reach a decision… and must include –

i. Cumulative impacts
ii. The nature of each impact
iii. The extent and duration of the impact
iv. The probability of the impact occurring
v. The degree to which the impact can be reversed
vi. The degree to which the impact will result in the loss of resources
vii. The degree to which the impact can be mitigated.

Table 7: Rating criteria for the identified impacts.

Numerical Value	Extent	Duration	Probability	Magnitude
1	Site Specific:- Impact limited to area within the site boundary	None	None	None
2	Local:- beyond site boundary but within 500 meters or less of the site boundary	Immediate: – limited to the duration of the impact event.	Improbable:- Less than 1% chance of occurrence.	Insignificant or Minor
3	Regional A:- Beyond 500 meters of the site but within the local administrative boundaries (e.g. municipality).	Short Term:- o to 5 years.	Low Probability:- More than 1% chance of occurrence but less than 20%.	Low
4	Regional B:- Beyond local administrative boundaries but within Provincial boundaries.	Medium Term:- 5 – 10 years.	Medium Probability: 20% - 50% chance of occurring.	Moderate
5	National: Beyond provincial boundaries but within the national boundary.	Long Term:- 10 – 20 years.	High Probability:- More than 50% chance of occurrence but less than 99%	High
6	Cross boundary impacts beyond international borders.	Permanent:- Impact remains indefinitely.	Definite:- It is a predicted certainty that the impact will occur.	Very High

Impacts must therefore also be assessed in terms of the following criteria:

- Extent of the impact or spatial scale in which impacts are anticipated.
- Duration of impacts and how long the identified impact will be present or show an effect on the extent identified.
- Probability is the likelihood of the predicted impact occurring.
- Magnitude is a relative characterisation of the intensity of the impact.

In order to assign a numerical value to these criteria, **Table 7** provides the explanation as to how numerical values have been assigned and should be kept in mind in the summary of impacts.

In order to determine the relative risk that may result from the development and associated impacts identified, **Table 8** provides the ranges of how the relative risk has been grouped and categorised to make a determination of the anticipated impacts.

Table 8: Significance determination as a relative determination of risk.

Number Value Calculated	Classification	Reason	Calculated relative percentage risk
0 - 5	Insignificant	Insignificant or no loss of resources. Calculated value is less than 2%.	0 - <5%
5-27	Low	Low significance with calculated value being less than 10%.	5% - 25%
>27-55	Moderate	Less than 50% indicates a moderate significance due to the probability and magnitude of the loss of resources.	>25% - 50%
>55-100	High	More than 97% which indicates a high potential for loss of resources.	>50% - 92%
>100-108	National: Beyond provincial boundaries but within the national boundary.	Long Term:- 10 – 20 years.	93% - 100%
6	Cross boundary impacts beyond international borders.	Permanent:- Impact remains indefinitely or are considered unacceptably high.	!00%

9.2 Predicted Impacts

Based on the assessment of the activities associated with the changes to the facility, the following impacts are anticipated:

Table 9: Initial identification of impacts to be assessed.

Impact Description	Impact Origin	Opinion on Nature	Assesses Further
A. Planning and Design Phase			
No impacts identified.			No
B. Construction Phase			
Excavations and demolition	Waste generation from building rubble Dust generation from excavations and demolition. Safety	Low - waste volumes are expected to be low and not continuous. Low - dust generation will be low and short term.	Yes
Waste management	Rubble generated from demolition activities	Low - waste volumes are expected to be low and not continuous.	Yes
Traffic	Additional vehicle traffic resulting from deliveries during construction activities to effect changes.	Insignificant - traffic volumes will be extremely low and is unlikely to affect the traffic flow.	No

Impact Description	Impact Origin	Opinion on Nature	Assesses Further
Job creation	Additional employment opportunities during construction.	Low - most employment opportunities will be limited to specialist installers as opposed to construction firms.	Yes
Heritage Buildings	Buildings present on site classified as heritage resources or building older than 60 years.	Low - No formal heritage buildings are present on the site although some site features may be in excess of 60 years old	No
C. Operational Phase			
Groundwater quality	Leaks and spills from poor operational controls and penetration to groundwater	Low - no new infrastructure is being installed in this regard and continuation of current procedures and controls will not result in increased risk.	Yes
Emissions	Emissions from paint production through ventilation of volatile organic compounds	Moderate - emissions need to be licensed as part of the operations	Yes
Traffic	Additional vehicle traffic resulting from deliveries and sales	Low - waste volumes are expected to be low and not continuous.	No
Noise	Noise generation resulting from the equipment	Insignificant - noise levels present on site is unlikely to be elevated considering the minor changes in relation to the site operations. The changes proposed are not rated as noise generators.	No
Waste Management and Re-use	Products and input materials will generate small amounts of waste. The majority of input products will be re-used and recycled in the process.	Low - the volumes are low and all material and all waste streams will be included in the existing operations under the management measures employed.	Yes
Stormwater management	Drainage of dirty stormwater areas.	Insignificant - stormwater volumes and quality will not be influenced by the changes.	No
Operational Risk - MHI	Inherent fire and safety risks are present in the operation of the facility.	Moderate - risks of the changes and how they influence the existing MHI operational procedures should be assessed.	Yes
D. Decommissioning Phase			
Site rehabilitation and remediation	Waste generation from contaminated land and soils.	Moderate - industrial sites in operation for this long often have sub-surface contamination that requires removal.	Yes

Impact Description	Impact Origin	Opinion on Nature	Assesses Further
Waste management	Demolition waste generated. Removal of unused products and expired chemicals	Low - building rubble will require removal to relevant waste facility. Low- all waste will be removed to a licensed hazardous waste facility.	Yes
Noise	Noise generation during demolition activities.	Low - the nature of the area is industrial although temporary spikes in noise generation will be short-lived.	Yes
Traffic	Removal of rubble and infrastructure may lead to a temporary increase in traffic volumes.	Low- temporary increases in traffic volumes could pose a nuisance to general traffic in the area.	Yes
E. Cumulative Impacts			
Emissions	Loss of available air space for other industries in the local and regional context.	Low - the facility is not expected to generate high volumes relative to the available air space.	Yes

9.3 Assessment Outcomes and Discussion

The review of the proposed changes to the Kansai Plascon complex will not result in major construction activities or large-scale demolition works. The major changes will be the resultant changes to the ventilation equipment and the associated emissions to air that will be increased.

Similarly, the solvent-based paint manufacturing process is currently in practise by Kansai Plascon, and the additional capacity produced will be resulting in a ~15 % increase from the current activities. The volumes of input substances will therefor remain the same with the addition of two new substances that will increase the volumes of product stored by ~10% annually.

The facility is therefore not introducing any new activities that will result in new impacts to be assessed and the focus of the impact assessment is therefore on the emissions to air and use and handling of solvents and chemicals on site. The facility has been in operation for some time and the current controls (secondary containment, spill response, emergency procedures, operating procedures, environmental management systems etc. appears to be in good working order. The assessment is therefore not intended to assess the facility, but only the changes to the existing facility that will result in an increased risk or impact from the status quo.

Based on the above observations, the impact assessment will address some of lesser impacts in the assessment below, however, the focus of the specialist investigations was on the emissions to air and risk assessment which have been deemed to be the major impacts to investigate.

9.3.1 Construction Impacts

The nature of the modifications to the existing facilities are considered to be minor and will be limited to a very short period of installation and modifications to the existing equipment as opposed to construction and erection of buildings.

Dust Generation: The impacts that are anticipated from this process is dust generated from limited excavations to modify infrastructure and dust resulting from demolition activities. Both these instances of dust generation will have a very low impact on surrounding neighbours. It should be noted that Kansai Plascon has a vested interest in reducing particulates due to the contamination of the paint products.

Table 10: Rating inputs for dust generation during construction.

Criterion	Rating Comment	Mitigation Proposed
Extent	The impact is anticipated to be restricted to the local site mostly.	- Enforce Health and safety measures for workers. - Avoid dust creation activities during high winds. - Apply appropriate dust control measures where required.
Duration	Very short as limited excavation and demolition is required.	
Magnitude	The magnitude of the impacts are expected to be low due to the short duration and limited extent of these activities. Negative Impact	
Probability	Although dust impacts are expected during specific activities, they are unlikely to occur for any length of time that would make the probability of low.	

Waste Generation: The modifications and demolition will result in building rubble and potential removal of materials that may be classified as hazardous. The volume of material is anticipated to be low with the bulk of the material to be disposed off at a registered landfill site, should any asbestos containing material be identified, these will be removed by a licenses contrator.

Table 11: Rating inputs for waste generation.

Criterion	Rating Comment	Mitigation Proposed
Extent	Rated regional as the waste generated will be transported to the regional city landfills reducing the space of these facilities.	- Employ reputable waste removal contractor to remove waste as per the norms and standards in place.
Duration	Very short, this would be a single event.	
Magnitude	Indiscriminate dumping and removal of the waste could potentially result in impacts to property within the region. Waste removal should be through responsible measures. Negative Impact	
Probability	The probability is rated as a definite impact based on the project scope.	

Job Creation: Job creation during construction is not anticipated to be very high, although the modifications will rather result in sustaining business in the region due to the spending of capital inputs on suppliers and service providers in the municipal area during the construction activities.

Table 12: Rating inputs for job creation.

Criterion	Rating Comment	Mitigation Proposed
Extent	Rated regional as suppliers and service providers and employees will be located within the municipal boundaries.	- No further mitigation is proposed.

Duration	Very short, this would be a single event.	
Magnitude	The magnitude of the impact is low due to the short duration and low numbers of employment. Positive Impact	
Probability	The probability is rated as a definite impact based on the project scope.	

9.3.2 Emissions to air[1]:

Various definitions exist for the term "volatile organic compounds" (VOCs) and vary from country to country. According to the popular online encyclopedia Wikipedia, VOCs are "*organic compounds that have a high vapor pressure at room temperature. High vapor pressure correlates with a low boiling point, which relates to the number of the sample's molecules in the surrounding air, a trait known as volatility*". The United States Environmental Protection Agency (US EPA 2023), states that VOCs are compounds with a high vapor pressure and low water solubility. A large proportion of the VOCs in use, are human-made chemicals used in the in the manufacture of paints, pharmaceuticals, and refrigerants. VOCs typically are industrial solvents or by-products produced by chlorination in water treatment, such as chloroform, and are often components of petroleum fuels, hydraulic fluids, paint thinners, and dry cleaning agents. In addition, many studies have reported that VOCs occur as in-door air pollutants, the pollution sources being tobacco smoke, chlorinated water, the use of perfumes, paint removers, adhesives, new clothing, plastics or kerosene heaters (David and Nicolescu, 2021).

According to the USEPA, VOCs exclude carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, methane, ethane, butane, propane, etc. In layman's terms, VOCs are compounds that contain carbon atoms and that, at room temperature, will easily evaporate. It is important to note that no official ambient air quality limits are specified for total VOCs in the National Ambient Air Quality Standards (Government Notice 1210), although limits are included Government Notice R.533 which provides regulations regarding air dispersion modelling. Limits for benzene have therefore been used as a proxy (Albertyn, 2023).

For the facility to proceed with the increase in production, an AEL is required to authorise the emissions of VOCs. Kansai Plascon's AEL is therefore in place for this purpose, however needs to be updated and amended to include the increase in production by the addition of one more stack where VOC emissions will be ventilated. This AEL amendment process is administered by the Nelson Mandela Bay Municpality.

Four stacks currently emit VOCs to the atmosphere on Kansai's premises. These are:

i. Bulk mix stack
ii. Main factory stack
iii. Premix stack
iv. Solvent recovery stack

The proposed changes and expanded operations are intended to allow for the manufacturing of clear coat surface coverings. The proposed expanded operations will be of a similar size to the existing main factory process. Therefore the new proposed stack will have similar dimensions and characteristics as the existing main factory process (ii above).

[1] Much of this section is obtained, and in some instances paraphrased, from the Air Emissions Impact Study conducted by LAQS.

Table 13 below provides a summary of the relevant stack and flue gas details and annual emissions (based on measured concentrations) and based on the official emission limits. The latter is included as GN R.533 specifies that emissions must be based on emission limits for the purpose of calculating annual emission rates.

Table 13: Stack and flue gas characteristics in relation to the estimate clearcoat additions.

Parameter	Bulk mix	Main factory	Premix	Solvent recovery	Clear-coat(*)
Stack height, m	7	7	7	7	7
Stack diameter, m	0.5	0.68x0.95	0.8	0.6x0.25	0.68x0.95
Flue gas velocity, m/s	13.6	6.4	2.4	10.2	6
Flue gas temperature, °C	17.6	25.4	28.9	17.6	20
Volumetric flowrate, Nm^3/h	9 031	13 617	3 927	5 174	13 000
VOCs measured, mg/Nm^3	57.52	114.7	538.7	66.1	110
Total VOC emissions, tons per annum, measured data	0.74	2.23	3.02	0.49	2.04
Total VOC emissions, tons per annum, at AEL limits	516	778	224	296	743

(*): Estimated

The total annual VOC emissions, based on AEL limits, are therefore estimated to amount to 2 556 tons. Total emissions based on measured concentrations are estimated to amount to 8.5 tons per annum of which only approximately 4.2 kg consist of benzene (0.08%). It is important to note therefore that, based on actual measured concentrations at the existing Kansai Plascon Complex, their current VOC emissions consist of the less than a quarter of 1% of the allowable limit.

Some organic materials used in the input process for paint manufacture on site are stored in four underground tanks (2 x $14m^3$ and 2 x 23 m^3). These compounds are acrylic resin, xylene and butyl acetate. During normal operations, the compounds are withdrawn from the tanks and air is drawn into the tanks to prevent the build-up of vacuum. Emissions from the tanks only occur directly to atmosphere through the air vents when the stocks are replenished by offloading from tanker trucks. The air vents are located at ground-level and consist of 100 mm pipes fitted with quick-connect flanges. As such the vent pipes act as point sources.

Based on the assumption that the temperature of the underground tanks is stable at 20 °C, the air quality specialist study used the vapour pressures of the tanks' contents to calculate the saturation concentration of vapours inside the tanks, and which are expelled from the tanks during loading operations.

Annual emissions were calculated from the maximum quantities of the relevant compounds listed in Kansai's AEL and found to be 0.01 tons per annum. Maximum AEL quantities were used in keeping with the requirements of GN R.533, i.e. maximum possible emissions. The calculated emissions from the underground tanks are therefore negligible when compared to total stack emissions based on emission limits, which in turn is well within the allowable limits.

As can be seen from **Table 13**, the measured concentrations of VOCs in all cases are very low when compared to the official emission limit of 40 000 mg/Nm^3. Annual emissions are based on measured flue gas parameters, measured VOC concentrations and VOC emission limits, as specified in the regulations (GN R.533).

Using the above maximum limits, the air quality specialist study modelled the dispersion of VOCs from all of the sources identified under the following scenarios:

- Dispersion of emissions from Kansai's site only.
- Dispersion of emissions from all industrial sources, including Kansai.

For each scenario, the air quality specialist study estimated the ground-level concentrations under two conditions. Firstly, annual emissions based on AEL limits were included to show the expected maximum ground-level concentrations, should emissions from all stacks occur at the legal limit of 40 000 mg/Nm^3. This represents a worst-case condition. Secondly, annual emissions based on measured concentrations were included to show ground-level concentrations that can be expected during typical operations. This scenario represents "normal" or day-to-day operations.

The approach to the study was to determine annual average ground-level concentrations of VOCs as no short-term air quality standard for total VOCs is specified in GN1210. In addition, the maximum estimated ground-level concentrations were determined, as well as where these would occur.

All simulations were carried out for a receptor height of 2 metres above ground level and a plume dispersion period of 60 minutes. This simulation period ensured that very low winds, e.g. 1 m/s, would carry pollutants some distance from the plant.

The dispersion of pollutants from Kansai's planned operations is shown graphically in **Figure 17** to **Figure 15** below. **Figure 17** and **Figure 14** respectively show the annual average ground-level concentrations of VOCs as a result of emissions from Kansai at AEL limits and at measured concentrations respectively. **Figure 16** and **Figure 15** respectively show the annual average ground-

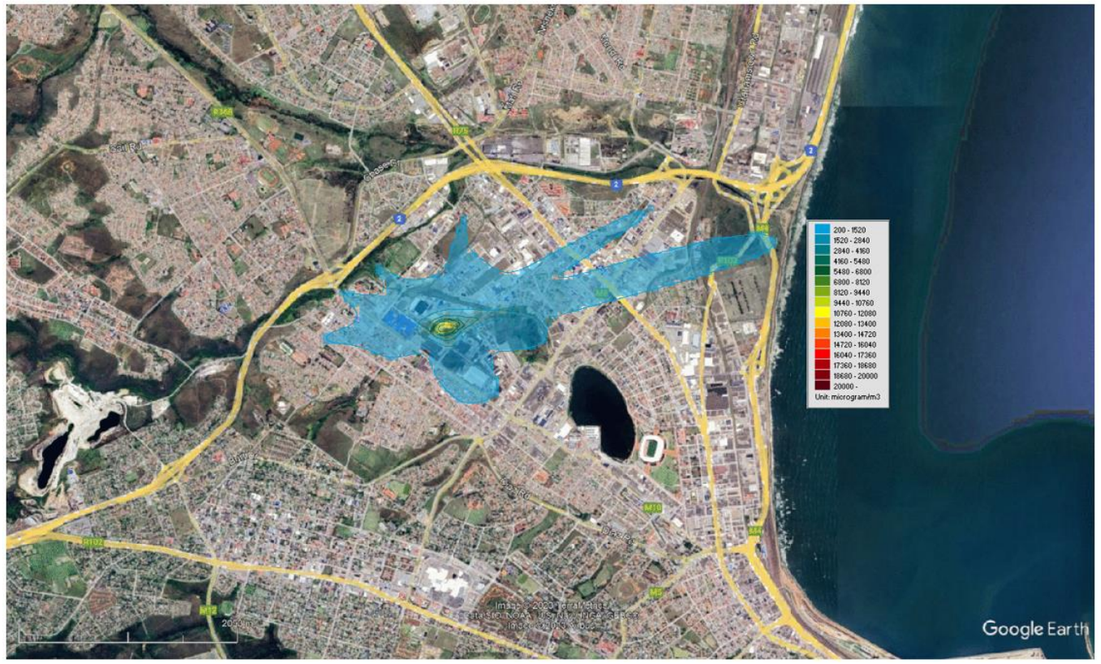


Figure 17: Annual Average VOC Concentrations, Kansai sources at AEL limits Maximum scale is 20 000 µg/m³ (20 mg/m³); no air quality standard for VOCs

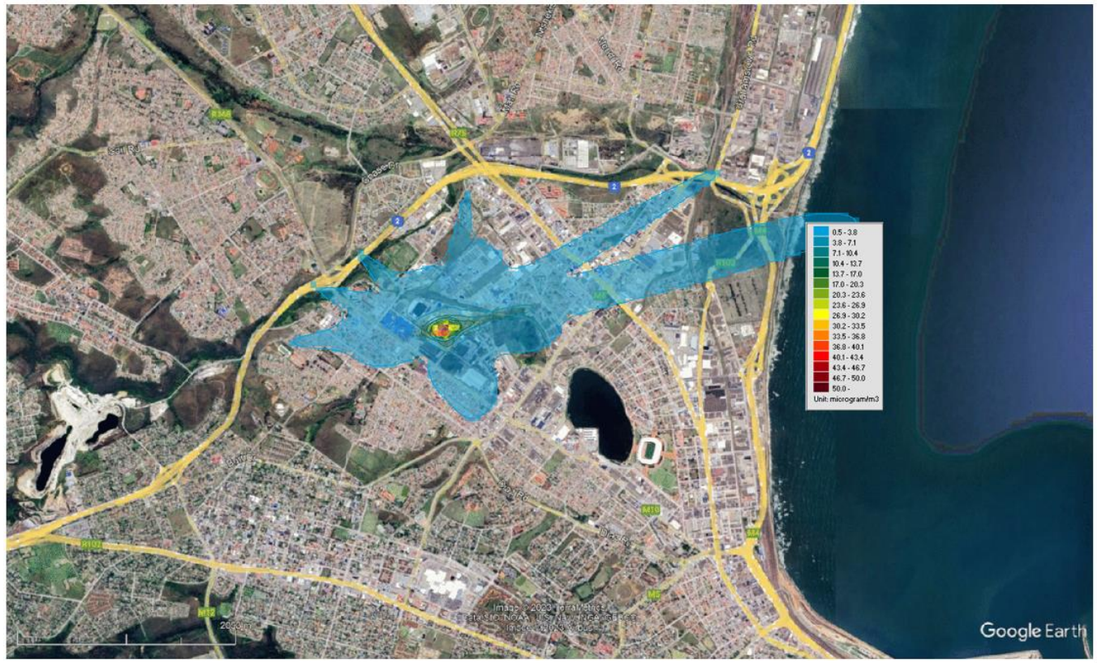


Figure 14: Annual Average VOC Concentrations, Kansai sources at measured concentrations.

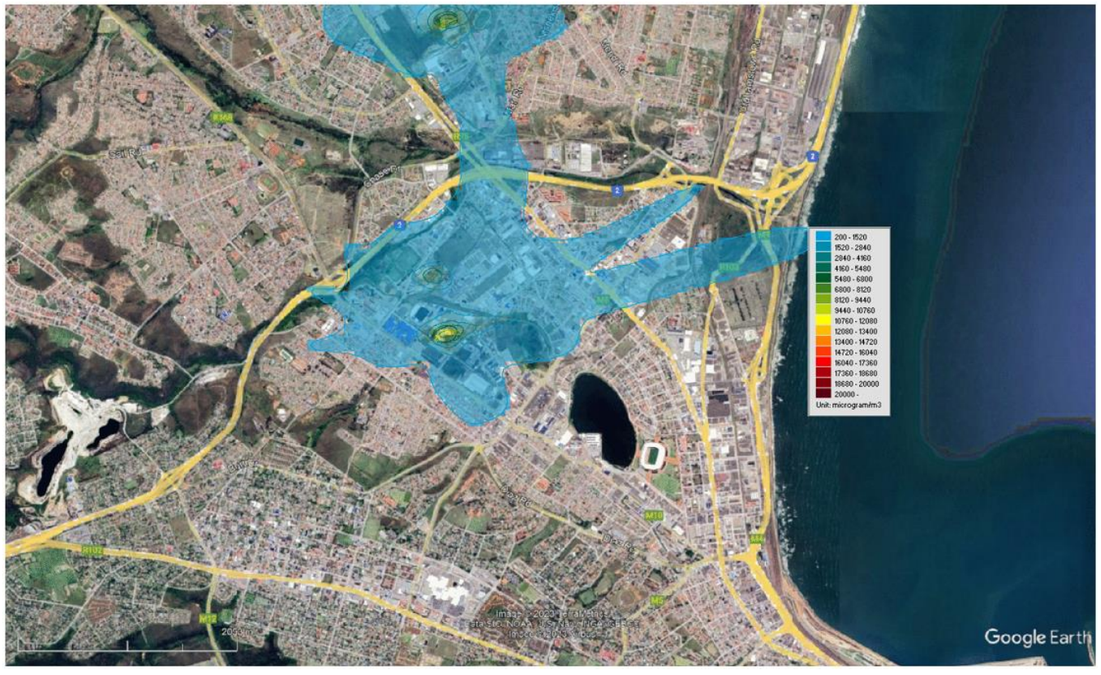


Figure 16: Annual Average VOC Concentrations, all sources at AEL limits Maximum scale is 20 000 µg/m³ (20 mg/m³); no air quality standard for VOCs

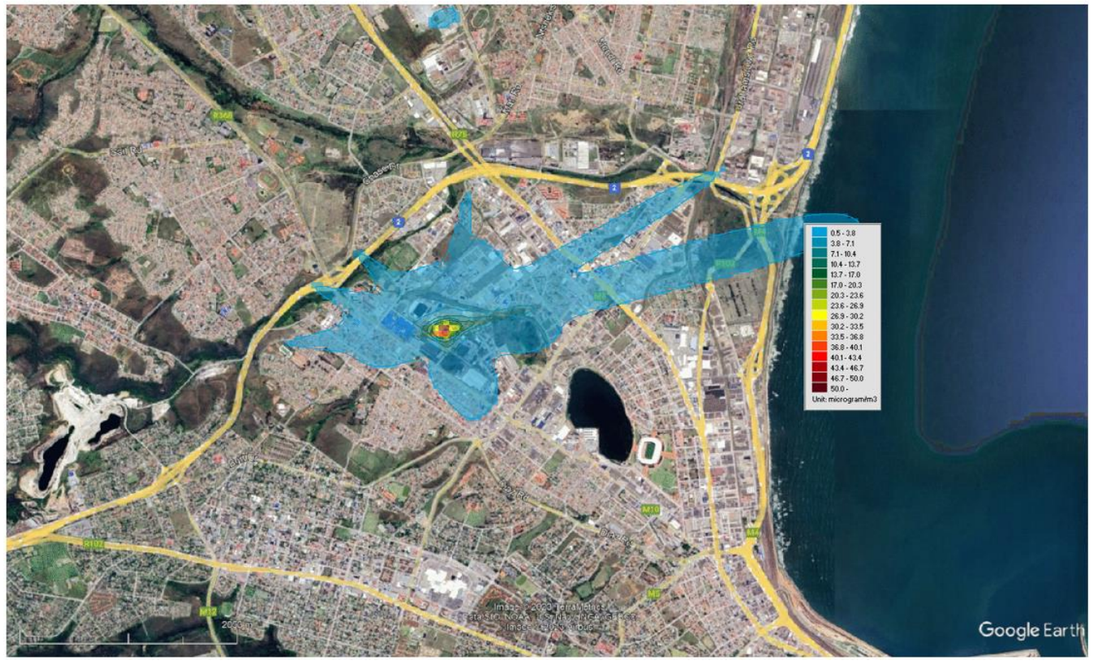


Figure 15: Annual Average VOC Concentrations, all sources at measured concentrations

level concentrations of VOCs as a result of emissions from all sources, including Kansai at AEL limits and at measured concentrations respectively.

The assessment of the impacts related to emissions to air is therefore presented in **Table 14** based on the inputs from the air quality specialist study.

Table 14: Emissions to air.

Criterion	Rating Comment	Mitigation Proposed
Extent	The extent of the impacts resulting from the emissions of VOCs are limited to the regional municipal level. Even at maximum emissions limits, the Kansai Plascon complex will have a limited impact within a 5 km radius of the site.	- Annual emissions monitoring. - Adherence to the operating procedures already in place. - Ensuring emissions are controlled by preventing open ventilation of containers outside of the stacks.
Duration	The duration of the impact is rated as long-term since the plant is expected to continue operating in this manner for the duration of its operations.	
Magnitude	The magnitude is low due to the low volumes of actual emissions measured compared to the maximum allowable limits. The facility would need to engage in further expansion upgrades and point source installations to achieve the maximum allowable limits.	
Probability	The probability of the impact occurring and exceedances of the AEL limits is achieved is rated as low considering the current measured emissions.	

9.3.3 Fire and Safety Risk[2]

Kansai Plascon undertook a risk assessment to quantify the potential risks associated with their facility in 2019. This was required due to the storage of compounds that pose a potential fire and explosion risk. The compounds by themselves may not prove to be a particularly high risk, however, when stored in conjunction with each other and other infrastructure, the compounded effect may pose a risk to the facility occupiers as well as neighbouring areas. The outcome of such a risk assessment is therefore to confirm if the facility is classified as a Major Hazardous Installation (MHI) and to provide management measures to ensure that compounds are sorted or managed in such a way as to reduce or avoid any such risk. In this case, the following was identified and assessed:

- Bulk solvent storage (140 tons in underground storage vessels)
- Bulk resin tank (23 tonnes in above ground tanks)
- Smaller individually packaged olvents and flammable materials in the flammable store (up to 450 tonnes)
- Liquid Petroleum Gas (LPG up to 960 kg)

Risk is made up of two components namely the probability of a certain magnitude of hazardous event occurring and the severity of the consequences of the hazardous event should it occur. The methodology employed in assessment of the MHI is therefore as follows:

- Identifying the likely major hazards expected to be associated with the operation of the installation including the causes, consequences and effects.
- Quantifying the hazards in terms of their magnitude (release rate and duration).

[2] Portions of this section have been extracted from the MHI Risk Assessment conducted by iSHECon and portions may have been paraphrased or directly quoted.

- Quantifying the consequences of the hazards and the severity of the effects using dispersion, radiation and explosion modelling.
- Determining the lethality of the effects of the hazardous consequences.
- Quantifying the likely frequency of the hazardous events.
- Estimating the individual risks (the frequency at which an individual may be expected to sustain a given level of harm from the realisation of specified hazards) by combining the severity (lethality) and the likelihood of the various hazards.
- Estimating the societal risk (this is the relationship between the frequency and the number of people suffering from a specified level of harm in a given population from the realisation of specified hazards) by taking the surrounding population into account.
- Comparing risks with international acceptability criteria.
- Reviewing the suitability of the emergency plan and organisational measures in terms of the risks.
- Proposing measures to reduce or eliminate the risk where necessary.

This MHI risk assessment and report was conducted by a Department of employment and labour Approved Inspection Authority and complies with the requirements of SANS 1461:2018.

Due to the presence of hazardous materials on the Kansai Plascon site, as well as their associated potential offsite effects, the Kansai Plascon Port Elizabeth site was found to be in the risk categories to be classified as a major hazard installation. The 2022 findings, regarding the Axalta-Plascon modifications do not constitute an MHI as they are not expected to possibly generate accidents with catastrophic offsite impacts. The modifications only add marginally to the on-site risks. In addition, no known MHI declared facilities are within a range of the sites that could potentially lead to a greater domino effect. Therefore the risks are located to the site and immediate surroundings. The extent of the risk calculated in the specialist study, is shown in **Figure 18**.

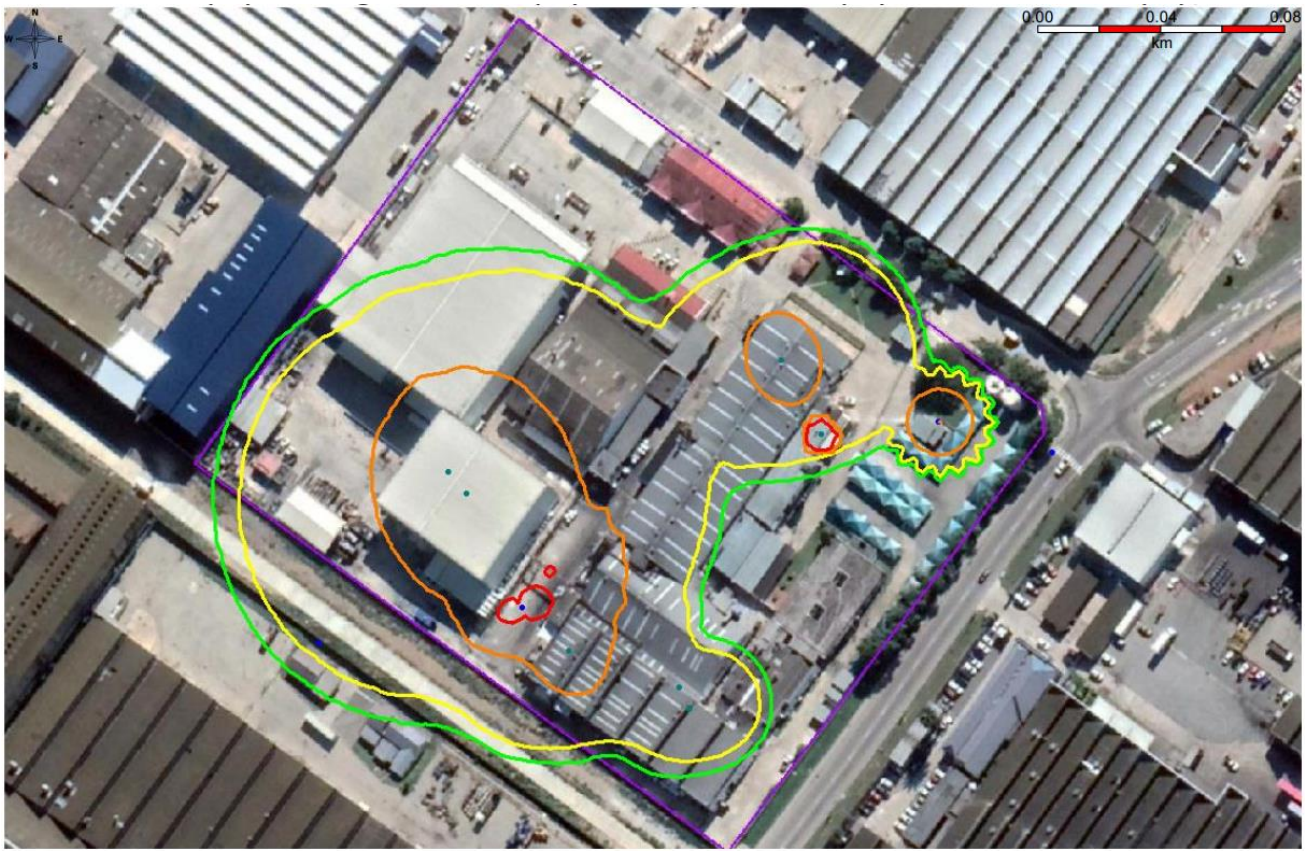


Figure 18: Individual Risk Isopleths for the Kansai Plascon Port Elizabeth Installation.

Figure 18 above shows the individual isopleths as found in the risk determination. The colouration indicates the levels of risk as calculated with red areas being the highest and the green areas but all mainly restricted to the site.

This assessment is limited to the amended AEL only, and therefore will assess the fire risk in terms of the additional expansion only and not the entire risk. However, the MHI risk assessment have confirmed that the risk, for the total complex, is acceptable. The fire and safety risk for the Kansai Plascon expansion is a negligible increase, however, considering that the facility is operating as a joint venture and will utilise the same AEL, the impact rating is provided for the entire complex in **Table 15**. Recommendations for mitigation is included for the entire facility as the improvements would benefit the combined complex.

Table 15: Fire and safety risk.

Criterion	Rating Comment	Mitigation Proposed
Extent	Restricted to site	- Consider including instructions to review major process safety hazards in the proposed MOC procedure. - Consider implementing scheduled inspections of offloading hoses. - Consider providing employees with training on the major hazards associated with the materials stored and handled at the facility. - consider erecting additional impact protection around the solvent pumps that are unprotected from vehicle traffic. - consider storing offloading hoses on dedicated cradles, off of the ground. Also, see organisational measures regarding offloading hoses above. - consider segregating certain hazardous materials from the general stacking area where mainly flammable liquids are stored. - consider removing all combustible materials that are stored within the LPG manifold caged area. - consider reviewing whether the total inventory of LPG cylinders could be reduced, based on cylinder turnover
Duration	Immediate, the impact will be an event that would occur and be very short-lived.	
Magnitude	High	
Probability	Low	

9.3.4 Other Operational Impacts

The highest impacts from the changes to the Kansai Plascon complex will be during the operations and mainly related to the increase in the production outputs that have a similar increase in production input materials and higher volumes of substances required.

Groundwater Quality: The existing facility undertakes storage of material underground. No new facilities are proposed and additional storage capacity will be provided in above ground storage within controlled areas. In this regard, the control measures in place, proposed by Kansai Plascon, includes above ground sumps and secondary containment to prevent spillages above ground from entering the stormwater and penetrate into subsoil layers.

Table 16: Rating inputs for groundwater quality.

Criterion	Rating Comment	Mitigation Proposed
Extent	Regional as the potential underground resources are used in the local municipal area.	- Provide secondary containment. - Regular maintenance and monitoring of infrastructure. - Include spills response equipment on site. - Ensure trained individuals are on site to implement emergency measures.
Duration	Any spill event will be short but may only be detected over time.	
Magnitude	Impact would be small due to the volumes and the nature of the storage containers in above-ground containers. Negative Impact	
Probability	The probability is rated as low.	

Waste Management: Additional waste are anticipated to result from the increase in production through waste containers and residue resulting from the process. The site currently produces ~ 81 000 kg of solid waste and ~173 000 kg of liquid waste per annum. All waste is store and collected by a waste contractor and the additional waste generated will follow this protocol.

Table 17: Waste generated during operations.

Criterion	Rating Comment	Mitigation Proposed
Extent	Regional as all waste disposals will be to the municipal resources.	- Further re-use of materials to reduce waste outputs. - Inclusion of waste generated into the current procedures for waste management. - Appointment of a reputable waste contractor to handle and dispose of waste in licensed facilities.
Duration	Waste will be generated for as longas the facility is operational.	
Magnitude	The magnitude is considered to be low due to the volumes produced and is not expected to increase substantially as a result of the changes. Negative Impact	
Probability	The probability of the impact is occurring is low due to the existing nature of the operations and volumes processed.	

Contributions to the local economy: The facility is based in Nelson Mandela Bay and serves the vehicle manufacturing industry which is a fundamental driving force of the local municipal and regional provincial economy with many of the biggest vehicle manufacturers globally having large production and assembly plants located within a 400 kilometre radius. The facility is moving a portion of their clearcoat production facility from the United States and locating production capacity in Nelson Mandela Bay which provides a small increase in local economic activity. It also fits into the production philosophy of the vehicle manufacturing industry in being able to supply within the Just-in-time principle operated under. This principle denotes that such large manufacturers only store what is needed on their premises, but rely on logistics to supply input materials to the manufacturing plant when needed. The Kansai Plascon complex therefore meets this requirement and further enhances its ability to participate in the local economy by having local production.

Table 18: Contributions to local economy rating.

Criterion	Rating Comment	Mitigation Proposed
Extent	Local municipal	- Adopt a policy of utilising local suppliers where practicable.
Duration	For the duration of the operations	
Magnitude	Low due to the fairly small values in relation to the current market of the area. Positive Impact	
Probability	Almost certain.	

9.3.5 Decommissioning Impacts

At present, the facility is enhancing and making chances to extend the life of the facility and continue serving the local market. However, should the facility stop production and be required to close, the following decommissioning impacts are anticipated (**it should be noted that these impacts are assessed in fulfilment of the legal requirements but in no way has it been observed at present**):

Site rehabilitation and remediation: The facility has been in operation for approximately 30 years, since 1990. Over this time, it is common for industrial sites, where VOCs and such chemicals form part of the production process to have latent pollution and potential active polluted areas not detected. This is particularly the case in areas such as this where industry is the dominant land use and pollution that may have resulted from other land users. Furthermore, the fact that the site has been in operation for more than 30 years, means it pre-dates certain environmental requirements commonplace today. Whilst it is not possible to make a determination on the status of the subsoil conditions on site, PDES have assessed this potential impact as a possible risk to be addressed in such an event and the impact would be related to removal of any areas deemed as a risk to the surroundings.

Table 19: Contributions to local economy rating.

Criterion	Rating Comment	Mitigation Proposed
Extent	Local municipal, remediation may require removal of soil and bulk earth moving.	- Explore the ability to remediate site features in-situ. - Adherence to operating procedures for handling and storage of chemicals. - Regular testing and maintenance of infrastructure to avoid spills/leaks.
Duration	Short term, once-off event.	
Magnitude	Moderate Negative Impact	
Probability	Possible due to the chemicals used and underground storage.	

9.3.6 Cumulative Impacts

The Nelson Mandela Bay Municipality requires a cumulative air quality impact assessment which includes industrial VOC emissions from all sources within a 5 km radius in addition to the VOC emissions from Kansai's site. In support of this requirement, NMBM provided stack details, flue gas details and measured VOC concentrations of four additional companies. These are:

-- BASF
-- Continental Tyres
-- Felltex

LAQS assumed that the information given was based on emission measurements. Where applicable, all are subject to the same emission limit that applies to the Kansai site operations.

Relevant information about stack details, flue gas details and VOC concentrations of three additional sources were provided by NMBM. For the sake of confidentiality, details of each stack are not listed in this report but were included in the emission database on which this air quality impact assessment is obtained.

9.3.7 Climate Change Impacts

VOCs have a limited contribution to climate change. In the context of this project, and the additional emissions measured and predicted, the overall impact on climate change will be insignificant.

9.4 Impact Statement

Based on the assessed impacts (**Table 20**) and the conclusions from specialists. The overall impacts that will occur will be of low significance with some measured to be moderate in nature. No specialist investigations or assessment outcomes resulted in high or unacceptable impacts and is the reasoned opinion of the EAP to issue an environmental authorisation for the amendment of the AEL.

Table 20: Impact Assessment outcomes, negative impact is denoted as red text and positive impact green text in the Impact Description coloumn.

Impact Description	Nature of Impact	Extent	Duration	Magnitude	Probability	Significance Pre Mitigation	Mitigation Proposed	Significance Post Mitigation
Construction Impacts								
Excavations on site	Dust release from excavations during construction. All excavations for sumps will take place within the existing buildings and is covered under roof.	1	1	2	2	Low	Ensure excavation areas are damp to reduce dust.	Insignificant
	Human health as a result of exposure to dust particulates generated within confined spaces.	1	1	4	5	Moderate	Enforce wearing of dust protective wear during excavations	Low
Waste management	Generation of construction waste.	3	4	2	6	Moderate	Disposal to licensed landfill site.	Moderate
Job creation	Additional temporary employment opportunities during construction.	2	2	2	2	Low	No mitigation proposed	Low
Operational Phase								
Groundwater quality	Contamination of groundwater from spills or leaks	4	3	2	3	Low	Implement controls and leak detection	Low
Emissions	VOC emissions from the operations	3	5	3	3	Moderate	Implement stack heights and controls	Low
Waste Management and Re-use	Products and input materials will generate small amounts of waste. The majority of input products will be re-used and recycled in the process. Poor management practices may lead to increased volumes of waste to me removed to landfill or stored on site.	1	5	1	2	Low	Ensure operating protocols are in place and adhered to.	Low
Fire and Safety Risk	The existing facility is considered to be a major hazard installation due to the nature and volumes of products stored on site. The additional substances required in the production process would need to be handled in a manner that takes this into account.	1	5	1	1	Low	Existing handling and storage protocols to be implemented.	Low
Contributions to local economy	The anticipated 4000 tons per year of clearcoat paint will be available to the local vehicle manufacturers in the region and local production contributes to the local economic activity.	3	5	1	5	Moderate	No mitigation is proposed.	Moderate
Decommissioning Phase								
Site rehabilitation and remediation	Waste generation from contaminated land and soils.	3	2	4	3	Low	On site rehabilitation and implementation of risk avoidance during life-span.	Low

9.5 Mitigation of Impacts

The following measures are proposed to manage and/or mitigate any potential impacts that may occur:

- Compliance
  - An agreement should be drafted whereby the parties take joint responsibility for compliance to the requirements and conditions of the EA and AEL.
- Dust emission during construction
  - Apply appropriate measures to control dust.
- Generation of Construction waste
  - Classification of waste anticipated into waste streams for identification of appropriate waste disposal facilities.
  - Removal of all waste generated to the appropriate registered waste site.
- Groundwater quality
  - Maintain monitoring regime to detect potential subsurface leaks.
  - Continue with regular pressure testing of underground storage tanks.
  - Implement an appropriate maintenance regime for all subsurface infrastructure.
- Emissions
  - Implement the design measures as per the air quality specialist study.
  - Conduct annual emission monitoring on the stacks and include the new stack measurements into the emissions monitoring plan.
- Waste management and re-use
  - Ensure appropriate spill mitigation and containment in re-use areas are in place.
- Fire and safety risk
  - The Kansai Plascon complex modifications need not be considered an MHI while part of the greater Plascon operating site. However, should Axalta separate out its operations from within the Plascon access controlled area, then the MHI status will need to be reviewed.
  - A copy of the MHI risk assessment should be available on the site at all times for inspection by the authorities.
  - The relevant authorities (i.e. local Fire and Emergency services, Provincial Department of employment and labour and National Department of Labour) should have been notified by Plascon after the 2019 MHI QRA. They need to be re-notified by way of a copy of this updated risk assessment and SDSs, with a covering letter from Kansai Plascon Port Elizabeth.
  - Kansai Plascon Port Elizabeth should inform their Health and Safety Committee of the results of this risk assessment.
  - Implement the suggested improvements to the on-site emergency proceduresas per the MHI risk assessment.
  - Kansai Plascon Port Elizabeth should confirm that the local emergency services have an off-site emergency plan in place.
  - Given the tolerably low, provided ALARP risk levels, risk reduction measures should continue to be explored and implemented.
  - The Kansai Plascon Port Elizabeth facility could affect land-use planning. Land use planning restrictions apply within 45 m of the facility.
  - MHI Regulation 7 states that incidents and near misses have to be recorded and reported to the authorities. Kansai Plascon Port Elizabeth should comply with this regulation.
  - The MHI facility should be reassessed 5-yearly, (i.e. due 2024), or earlier if major modifications are made, the installations are expanded, or a major incident occurs.
- Decommissioning Impacts
  - At decommissioning, the relevant responsible party should conduct an investigation into the environmental risk at that time based on the regulations which may be appropriate.
  - The conditions of the EA and AEL should be transferred to any party upon change of ownership, sale of the facility where decommissioning will not take place.

10. Conclusion and Next Steps

The current phase of the assessment is the public consultation phase on the Basic Assessment Report. Interested stakeholders can provide written comment to the following email address: admin@proportiodivina.co.za. The public consultation phase will come to an end on 27 June 2023 following which the final report will be submitted to DEDEAT for a decision.

For any queries or comments the following contact details can also be used:
Tel: 087 702 5996
Whatsapp: 069 808 1431

11. References

1. Draper, W. and Blanche, M. 2022 – Air Quality Screening Assessment: Axalta Plascon Facility. WKC.
2. Gird, A. and Mitchell, D.C. 2022 – MHI Risk Assessment Interim Update for Proposed 3rd Party on Existing MHI Site Kansai Plascon, Port Elizabeth Facility. iSHEcon
3. Stuart *et al.* (SRK Consulting) – 2014, Nelson Mandela Bay Municipality Bioregional Plan
4. Albertyn, C.H. – 2023, Air Quality Impact Assessment prepared for the Kansai Plascon Facility, Port Elizabeth.
5. SA Weather Service Data (obtained by direct purchase)
6. David, E.; and Niculescu, V-C.; 2021 – Volatile Organic Compounds (VOCs) as Environmental Pollutants: Occurrence and Mitigation Using Nanomaterials. International Journal of Environmental Research 18: 13147.
7. US EPA Available here

PART 2: CONTENT REQUIREMENTS OF BASIC ASSESSMENT REPORT

The content requirements of a BAR, in accordance with Appendix 1, is outlined below in Table # and has included cross-references to where the relevant information is in this document.

Table #. Content requirements of a BAR, in accordance with Appendix 1 of GN R. 982 of the EIA Regulations, 2014 as amended on 7 April 2017.

Table 21: Content requirements of Basic Assessment Reports, as per Appendix 1 of the EIA Regulations.

Content Requirements (Appendix 1)	Relevant Section in BAR Report
3. (1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include—	This document includes a summary document and includes DEDEAT Template forms for the Basic Assessment Report.
a) details of— **(i) the EAP who prepared the report; and** **(ii) the expertise of the EAP, including a curriculum vitae;**	 (i) Located in **Table 1** in Part 1 (ii) Located in Appendix G1 in Part 3
(b) the location of the activity, including: **(i) the 21-digit Surveyor General code of each cadastral land parcel;** **(ii) where available, the physical address and farm name;** **(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;**	 (i) Section 3.1 provides erf number (ii) Section 3.1 provides the address (iii) Section 3.1 provides the coordinates
c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is— **(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or** **(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;**	The site plans are provided in **Figure 1: Site Locality** and Appendix A.
(d) a description of the scope of the proposed activity, including— **(i) all listed and specified activities triggered and being applied for; and** **(ii) a description of the activities to be undertaken including associated structures and infrastructure;**	 (i) The project description is provided in section 3.2 (Part 1) to section 3.5 (Part 1). The listed activities are provided in section 4 (Part 1). (ii) The activities to be undertaken is described in section 3 (Part 1).
(e) a description of the policy and legislative context within which the development is	

proposed including— **(i) an identification of all legislation, policies, plans, guidelines, spatial tools,** **municipal development planning frameworks, and instruments that are** **applicable to this activity and have been considered in the preparation of the** **report; and** **(ii) how the proposed activity complies with and responds to the legislation and** **policy context, plans, guidelines, tools frameworks, and instruments;**	(i) Section 10 (Part 3) (ii) Section 10 (Part 3)
(f) a motivation for the need and desirability for the proposed development including **the need and desirability of the activity in the context of the preferred location;**	Section 5 (Part 1) and Section 9b (Part 3)
(g) a motivation for the preferred site, activity and technology alternative;	Section 2 (Part 3) and **Table 24: Alternatives Assessment.**
(h) a full description of the process followed to reach the proposed preferred alternative **within the site, including—** **(i) details of all the alternatives considered;** **(ii) details of the public participation process undertaken in terms of regulation 41** **of the Regulations, including copies of the supporting documents and inputs;** **(iii) a summary of the issues raised by interested and affected parties, and an** **indication of the manner in which the issues were incorporated, or the** **reasons for not including them;** **(iv) the environmental attributes associated with the alternatives focusing on the** **geographical, physical, biological, social, economic, heritage and cultural** **aspects;** **(v) the impacts and risks identified for each alternative, including the nature,** **significance, consequence, extent, duration and probability of the impacts,** **including the degree to which these impacts—** **(aa) can be reversed;** **(bb) may cause irreplaceable loss of resources; and** **(cc) can be avoided, managed or mitigated;**	(i) Section 2 (Part 3) and **Table 24: Alternatives Assessment.** (ii) Section 8 (Part 1) and Section C (Part 3) (iii) Section 8 (Part 1) and Section C (Part 3) (iv) Section 7 (Part 1) (v) Section 9 (Part 1) (vi) Section 9 (Part 1) (vii) Section 9 (Part 1) (viii) Section 9 (Part 1) (ix) Section 9 (Part 1) (x) Section 9 (Part 1) (xi) Section 9 (Part 1)

(vi) the methodology used in determining and ranking the nature, significance, **consequences, extent, duration and probability of potential environmental** **impacts and risks associated with the alternatives;** **(vii) positive and negative impacts that the proposed activity and alternatives will** **have on the environment and on the community that may be affected** **focusing on the geographical, physical, biological, social, economic, heritage** **and cultural aspects;** **(viii) the possible mitigation measures that could be applied and level of residual** **risk;** **(ix) the outcome of the site selection matrix;** **(x) if no alternatives, including alternative locations for the activity were** **investigated, the motivation for not considering such; and** **(xi) a concluding statement indicating the preferred alternatives, including** **preferred location of the activity;**	
(i) a full description of the process undertaken to identify, assess and rank the impacts **the activity will impose on the preferred location through the life of the activity,** **including—** **(i) a description of all environmental issues and risks that were identified during** **the environmental impact assessment process; and** **(ii) an assessment of the significance of each issue and risk and an indication of** **the extent to which the issue and risk could be avoided or addressed by the** **adoption of mitigation measures;**	Section 9 (Part 1)
(j) an assessment of each identified potentially significant impact and risk, including— **(i) cumulative impacts;** **(ii) the nature, significance and consequences of the impact and risk;** **(iii) the extent and duration of the impact and risk;** **(iv) the probability of the impact and risk occurring;** **(v) the degree to which the impact and risk can be reversed;**	Section 9 (Part 1)

(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and **(vii) the degree to which the impact and risk can be avoided, managed or mitigated;**	
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Section 9 (Part 1) and (Part 3)
(l) an environmental impact statement which contains— **(i) a summary of the key findings of the environmental impact assessment;** **(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and** **(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;**	(Part 2) Section 9 (Part 1) Appendix A Section 9 (Part 1)
m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Section 9 (Part 1) and Section 10 (Part 1)
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section 11 (Part 1)
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 9 (Part 1)
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 9 (Part 1)
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will	For the lifetime of the facility

be concluded, and the post construction monitoring requirements finalised;	
(r) an undertaking under oath or affirmation by the EAP in relation to— **(i) the correctness of the information provided in the reports;** **(ii) the inclusion of comments and inputs from stakeholders and I&APs;** **(iii) the inclusion of inputs and recommendations from the specialist reports where** **relevant; and** **(iv) any information provided by the EAP to interested and affected parties and any** **responses by the EAP to comments or inputs made by interested and affected** **parties; and**	Refer to Appendix G, E and the associated sections in this report.
(s) where applicable, details of any financial provision for the rehabilitation, closure, and **ongoing post decommissioning management of negative environmental impacts;**	Not Applicable
(t) any specific information that may be required by the competent authority; and	Stated above
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	None

PART 3: OFFICIAL BASIC ASSESSMENT REPORT TEMPLATE

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?	YES	NO

If YES, please complete form XX for each specialist thus appointed:

Any specialist reports must be contained in Appendix D.

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail

Project Location

The proposed project area is situated on erf 2602 in Korsten, at 4 Bedford Street, Neave Township, Gqeberha, 6001, measuring approximately 3.74 ha. The site is situated in the Neave Industrial area of Gqeberha (this is in terms of the Spatial Development framework (SDF) of the Nelson Mandela Bay Municipality (NMBM), where the topography is flat.

The erf is zoned industrial 2 in terms of the Port Elizabeth Zoning Scheme and the project activity is in line with the vision that the NMBM has for the area and aligns to the character of the surroundings. The site is surrounded by other industrial and commercial activities.

The site can be accessed via Standford Road Arterial (which runs in a south easterly direction relative to the site) and then via New Bolt Rd and Bedford Rd. Entrance to the site can be either through New Bolt road or through three entrances in Bedford road.

The sections of the existing facility that will be re-furbished to incorporate the new solvent-based lab is located at the following GPS co-ordinates:-

Table 22: Location (coordinates) of stack and mixing areas.

Stack Location	**33°55'39.67"S** **25°34'43.39"E**
Mixing Area	33°55'39.61"S 25°34'41.95"E

Project Description

Kansai Plascon produces automotive paint for the vehicle manufacturing industry in Gqeberha. Solvent based paints are already produced on site by Kansai Plascon, however Axalta Plascon only produces water-based paints at present. Paint produced on site is stored on the premises and then later sold to customers. Kansai Plascon intends to include into their current facilities, the ability to be able to increase the production of solvent-based paints, at an approximate capacity of 4000 tons per year in addition to their existing water-based paint production and over and above the solvent-based paints produced. This additional infrastructure will be operated by Axalta Plascon under a JV agreement.

Due to the current activities, Kansai Plascon is the holder of an approved Air Emission License [19/2/9/2/1/2/ NMBM AEL 20/60] for 'Category 6: Organic Chemical Industry' activities for the site which applies to their solvent-based paint production activities. The current Kansai Plascon facility is also considered to be an approved Major Hazardous Installation due to the nature of the products and chemicals handled on site which has the potential to ignite and result in fires or explosions if stored incorrectly. The need for the AEL arose from the use or production of organic chemicals onsite which requires ventilation into the atmosphere.
The National Environmental Management: Air Quality Act (NEM:AQA) includes a "List of Activities Which Result in Atmospheric Emissions" as published in Government Notice 893 on 22 November 2013 (GN893) and which requires to be operated under an AEL. The proposed increase in solvent-based paint production at the site necessitates the need to amend the AEL operated under by Kansai Plascon. An additional emissions point source will be added to the existing AEL held by Kansai Plascon for the release of volatile organic compounds.

Proposed changes to the site development plan

The current water-based production plant area includes, amongst others:

- a material store where input materials are stored.
- a production store where product is stored.
- two production plants.

Figure 2 shows a detailed site layout plan illustrating the main facilities that comprise the water-based plant at Kansai Plascon as well as the Axalta Plascon plant as it currently operates. The new solvent-based paint plant is planned for the existing water-based plant production area, as identified in **Figure 3**. The additional facilities will make use of two existing storage vessels (both at a capacity of 10 000 litres each) that are currently used at the water-based plant, to be used for storage of the proposed solvent-based plant. The offices that are currently located in Production Area (North), as indicated in Figure 1, will be demolished and this area will be used as a staging area. To contain any spills, the planned solvent-based production plant will be cordoned off and equipped with a sump spillage containment measure and includes concrete surfaces. A stack will be added above the storage tanks in the plant. The tanks will be equipped with nitrogen blanks to protect the product from vapour.

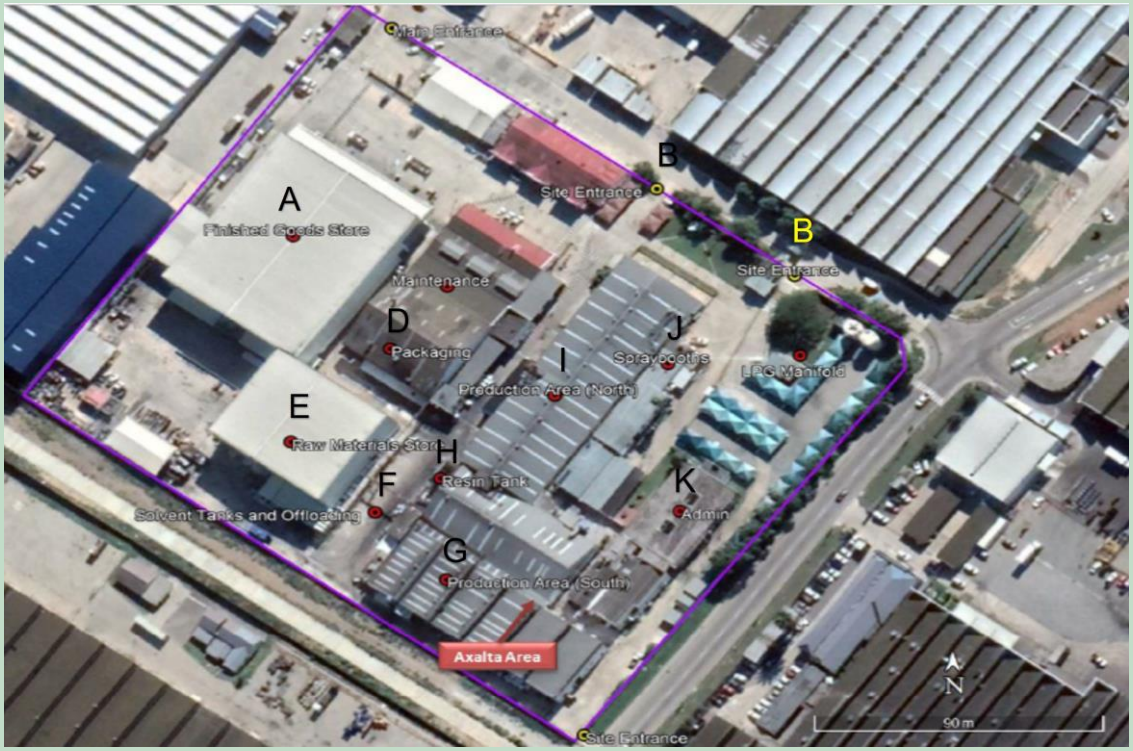


Figure 19: Existing site layout plan of the Plascon operated water-based facilities, where A is the Finished Goods store, B is the Site Entrance, C is Maintenance, D is Packaging, E is the Raw Material Store, F is the Solvent Tanks Offloading, G is the Production

The proposed facilities to be constructed and installed at the site will include the following:

- To control spills and leaks during the manufacturing process, containment facilities in the form of a bund with a sump will be installed around above-ground storage containers/storage areas.
- A stack will be constructed to allow for ventilation and to neutralize the vapours produced during the mixing process.
- Nitrogen, stored on site in 2x 11kg cylinders, and due to its inert nature, will be used as a barrier to insulate the product from vapours.
- Nitrogen will be brought to the mixing area through either a pipeline or by installation of smaller nitrogen tanks at strategic locations;
- Tanks are cleaned using solvents and the resultant effluent are distilled on site for storage and re-use. The associated distillation, handling and storage facilities will form part of this expansion. These facilities are existing but will be expanded.
- Facilities for the temporary waste handling and storage will be required for the resultant sludge that is produced in the cleaning process. These are existing facilities but the volumes will be increased.

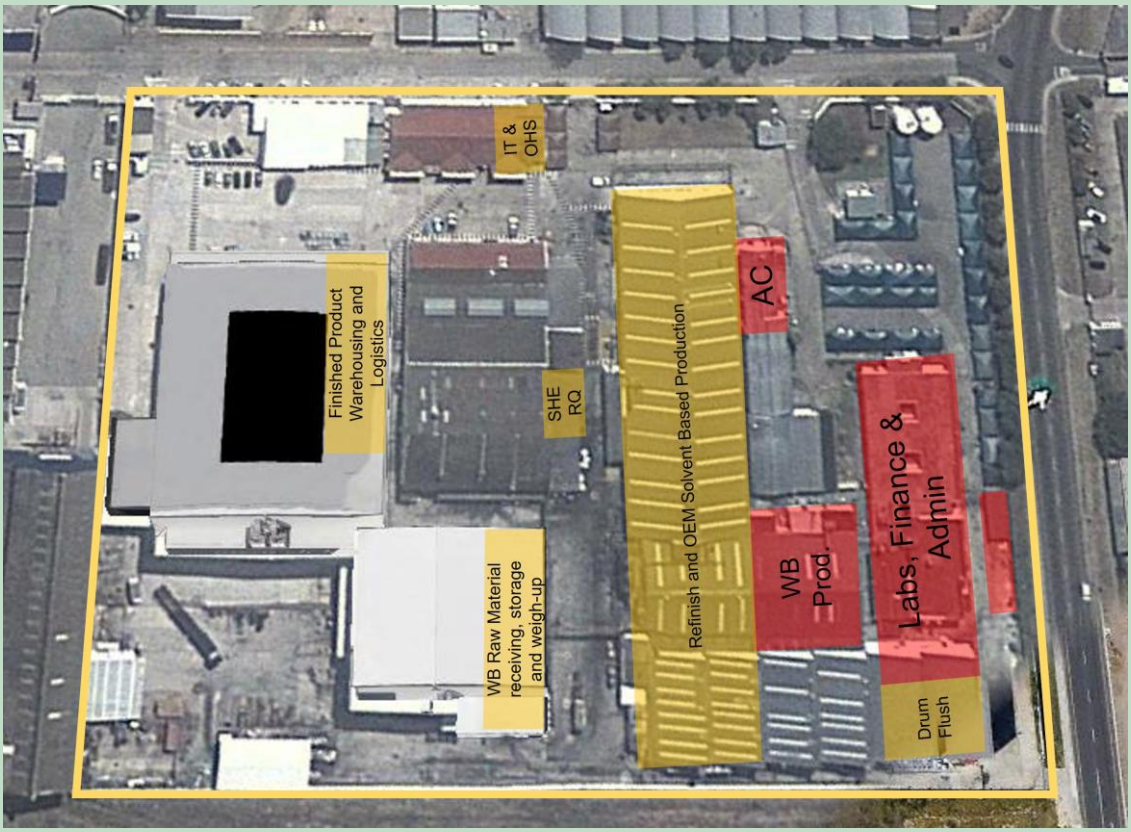


Figure 20: A revised site layout plan for the facility that will be changed to incorporate the production of solvent-based paint.

The production process of solvent-based paints

A Bulk Mix process, as used at Kansai Plascon, will be used to produce solvent-based paint, including two additional material inputs to achieve the correct composition. This production process is illustrated in **Figure 4**, and involves the mixing of solvents, resins, and other substances to produce the final product. Gaseous emissions, in the form of vapours, may result from the mixing process due to the nature of the solvents and volatile chemicals that release vapour that require ventilation. A stack will be added above the storage tanks in the plant to extract the vapours. The tanks will be equipped with nitrogen blanks to protect the product from vapour.

The production process of solvent-based paint therefore is summarised as follows: -

8. The ingredients of the solvent-based paint are delivered to the site and stored in existing underground tanks.
9. A manual operated diaphragm is used to load the solvent-based paint ingredients (resins, solvents, and additions) into the mixing containers.
10. The mixing of ingredients is undertaken by an operator.
11. Colouration and tinting of the product take place as required by the paint specifications.
12. Testing of the product is done in terms of the quality control requirements.
13. Approved product is transferred to containers with approved product for sale.
14. Storage and transportation of filled containers occur on site until such time as it is transported to clients.

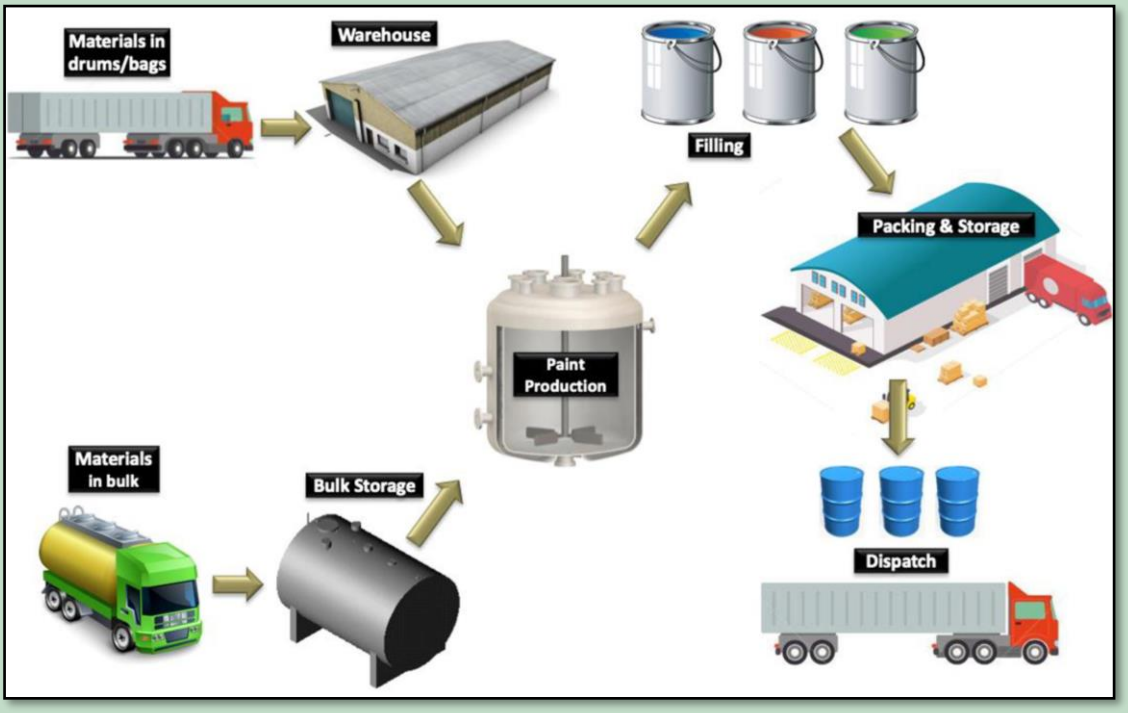


Figure 21: A schematic illustration of the production process (WKC 2021).

Changes to the material stored on-site

The solvent-based production process will use mainly the same input materials as currently being used for the water-based paint production process. The solvent-based process however requires two additional input products. The raw input materials used in the production of solvent-based paint are stored on site, however a greater storage volume of 90 tonnes per month will be required to be able to make provision for the sorted products and to include the 10% containment area. The estimated volume of solvent-based paint product that will be produced and stored in the product store is 30 tonnes per month.

Table 23: Material inputs indicating new products and volumes stored (Draper and Blanche 2021).

	Ingredient Designation	Ingredient Name	Material Inputs (t/y)
Existing Inputs Stored	176-16050	W-10031 HAPS Compliant Acrylic Dispersion	1.69
	VMS46561	UVA Screener / HALS Solution	4.42
	VM-1940	DDBSA / DIPA Solution – HAPS Compliant	1.12
	RCS47670	Low Tg Urethane Oligomer	7.04
	RCS47606	Acrylic Copolymer Flow Additive	0.23
	RCS37919	Dual Function Resin for SHS Clear	3.94
	RCS29899	Dual Functional Acrylosilane Polymer	19.97
	RCP 1888	Clearcoat NAD	13.19
	RCH72716	NAD Resin	3.51
	RC-7126	HAPS Compliant High Solids Acrylic Resin	1.69
	H-948	Trimethyl Orthoacetate	2.34

	H-883	Ethyl 3-Ethoxy Propionate	0.59
	H-12	N-Butyl Alcohol	3.80
	G-1600	Hindered Amine	0.23
	G-1307	Melamine Resin	6.70
	G-1270	Melamine Formaldehyde Resin	1.86
New	***RCS47626***	***Silated Oligomer***	***3.85***
	RCR35197	***Sag Control Agent for NAAB***	***3.85***
	Total		**80.00**

2. FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Paragraphs 3 – 13 below should be completed for each alternative.

Table 24: Alternatives Assessment.

	Alternative Type		Alternatives Considered		Advantages	Disadvantages	Preference	Proceed to Impact Assessment	Concluding Remarks
(a)	the property on which or location where it is proposed to undertake the activity;	1	Using existing property	1	Site agreements and leases are in place.	Limited opportunities for further expansion as a result of the existing use and space constraints.	Applicant preferred	Yes, Assessed as alternative A1.	In the context of the location and existing conditions of the site, the agreements and operating philosophy and culture, the use of the existing site is preferred until such time as expansion needs may require changes that cannot accommodate both entities.
				2	Site infrastructure required is largely in place and only requires slight modifications as opposed to construction and delays in commencement due to major reconstruction.	Competition for services			
				3	No capital expense is required for the changes to re-construct infrastructure. Existing infrastructure is available.				
				4	Branding and identification within the site aligns to the overall branding of the parties and activities within their existing agreements				
				5	Services are in place and relevant to the processes proposed.				
		2	New Property	1	A new design will be purpose built for the operations.	New lease or construction would delay commencement Capital outlay is restricted to direct infrastructure needs as opposed to ancillary infrastructure		No	
				2	No competition for space or resources.				
				3		Availability of suitable industrial property within the service area.			
				4		New site impacts could result in new builds and in areas where this activity is not currently taking place.			
				5		Exiting of existing agreements and shared opportunities.			
(b)	the type of activity to be undertaken;		No alternate types are feasible options as this would require a re-design of the existing facilities.					No	Axalta and Kansai are operating in a Joint Venture. The existing activities on site already exists and it therefore is not feasible to alter this to increase the volumes produced.
(c)	the design or layout of the activity;		No layout options are available.					No	The site is an existing site and no options exist for re-design other than to re-assign portions of the built environment to the parties operating on site.

(d)	the technology to be used in the activity;		No technology alternatives are available.					No	Due to the site being an existing operation, technology changes would result in additional costs to the existing operations.
(e)	the operational aspects of the activity; and		No operational alternatives are available					No	
(f)	the option of not implementing the activity.		This option does apply considering the existing nature of the agreements between the parties.					Yes	

3. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.
List alternative sites if applicable.

	Latitude (S):		Longitude (E):	
Alternative:				
Alternative S1[3] (preferred or only site alternative)	33°	927688‘	25°	578688‘
Alternative S2 (if any)	°	‘	°	‘
Alternative S3 (if any)	°	‘	°	‘

In the case of linear activities:

Alternative:	**Latitude (S):**		**Longitude (E):**	
Alternative S1 (preferred or only route alternative)				
• Starting point of the activity	°	‘	°	‘
• Middle point of the activity	°	‘	°	‘
• End point of the activity	°	‘	°	‘
Alternative S2 (if any)				
• Starting point of the activity	°	‘	°	‘
• Middle point of the activity	°	‘	°	‘
• End point of the activity	°	‘	°	‘
Alternative S3 (if any)				
• Starting point of the activity	°	‘	°	‘
• Middle point of the activity	°	‘	°	‘
• End point of the activity	°	‘	°	‘

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

[3] “Alternative S..” refer to site alternatives.

4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	**Size of the activity:**
Alternative A1[4] (preferred activity alternative)	m²
Alternative A2 (if any)	
Alternative A3 (if any)	

or, for linear activities:

Alternative:	**Length of the activity:**
Alternative A1 (preferred activity alternative)	
Alternative A2 (if any)	
Alternative A3 (if any)	

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	**Size of the site/servitude:**
Alternative A1 (preferred activity alternative)	m²
Alternative A2 (if any)	
Alternative A3 (if any)	

5. SITE ACCESS

Does ready access to the site exist?	YES	NO
If NO, what is the distance over which a new access road will be built	m	

Describe the type of access road planned:

N/A

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

6. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

6.1 the scale of the plan which must be at least a scale of 1:500;

6.2 the property boundaries and numbers of all the properties within 50 metres of the site;

6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;

[4] "Alternative A.." refer to activity, process, technology or other alternatives.

6.4 the exact position of each element of the application as well as any other structures on the site;

6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;

6.6 all trees and shrubs taller than 1.8 metres;

6.7 walls and fencing including details of the height and construction material;

6.8 servitudes indicating the purpose of the servitude;

6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):

- rivers;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or invested with alien species);

6.9 for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and

6.10 the positions from where photographs of the site were taken.

7. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this form**.** It must be supplemented with additional photographs of relevant features on the site, if applicable.

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

9. ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R 12 000 000
What is the expected yearly income that will be generated by or as a result of the activity?	R 34 000 000

Will the activity contribute to service infrastructure?	NO
Is the activity a public amenity?	NO
How many new employment opportunities will be created in the development phase of the activity?	2
What is the expected value of the employment opportunities during the development phase?	R1 728 000
What percentage of this will accrue to previously disadvantaged individuals?	100%
How many permanent new employment opportunities will be created during the operational phase of the activity?	3
What is the expected current value of the employment opportunities during the first 10 years?	R 27 648 000
What percentage of this will accrue to previously disadvantaged individuals?	100%

9(b) Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

The EIA Regulations (2014, as amended) requires that the "need for and desirability of the activity" must be considered in an environmental assessment. This means that the 'need' and 'desirability' of the proposed development must be assessed separately where the 'need' relates to the 'timing' and 'desirability' to 'place'. It also relates to the "nature, scale and the location of the development is proposed, as well as the wise use of the land". Evaluating the 'needs and desirability' of a proposed development allows the authorities to understand if sustainability (social, environmental, and financial) issues have been considered in the proposed development.
The need and desirability concept in relation to the proposed development has been deliberated as follows: -

Need (Timing) of the proposed development

The automotive industry accounts for more than 50% of the manufacturing sector in Gqeberha which accounts for more than half (58%) of Gqerberha's Gross Value Add (GVA). Automotive related companies, like Kansai Plason, are benefitting from the demand created by companies like the VW Motor Plant, the NMB Logistical Park, the new automotive manufacturer (FAW) plant at the Coega Industrial Development Zone (IDZ) etc. Kansai Plascon has an existing facility where solvent-based paints are produced, stored, and sold to various industries, inclusive of the automotive industry. Given that there is an existing demand for this paint, Kansai Plascon intends to upgrade its current facility to produce additional volumes of solvent-based paints.

Desirability of the development

The project area/site is an existing automotive paint manufacturing facility that produces solvent and water-based paints. The site is located in the Neave Township in Gqeberha and the Spatial Development Framework of the Nelson Mandela Bay Municipality identifies Neave Township as a light industrial area. It is zoned as industrial 2 in terms of the NMBM zoning scheme which means that the proposed development is in line with the NMBM's vision for that area in Gqeberha.

Indicate any benefits that the activity will have for society in general:

Benefits to society

Kansai Plascon produces top quality paint products for the Industrial, Automotive, and Decorative sectors in our society. Plascon has integrated sustainability issues into their business strategy by striving to reduce their carbon emissions, their electricity use, water consumption and waste production. They have done this to ensure that they have a positive impact on the communities that they operate in. They believe that a healthy business is rooted in healthy societies, communities and labour forces.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

Benefits to the local community

Indirect employment opportunities could benefit local communities through the strengthening of Gqeberha's economy through the proposed development.
Local employment will be created during the construction and operational phases of the activity.
The upgrading of the facility will provide a few employment opportunities for the surrounding community as follows: -.

- Two new skilled employment opportunities during the construction phase of the development;
- Three new skilled employment opportunities during the operational phase of the development; and
- Six new skilled employment opportunities during the operational phase of the development.
- An important factor in the development is the fact that the continuation of the operations supports the sustained operations of the facility and products that are produced locally, and sold locally to the vehicle manufacturing industry maintains economic activity in the local surroundings.

.10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:	Administering authority:	Date:
NEMA	DEDEAT	1998
NEM:AQA	DFFE/NMBM	2008
"*List of Activities That Result in Atmospheric Emissions*" as published in Government Notice 893 of 22 November 2018 (GN893), as amended.	DFFE/NMBM	
"*National Ambient Air Quality Standards*" as published in Government Notice 1210 of 24 December 2009 (GN1210)	DFFE/NMBM	
"*Regulations Regarding Air Dispersion Modelling*" as published in Government Notice GN R.533 of 11 July 2014 (GN R.533)	DFFE/NMBM	

11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES	NO
If yes, what estimated quantity will be produced per month?	10m^3	

How will the construction solid waste be disposed of (describe)?

Disposed of at municipal landfill site through removal by licensed contractor.

Where will the construction solid waste be disposed of (describe)?

Disposed of at municipal landfill site

Will the activity produce solid waste during its operational phase?	YES	NO
If yes, what estimated quantity will be produced per month?	7m^3	

How will the solid waste be disposed of (describe)?

Collection through the existing municipal services. Where waste is produced that is not accepted in municipal facilities, the waste will be removed through the existing waste removal services.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

Removal by Waste contractor to private site (Aloes).

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	YES	NO

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility?	YES	NO

If yes, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

11(b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	YES	NO
If yes, what estimated quantity will be produced per month?	14m^3	
Will the activity produce any effluent that will be treated and/or disposed of on site?	Yes	NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility?	YES	NO

If yes, provide the particulars of the facility:

Facility name:	[redacted]		
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	YES	NO
If yes, is it controlled by any legislation of any sphere of government?	YES	NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

In discussions with the NMBM and DEDEAT it has been confirmed that this process is for an Amendment of the existing Kansai Plascon Atmospheric Emissions License and therefore a Basic Assessment Process is being undertaken.

11(d) Generation of noise

Will the activity generate noise?	YES	NO
If yes, is it controlled by any legislation of any sphere of government?	YES	NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

Existing noise is within the allowable limits and controlled through the Health and Safety plan.

12. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es)

municipal	water board	groundwater	river, stream, dam or lake	other	the activity will not use water

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be extracted per month:	litres	
Does the activity require a water use permit from the Department of Water Affairs?	YES	NO

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

13. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

Energy efficiency has been incorporated into the facility at present. The proposed changes will not influence energy efficiency.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

None, the facility is operating off the national grid and has been in operation for more than 30 years.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):	

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section?

YES	NO

If YES, please complete form XX for each specialist thus appointed:

All specialist reports must be contained in Appendix D.

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S2 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

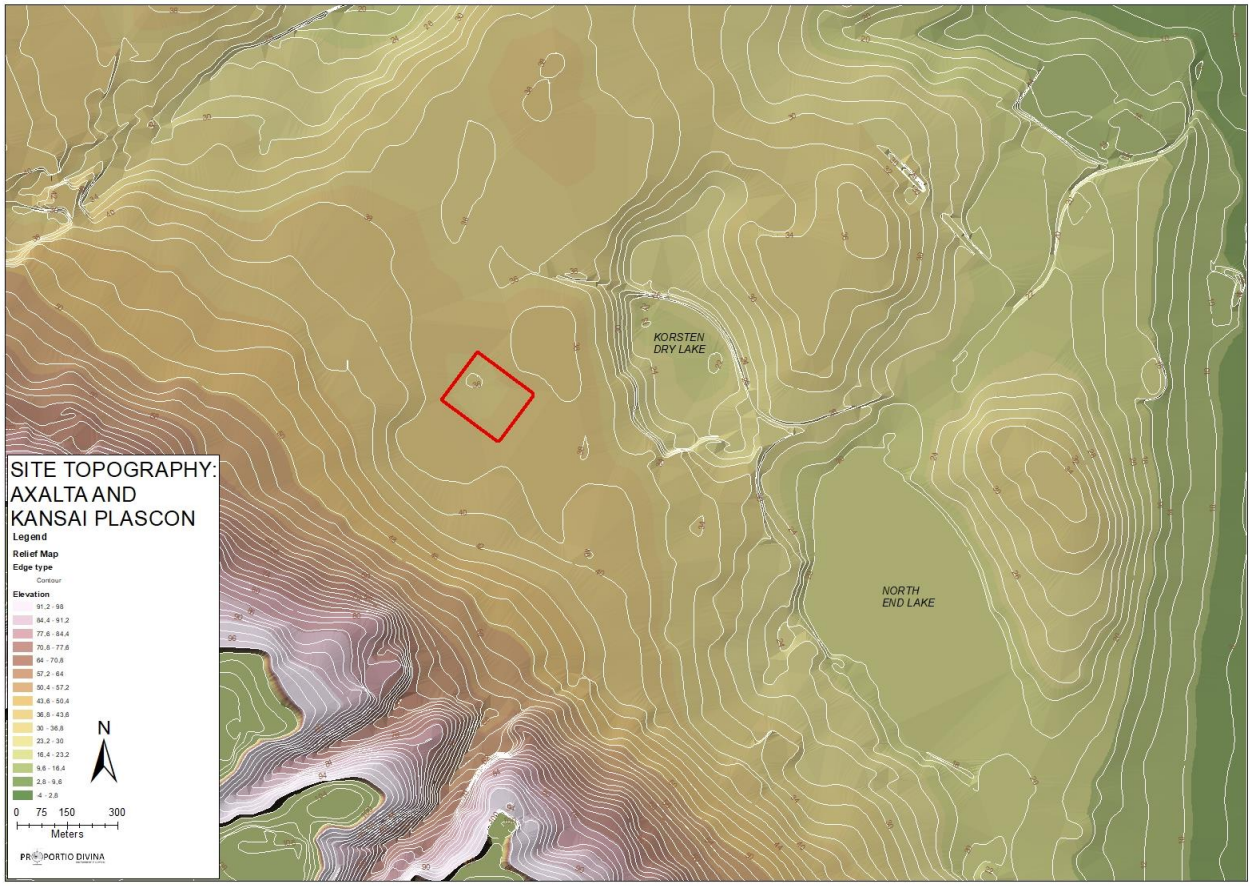


Figure 22: Contours on the site.

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline
2.2 Plateau
2.3 Side slope of hill/mountain
2.4 Closed valley
2.5 Open valley
2.6 Plain
2.7 Undulating plain / low hills
2.8 Dune
2.9 Seafront

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (tick the appropriate boxes)?

	Alternative S1:		Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	YES	NO	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	YES	NO	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO	YES	NO	YES	NO
An area sensitive to erosion	YES	NO	YES	NO	YES	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

4. GROUNDCOVER

Indicate the types of groundcover present on the site:

4.1 Natural veld – good condition [E]
4.2 Natural veld – scattered aliens [E]
4.3 Natural veld with heavy alien infestation [E]
4.4 Veld dominated by alien species [E]
4.5 Gardens
4.6 Sport field
4.7 Cultivated land
4.8 Paved surface
4.9 Building or other structure
4.10 Bare soil

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition[E]	Natural veld with scattered aliens[E]	Natural veld with heavy alien infestation[E]	Veld dominated by alien species[E]	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

5. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

5.1 Natural area
5.2 Low density residential
5.3 Medium density residential
5.4 High density residential
5.5 Informal residential
5.6 Retail commercial & warehousing

5.7 Light industrial
5.8 Medium industrial [AN]
5.9 Heavy industrial [AN]
5.10 Power station
5.11 Office/consulting room
5.12 Military or police base/station/compound
5.13 Spoil heap or slimes dam[A]
5.14 Quarry, sand or borrow pit
5.15 Dam or reservoir
5.16 Hospital/medical centre
5.17 School
5.18 Tertiary education facility
5.19 Church
5.20 Old age home
5.21 Sewage treatment plant[A]
5.22 Train station or shunting yard [N]
5.23 Railway line [N]
5.24 Major road (4 lanes or more) [N]
5.25 Airport [N]
5.26 Harbour
5.27 Sport facilities
5.28 Golf course
5.29 Polo fields
5.30 Filling station [H]
5.31 Landfill or waste treatment site
5.32 Plantation
5.33 Agriculture
5.34 River, stream or wetland
5.35 Nature conservation area
5.36 Mountain, koppie or ridge
5.37 Museum
5.38 Historical building
5.39 Protected Area
5.40 Graveyard
5.41 Archaeological site
5.42 Other land uses (describe)

If any of the boxes marked with an "[N] "are ticked, how will this impact / be impacted upon by the proposed activity.

Not Applicable

If any of the boxes marked with an "[An]" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain: The facility will release emissions into the atmosphere thereby reducing the available airspace for other industries by having a cumulative effect on the existing air quality in the area.
If YES, specify: Similarly, the facility will be impacted by fallout or particulates emitted in the surroundings due to potential contamination of clearcoat paint with particulates where these particles are able to enter the facilities.

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain: The facility itself will not be impacted upon by the filling station since the distance from between the sites are too big to affect the Plascon site. The filling station impacts are expected to be very localized and will be as a result of contamination from fuel spills on the forecourt area, affecting stormwater (if not well mitigated) or potentially groundwater where underground fuel leaks may occur over time.
If YES, specify: The filling station will not be impacted by the Plascon Facility as the only impact that will be able to reach the filling station is limited to emissions resulting from vapours released by the Plascon Facility.

6. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including	YES	NO
Archaeological or palaeontological sites, on or close (within 20m) to the site?	Uncertain	
If YES, explain:		
If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.		
Briefly explain the findings of the specialist:		
Will any building or structure older than 60 years be affected in any way?	YES	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

SECTION C: PUBLIC PARTICIPATION

Public Participation Process

The Public Participation Process is currently under way and commenced 9 June 2023. IAPs have until 10 July 2023 to submit comment on the report and the process followed or raise any general concerns or issues.

Process Followed

The Public Participation Process (PPP) that has been undertaken to obtain public inputs into the environmental process are as follows: -

12. The PP process commenced on the 13 March 2023 and ended on the 13 April 2023.
13. A Background Information Document (BID) was developed and distributed to relevant stakeholders over the course of this period. A 30-day registration period was instituted to register Interested and Affected Parties (I&APs).
14. BIDs were hand delivered to all direct neighbours on the 13 March 2023 and details of landowners collected through enquiry.
15. A pre-application meeting was held with DEDEAT and the air quality officials from the NMBM on 3 March 2023.
16. All relevant government departments will be informed of the availability of the Draft BAR on 26 May 2023.
17. A site notice (see **Figure 12**) was developed and attached to the fence at the entrance gate and reception entrance of the site on the 13 March 2023;
18. Newspaper advertisements were placed in the following newspapers (**Figure 13**):-

a. An advertisement was placed in the Eastern Cape Herald on Monday 13 March 2023.
b. A second advertisement was placed in the Port Elizabeth Express on the 15th March 2023.

19. The Draft BAR (this document) will be submitted to the competent authorities following completion of the public comment period.
20. A 30-day commenting period will be extended to stakeholders and I&APs to provide inputs on the documents.
21. All public comments will be addressed and incorporated in the Final BAR.
22. The Final BAR will be made available to stakeholders once finalised.

Figure 23: Site notices placed at the entrance gates and reception entrance.

Figure 24: The advertisements placed in the Eastern Cape Herald (left) and Port Elizabeth Express (Right).

Comments Received

No comments received to date, major landowners and tenants in the vicinity did not raise any issues in formal discussions and noted no issues with the applicant. Comments received from authorities consulted to date are included in

Table 6.

Table 25: Comments Received

Theme	Commenter	Comment	Response
Specialist Study – Air Quality / AEL	NMBM	Please consider inclusion of a map showing a 5km radius around the site.	A Map has been included in the specialist assessment report.
Specialist Study – Air Quality / AEL	NMBM	Process flow diagrams for both operations should be included in the specialist report.	Process flow diagrams have been included into the specialist assessment report.
Specialist Study – Air Quality / AEL	NMBM	Impacts on the environment and human health need to be included in the report.	Impacts on the environment and human health are addressed in the Basic Assessment Report.

1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

(a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
  (i) the site where the activity to which the application relates is or is to be undertaken; and
  (ii) any alternative site mentioned in the application;
(b) giving written notice to—
  (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  (v) the municipality which has jurisdiction in the area;
  (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  (vii) any other party as required by the competent authority;
(c) placing an advertisement in—
  (i) one local newspaper; or
  (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and
(e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
  (i) illiteracy;
  (ii) disability; or
  (iii) any other disadvantage.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

(a) indicate the details of the application which is subjected to public participation; and
(b) state—
  (i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be;

(ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;

(iii) the nature and location of the activity to which the application relates;

(iv) where further information on the application or activity can be obtained; and

(iv) the manner in which and the person to whom representations in respect of the application may be made.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

6. AUTHORITY PARTICIPATION

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least 30 (thirty) calendar days before the submission of the application.

List of authorities informed:

The following authorities will be provided with a copy of the report for comment:

- Nelson Mandela Bay Municipality: Air Pollution and Noise Control
- Department of Water Affairs
- Eastern Cape Heritage
- Department of Labour

List of authorities from whom comments have been received:

Nelson Mandela Bay Municipality: Air Pollution and Noise Control

7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that subregulation to the extent and in the manner as may be agreed to by the competent authority.

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application at least 30 (thirty) calendar days before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?	YES	NO

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

No comment has been received from stakeholders to date. Further focus group discussions are planned as part of the next phase of public comment as part of the Draft Basic Assessment Report to determine if any parties have additional inputs.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 as amended, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

NMBM – Application for AEL - refer to **Table 6**

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report):

Refer to **Table 6** and Appendix E

2.IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

Alternative (preferred alternative)

Direct impacts: Refer to sections below ***Indirect impacts:*** ***Cumulative impacts:***

12. Impact Assessment

This section provides an assessment of the anticipated impacts. It is important that readers utilise the assessment methodology to understand how the rating of an impact has been determined as provided in **Table 7** and **Table 8**.

19.1 Methodology of Assessment of Impacts

In consideration of regulation 31(2)(I) of the National Environmental Management Act, Act 107 of 1998 as amended which states that "An Environmental Assessment report must contain all the information that is necessary for the competent authority to consider the application and to reach a decision… and must include –

viii. Cumulative impacts
ix. The nature of each impact
x. The extent and duration of the impact
xi. The probability of the impact occurring
xii. The degree to which the impact can be reversed
xiii. The degree to which the impact will result in the loss of resources
xiv. The degree to which the impact can be mitigated.

Table 26: Rating criteria for the identified impacts.

Numerical Value	Extent	Duration	Probability	Magnitude
1	Site Specific:- Impact limited to area within the site boundary	None	None	None
2	Local:- beyond site boundary but within 500 meters or less of the site boundary	Immediate: – limited to the duration of the impact event.	Improbable:- Less than 1% chance of occurrence.	Insignificant or Minor
3	Regional A:- Beyond 500 meters of the site but within the local administrative boundaries (e.g. municipality).	Short Term:- o to 5 years.	Low Probability:- More than 1% chance of occurrence but less than 20%.	Low
4	Regional B:- Beyond local administrative boundaries but within Provincial boundaries.	Medium Term:- 5 – 10 years.	Medium Probability: 20% - 50% chance of occurring.	Moderate
5	National: Beyond provincial boundaries but within the national boundary.	Long Term:- 10 – 20 years.	High Probability:- More than 50% chance of occurrence but less than 99%	High
6	Cross boundary impacts beyond international borders.	Permanent:- Impact remains indefinitely.	Definite:- It is a predicted certainty that the impact will occur.	Very High

Impacts must therefore also be assessed in terms of the following criteria:

- Extent of the impact or spatial scale in which impacts are anticipated.
- Duration of impacts and how long the identified impact will be present or show an effect on the extent identified.
- Probability is the likelihood of the predicted impact occurring.
- Magnitude is a relative characterisation of the intensity of the impact.

In order to assign a numerical value to these criteria, **Table 7** provides the explanation as to how numerical values have been assigned and should be kept in mind in the summary of impacts.

In order to determine the relative risk that may result from the development and associated impacts identified, **Table 8** provides the ranges of how the relative risk has been grouped and categorised to make a determination of the anticipated impacts.

Table 27: Significance determination as a relative determination of risk.

Number Value Calculated	Classification	Reason	Calculated relative percentage risk
0 - 5	Insignificant	Insignificant or no loss of resources. Calculated value is less than 2%.	0 - <5%
5-27	Low	Low significance with calculated value being less than 10%.	5% - 25%
>27-55	Moderate	Less than 50% indicates a moderate significance due to the probability and magnitude of the loss of resources.	>25% - 50%
>55-100	High	More than 97% which indicates a high potential for loss of resources.	>50% - 92%
>100-108	National: Beyond provincial boundaries but within the national boundary.	Long Term:- 10 – 20 years.	93% - 100%
6	Cross boundary impacts beyond international borders.	Permanent:- Impact remains indefinitely or are considered unacceptably high.	!00%

19.2 Predicted Impacts

Based on the assessment of the activities associated with the changes to the facility, the following impacts are anticipated:

Table 28: Initial identification of impacts to be assessed.

Impact Description	Impact Origin	Opinion on Nature	Assesses Further
A. Planning and Design Phase			
No impacts identified.			No
B. Construction Phase			
Excavations and demolition	Waste generation from building rubble Dust generation from excavations and demolition. Safety	Low - waste volumes are expected to be low and not continuous. Low - dust generation will be low and short term.	Yes
Waste management	Rubble generated from demolition activities	Low - waste volumes are expected to be low and not continuous.	Yes
Traffic	Additional vehicle traffic resulting from deliveries during construction activities to effect changes.	Insignificant - traffic volumes will be extremely low and is unlikely to affect the traffic flow.	No
Job creation	Additional employment opportunities during construction.	Low - most employment opportunities will be limited to specialist installers as opposed to construction firms.	Yes
Heritage Buildings	Buildings present on site classified as heritage resources or building older than 60 years.	Low - No formal heritage buildings are present on the site although some site features may be in excess of 60 years old	No
C. Operational Phase			
Groundwater quality	Leaks and spills from poor operational controls and penetration to groundwater	Low - no new infrastructure is being installed in this regard and continuation of current procedures and controls will not result in increased risk.	Yes
Emissions	Emissions from paint production through ventilation of volatile organic compounds	Moderate - emissions need to be licensed as part of the operations	Yes
Traffic	Additional vehicle traffic resulting from deliveries and sales	Low - waste volumes are expected to be low and not continuous.	No
Noise	Noise generation resulting from the equipment	Insignificant - noise levels present on site is unlikely to be elevated considering the minor changes in relation to the site operations. The changes proposed are not rated as noise generators.	No
Waste Management and Re-use	Products and input materials will generate small amounts of waste. The majority of input products will	Low - the volumes are low and all material and all waste streams will be included in the existing	Yes

Impact Description	Impact Origin	Opinion on Nature	Assesses Further
	be re-used and recycled in the process.	operations under the management measures employed.	
Stormwater management	Drainage of dirty stormwater areas.	Insignificant - stormwater volumes and quality will not be influenced by the changes.	No
Operational Risk - MHI	Inherent fire and safety risks are present in the operation of the facility.	Moderate - risks of the changes and how they influence the existing MHI operational procedures should be assessed.	Yes
D. Decommissioning Phase			
Site rehabilitation and remediation	Waste generation from contaminated land and soils.	Moderate - industrial sites in operation for this long often have sub-surface contamination that requires removal.	Yes
Waste management	Demolition waste generated. Removal of unused products and expired chemicals	Low - building rubble will require removal to relevant waste facility. Low- all waste will be removed to a licensed hazardous waste facility.	Yes
Noise	Noise generation during demolition activities.	Low - the nature of the area is industrial although temporary spikes in noise generation will be short-lived.	Yes
Traffic	Removal of rubble and infrastructure may lead to a temporary increase in traffic volumes.	Low- temporary increases in traffic volumes could pose a nuisance to general traffic in the area.	Yes
E. Cumulative Impacts			
Emissions	Loss of available air space for other industries in the local and regional context.	Low - the facility is not expected to generate high volumes relative to the available air space.	Yes

19.3 Assessment Outcomes and Discussion

The review of the proposed changes to the Kansai Plascon complex will not result in major construction activities or large-scale demolition works. The major changes will be the resultant changes to the ventilation equipment and the associated emissions to air that will be increased.

Similarly, the solvent-based paint manufacturing process is currently in practise by Kansai Plascon, and the additional capacity produced will be resulting in a ~15 % increase from the current activities. The volumes of input substances will therefor remain the same with the addition of two new substances that will increase the volumes of product stored by ~10% annually.

The facility is therefore not introducing any new activities that will result in new impacts to be assessed and the focus of the impact assessment is therefore on the emissions to air and use and handling of solvents and chemicals on site. The facility has been in operation for some time and the current controls

(secondary containment, spill response, emergency procedures, operating procedures, environmental management systems etc. appears to be in good working order. The assessment is therefore not intended to assess the facility, but only the changes to the existing facility that will result in an increased risk or impact from the status quo.

Based on the above observations, the impact assessment will address some of lesser impacts in the assessment below, however, the focus of the specialist investigations was on the emissions to air and risk assessment which have been deemed to be the major impacts to investigate.

19.3.1 Construction Impacts

The nature of the modifications to the existing facilities are considered to be minor and will be limited to a very short period of installation and modifications to the existing equipment as opposed to construction and erection of buildings.

Dust Generation: The impacts that are anticipated from this process is dust generated from limited excavations to modify infrastructure and dust resulting from demolition activities. Both these instances of dust generation will have a very low impact on surrounding neighbours. It should be noted that Kansai Plascon has a vested interest in reducing particulates due to the contamination of the paint products.

Table 29: Rating inputs for dust generation during construction.

Criterion	Rating Comment	Mitigation Proposed
Extent	The impact is anticipated to be restricted to the local site mostly.	- Enforce Health and safety measures for workers. - Avoid dust creation activities during high winds. - Apply appropriate dust control measures where required.
Duration	Very short as limited excavation and demolition is required.	
Magnitude	The magnitude of the impacts are expected to be low due to the short duration and limited extent of these activities. Negative Impact	
Probability	Although dust impacts are expected during specific activities, they are unlikely to occur for any length of time that would make the probability of low.	

Waste Generation: The modifications and demolition will result in building rubble and potential removal of materials that may be classified as hazardous. The volume of material is anticipated to be low with the bulk of the material to be disposed off at a registered landfill site, should any asbestos containing material be identified, these will be removed by a licenses contrator.

Table 30: Rating inputs for waste generation.

Criterion	Rating Comment	Mitigation Proposed
Extent	Rated regional as the waste generated will be transported to the regional city landfills reducing the space of these facilities.	- Employ reputable waste removal contractor to remove waste as per the norms and standards in place.
Duration	Very short, this would be a single event.	
Magnitude	Indiscriminate dumping and removal of the waste could potentially result in impacts to property within	

	the region. Waste removal should be through responsible measures. Negative Impact	
Probability	The probability is rated as a definite impact based on the project scope.	

Job Creation: Job creation during construction is not anticipated to be very high, although the modifications will rather result in sustaining business in the region due to the spending of capital inputs on suppliers and service providers in the municipal area during the construction activities.

Table 31: Rating inputs for job creation.

Criterion	Rating Comment	Mitigation Proposed
Extent	Rated regional as suppliers and service providers and employees will be located within the municipal boundaries.	- No further mitigation is proposed.
Duration	Very short, this would be a single event.	
Magnitude	The magnitude of the impact is low due to the short duration and low numbers of employment. Positive Impact	
Probability	The probability is rated as a definite impact based on the project scope.	

19.3.2 Emissions to air[5]:

Various definitions exist for the term "volatile organic compounds" (VOCs) and vary from country to country. According to the popular online encyclopedia Wikipedia, VOCs are "*organic compounds that have a high vapor pressure at room temperature. High vapor pressure correlates with a low boiling point, which relates to the number of the sample's molecules in the surrounding air, a trait known as volatility*". The United States Environmental Protection Agency (US EPA 2023), states that VOCs are compounds with a high vapor pressure and low water solubility. A large proportion of the VOCs in use, are human-made chemicals used in the in the manufacture of paints, pharmaceuticals, and refrigerants. VOCs typically are industrial solvents or by-products produced by chlorination in water treatment, such as chloroform, and are often components of petroleum fuels, hydraulic fluids, paint thinners, and dry cleaning agents. In addition, many studies have reported that VOCs occur as in-door air pollutants, the pollution sources being tobacco smoke, chlorinated water, the use of perfumes, paint removers, adhesives, new clothing, plastics or kerosene heaters (David and Nicolescu, 2021).

According to the USEPA, VOCs exclude carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, methane, ethane, butane, propane, etc. In layman's terms, VOCs are compounds that contain carbon atoms and that, at room temperature, will easily evaporate. It is important to note that no official ambient air quality limits are specified for total VOCs in the National Ambient Air Quality Standards (Government Notice 1210), although limits are included Government Notice R.533 which provides regulations regarding air dispersion modelling. Limits for benzene have therefore been used as a proxy (Albertyn, 2023).

[5] Much of this section is obtained, and in some instances paraphrased, from the Air Emissions Impact Study conducted by LAQS.

For the facility to proceed with the increase in production, an AEL is required to authorise the emissions of VOCs. Kansai Plascon's AEL is therefore in place for this purpose, however needs to be updated and amended to include the increase in production by the addition of one more stack where VOC emissions will be ventilated. This AEL amendment process is administered by the Nelson Mandela Bay Municpality.

Four stacks currently emit VOCs to the atmosphere on Kansai's premises. These are:

v. Bulk mix stack
vi. Main factory stack
vii. Premix stack
viii. Solvent recovery stack

The proposed changes and expanded operations are intended to allow for the manufacturing of clear coat surface coverings. The proposed expanded operations will be of a similar size to the existing main factory process. Therefore the new proposed stack will have similar dimensions and characteristics as the existing main factory process (ii above).

Table 13 below provides a summary of the relevant stack and flue gas details and annual emissions (based on measured concentrations) and based on the official emission limits. The latter is included as GN R.533 specifies that emissions must be based on emission limits for the purpose of calculating annual emission rates.

Table 32: Stack and flue gas characteristics in relation to the estimate clearcoat additions.

Parameter	Bulk mix	Main factory	Premix	Solvent recovery	Clear-coat(*)
Stack height, m	7	7	7	7	7
Stack diameter, m	0.5	0.68x0.95	0.8	0.6x0.25	0.68x0.95
Flue gas velocity, m/s	13.6	6.4	2.4	10.2	6
Flue gas temperature, °C	17.6	25.4	28.9	17.6	20
Volumetric flowrate, Nm^3/h	9 031	13 617	3 927	5 174	13 000
VOCs measured, mg/Nm^3	57.52	114.7	538.7	66.1	110
Total VOC emissions, tons per annum, measured data	0.74	2.23	3.02	0.49	2.04
Total VOC emissions, tons per annum, at AEL limits	516	778	224	296	743

(*): Estimated

The total annual VOC emissions, based on AEL limits, are therefore estimated to amount to 2 556 tons. Total emissions based on measured concentrations are estimated to amount to 8.5 tons per annum of which only approximately 4.2 kg consist of benzene (0.08%). It is important to note therefore that, based

on actual measured concentrations at the existing Kansai Plascon Complex, their current VOC emissions consist of the less than a quarter of 1% of the allowable limit.

Some organic materials used in the input process for paint manufacture on site are stored in four underground tanks (2 x 14m^3 and 2 x 23 m^3). These compounds are acrylic resin, xylene and butyl acetate. During normal operations, the compounds are withdrawn from the tanks and air is drawn into the tanks to prevent the build-up of vacuum. Emissions from the tanks only occur directly to atmosphere through the air vents when the stocks are replenished by offloading from tanker trucks. The air vents are located at ground-level and consist of 100 mm pipes fitted with quick-connect flanges. As such the vent pipes act as point sources.

Based on the assumption that the temperature of the underground tanks is stable at 20 °C, the air quality specialist study used the vapour pressures of the tanks' contents to calculate the saturation concentration of vapours inside the tanks, and which are expelled from the tanks during loading operations.

Annual emissions were calculated from the maximum quantities of the relevant compounds listed in Kansai's AEL and found to be 0.01 tons per annum. Maximum AEL quantities were used in keeping with the requirements of GN R.533, i.e. maximum possible emissions. The calculated emissions from the underground tanks are therefore negligible when compared to total stack emissions based on emission limits, which in turn is well within the allowable limits.

As can be seen from **Table 13**, the measured concentrations of VOCs in all cases are very low when compared to the official emission limit of 40 000 mg/Nm^3. Annual emissions are based on measured flue gas parameters, measured VOC concentrations and VOC emission limits, as specified in the regulations (GN R.533).

Using the above maximum limits, the air quality specialist study modelled the dispersion of VOCs from all of the sources identified under the following scenarios:

- Dispersion of emissions from Kansai's site only.
- Dispersion of emissions from all industrial sources, including Kansai.

For each scenario, the air quality specialist study estimated the ground-level concentrations under two conditions. Firstly, annual emissions based on AEL limits were included to show the expected maximum ground-level concentrations, should emissions from all stacks occur at the legal limit of 40 000 mg/Nm^3. This represents a worst-case condition. Secondly, annual emissions based on measured concentrations were included to show ground-level concentrations that can be expected during typical operations. This scenario represents "normal" or day-to-day operations.

The approach to the study was to determine annual average ground-level concentrations of VOCs as no short-term air quality standard for total VOCs is specified in GN1210. In addition, the maximum estimated ground-level concentrations were determined, as well as where these would occur.

All simulations were carried out for a receptor height of 2 metres above ground level and a plume dispersion period of 60 minutes. This simulation period ensured that very low winds, e.g. 1 m/s, would carry pollutants some distance from the plant.

The dispersion of pollutants from Kansai's planned operations is shown graphically in **Figure 17** to **Figure 15** below. **Figure 17** and **Figure 14** respectively show the annual average ground-level

concentrations of VOCs as a result of emissions from Kansai at AEL limits and at measured concentrations respectively. **Figure 16** and **Figure 15** respectively show the annual average ground-

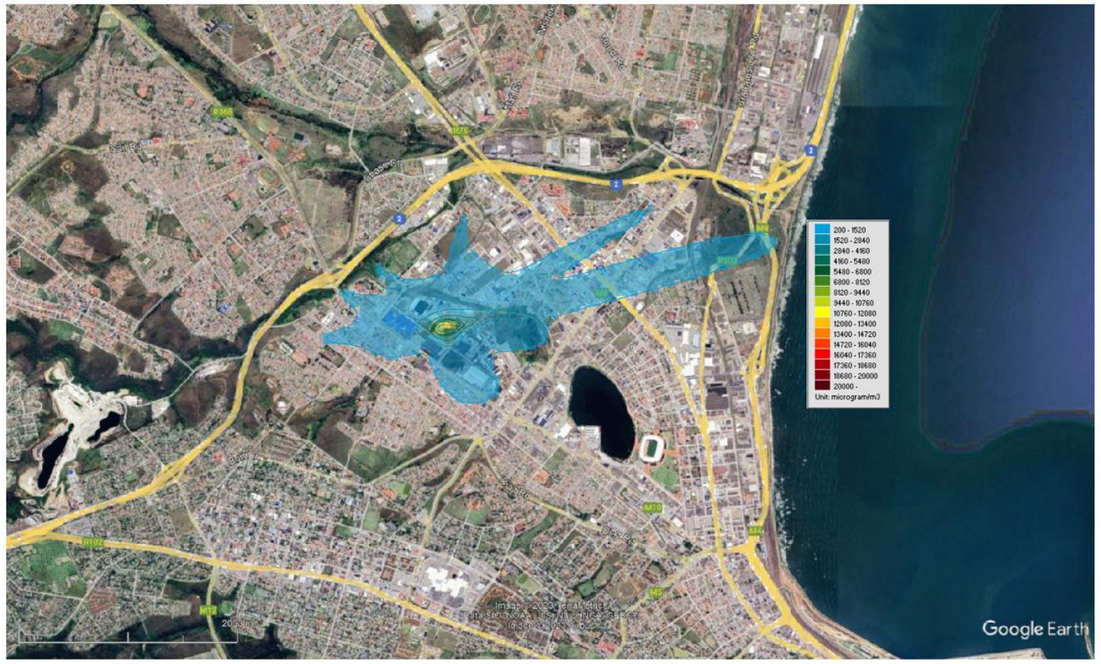


Figure 28: Annual Average VOC Concentrations, Kansai sources at AEL limits Maximum scale is 20 000 µg/m³ (20 mg/m³); no air quality standard for VOCs

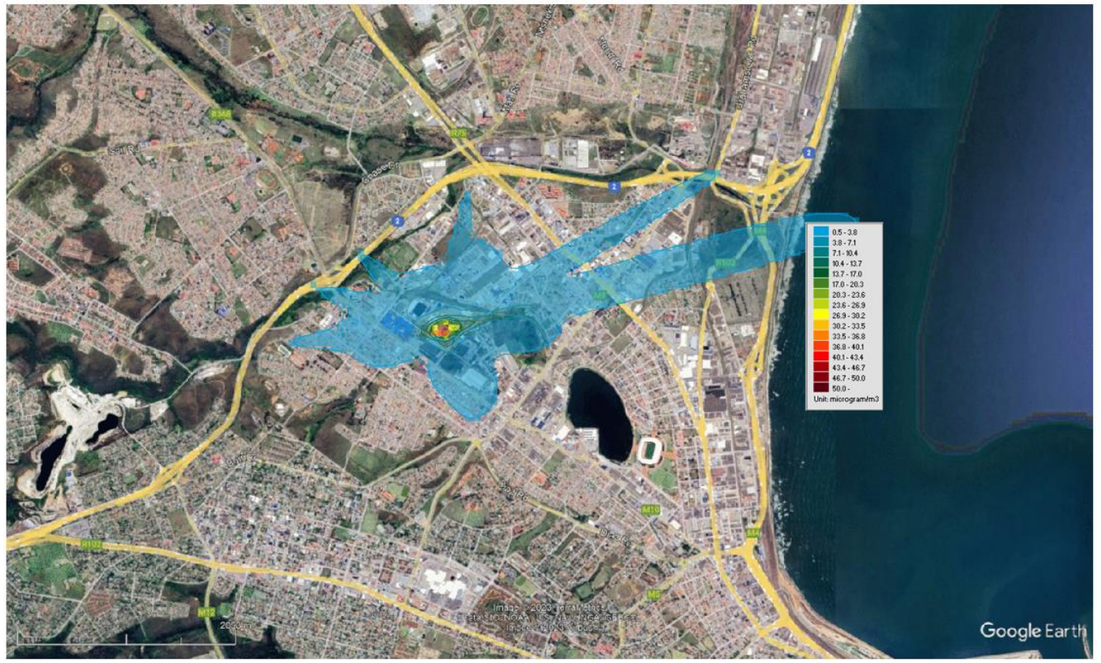


Figure 25: Annual Average VOC Concentrations, Kansai sources at measured concentrations.

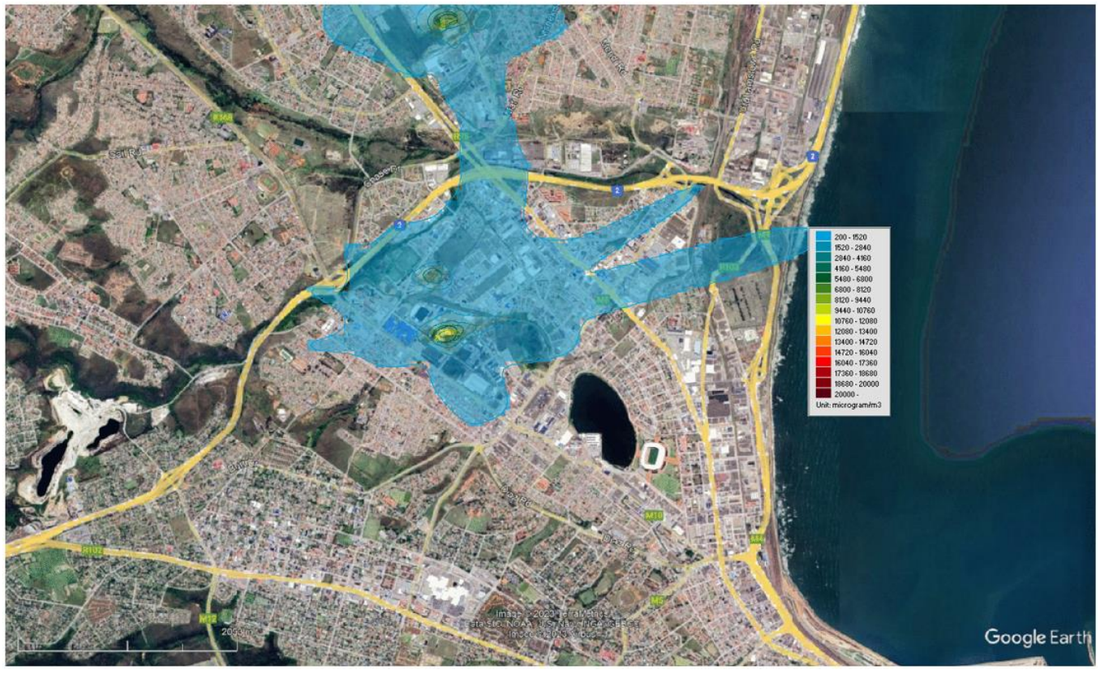


Figure 27: Annual Average VOC Concentrations, all sources at AEL limits Maximum scale is 20 000 µg/m³ (20 mg/m³); no air quality standard for VOCs

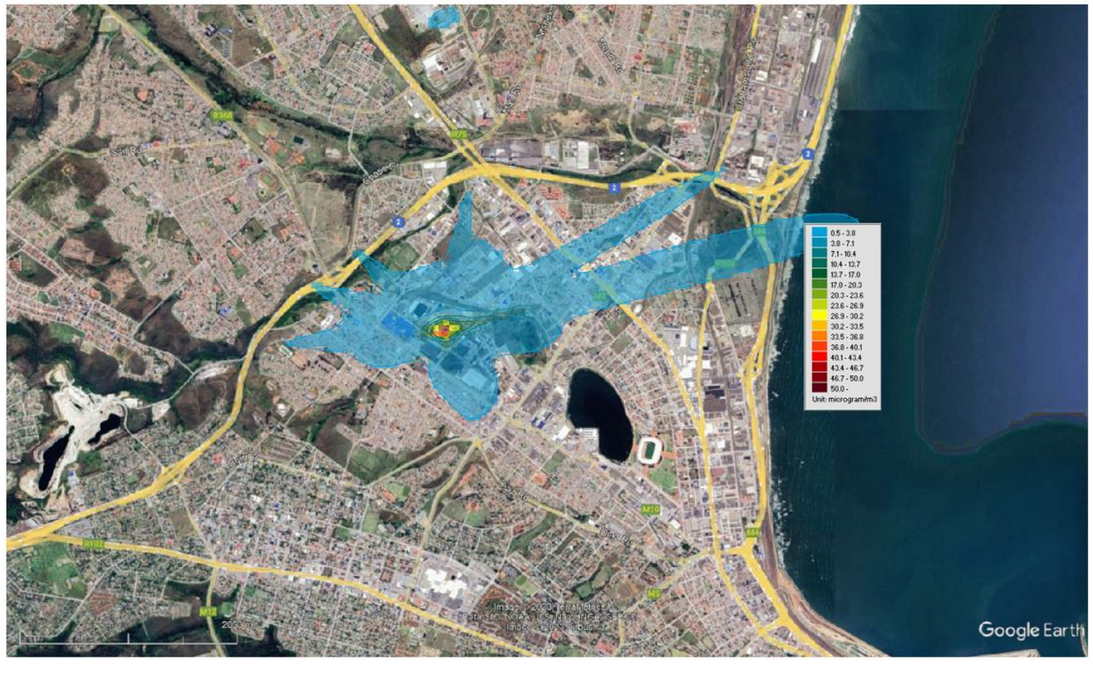


Figure 26: Annual Average VOC Concentrations, all sources at measured concentrations

level concentrations of VOCs as a result of emissions from all sources, including Kansai at AEL limits and at measured concentrations respectively.

The assessment of the impacts related to emissions to air is therefore presented in **Table 14** based on the inputs from the air quality specialist study.

Table 33: Emissions to air.

Criterion	Rating Comment	Mitigation Proposed
Extent	The extent of the impacts resulting from the emissions of VOCs are limited to the regional municipal level. Even at maximum emissions limits, the Kansai Plascon complex will have a limited impact within a 5 km radius of the site.	- Annual emissions monitoring. - Adherence to the operating procedures already in place. - Ensuring emissions are controlled by preventing open ventilation of containers outside of the stacks.
Duration	The duration of the impact is rated as long-term since the plant is expected to continue operating in this manner for the duration of its operations.	
Magnitude	The magnitude is low due to the low volumes of actual emissions measured compared to the maximum allowable limits. The facility would need to engage in further expansion upgrades and point source installations to achieve the maximum allowable limits.	
Probability	The probability of the impact occurring and exceedances of the AEL limits is achieved is rated as low considering the current measured emissions.	

19.3.3 Fire and Safety Risk[6]

Kansai Plascon undertook a risk assessment to quantify the potential risks associated with their facility in 2019. This was required due to the storage of compounds that pose a potential fire and explosion risk. The compounds by themselves may not prove to be a particularly high risk, however, when stored in conjunction with each other and other infrastructure, the compounded effect may pose a risk to the facility occupiers as well as neighbouring areas. The outcome of such a risk assessment is therefore to confirm if the facility is classified as a Major Hazardous Installation (MHI) and to provide management measures to ensure that compounds are sorted or managed in such a way as to reduce or avoid any such risk. In this case, the following was identified and assessed:

- Bulk solvent storage (140 tons in underground storage vessels)
- Bulk resin tank (23 tonnes in above ground tanks)
- Smaller individually packaged olvents and flammable materials in the flammable store (up to 450 tonnes)
- Liquid Petroleum Gas (LPG up to 960 kg)

Risk is made up of two components namely the probability of a certain magnitude of hazardous event occurring and the severity of the consequences of the hazardous event should it occur. The methodology employed in assessment of the MHI is therefore as follows:

- Identifying the likely major hazards expected to be associated with the operation of the installation including the causes, consequences and effects.
- Quantifying the hazards in terms of their magnitude (release rate and duration).

[6] Portions of this section have been extracted from the MHI Risk Assessment conducted by iSHECon and portions may have been paraphrased or directly quoted.

- Quantifying the consequences of the hazards and the severity of the effects using dispersion, radiation and explosion modelling.
- Determining the lethality of the effects of the hazardous consequences.
- Quantifying the likely frequency of the hazardous events.
- Estimating the individual risks (the frequency at which an individual may be expected to sustain a given level of harm from the realisation of specified hazards) by combining the severity (lethality) and the likelihood of the various hazards.
- Estimating the societal risk (this is the relationship between the frequency and the number of people suffering from a specified level of harm in a given population from the realisation of specified hazards) by taking the surrounding population into account.
- Comparing risks with international acceptability criteria.
- Reviewing the suitability of the emergency plan and organisational measures in terms of the risks.
- Proposing measures to reduce or eliminate the risk where necessary.

This MHI risk assessment and report was conducted by a Department of employment and labour Approved Inspection Authority and complies with the requirements of SANS 1461:2018.

Due to the presence of hazardous materials on the Kansai Plascon site, as well as their associated potential offsite effects, the Kansai Plascon Port Elizabeth site was found to be in the risk categories to be classified as a major hazard installation. The 2022 findings, regarding the Axalta-Plascon modifications do not constitute an MHI as they are not expected to possibly generate accidents with catastrophic offsite impacts. The modifications only add marginally to the on-site risks. In addition, no known MHI declared facilities are within a range of the sites that could potentially lead to a greater domino effect. Therefore the risks are located to the site and immediate surroundings. The extent of the risk calculated in the specialist study, is shown in **Figure 18**.

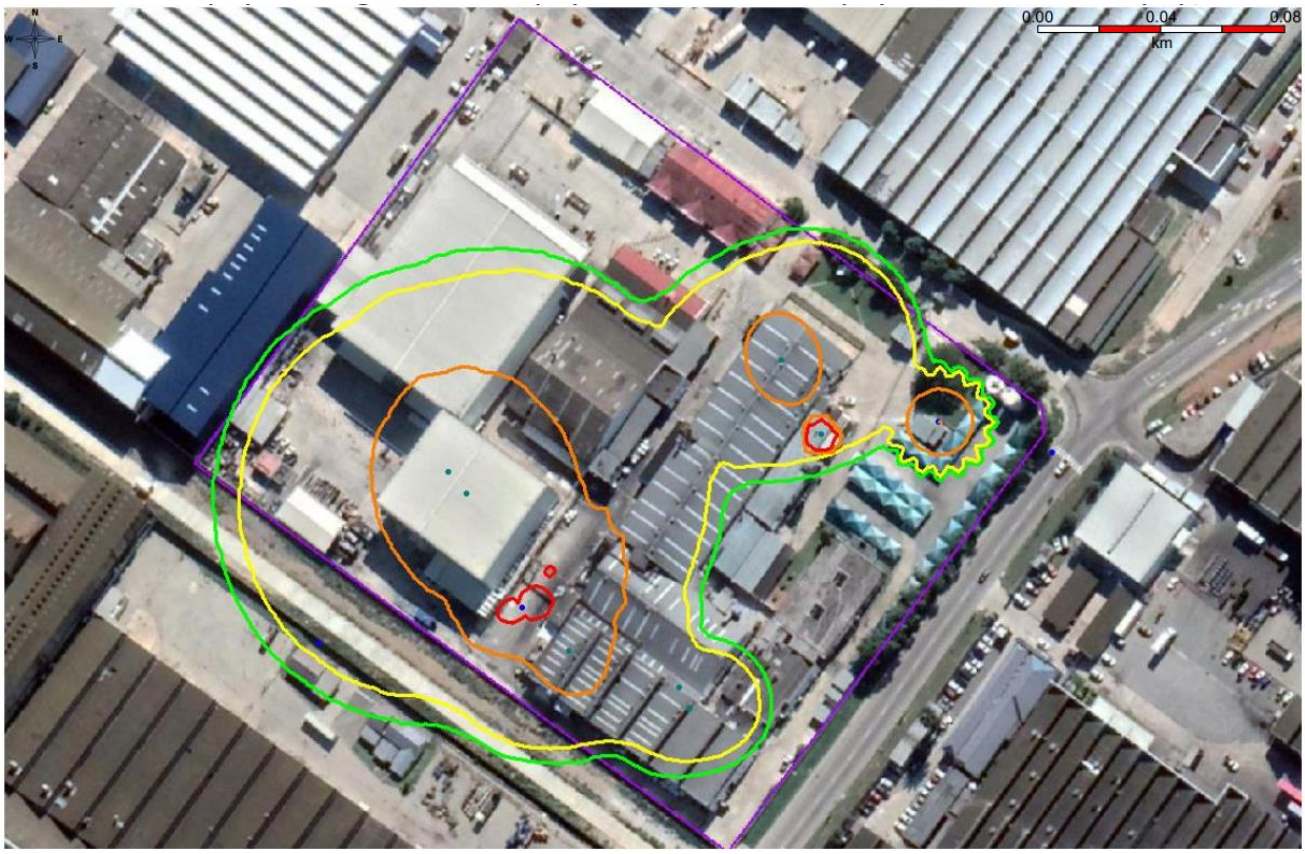


Figure 29: Individual Risk Isopleths for the Kansai Plascon Port Elizabeth Installation.

Figure 18 above shows the individual isopleths as found in the risk determination. The colouration indicates the levels of risk as calculated with red areas being the highest and the green areas but all mainly restricted to the site.

This assessment is limited to the amended AEL only, and therefore will assess the fire risk in terms of the additional expansion only and not the entire risk. However, the MHI risk assessment have confirmed that the risk, for the total complex, is acceptable. The fire and safety risk for the Kansai Plascon expansion is a negligible increase, however, considering that the facility is operating as a joint venture and will utilise the same AEL, the impact rating is provided for the entire complex in **Table 15**. Recommendations for mitigation is included for the entire facility as the improvements would benefit the combined complex.

Table 34: Fire and safety risk.

Criterion	Rating Comment	Mitigation Proposed
Extent	Restricted to site	- Consider including instructions to review major process safety hazards in the proposed MOC procedure. - Consider implementing scheduled inspections of offloading hoses. - Consider providing employees with training on the major hazards associated with the materials stored and handled at the facility. - consider erecting additional impact protection around the solvent pumps that are unprotected from vehicle traffic. - consider storing offloading hoses on dedicated cradles, off of the ground. Also, see organisational measures regarding offloading hoses above. - consider segregating certain hazardous materials from the general stacking area where mainly flammable liquids are stored. - consider removing all combustible materials that are stored within the LPG manifold caged area. - consider reviewing whether the total inventory of LPG cylinders could be reduced, based on cylinder turnover
Duration	Immediate, the impact will be an event that would occur and be very short-lived.	
Magnitude	High	
Probability	Low	

19.3.4 Other Operational Impacts

The highest impacts from the changes to the Kansai Plascon complex will be during the operations and mainly related to the increase in the production outputs that have a similar increase in production input materials and higher volumes of substances required.

Groundwater Quality: The existing facility undertakes storage of material underground. No new facilities are proposed and additional storage capacity will be provided in above ground storage within controlled areas. In this regard, the control measures in place, proposed by Kansai Plascon, includes above ground sumps and secondary containment to prevent spillages above ground from entering the stormwater and penetrate into subsoil layers.

Table 35: Rating inputs for groundwater quality.

Criterion	Rating Comment	Mitigation Proposed
Extent	Regional as the potential underground resources are used in the local municipal area.	- Provide secondary containment. - Regular maintenance and monitoring of infrastructure. - Include spills response equipment on site. - Ensure trained individuals are on site to implement emergency measures.
Duration	Any spill event will be short but may only be detected over time.	
Magnitude	Impact would be small due to the volumes and the nature of the storage containers in above-ground containers. Negative Impact	
Probability	The probability is rated as low.	

Waste Management: Additional waste are anticipated to result from the increase in production through waste containers and residue resulting from the process. The site currently produces ~ 81 000 kg of solid waste and ~173 000 kg of liquid waste per annum. All waste is store and collected by a waste contractor and the additional waste generated will follow this protocol.

Table 36: Waste generated during operations.

Criterion	Rating Comment	Mitigation Proposed
Extent	Regional as all waste disposals will be to the municipal resources.	- Further re-use of materials to reduce waste outputs. - Inclusion of waste generated into the current procedures for waste management. - Appointment of a reputable waste contractor to handle and dispose of waste in licensed facilities.
Duration	Waste will be generated for as longas the facility is operational.	
Magnitude	The magnitude is considered to be low due to the volumes produced and is not expected to increase substantially as a result of the changes. Negative Impact	
Probability	The probability of the impact is occurring is low due to the existing nature of the operations and volumes processed.	

Contributions to the local economy: The facility is based in Nelson Mandela Bay and serves the vehicle manufacturing industry which is a fundamental driving force of the local municipal and regional provincial economy with many of the biggest vehicle manufacturers globally having large production and assembly plants located within a 400 kilometre radius. The facility is moving a portion of their clearcoat production facility from the United States and locating production capacity in Nelson Mandela Bay which provides a small increase in local economic activity. It also fits into the production philosophy of the vehicle manufacturing industry in being able to supply within the Just-in-time principle operated under. This principle denotes that such large manufacturers only store what is needed on their premises, but rely on logistics to supply input materials to the manufacturing plant when needed. The Kansai Plascon complex therefore meets this requirement and further enhances its ability to participate in the local economy by having local production.

Table 37: Contributions to local economy rating.

Criterion	Rating Comment	Mitigation Proposed
Extent	Local municipal	- Adopt a policy of utilising local suppliers where practicable.
Duration	For the duration of the operations	
Magnitude	Low due to the fairly small values in relation to the current market of the area. Positive Impact	
Probability	Almost certain.	

19.3.5 Decommissioning Impacts

At present, the facility is enhancing and making chances to extend the life of the facility and continue serving the local market. However, should the facility stop production and be required to close, the following decommissioning impacts are anticipated (**it should be noted that these impacts are assessed in fulfilment of the legal requirements but in no way has it been observed at present**):

Site rehabilitation and remediation: The facility has been in operation for approximately 30 years, since 1990. Over this time, it is common for industrial sites, where VOCs and such chemicals form part of the production process to have latent pollution and potential active polluted areas not detected. This is particularly the case in areas such as this where industry is the dominant land use and pollution that may have resulted from other land users. Furthermore, the fact that the site has been in operation for more than 30 years, means it pre-dates certain environmental requirements commonplace today. Whilst it is not possible to make a determination on the status of the subsoil conditions on site, PDES have assessed this potential impact as a possible risk to be addressed in such an event and the impact would be related to removal of any areas deemed as a risk to the surroundings.

Table 38: Contributions to local economy rating.

Criterion	Rating Comment	Mitigation Proposed
Extent	Local municipal, remediation may require removal of soil and bulk earth moving.	- Explore the ability to remediate site features in-situ. - Adherence to operating procedures for handling and storage of chemicals. - Regular testing and maintenance of infrastructure to avoid spills/leaks.
Duration	Short term, once-off event.	
Magnitude	Moderate Negative Impact	
Probability	Possible due to the chemicals used and underground storage.	

19.3.6 Cumulative Impacts

The Nelson Mandela Bay Municipality requires a cumulative air quality impact assessment which includes industrial VOC emissions from all sources within a 5 km radius in addition to the VOC emissions from Kansai's site. In support of this requirement, NMBM provided stack details, flue gas details and measured VOC concentrations of four additional companies. These are:

-- BASF
-- Continental Tyres
-- Felltex

LAQS assumed that the information given was based on emission measurements. Where applicable, all are subject to the same emission limit that applies to the Kansai site operations.

Relevant information about stack details, flue gas details and VOC concentrations of three additional sources were provided by NMBM. For the sake of confidentiality, details of each stack are not listed in this report but were included in the emission database on which this air quality impact assessment is obtained.

19.3.7 Climate Change Impacts

VOCs have a limited contribution to climate change. In the context of this project, and the additional emissions measured and predicted, the overall impact on climate change will be insignificant.

19.4 Impact Statement

Based on the assessed impacts (**Table 20**) and the conclusions from specialists. The overall impacts that will occur will be of low significance with some measured to be moderate in nature. No specialist investigations or assessment outcomes resulted in high or unacceptable impacts and is the reasoned opinion of the EAP to issue an environmental authorisation for the amendment of the AEL.

Table 39: Impact Assessment outcomes, negative impact is denoted as red text and positive impact green text in the Impact Description coloumn.

Impact Description	Nature of Impact	Extent	Duration	Magnitude	Probability	Significance Pre Mitigation	Mitigation Proposed	Significance Post Mitigation
Construction Impacts								
Excavations on site	Dust release from excavations during construction. All excavations for sumps will take place within the existing buildings and is covered under roof.	1	1	2	2	Low	Ensure excavation areas are damp to reduce dust.	Insignificant
	Human health as a result of exposure to dust particulates generated within confined spaces.	1	1	4	5	Moderate	Enforce wearing of dust protective wear during excavations	Low
Waste management	Generation of construction waste.	3	4	2	6	Moderate	Disposal to licensed landfill site.	Moderate
Job creation	Additional temporary employment opportunities during construction.	2	2	2	2	Low	No mitigation proposed	Low
Operational Phase								
Groundwater quality	Contamination of groundwater from spills or leaks	4	3	2	3	Low	Implement controls and leak detection	Low
Emissions	VOC emissions from the operations	3	5	3	3	Moderate	Implement stack heights and controls	Low
Waste Management and Re-use	Products and input materials will generate small amounts of waste. The majority of input products will be re-used and recycled in the process. Poor management practices may lead to increased volumes of waste to me removed to landfill or stored on site.	1	5	1	2	Low	Ensure operating protocols are in place and adhered to.	Low
Fire and Safety Risk	The existing facility is considered to be a major hazard installation due to the nature and volumes of products stored on site. The additional substances required in the production process would need to be handled in a manner that takes this into account.	1	5	1	1	Low	Existing handling and storage protocols to be implemented.	Low
Contributions to local economy	The anticipated 4000 tons per year of clearcoat paint will be available to the local vehicle manufacturers in the region and local production contributes to the local economic activity.	3	5	1	5	Moderate	No mitigation is proposed.	Moderate
Decommissioning Phase								
Site rehabilitation and remediation	Waste generation from contaminated land and soils.	3	2	4	3	Low	On site rehabilitation and implementation of risk avoidance during life-span.	Low

3. CLIMATE CHANGE ASSESSMENT

Climate change issues must be considered as part of the EIA process Please consider the Climate Change guideline. EAP must determine:
a)The potential impact of climate change on society and the economy, whether the impact is negative or positive, considering that society needs to be at the centre of the proposed development;
b)The potential alternatives of the proposed development, alternatives that will have less impact on climate change (environment and generation of waste included), the society and economy;
c)whether, and to what extent, the proposed development will result in the release of greenhouse gas (GHG) emissions;
d)whether the proposed development is necessary to achieve long term decarbonisation goals;
e)the impact of the development on social, economic, natural and built environment that are crucial for climate change, adaptation and resilience;
f) the projected impact of climate change on proposed development; and surrounding environment, and implications for the development.
g)Explanation of how the impacts is likely to be exacerbated or minimised as result of climate change and what measures are likely to be implemented to accommodate and manage (adapt to) the anticipated worst scenario where applicable
h) whether, and to what extent, the impacts identified in (a) -(g) can be mitigated.

4. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Based on the assessed impacts (Table 20) and the conclusions from specialists. The overall impacts that will occur will be of low significance with some measured to be moderate in nature. No specialist investigations or assessment outcomes resulted in high or unacceptable impacts and is the reasoned opinion of the EAP to issue an environmental authorisation for the amendment of the AEL.

Alternative A (preferred alternative)

N/A

No-go alternative (compulsory)

If the activity does not proceed, the opportunity for further economic opportunities will be lost as this space is likely to be filled by other suppliers. The facility has relatively low environmental impacts compared to the ongoing economic benefits currently at play and that could be expanded with this development.

SECTION E. RECOMMENDATIONS OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	YES	NO
Is an EMPr attached?	YES	NO

The EMPr must be attached as Appendix F.

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

N/A

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

The following measures are proposed to manage and/or mitigate any potential impacts that may occur:

- Compliance
  - An agreement should be drafted whereby the parties take joint responsibility for compliance to the requirements and conditions of the EA and AEL.
- Dust emission during construction
  - Apply appropriate measures to control dust.
- Generation of Construction waste
  - Classification of waste anticipated into waste streams for identification of appropriate waste disposal facilities.
  - Removal of all waste generated to the appropriate registered waste site.
- Groundwater quality
  - Maintain monitoring regime to detect potential subsurface leaks.
  - Continue with regular pressure testing of underground storage tanks.
  - Implement an appropriate maintenance regime for all subsurface infrastructure.
- Emissions
  - Implement the design measures as per the air quality specialist study.
  - Conduct annual emission monitoring on the stacks and include the new stack measurements into the emissions monitoring plan.
- Waste management and re-use
  - Ensure appropriate spill mitigation and containment in re-use areas are in place.
- Fire and safety risk
  - The Kansai Plascon complex modifications need not be considered an MHI while part of the greater Plascon operating site. However, should Axalta separate out its operations from within the Plascon access controlled area, then the MHI status will need to be reviewed.
  - A copy of the MHI risk assessment should be available on the site at all times for inspection by the authorities.
  - The relevant authorities (i.e. local Fire and Emergency services, Provincial Department of employment and labour and National Department of Labour) should have been notified by Plascon after the 2019 MHI QRA. They need to

be re-notified by way of a copy of this updated risk assessment and SDSs, with a covering letter from Kansai Plascon Port Elizabeth.
    - Kansai Plascon Port Elizabeth should inform their Health and Safety Committee of the results of this risk assessment.
    - Implement the suggested improvements to the on-site emergency proceduresas per the MHI risk assessment.
    - Kansai Plascon Port Elizabeth should confirm that the local emergency services have an off-site emergency plan in place.
    - Given the tolerably low, provided ALARP risk levels, risk reduction measures should continue to be explored and implemented.
    - The Kansai Plascon Port Elizabeth facility could affect land-use planning. Land use planning restrictions apply within 45 m of the facility.
    - MHI Regulation 7 states that incidents and near misses have to be recorded and reported to the authorities. Kansai Plascon Port Elizabeth should comply with this regulation.
    - The MHI facility should be reassessed 5-yearly, (i.e. due 2024), or earlier if major modifications are made, the installations are expanded, or a major incident occurs.
- Decommissioning Impacts
    - At decommissioning, the relevant responsible party should conduct an investigation into the environmental risk at that time based on the regulations which may be appropriate.
    - The conditions of the EA and AEL should be transferred to any party upon change of ownership, sale of the facility where decommissioning will not take place.

SECTION F: APPENDICES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Comments and responses report

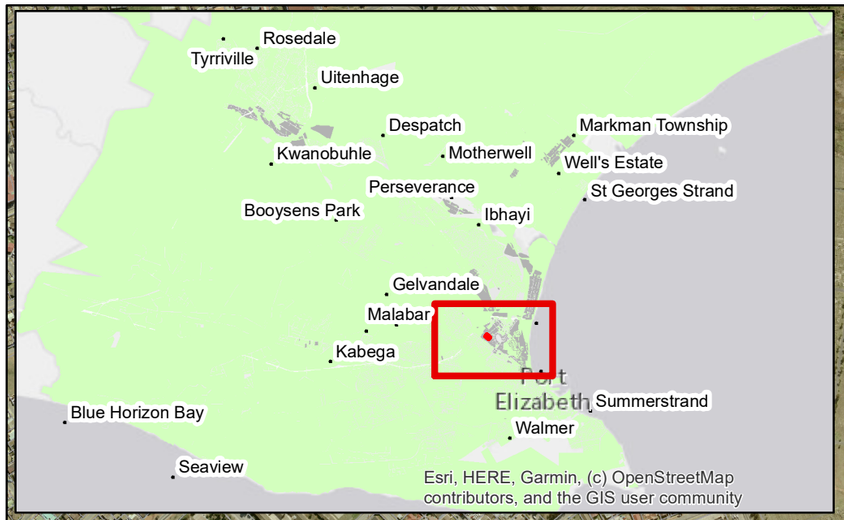
Appendix F: Environmental Management Programme (EMPr)

Appendix G: Other information

G1: EAP CV

Appendix A: Site plan(s)

SITE LOCALITY: AXALTA AND KANSAI PLASCON



Legend

- SCHOOL
- CHURCH
- CLINIC
- FIRE STATION
- LIBRARY
- POLICE

N

0 205 410 820

Meters

PROPORTIO DIVINA environmental services

TO COEGA

N2

LIVINGSTON HOSPITAL

TO BAYWEST

PLASCON SITE

STANFORD ROAD

KEMPSTON ROAD

Schauder Clinic

NORTH END LAKE

Appendix B: Photographs

Appendix C: Facility illustration(s)

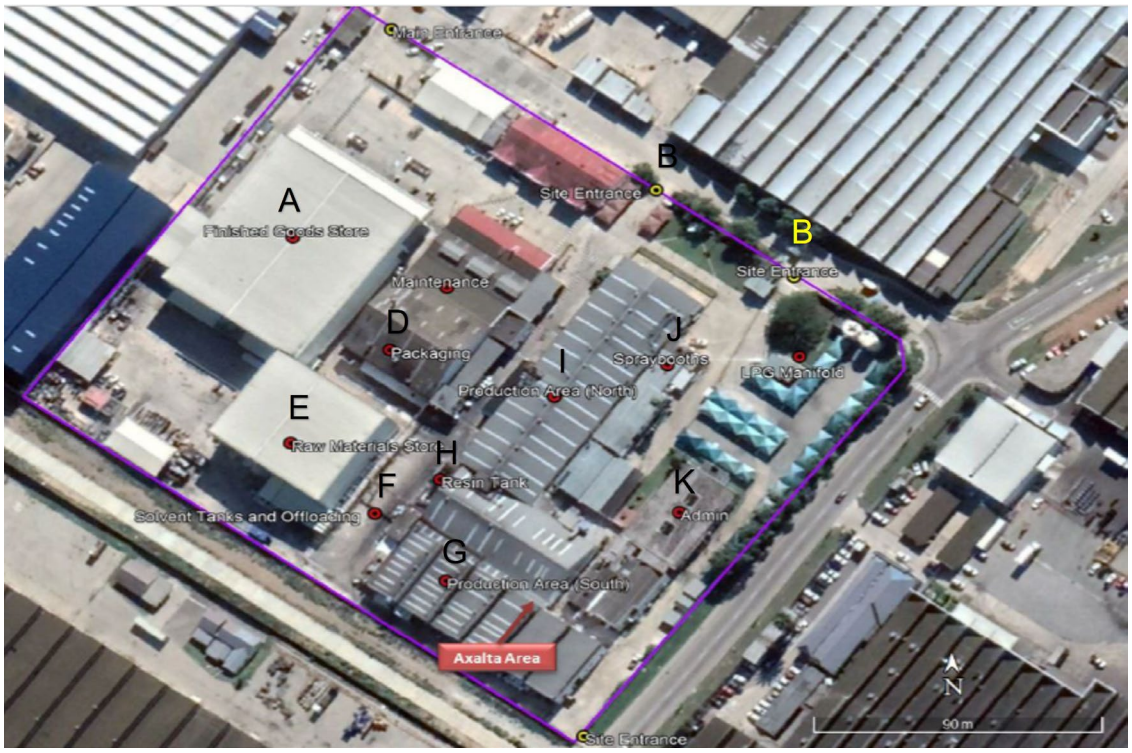


Figure 1: Existing site layout plan of the Plascon operated water-based facilities, where A is the Finished Goods store, B is the Site Entrance, C is Maintenance, D is Packaging, E is the Raw Material Store, F is the Solvent Tanks Offloading, G is the Production

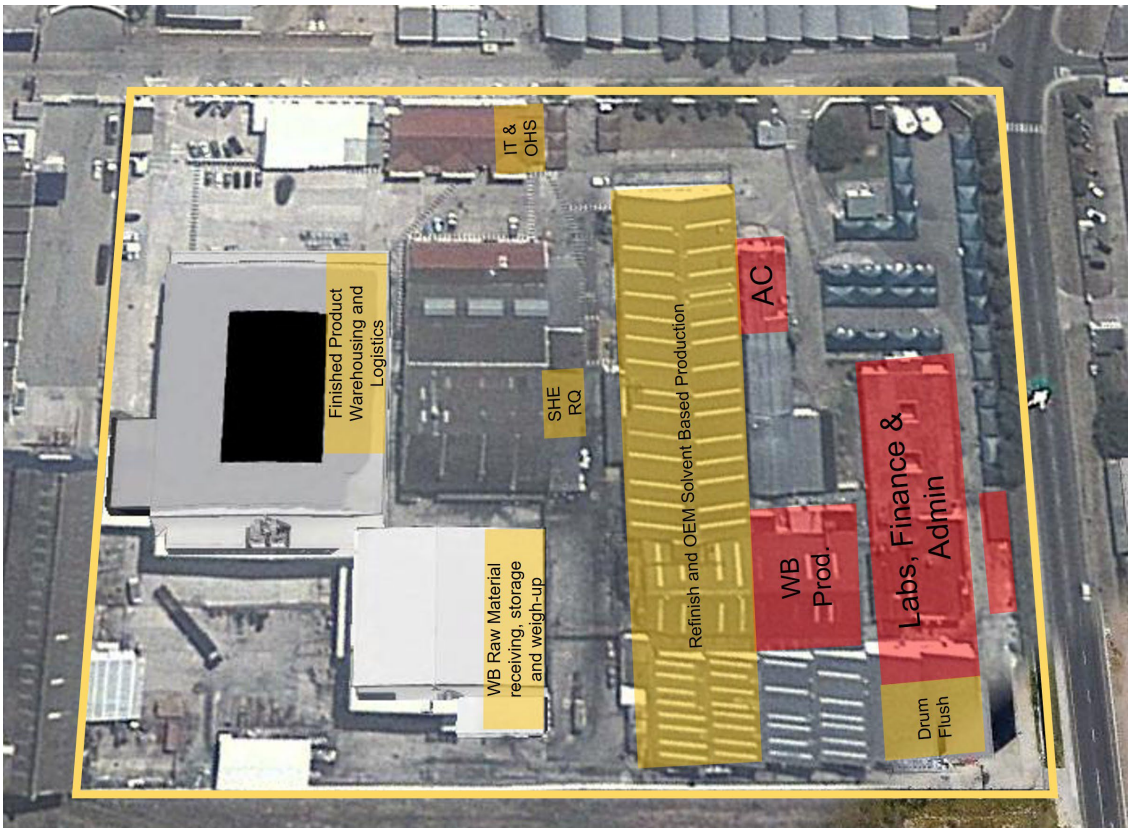


Figure 2: A revised site layout plan for the facility that will be changed to incorporate the production of solvent-based paint.

Appendix D: Specialist reports

AIR QUALITY IMPACT ASSESSMENT

AIR QUALITY IMPACT ASSESSMENT

Prepared for

Kansai Plascon (Pty) Ltd

FINAL REPORT, Revision 1

MAY 2023

By

C H Albertyn, Pr Eng

Lethabo Air Quality Specialists (Pty) Ltd
2018/109208/07

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Contents

AIR QUALITY IMPACT ASSESSMENT

1 INTRODUCTION

Axalata Plascon (Pty) Ltd (Axalta) manufactures a range of automotive surface coating materials in Gqeberha in the Eastern Cape and wishes to expand its operations by the addition of a clear-coat manufacturing process.

Axalta operates on the same premises as Kansai Plascon (Pty) Ltd (Kansai) and Kansai is the holder of environmental authorisation for all operations on the site. The nearest residential area is located approximately 350 metres south-west of Kansai's site.

Axalta's expansion entails a revision of Kansai's environmental authorisation and appointed Lethabo Air Quality Specialists (Pty) Ltd (LAQS) to lead them through the process. As the expansion is of sufficient size to warrant revision of Kansai's atmospheric emissions license (AEL), a revised environmental impact assessment is also required and LAQS appointed Proportio Divina (PD) to obtain the necessary environmental authorisation for the expansion of operations.

Kansai's process is included in the *List of Activities That Result in Atmospheric Emissions* as published in Government Notice 893 of 22 November 2013 (GN893). As part of Kansai's atmospheric emissions license (AEL) revision, an air quality impact assessment is required and this work will be done by LAQS.

Application for revision of the AEL will be submitted by LAQS to the relevant emissions licensing authority, i.e., the Nelson Mandela Bay Municipality (NMBM).

This report discusses the steps followed by LAQS to carry out the air quality impact assessment.

2 RELEVANT GOVERNMENT REGULATIONS

The following Government Regulations apply to this air quality impact assessment and are referred to in the report where applicable.

1 "*List of Activities That Result in Atmospheric Emissions*" as published in Government Notice 893 of 22 November 2018 (GN893), as amended

2 "*National Ambient Air Quality Standards*" as published in Government Notice 1210 of 24 December 2009 (GN1210)

3 "*Regulations Regarding Air Dispersion Modelling*" as published in Government Notice GN R.533 of 11 July 2014 (GN R.533)

LAQS modelled the dispersion of volatile organic compounds (VOCs) as emission limits have been specified in GN893. No official ambient air quality standards for total VOCs are included in GN1210. An annual average concentration of 5 µg/m^3 for benzene only is specified.

3 VOLATILE ORGANIC COMPOUNDS

Various definitions exists of the term “volatile organic compounds” (VOCs) and vary from country to country. According to Wikipedia, VOCs are “*organic compounds that have a high vapor pressure at room temperature. High vapor pressure correlates with a low boiling point, which relates to the number of the sample's molecules in the surrounding air, a trait known as volatility*”.

According to the USEPA, VOCs exclude carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, methane, ethane, butane, propane, etc.

In layman’s terms, VOCs are compounds that contain carbon atoms and that, at room temperature, easily evaporate.

4 PROCESS DESCRIPTION

Axalta produces automotive paint for the vehicle manufacturing industry which is a large economic driver in the Nelson Mandela Bay area. To date Axalta has only produced water-based paints, but plans to add a solvent-based clear-coat paint for the automotive industry. A production capacity of approximate 4 000 tons per year is planned.

The production process for the expansion results in solvent-based paints produced through mixing of several solvents and chemicals to produce the final product. The production process involves the following steps:

1 Receipt and storage of input materials (solvents, resins, and other chemicals).

2 Loading of mixing facilities with different volumes of ingredients.

3 Mixing of the combined substances by an operator.

4 Colouration and tinting of the product.

5 Testing of the product.

6 Filling of containers with approved product.

7 Storage and transportation of filled containers to clients.

The mixing process takes place in a series of tanks where substances are added sequentially. This stirring action, and the nature of the solvents and volatile chemicals result in the release of vapours that requires ventilation. The stirring process is manually controlled by the operator and the facility is equipped with a stack to vent vapours from the tanks.

Axalta Plascon therefore now seeks to amend the Atmospheric Emissions License operated by Kansai Plascon by utilising the existing processes on site and amending the emissions permitted.

The proposed facilities to be constructed and installed at the site will include the following:

-- The existing infrastructure on site will be re-purposed to allow for the expansion and a clearcoat manufacturing plant will be installed in the re-purposed areas.

-- This plant will have containment facilities in the form of a bund with a sump to control any spills and leaks that may occur during the manufacturing process.

-- To allow for ventilation and removal of vapours produced during the mixing process, a dedicated stack will be constructed.

-- To insulate some of the mixing tanks from vapours released, Axalta proposes to make use of nitrogen (due to its inert properties) as a barrier to prevent unwanted contamination of product mixes.

-- The provision of nitrogen to the required mixing area will be through a pipeline.

-- Tanks are cleaned using solvents and the resultant effluent are distilled on site for storage and re-use. The associated distillation, handling and storage facilities will form part of this expansion. These facilities are existing but will be expanded.

-- Facilities for the temporary waste handling and storage will be required for the resultant sludge that is produced in the cleaning process. These are existing facilities but the volumes will be increased.

5 ATMOSPHERIC EMISSION LICENSE REQUIREMENTS

As stated in Section 1, the processes involved on Kansai's site are included in GN893. The activity falls under the following category:

Subcategory 6: Organic Chemicals Industry

Description	The production, or use in production of organic chemicals not specified elsewhere including acetylene, acetic, maleic or phthalic anhydride or their acids, carbon disulphide, pyridine, formaldehyde, acetaldehyde, acrolein and its derivatives, acrylonitrile, amines and synthetic rubber. The production of organometallic compounds, organic dyes and pigments, surface-active agents. The polymerisation or co-polymerisation of any unsaturated hydrocarbons, substituted hydrocarbon (including vinyl chloride). The manufacture, recovery or purification of acrylic acid or any ester of 1 acrylic acid. The use of toluene di-isocyanate or other di-isocyanate of comparable volatility; or recovery of pyridine.		
Application	All installations producing or using more than 100 tons per annum of any of the listed compounds		
Substance or mixture of substances		Plant status	mg/Nm^3 under normal conditions of 273 Kelvin and 101.3 kPa
Sulphur trioxide (from sulphonation processes)	SO_3	New	30
Acrylonitrile (from processes producing and/or using acrylonitrile)	CH_2CHCN	New	5

Methylamines (from nitrogen- containing organic chemicals)	CH_5N	New	00
Total volatile organic compounds (thermal)	N/A	New	150
Total volatile organic compounds (non-thermal)	N/A	New	40 000

Table 1: Official Emission Limits for Organic Chemicals Industry

Of the pollutants listed, the emission limits for non-thermal process apply to Kansai, i.e. 40 000 mg/Nm^3.

6 DISPERSION MODELLING STUDY

The Department of Environmental Affairs moved to homogenise dispersion modelling in South Africa by publishing "*Regulations Regarding Air Dispersion Modelling*" in Government Notice GN R.533 on 11 July 2014 (GN R.533). Throughout this report mention is made of compliance with this set of Regulations.

The dispersion modelling study was carried out with evMan, a GIS-based emissions management software suite produced by Narsil AB in Sweden. The dispersion modelling component of the suite consists of the following four modules:

-- evMapper: A map manipulation tool
-- evEmissioner: An extensive, relational emissions data base
-- evMet: A meteorological data management program
-- evPlanner: The actual dispersion model

6.1 evMAPPER

evMapper is a digital map compiler. It is used to define GIS map sets to be used by all evMan GIS modules. It can import a variety of digital maps and structure the data in suitable forms, e.g. sheets, objects, etc.

It is the basis of the evMan GIS suite as it defines all co-ordinates for subsequent use by the various evMan modules.

4.2 evEMISSIONER

evEmissioner is a comprehensive, relational emissions data base that locates emission sources at fixed co-ordinates on the map compiled with evMapper. Sources are placed on the map by the user and the co-ordinates are automatically generated by evMapper.

evEmissioner can handle particulate and gaseous emissions from the following sources:

-- Point sources, e.g. industrial stacks

-- Area sources, e.g. landfill sites
-- Grid sources, e.g. complete informal settlement areas
-- Line sources, e.g. motor vehicle emissions

Of these, point sources apply to this air quality impact assessment.

6.3 evMET

evMet uses meteorological data collected at ground level to calculate meteorological data sets used in dispersion modelling studies. Of primary importance are those parameters that determine scaling of the boundary air layer. These are:

-- Wind speed
-- Wind direction
-- Standard deviation of wind direction
-- Temperature
-- Relative humidity
-- Solar radiation

These parameters are used by evMet to calculate all of the parameters, e.g. stability of the air boundary layer, mixing heights, climate sets, etc., which are required by Planner in calculating the dispersion of pollutants from a source.

6.4 evPLANNER

Planner is the dispersion module of the evMan suite and links with evMapper, evEmissioner and evMet to carry out dispersion modelling activities. It is designed to run simulations of air quality based on emission data created in evEmissioner for the following scenarios:

-- Hypothetical weather definitions, i.e. user-supplied information about temperature, wind speed, wind direction, cloud cover, etc.

-- True weather period, i.e. using recorded data from a weather monitoring station to simulate plume dispersion hour-by-hour over a defined period

-- Statistical weather period, i.e. using a pre-calculated sample of various weather conditions that typically occur during a year. This allows the creation of annual air quality maps for comparison against national guidelines and limit values.

Of these scenarios, the statistical period is applicable to the study of plume dispersion from Kansai's planned operations.

evPlanner makes use of three different dispersion models, two of which are aimed at motor vehicle emissions. The Aermod dispersion model is used for the purposes of calculating the dispersion of plumes from point, area and grid sources. Aermod is a USEPA-approved Gaussian plume dispersion model and is capable of simulating dispersion of pollutants over a distance up to approximately 50 km from the source.

Aermod is listed as an approved dispersion model in GN R.533.

6.5 INPUT DATA

6.5.1 evMapper

A bitmap of the area around the site was obtained from Google Earth® and imported into evMapper as a suitable multi-layer digital map of the area was not readily available.

The map covers an area of approximately 10 km x 6 km and is shown in Figure 1 below. For dispersion modelling purposes the area covered by the map was divided into a 25m x 25m grid.

The emissions data base (evEmissioner) links with the map and places emission sources on specific locations, as defined by the user.

Figure 1: Map covering 10 km x 6 km

The location of Kansai's site is indicated by a yellow border. Other sources included in this air quality impact assessment are indicated in yellow numbers 1 to 6 and these are:

-- 1 BASF
-- 2 Continental
-- 3 Felltex
-- 4 Auto-X
-- 5 Autocast
-- 6 Aberdare Cables

6.5.2 evEmissioner

Compulsory information for point sources is:

-- Height of stack
-- Internal diameter of stack
-- External diameter of stack
-- Flue gas temperature
-- Flue gas velocity
-- Height and width of adjacent structures that could influence the wind profile

Output units:

Given an input of tons per annum, the output of evPlanner is in units of micrograms per cubic meter ($\mu g/m^3$).

6.5.3 evMet

Eight years' hourly meteorological data collected in the Gqeberha region was procured by LAQS and imported into evMet. The dataset is complete and includes the necessary parameters required by evMet and is complete. Bad or missing data is less than 1% of the total data set.

6.5.4 evPlanner

Planner does not require any user input as it extracts data from evMapper, evEmissioner and evMet.

7 EMISSIONS

NMBM requires a cumulative air quality impact assessment which includes industrial VOC emissions from all sources within a 5 km radius in addition to the VOC emissions from Kansai's site.

In support of this requirement, NMBM provided stack details, flue gas details and measured VOC concentrations of four additional companies. These are:

-- BASF

-- Continental Tyres

-- Felltex

LAQS assumed that the information given was based on emission measurements. Where applicable, all are subject to the same emission limit that applies to the Kansai site operations.

7.1 KANSAI SITE EMISSIONS

Four stacks currently emit VOCs to atmosphere on Kansai's site. These are:

-- Bulk mix stack

-- Main factory stack

-- Premix stack

-- Solvent recovery stack

The expanded operations will allow the manufacturing of clear coat surface coverings. The operations will be of similar size to the existing main factory process with the result that the new stack will have similar dimensions and characteristics as the existing main factory process.

The Table below lists the relevant stack and flue gas details, as well as annual emission based on measured concentrations and based on the official emission limits. The latter is included as GN R.533 specifies that emissions must be based on emission limits for the purpose of calculating annual emission rates.

Parameter	Bulk mix	Main factory	Premix	Solvent recovery	Clear-coat(*)
Stack height, m	7	7	7	7	7
Stack diameter, m	0.5	0.68x0.95	0.8	0.6x0.25	0.68x0.95
Flue gas velocity, m/s	13.6	6.4	2.4	10.2	6
Flue gas temperature, °C	17.6	25.4	28.9	17.6	20
Volumetric flowrate, Nm^3/h	9 031	13 617	3 927	5 174	13 000
VOCs measured, mg/Nm^3	57.52	114.7	538.7	66.1	110
Total VOC emissions, tons per annum, measured data	0.74	2.23	3.02	0.49	2.04
Total VOC emissions, tons per annum, at AEL limits	516	778	224	296	743

(*): Estimated

Table 2: Stack and Emission Details

Total annual VOC emissions based on AEL limits are estimated to amount to 2 556 tons. Total emissions based on measured concentrations are estimated to amount to 8.5 tons per annum of which only approximately 4.2 kg consist of benzene (0.08%).

Some organic materials used on site are stored in four underground tanks. These compounds are acrylic resin, xylene and butyl acetate. Acrylic resin is stored in one XXXX m^3 tank, xylene in two XXX m^3 tanks and butyl acetate in one XXXX m^3 tank.

During normal operations, the compounds are withdrawn from the tanks and air is drawn into the tanks to prevent the build-up of vacuum. Emissions from the tanks only occur directly to atmosphere through the air vents when the stocks are replenished by offloading from tanker trucks. The air vents are located at ground-level and consist of 100 mm pipes fitted with quick-connect flanges. As such the vent pipes act as point sources.

Based on the assumption that the temperature of the underground tanks are stable at 20 °C, LAQS used the vapour pressures of the tanks' contents to calculate the saturation concentration of vapours inside the tanks, and which are expelled from the tanks during loading operations.

Annual emissions were calculated from the maximum quantities of the relevant compounds listed in Kansai's AEL and found to be 0.01 tons per annum. Maximum AEL quantities were used in keeping with the requirements of GN R.533, i.e. maximum possible emissions. The calculate emissions from the underground tanks are negligible when compared to total stack emissions based on emission limits.

7.2 OTHER VOC SOURCES

Relevant information about stack details, flue gas details and VOC concentrations of three additional sources were provided by NMBM. For the sake of confidentiality, details of each stack are not listed in this report, but were included in the emission database on which this air quality impact assessment is obtained.

Based on the information provided, LAQS summarised the following details:

Source	BASF	Continental	Felltex
No. stacks	20	1	9
Total VOC emissions, tons per annum, measured data	4.8	0.0063	0.089
Total VOC emissions, tons per annum, at AEL limits	30 070	766	10 432

Table 3: Stack and Emission Details, Other Sources

As can be seen from the two Tables, the measured concentrations of VOCs in all cases are very low when compared to the official emission limit of 40 000 mg/Nm^3.

Annual emissions are based on measured flue gas parameters, measured VOC concentrations and VOC emission limits, as specified in GN R.533.

7.3 OTHER INDUSTRIAL SOURCES

Kansai's site borders on, or is in close proximity of, the following large industries:

Autocast Ferrous: Steel foundry

Auto-X: Automotive lead/acid battery manufacturing

Aberdare Cables: Electrical cable manufacturing

None of these industries emit any VOCs and emissions consist mainly of particulate matter and inorganic acidic vapours. As a result these industries were excluded from this impact assessment.

8 RESULTS

LAQS modelled the dispersion of VOCs from all of the sources discussed in Section 7 under the following scenarios:

-- Dispersion of emissions from Kansai's site only.

-- Dispersion of emissions from all industrial sources, including Kansai.

For each scenario, LAQS estimated the ground-level concentrations under two conditions. Firstly, annual emissions based on AEL limits were included to show the expected maximum ground-level concentrations, should emissions from all stacks occur at the legal limit of 40 000 mg/Nm^3. This represents a worst-case condition. Secondly, annual emissions based on measured concentrations were included to show ground-level concentrations that can be expected during typical operations. This scenario shows "normal" or day-to-day operations.

The approach to the project was to determine annual average ground-level concentrations of VOCs as no short-term air quality standard for total VOCs is specified in GN1210. In addition, the maximum estimated ground-level concentrations were determined, as well as where these would occur.

All simulations were carried out for a receptor height of 2 metres above ground level and a plume dispersion period of 60 minutes. This simulation period ensured that very low winds, e.g. 1 m/s, would carry pollutants some distance from the plant.

The dispersion of pollutants from Kansai's planned operations is shown graphically in Figures 2 to 5 below.

Figures 2 and 3 respectively show the annual average ground-level concentrations of VOCs as a result of emissions from Kansai at AEL limits and at measured concentrations respectively.

Figures 4 and 5 respectively show the annual average ground-level concentrations of VOCs as a result of emissions from all sources, including Kansai at AEL limits and at measured concentrations respectively.

In addition to the various graphic results, results are summarised in tabular format in Table 4.

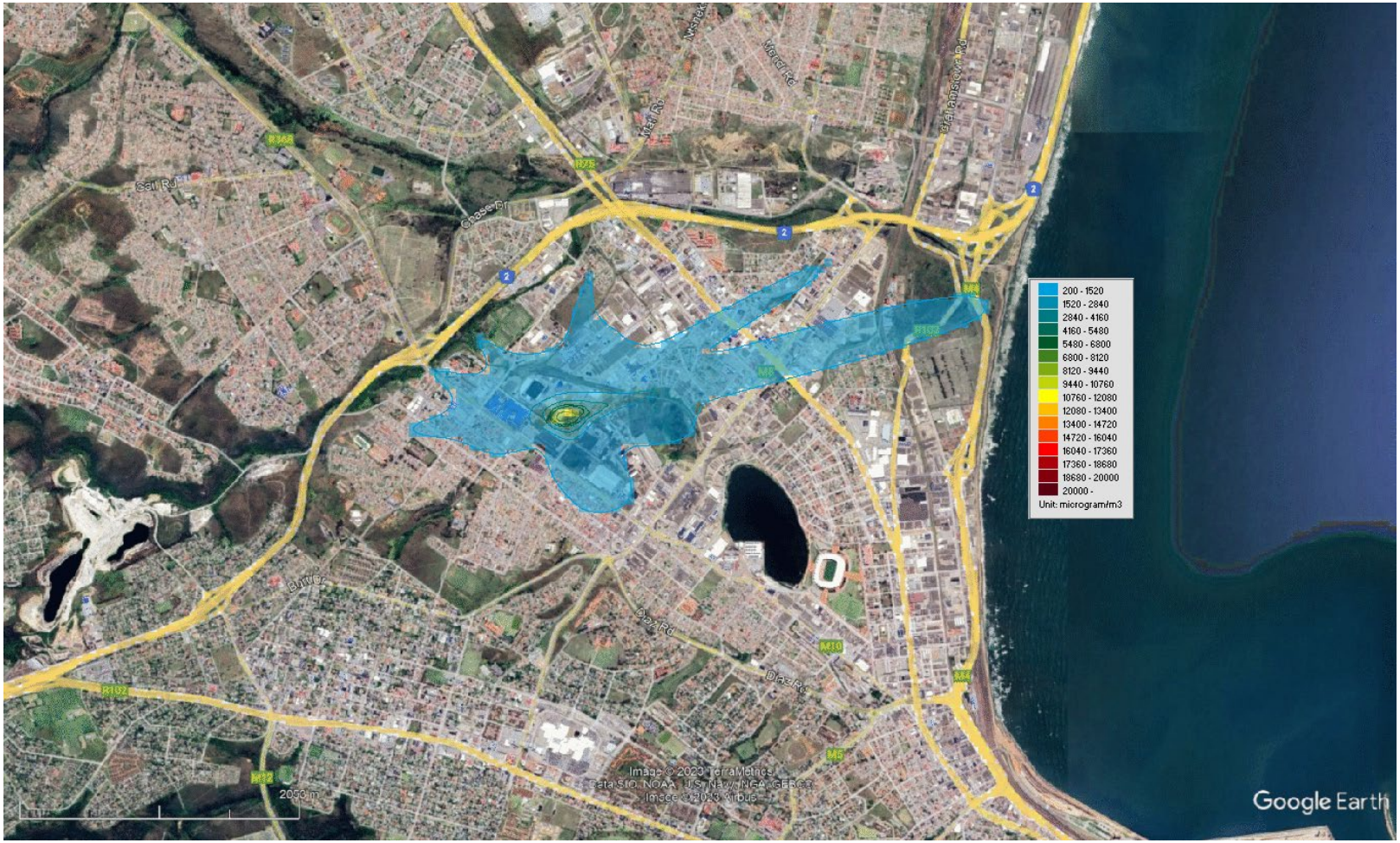

Figure 2: Annual Average VOC Concentrations, Kansai sources at AEL limits
Maximum scale is 20 000 µg/m^3 (20 mg/m^3); no air quality standard for VOCs

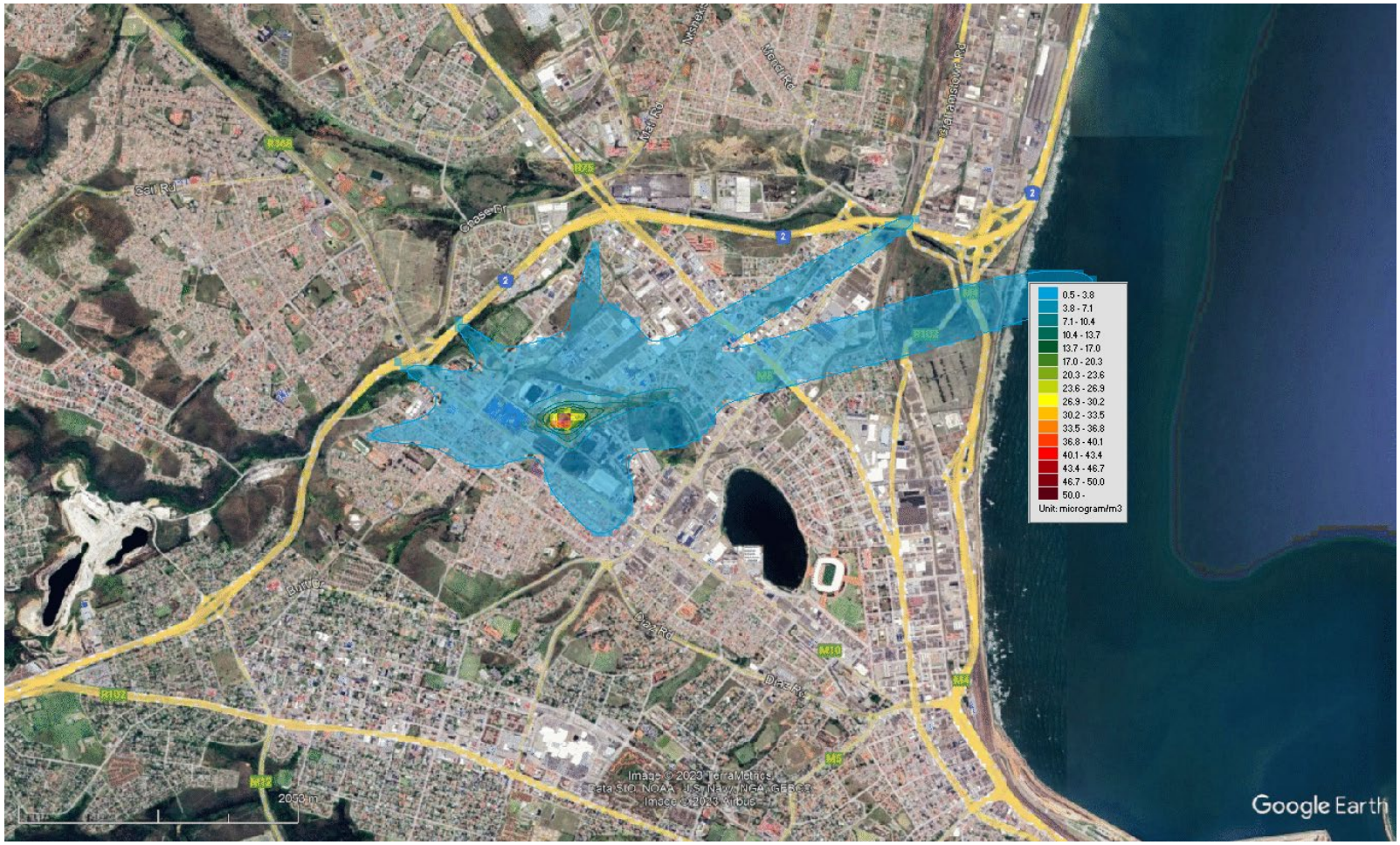

Figure 3: Annual Average VOC Concentrations, Kansai sources at measured concentrations
Maximum scale is 50 µg/m^3; no air quality standard for VOCs

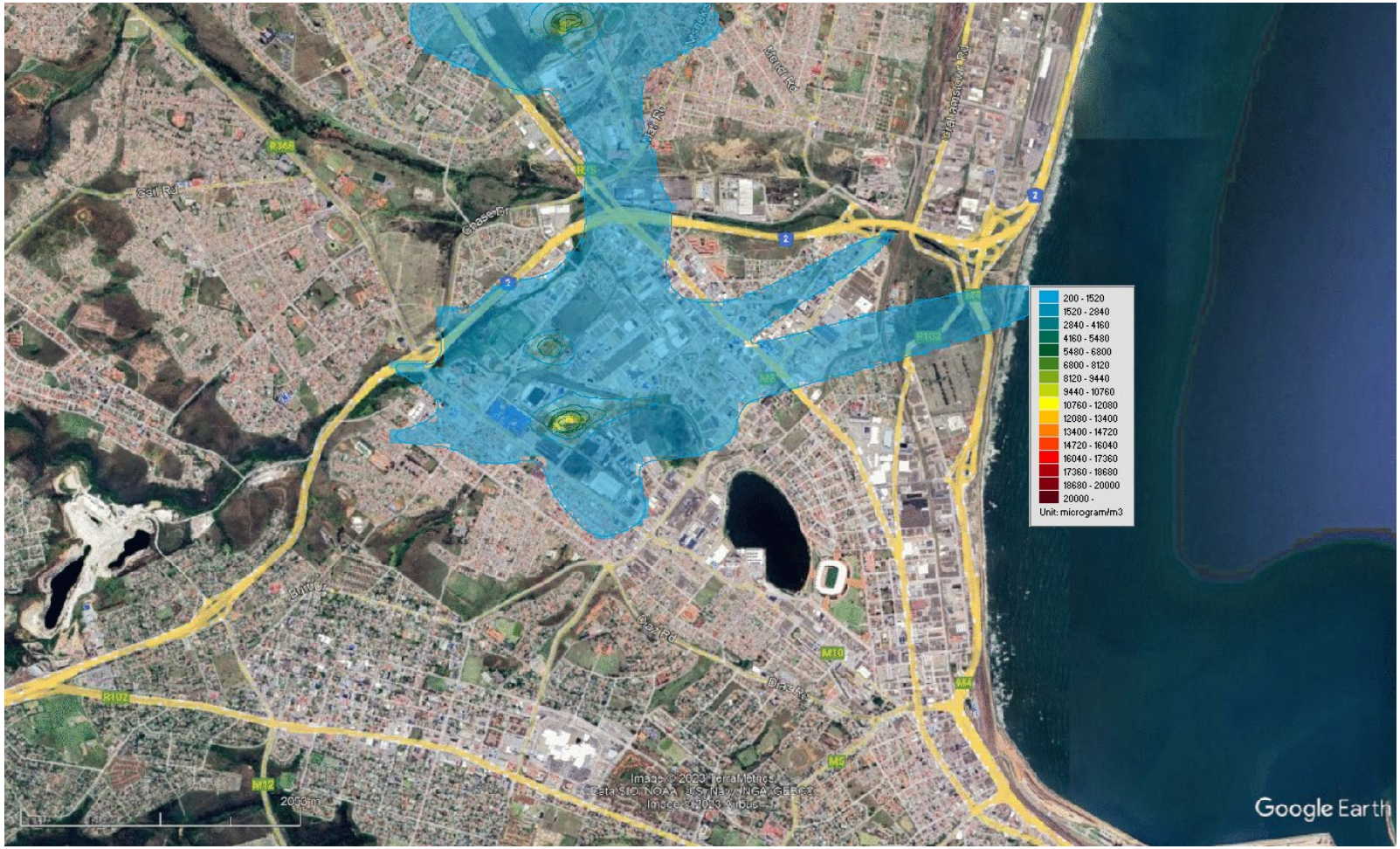

Figure 4: Annual Average VOC Concentrations, all sources at AEL limits
Maximum scale is 20 000 µg/m^3 (20 mg/m^3); no air quality standard for VOCs

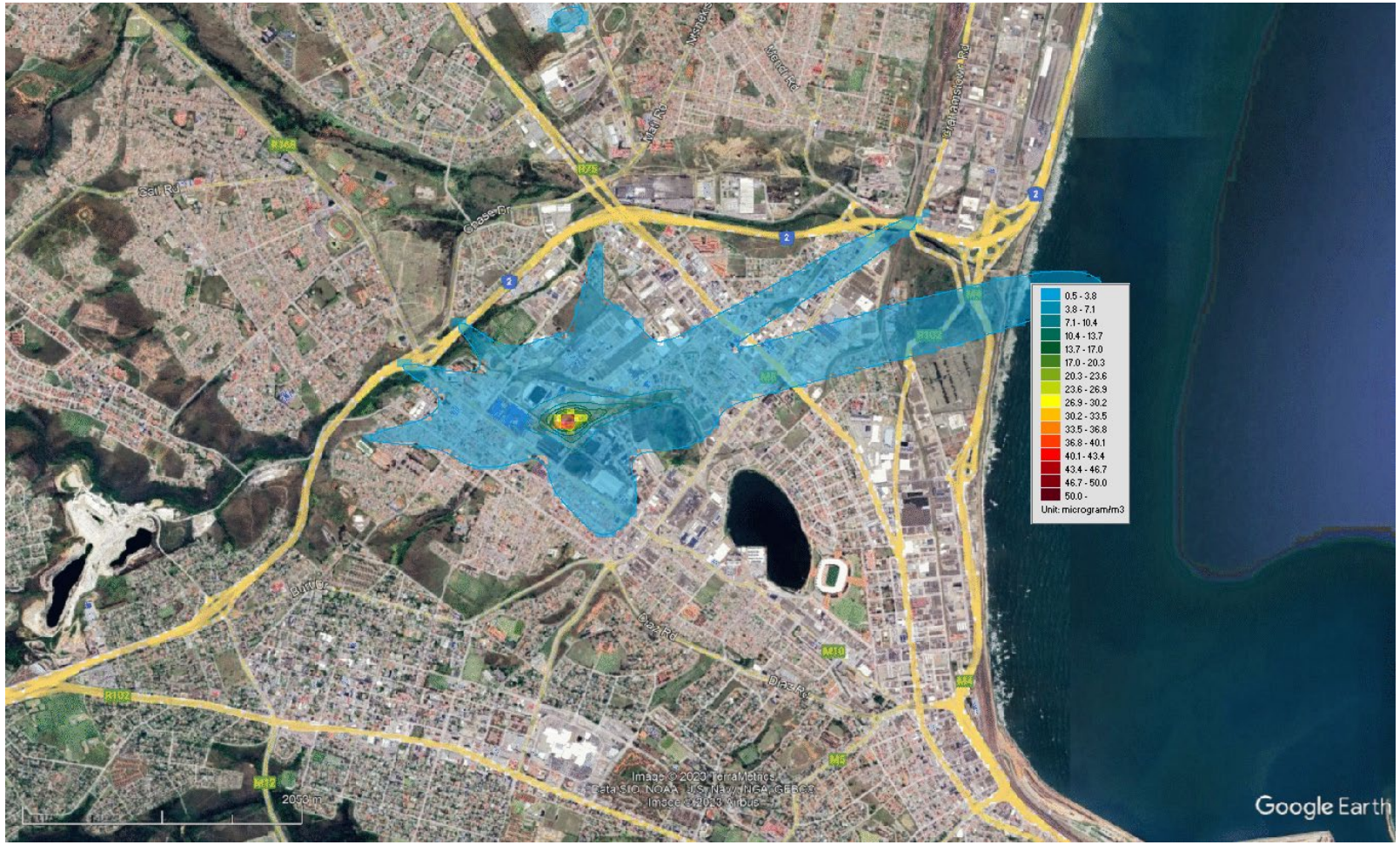

Figure 5: Annual Average VOC Concentrations, all sources at measured concentrations
Maximum scale is 50 µg/m^3; no air quality standard for VOCs

8.1 SUMMARISED RESULTS

Estimated ground-level concentrations are listed in Table 4 below.

	Maximum Concentrations	
	Kansai only	All sources
Location	On Kansai site	
VOCs at AEL limits, µg/m^3	14 610	14 770
VOCs as measured, µg/m^3	61.2	61.2

Table 4: Results Summary

9 IMPACT ON OVERALL AIR QUALITY

Ambient air quality standards for some pollutants were published by the Department of Environmental Affairs (DEA) in Government Notice No. 1210 on 24 March 2009 (GN1210). However, GN1210 does not include an air quality standard for total VOCs, but for benzene only. Benzene is one of the many organic compounds that fall under the general definition of "VOCs" and its air quality standard is:

-- Annual average: 5 µg/m^3, no exceedances

The estimated ground-level concentrations at the proposed operations is discussed in the various sections below.

9.1 KANSAI OPERATIONS

Should emissions occur at the legal limit defined by GN893, the highest annual average concentration of VOCs is estimated to be 14 610 µg/m^3. This estimated maximum annual average concentration will occur on Kansai's property.

At the measured concentrations listed in Table 2, the highest annual average concentration of VOCs is estimated to be 61.2 µg/m^3 and this estimated concentration will occur on Kansai's property.

Please see Section 10 below.

9.2 ALL SOURCES

Should emissions from all sources included in this study occur at the legal limit defined by GN893, the highest annual average concentration of VOCs is estimated to be 14 770 µg/m^3. This estimated maximum annual average concentration will occur on Kansai's property.

Should all emissions occur at the measured concentrations listed in Table 2, the highest annual average concentration of VOCs is estimated to be 61.2 µg/m^3 and this estimated maximum annual average concentration will occur on Kansai's property.

Please see Section 10 below.

9.3 BENZENE EMISSIONS

Unfortunately, speciated VOC concentrations are only available for Kansai's operations and the total benzene emissions have been calculated to be 403 grams per annum.

The fraction of benzene in the measured VOCs at Kansai's site was found to be 0.08% of total VOCs. Should this fraction also apply to the VOC emission limits, the maximum annual average ground-level benzene concentration is estimated to be 9.1 µg/m^3, i.e. over the ambient air quality standard of 5 µg/m^3.

At the measured benzene concentrations, the maximum annual average ground-level concentration is estimated to be 0.044 µg/m^3, i.e. negligible when compared to the ambient air quality standard.

As no speciated VOC results are available from the other sources included in this study, a similar interpretation of ground-level benzene concentrations cannot be done for all sources included in this study.

As the maximum concentration occurs in an industrial are, the occupational health impact should also be considered.

The United States of America's Occupational Safety and Health Administration (OSHA) specifies a benzene time-weighted average (TWA) threshold limit value (TLV) for many air pollutants. The TWA limits is for an 8-hour workweek and five working days per week.

OSHA's TLV-TWA for benzene is 1 ppm. This is equivalent to a concentration of approximately 3.2 mg/m^3 at 25 °C, or 3 200 µg/m^3. This TLV-TWA is well in excess of the level of 9.1 µg/m^3, which is based on the assumption that emissions occur at AEL limits with a benzene fraction of 0.06%. and all emissions consist of benzene.

10 DISCUSSION

10.1 MODEL RELIABILITY

The results of any computer model are only as reliable as the quality of the input data.

10.1.1 evEmissioner

As stipulated in GN R.533, the concentrations of all pollutants included in this study were calculated from official emission limits, as well as emission measurements conducted on the various stacks.

It must be borne in mind that the flue gas parameters and VOC concentrations were based on one set of emission measurements at each site only. The measured parameters are subject to change from day-to-day and year-to-year with the result that the calculated annual emission will vary accordingly.

Table 3 shows that the total annual VOC emissions from BASF's operations at AEL limits are substantially higher than those from Kansai, but the dispersion model predicts that the

maximum ground-level concentrations are dominated by emissions from Kansai's site. These maximum concentrations are expected to occur on Kansai's property.

This is due to the fact that BASF emits VOCs continuously for 24 hours per day, seven days per week and for 330 days per year, i.e. a total of 7 920 hours per year. Kansai's emissions occur for only 6 hours per day and 238 days per year, i.e. a total of 1 428 hours per year.

Furthermore, at measured concentration, total annual emissions from BASF are estimated to be 4.8 tons per annum while the equivalent emissions from Kansai are estimated to be 8.5 tons. As a result, the hourly VOC emissions from BASF are 0.6 kg/hour while the emissions from Kansai are 6.0 kg/hour, thus causing a higher impact at Kansai's site.

10.1.2 evMet

The meteorological data assembled by LAQS is comprehensive with no gaps in the data. It contains all of the necessary parameters required and LAQS is of the opinion that a reliable meteorological data set could be compiled. The distribution of winds in the Gqeberha region is shown graphically in Figure 8 below.

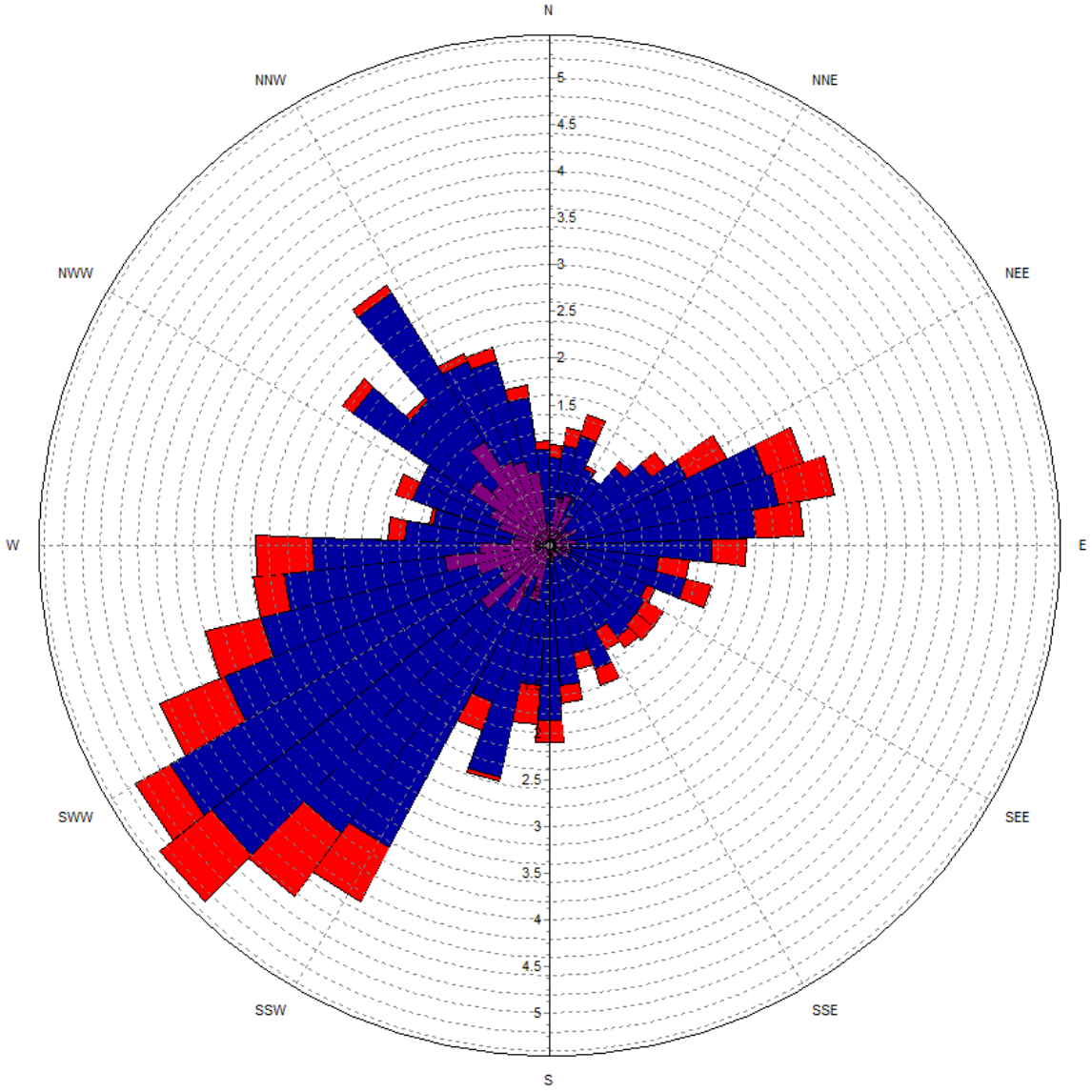

Figure 8: Frequency of Wind Direction

10.1.3 Planner

As was stated previously, the user provides no direct data input to Planner. It uses Aermod, a USEPA-approved Gaussian plume dispersion model, and there is no reason to doubt the reliability of the dispersion calculations. Aermod is also listed as an approved plume dispersion model in GN R.533.

10.1.4 Impact of surrounding structures

Where possible, the dimensions of the adjacent structures were incorporated in the emission database so that proper building downwash conditions were included in the simulation.

11 RECOMMENDATIONS

11.1 AEL RECOMMENDATION

It is recommended that the revision of Kansai's atmospheric emission license (AEL) is approved as the impact of actual emissions from Kansai's operations are low.

11.2 EMISSIONS QUANTIFICATION

LAQS is of the opinion that no continuous emission monitoring equipment will be required to monitor the emissions from Kansai's various stacks, but that emissions should be verified by a reputable and independent contractor at least on an annual basis, as required by GN893. All results obtained over time should then be used to calculate more representative average pollutant emission values for each stack.

Care should be exercised that these annual emissions verification tests are conducted strictly according to the emission methods listed in Annexure A, "*Methods for Sampling and Analysis*", to GN893 as results thus obtained will be representative, reliable and defendable, albeit applicable to measurements over a very short period only.

11.3 STACK DIMENSIONS

No changes to the dimensions and configuration of Kansai's stacks are recommended, even though the heights of the stacks are marginally higher than the height of surrounding buildings.

Increasing the stack heights is a future option, should emissions increase to the point where the ground-level benzene concentration approximates the ambient air quality standard of 5 µg/m^3. Currently, the ground-level concentration of benzene is estimated to be well below the air quality standard.

MAJOR HAZARD INSTALLATION

iSHEcon
CHEMICAL PROCESS SAFETY ENGINEERS

MHI RISK ASSESSMENT
INTERIM UPDATE FOR PROPOSED 3rd PARTY ON EXISTING MHI SITE
KANSAI PLASCON
PORT ELIZABETH FACILITY

REPORT:	**MAJOR HAZARD INSTALLATION RISK ASSESSMENT INTERIM UPDATE FOR THE PROPOSED AXALTA FACILITIES WITHIN THE EXISTING THE KANSAI PLASCON PORT ELIZABETH FACILITIES**
ASSIGNMENT NO:	J3251M
INSPECTION DATE:	12 August 2019
REPORT DATE:	19 September 2022
VALID TILL:	11 August 2024
SITE VISIT, CALCULATIONS, REPORT: **Telephone:** **Email:**	Allison Gird 011 9977 978 girda@ishecon.co.za
TECHNICAL SIGNATORY: **Telephone:** **Mobile phone:** **Email:**	Debra Mitchell 011 9977 976 082 428 8844 mitchelld@ishecon.co.za
CLIENT:	Kansai Plascon (Pty) Ltd
INSTALLATION REPRESENTATIVE: **Phone:** **Email:**	Anele Mesani +27 41 401 1400 AMesani@KansaiPlascon.co.za
PHYSICAL ADDRESS:	4 Bedford Street, Neave Township, Port Elizabeth, 6001
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Email: mitchelld@ishecon.co.za
CK 99/29022/23 VAT 4800182422

REPORT ADMINISTRATIVE RECORD

LIST OF ASSESSMENTS

Assessment	Rev. No.	Report Date	Description
Original	0	18 October 2019	J2597M - DRAFT MHI Risk assessment report issued by ISHECON.
Original	1	28 October 2019	J2597M - FINAL MHI Risk assessment report issued by ISHECON.
Original	2	6 November 2019	J2597M - FINAL MHI Risk assessment report issued by ISHECON – Rev 2
Interim Update	1	19 September 2022	J3251M - FINAL MHI Risk assessment report issued by ISHECON.

CONTRIBUTORS

The validity, results and conclusions of this assessment are based on the expertise, skills and information provided by the following contributing team members who are responsible for the design, operation and maintenance of the plant and equipment:

NAME	ORGANISATION	DISCIPLINE
Anele Mesani	Kansai Plascon	SHERQ Manager
Monde Mhletywa	Axalta Plascon	Project Manager
Raman Penja	Kansai	Kansai EHS

NOTIFICATIONS

(Notifications to be done by client in terms of regulation 3)

NAME OR DESIGNATION	ORGANISATION
Chief Fire Officer – Mr. Godfrey Gelderbloem	Sidwell Fire Station 4 Cadle Road Sidwell Port Elizabeth Tel – 041 508 5600
Chief Director, Provincial operations - Bheki Gama	Department of Labour (Eastern Cape) 3 Hill Street, East London, 5201
Specialist Major Hazard Installations - Rachel Aphane	Major Hazard Installations Department of Labour Private Bag X117, Pretoria, 0001

MHI CLASSIFICATION

The site is classified as a Major Hazard Installation.

DISCLAIMER

Note that, although every effort has been made by ISHECON to obtain the correct information and to carry out an appropriate, independent, impartial and competent study, ISHECON cannot be held liable for any incident which directly or indirectly relates to the work in this document and which may have an effect on the client or any other third party.

CONFIDENTIALITY

All information, results and findings will be kept confidential and will not be distributed to other parties except with the expressed permission of the client. The exception to this confidentiality being the requirement from the Department of employment and labour for Approved Inspection Authorities to inform them every month of the Risk Assessments conducted under accreditation. As Approved Inspection Authorities for the Department of Labour, I*SHE*CON is also under legal obligation to the Department of employment and labour to report any obvious violations of the OHS Act.

RISK ASSESSMENT APPROVAL

This report is approved for issue by the undersigned Technical Signatory as per the ISHECON - Approved Inspection Authority – Appendix 2.1.

NAME	CAPACITY	FINAL REPORT DATE	SIGNATURE
A. Gird	Site visit, Calculations Report preparation:	19 September 2022	
D.C. Mitchell	Technical signatory:	19 September 2022	

EXECUTIVE SUMMARY

Kansai Plascon operates an automotive paint manufacturing facility in Neave Township in Port Elizabeth. Hazardous materials stored on the site include bulk solvents (up to 140 tonnes in underground tanks), a bulk resin tank (23 tonne aboveground tank), smaller packaged solvents and flammable materials in a flammable store (up to 450 tonnes) and a 48 kg LPG cylinder manifold (up to 960 kg of LPG in total). ISHECON was contracted in 2019 to carry out a Major Hazard Installation (MHI) risk assessment, due to the storage and handling of the abovementioned materials. Plascon have embarked on a localization project which involves Axalta-Plascon (Pty) Ltd converting part of the current Plascon operated water based facilities to an Axalta operated solvent based installation. This document summarizes the interim update of the Plascon site Major Hazard Installation Risk Assessment from the Axalta modifications in 2022.

2. METHODOLOGY

Risk is made up of two components:

- The probability of a certain magnitude of hazardous event occurring.
- The severity of the consequences of the hazardous event.

The risk assessment therefore includes the following:

- Identifying the likely major hazards expected to be associated with the operation of the installation including the causes, consequences and effects.
- Quantifying the hazards in terms of their magnitude (release rate and duration).
- Quantifying the consequences of the hazards and the severity of the effects using dispersion, radiation and explosion modelling.
- Determining the lethality of the effects of the hazardous consequences.
- Quantifying the likely frequency of the hazardous events.
- Estimating the individual risks[1] by combining the severity (lethality) and the likelihood of the various hazards.
- Estimating the societal risk[2] by taking the surrounding population into account.
- Comparing risks with international acceptability criteria[3].
- Reviewing the suitability of the emergency plan and organisational measures in terms of the risks.
- Proposing measures to reduce or eliminate the risk where necessary.

This MHI risk assessment and report was conducted by a Department of employment and labour Approved Inspection Authority and complies with the requirements of SANS 1461:2018.

2. FINDINGS

Consequence Analysis and MHI Classification

- Due to the presence of certain hazardous materials and their associated offsite effects the Kansai Plascon Port Elizabeth site should be classified as a major hazard installation.

- The Axalta-Plascon modifications do not constitute an MHI as they are not expected to possibly generate accidents with catastrophic offsite impacts. The modifications only add marginally to the on-site risks.

[1]The frequency at which an individual may be expected to sustain a given level of harm from the realisation of specified hazards.
[2] This is the relationship between the frequency and the number of people suffering from a specified level of harm in a given population from the realisation of specified hazards.
[3]A standard or a norm.

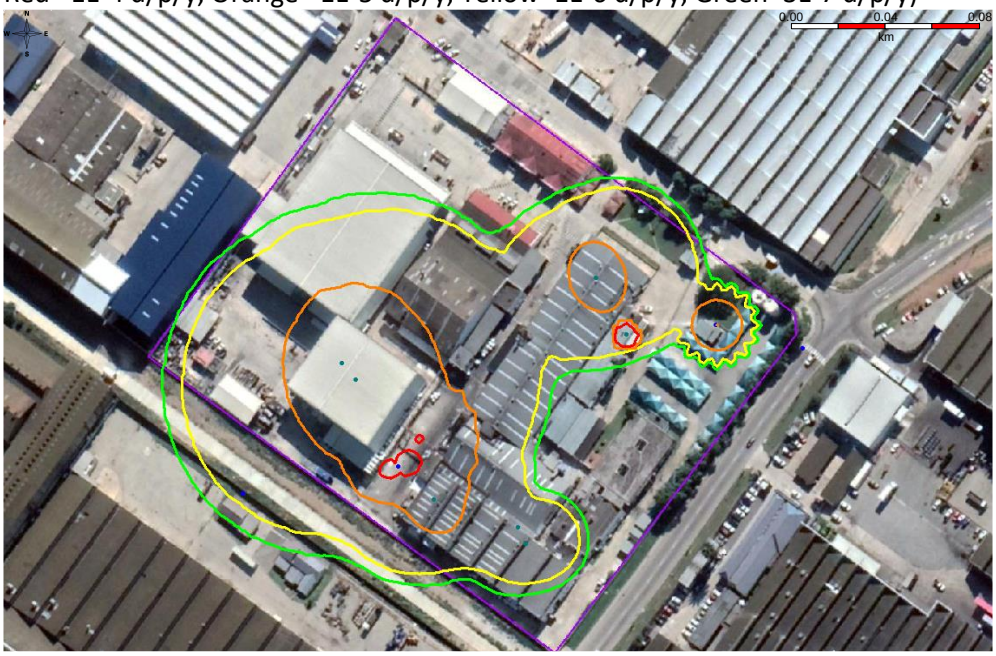
- The following installations within the Kansai Plascon Port Elizabeth have been found to be MHI installations:

Installation	Worst case incident	Distance To 1% lethality (m)
Bulk solvents (e.g. toluene)	Road tanker rupture	33
Drummed solvents	Raw materials store pool fire	74
Nitrocellulose	Detonation of pallet	68
LPG	Manifold rupture	59

- There are no known declared Major Hazard Installations in the vicinity within the domino effect range of worst-case events (55 m), therefore offsite domino effects are not a major concern.

Risks

- **Individual Risk Isopleths for the Kansai Plascon Port Elizabeth Installation**
  Red= 1E-4 d/p/y, Orange= 1E-5 d/p/y, Yellow=1E-6 d/p/y, Green=3E-7 d/p/y)



- Risk levels to individuals near the facility can be summarised as follows:

  - Onsite risk (employee risk): **tolerably low, provided ALARP** (i.e. Risk<$1*10^{-3}$ and >$1*10^{-5}$ deaths/person/year). Risk to employees are highest at the bulk solvent offloading area.

  - Offsite risk at the site boundary (risk to neighbours): **tolerably low, provided ALARP** (i.e. Risk<$1*10^{-4}$ and >$1*10^{-6}$ deaths/person/year). Risk to the public at the site boundary is highest near the southern site boundary.

  - Risks are broadly acceptable beyond ±30 m from the site boundary.

- Risk reduction should be explored by Kansai Plascon. The following organisational risk reduction suggestions have been made in section 9.1 of this report:

Aspect	Element	Review evaluation	Recommendation
Safety Documentation	Change / Modification control procedure	MOC procedure is currently being implemented.	Plascon could consider including instructions to review major process safety hazards in the proposed MOC procedure.
	Management of change procedure includes specific instructions for review of major process safety hazards.		
Integrity assurance	Loading hoses and arms inspected and tested	Currently not done. Hoses are replaced only if leaking. Offloading done by gravity, relatively low pressure.	Plascon could consider implementing scheduled inspections of offloading hoses.
Operator reliability	Major hazard awareness training program	Currently not done.	Plascon could consider providing employees with training on the major hazards associated with the materials stored and handled at the facility.

- The following technical risk reduction suggestions have been made in section 9.2 of this report:

Plant Area	Risk mitigated	Risk reduction suggestion
Solvents offloading area	Pipe or pump ruptures or leaks due to impact damage.	Plascon could consider erecting additional impact protection around the solvent pumps that are unprotected from vehicle traffic.
	Hose ruptures or leaks.	Plascon could consider storing offloading hoses on dedicated cradles, off of the ground. Also, see organisational measures regarding offloading hoses above.
Raw materials store	Fires and explosions within the store.	Plascon could consider segregating certain hazardous materials from the general stacking area where mainly flammable liquids are stored. For example: 1. Nitrocellulose, which could detonate if heated by an external fire, should ideally not be stored in between flammable liquids. 2. Class 6 (toxic) materials should ideally not be stored in between flammable liquids, as a fire could generate highly toxic smoke. Plascon could consider referring to SANS standard “SANS 10263-0:2017, The warehousing of dangerous goods” for further guidance.
LPG manifold	External fires impinging on LPG cylinders.	Plascon could consider removing all combustible materials that are stored within the LPG manifold caged area.

	Likelihood of cylinder failures and consequences of manifold failures.	Plascon could consider reviewing whether the total inventory of LPG cylinders could be reduced, based on cylinder turnover. Reducing the amount of cylinders present on the site, or the quantity of cylinders connected to the manifold at a time could reduce the consequences and likelihood of an LPG release.
	Rubber hose failures.	Plascon could consider inspecting the rubber hoses connecting the cylinders to the manifold, or replacing the hoses on a schedule, based on the mean time to failure.

- Societal risks are **tolerably low, provided ALARP**. The maximum number of fatalities for a worst-case scenario could be up to 23 persons. The likelihood of this is less than once in one hundred thousand years.

Emergency Plan

- There are Emergency Procedures for the Kansai Plascon Port Elizabeth facility, and the procedure has been reviewed and suggestions made in APPENDIX 11. The plan was found to be well suited to the hazards found on the site but should be updated to include the Axalta-Plascon facilities.

- In terms of the regulations, off-site emergency planning is the responsibility of the local authorities, with involvement from the operating personnel at the facility when developing the plan.

Land Use Planning

- Since there could be offsite effects Town Planning should be made aware of which areas could be affected, in order to manage the approval of new developments in the vicinity of this MHI.

- Land use planning restrictions apply within 45 m of the facility. The following land use planning restrictions have been suggested in section 10 of this report:

Development Type	Description	Suggested separation distance
Industrial use	Workplaces with buildings with <100 occupants and <3 storeys per building.	No land-use planning restrictions
	Workplaces containing buildings with >100 occupants and 3 or more storeys per building.	Not within the **Inner Zone** (None - these contours do not extend beyond site boundary)
Residential	Any housing developments, even those with less than 30 dwellings per hectare, except small infill projects of one or two units which could be allowed.	Not within the **Inner Zone** (None - these contours do not extend beyond site boundary)
	High density developments such as large blocks of flats, informal housing, etc.	Not within the **Middle Zone** (30 m from site boundary)
Other	Hospitals, old-age homes, crèches, schools, large outdoor entertainment facilities (theme parks, sports stadia), etc.	Not within the **Outer Zone** (45 m from site boundary)

Uncertainties and sensitivities

- A fire within the raw materials store could generate toxic smoke. However, since the materials stored

are mostly solvents, this toxic smoke is likely to be similar to any fire in a paint warehouse. With over 400 chemicals present in the store, the exact nature of the compounds is impossible to predict. There are no large quantities of any particular toxic component, i.e., no chlorides or sulphates and limited nitrogen. Generally, the smoke from such a fire tends to rise up rapidly and disperse in the upper atmosphere due to the heat generated in the fire. However, should there be an extremely strong wind that knocks the cloud back down to the ground, persons in the area exposed to the cloud would need to be protected or evacuated.

3. RECOMMENDATIONS

The following recommendations have been made:

1. The Kansai Plascon Port Elizabeth should be considered a Major Hazard Installation.

2. The Axalta-Plascon modifications need not be considered an MHI while part of the greater Plascon operating site. However, should Axalta separate out its operations from within the Plascon access controlled area, then it MHI status will need to be reviewed.

3. A copy of this risk assessment should be available on the site at all times for inspection by the authorities.

4. The relevant authorities (i.e. local Fire and Emergency services, Provincial Department of employment and labour and National Department of Labour) should have been notified by Plascon after the 2019 MHI QRA. They need to be re-notified by way of a copy of this updated risk assessment and SDSs, with a covering letter from Kansai Plascon Port Elizabeth. See section 5.3.2.

5. Public notification should have been done with the 2019 MHI Report and Kansai Plascon should have retained proof of notifications. See section 5.3.2. If this has been done, then public notification need not be repeated for this updated report.

6. Kansai Plascon Port Elizabeth should inform their Health and Safety Committee of the results of this risk assessment.

7. On-site emergency procedures for the site have been reviewed (See section 11). The plan was found to be well suited to the hazards found on the site, with some suggestions for improvement, e.g. update to include Axalta-Plascon facilities.

8. Kansai Plascon Port Elizabeth should confirm that the local emergency services have an off-site emergency plan in place.

9. Given the **tolerably low, provided ALARP** risk levels, risk reduction measures should continue to be explored and implemented. Some possible improvements have been suggested in section 9.

10. The Kansai Plascon Port Elizabeth facility could affect land-use planning. Land use planning restrictions apply within 45 m of the facility. See section 10.

11. MHI Regulation 7 states that incidents and near misses have to be recorded and reported to the authorities. Kansai Plascon Port Elizabeth should comply with this regulation.

12. This MHI facility should be reassessed 5-yearly, (i.e. due 2024), or earlier if major modifications are made, the installations are expanded, or a major incident occurs.

TABLE OF CONTENTS

APPENDICES

GLOSSARY OF SOME TERMS USED IN THIS REPORT

List of units, acronyms and abbreviations used in this report	Definition
AIA	Approved Inspection Authority
ALARP	As Low As Reasonably Practicable
ASOV	Automated Shut-Off Valve
CAS number	A unique numerical identifier assigned by the Chemical Abstracts Service (CAS) to every chemical substance described in the open scientific literature
d/p/y	Deaths per persons per year
EFV	Excess Flow Valve
EIA	Environmental Impact Assessment
ERPG	Emergency Response Planning Guideline
E-stop	Emergency stop button
F-N curve	Frequency of N+ fatalities curve (graph)
G-room	Gas escape room
GMR	General Machinery Regulations
H/HH/HHH	High/High high/High high high, usually referring to operating parameters e.g. temperature/pressure
HAZOP	Hazard and Operability Study
IBC	Intermediate Bulk Container, usually 1000 litre capacity
kW	Kilowatts
kPa	Kilopascal
m	Metres
m^2	Metres squared
m^3	Metres cubed
MHI	Major Hazard Installation
ppm	Parts Per Million (volume basis)
PRV	Pressure Relief Valve
(Q)RA	(Quantitative) Risk Assessment
ROSOV	Remotely Operated Shut-Off Valve
SANS	South African National Standards
SDS	Safety Data Sheet
SOP	Standard (Safe) Operating Procedure
XV	On/Off valve, usually operated by a solenoid when linked to an E-stop
List of units, acronyms and abbreviations used in this report	Definition

1. INTRODUCTION

1.1SCOPE OF ASSESSMENT

Kansai Plascon operates an automotive paint manufacturing facility in Neave Township in Port Elizabeth. Hazardous materials stored on the site include bulk solvents (up to 140 tonnes in underground tanks), a bulk resin tank (23 tonne aboveground tank), smaller packaged solvents and flammable materials in a flammable store (up to 450 tonnes) and a 48 kg LPG cylinder manifold (up to 960 kg of LPG in total). ISHECON was contracted in 2019 to carry out a Major Hazard Installation (MHI) risk assessment, due to the storage and handling of the abovementioned materials. Plascon have embarked on a localization project which involves Axalta-Plascon (Pty) Ltd converting part of the current Plascon operated water based facilities to an Axalta operated solvent based installation. This document summarizes the interim update of the Plascon site Major Hazard Installation Risk Assessment from the Axalta modifications in 2022.

Several sections of the report necessitate substantiating information, which can be found in the appendices. The structure of the report is such that the numbering of the appendix will correspond with the numbering of the relevant section in the body of the report. Thus, should one want to look up further information regarding the weather data in section 2.2, the appendix with the corresponding information will be numbered as Appendix 2.2.

Although this assessment is based on the best available information and expertise, ISHECON cc cannot be held liable for any incident that may occur on this installation and associated equipment which directly or indirectly relate to the work in this report.

1.2 MHI REGULATION SCOPE OF APPLICATION

This risk assessment is conducted to comply with the Major Hazard Installation Regulations under the (Occupational Health and Safety Act Nr. 85 of 1993, revised June 2001). Refer to Appendix 1.2 for further details of the regulation requirements.

1.3 PHILOSOPHY FOR CLASSIFICATION AS AN MHI

Two criteria define a site as an MHI:

1. The General Machinery Regulations* contains a list of hazardous materials with qualifying quantities for each. A site that stores more than the prescribed quantity of any of these materials is classified as an MHI.

OR

2. An installation that could cause a major incident that will affect the public is also classified as an MHI. MHI risk assessments consider only sites with materials that could lead to catastrophic fires, explosions or toxic releases.

Refer to Appendix 1.3 for details.

*(of the Occupational Health and Safety Act Nr. 85 of 1993, revised June 2001)

1.4 RISK ASSESSMENT METHODOLOGY

Risk is made up of two components:

- The probability of a certain hazardous event or incident occurring.
- The severity of the consequences of that hazardous event / incident.

Therefore, this assessment of risk comprises:

- Identification of the likely hazards and hazardous events related to the operation of the installation.
- Calculation of the likelihood of these hazardous events occurring
- Calculation of the consequences of these hazardous events.
- Estimation of the risk and comparison against certain acceptability criteria.

Refer to Appendix 1.4 for details.

The MHI regulations require that a risk assessment should be carried out by a Department of Labour Approved Inspection Authority (AIA) to comply with the South African standard SANS 1461.2018 Edition 1. Refer to Appendix 1.4 for AIA approval certification for details of risk assessment procedures and Certification.

2. DESCRIPTIONS

2.1 ORGANISATION, SITE LOCATION AND SURROUNDING AREAS

2.1.1 ORGANIZATION

Plascon, a paint manufacturing company, was formed in 1949 when Herbert Evans and Chrome Chemicals joined. Plascon was acquired by Barloworld Coatings in 1970, which was in turn acquired by Kansai Paints in 2011, and the company name was changed to Kansai Plascon Africa Limited in 2012. Since 2012 Kansai Plascon operations have expanded to Nigeria, Kenya, and other southern and eastern African countries. The Plascon head offices are situated in Krugersdorp, Gauteng.

2.1.2 LOCATION AND PHYSICAL ADDRESS

The installation's physical address is:

4 Bedford Street, Neave Township, Port Elizabeth, 6001 GPS co-ordinates: 33°55'35.21"S25°34'41.78"E

2.1.3 DESCRIPTION OF SITE AND SURROUNDINGS

On **Figure 2.1.2** the border of Kansai Plascon Port Elizabeth site (defined as the Major Hazard Installation Premises) is marked in purple. All persons outside this area are considered to be members of the public.

The following nearby locations are relevant:

1. Neighbouring industrial sites: Aspen Pharmacare, Taxi Trucks, RKA Industrial Park, CRH Africa, Autocast Ferrous, etc.
2. Nearby MHIs and possible MHIs:
    a. No known or suspected neighbouring MHIs within the Plascon MHI effect zone.
3. Residential areas:
    a. None within MHI effect zone.
4. Busy main roads or highways:
    a. Newbolt road runs along the site's eastern boundary.
5. Schools or hospitals:
    a. None within MHI effect zone.

Figure 2.1.1 is a map of South Africa showing the location of Kansai Plascon Port Elizabeth.
Figure 2.1.2 shows the location of the site and surrounding area in more detail.
Figure 2.1.3 is a layout of the Kansai Plascon Port Elizabeth site including the Axalta-Plascon Area.

Figure 2.1.1 - Map showing the location of Kansai Plascon Port Elizabeth

Figure 2.1.2 - The location of the site and surrounding area

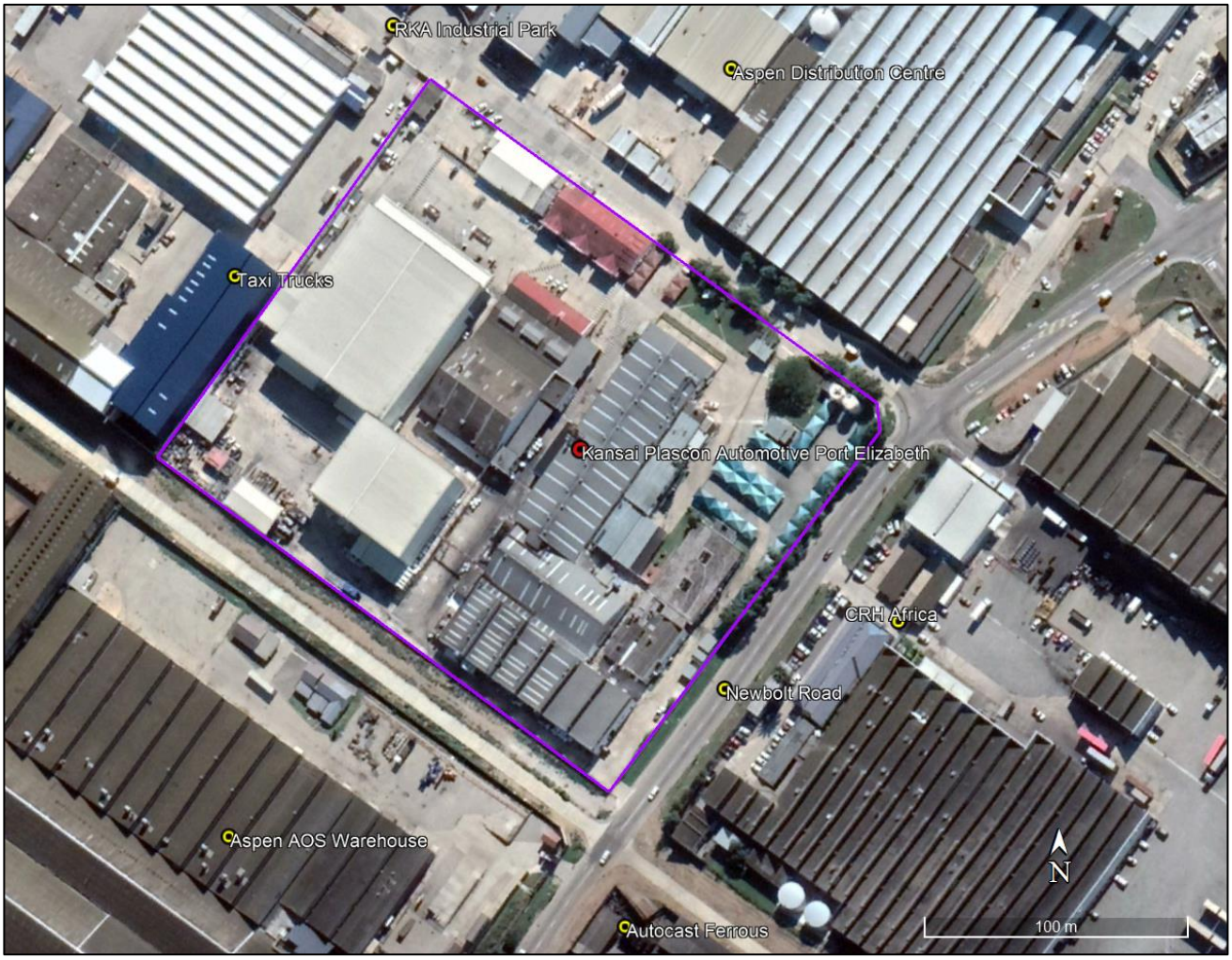


Figure 2.1.3 is a layout of the Kansai Plascon Port Elizabeth site showing the main facilities and the Axalta Area

2.2 TOPOGRAPHY AND METEOROLOGY

2.2.1 TOPOGRAPHY

The site is situated in an industrial area of Port Elizabeth. Surrounding topography is flat. There are no significant rivers or mountains in the immediate vicinity.

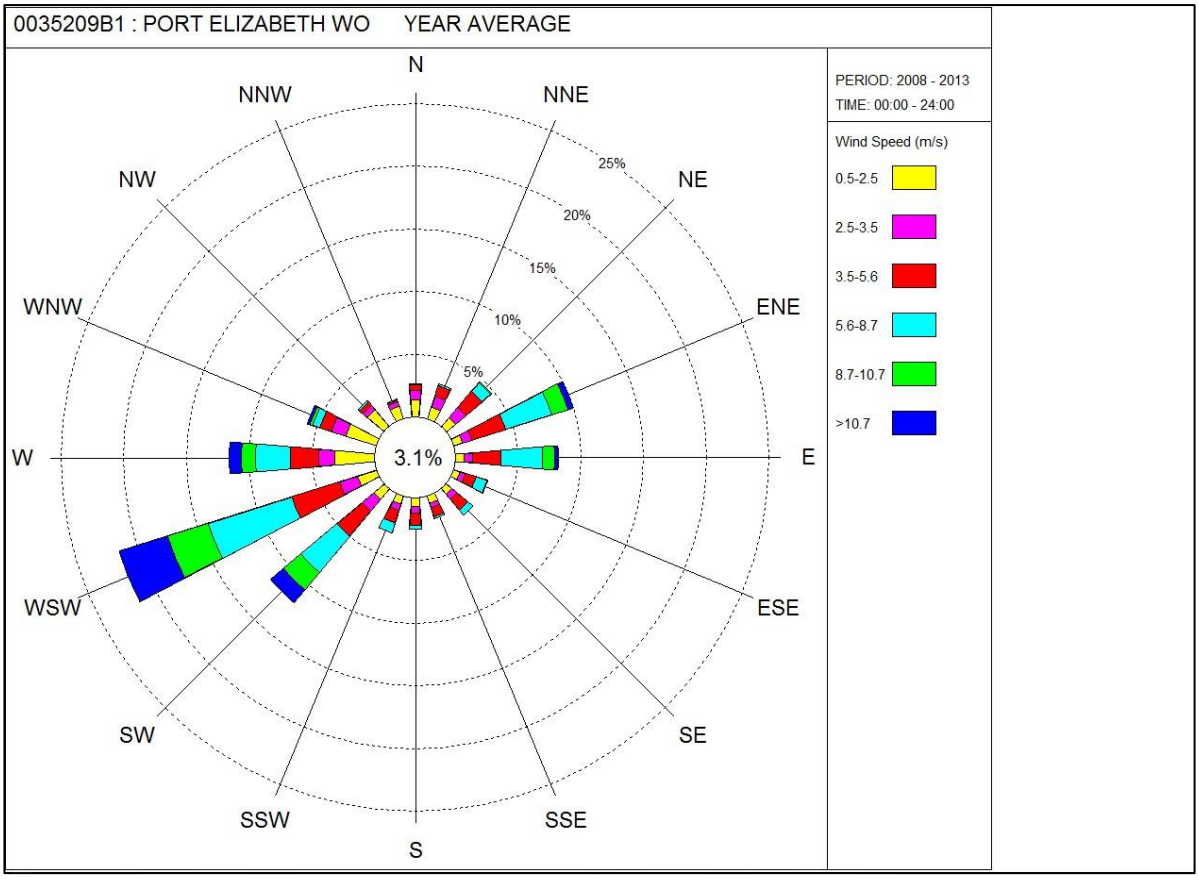
The risk assessment software (PHAST RISK 6.7), does not take into account topography such as hills and valleys, nor local thermal conditions (upward currents due to heat generated by industries). However, the surrounding land is classified according to its "surface roughness" which influences dispersion modelling. (Refer to Appendix 2.2).

Across South Africa seismic activity is conceivable, refer to SANS 10160:2011, part 4.

2.2.2 METEOROLOGY

Weather data for **Port Elizabeth** was applied to the site.

Figure 2.2.2 Port Elizabeth wind rose:



The dominant wind directions are west-south west or from the east-north east. Refer to section 3.1.3 above for an indication of existing surrounding developments downwind of the dominant wind direction. (Refer to Appendix 2.2).

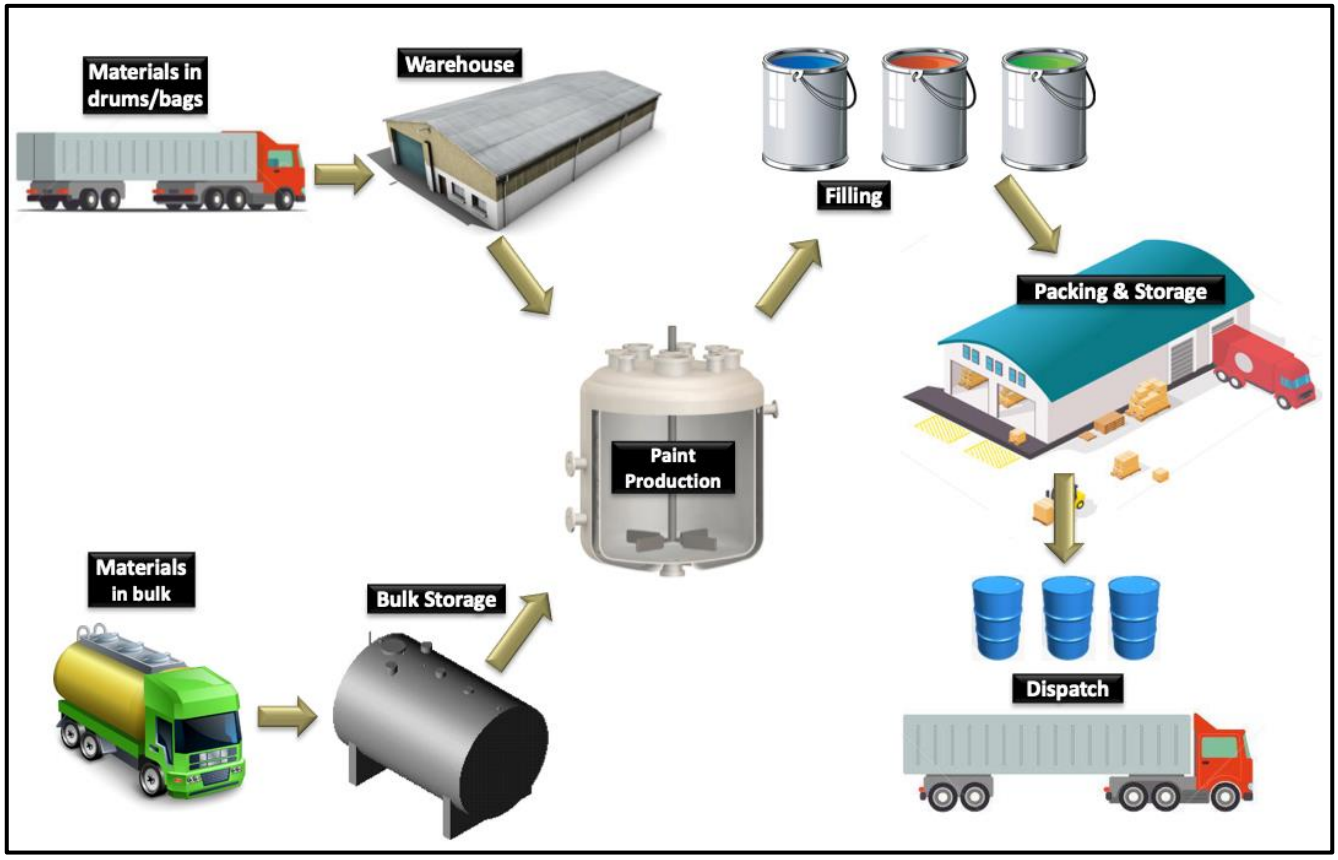
Across South Africa lightning strikes are conceivable, refer to SANS10313:2012.

2.3 PLANT AND PROCESSES

2.3.1 PLANT AND PROCESS DESCRIPTION

The Kansai Plascon facility in Port Elizabeth is an automotive coatings and paints manufacturing plant. Over four hundred different chemicals are used, stored and handled in various areas across the site. Below is a very basic flow diagram for the paint production process.

Figure 2.3.1 Basic flow diagram of the production process



The following installations were excluded from this MHI Risk assessment as they were found not to be the origin of any MHI events:

- The finished product warehouse
- The solvent recovery unit (worst case scenarios were modelled, and consequences were found not to extend beyond the site boundary)
- The bulk resin tank (worst case scenarios were modelled, and consequences were found not to extend beyond the site boundary)

The following main areas were assessed:

- Delivery of solvents to the underground tank farm and solvents supply to plant
- Production areas
- Raw materials warehouse
- LPG cylinder manifold

2.3.1.1 Delivery of solvents to the underground tank farm and solvents supply to plant

Solvents are delivered to the site by road tanker and stored in eight underground tanks. The tank inventories are as follows:

Tank number	Material	Capacity (m^3)
2	n-Butyl Acetate	14
4	Xylene	14
5	Xylene	14
6	n-Butyl Acetate	23
7	Toluene	23
8	Fluidar 100	14
11	Butyl Cellosolve	23
12	Methyl Proxitol Acetate	23
Total:		**162**

The road tanker is made up of separate compartments to prevent large spills. Solvents are offloaded by gravity and not pumped into the tanks. There are three offloading points along the length of the underground tank farm, each with four connection points to offload into the relevant tank. The underground tanks are either 14 or 23 m^3 each. The tanks have a vent pipe with a silica filled flame arrestor at the outlet which allows the displaced vapours to disperse while the road tanker fills the tank. The pump slabs are situated near the tanks and are used to transfer the solvents from the tank to the plant via a 2.5" line. The pumped pressure is around six bar. All pumps have emergency stop buttons. The solvent tanks area is sloped to drainage ditches which lead to a 28 m^3 sump.

2.3.1.2 Paint production

The production building consists of a water based, hardener and solvent based section. The various products (clear coat, primers, basecoats, hardeners, solvents and toners) have slightly different manufacturing processes, depending on the product and the batch size. In general, raw materials (additives, drummed solvents, resins and pigments) are added to the pre-mixers. From the pre-mixers product is transferred to the grinding pots. After grinding, a sample is taken for quality control. Product will be ground until a fineness of grind stipulated on the formulation is achieved. From the grind stage, the mill-base is added to the blenders. Bulk solvents are pumped to the production building as described above. Bulk solvents are dispensed at a decanting area where drums are placed on a scale and a computerized system dispenses the necessary amount of solvent. The drummed solvent is then added to the blenders. After blending (known as "let- down"), a sample is taken to the lab for further testing. Once the batch has been approved, the finished product is filtered, packaged and placed in the finished goods warehouse for 24 hrs, ready to be dispatched.

2.3.1.3 Raw materials store

Drummed liquids and drums or bags of solid raw materials are stored in racks in the raw materials store. The store has a floor area of around 1500 m^2 and the racks are seven levels high. There could be up over 400 different chemicals with a total mass of up to 450 tonnes in the raw maters store. Some typical materials found in this store include:

- Polyester resin
- Cellulose acetate butyrate
- Solutac
- Aldecryl
- Titanium dioxide

Generally, the materials are either solvents, pigments or resins. From time to time two to three pallets of isocyanide resin may be present. There could also be around thirty drums of nitrocellulose present.
A fire within the raw materials store could generate toxic smoke. However, since the materials stored are mostly solvents, this toxic smoke is likely to be similar to any fire in a paint warehouse. With over 400 chemicals present in the store, the exact nature of the compounds is impossible to predict. There are no large quantities of any particular toxic component, i.e., no chlorides or sulphates and limited nitrogen. Generally, the smoke from such a fire tends to rise up rapidly and disperse in the upper atmosphere due to the heat generated in the fire. However, should there be an extremely strong wind that knocks the cloud back down to the ground, persons in the area exposed to the cloud would need to be protected or evacuated.

2.3.1.4 LPG Manifold

LPG is used in the paint spray booths where panels are sprayed for colour matching. LPG is supplied to the facility by Afrox in 48 kg cylinders. The cylinder's liquid valves are connected to a manifold. The manifold consists of two ten-cylinder banks, one duty and one standby. The cylinders on the standby manifold are not left connected when not in use, i.e. cylinder valves are closed. Liquid LPG is drawn from the cylinders into the 1" manifold and passes through a vaporizer in order to convert the liquid LPG to gas. LPG pressure is controlled by a pressure regulating valve, set at 0.9 bar. The LPG vapour line goes underground under the road and emerges outside the spray booth area. The manifold is situated in a locked cage and is supplied with sprinklers. There is a manual valve inside the cage which can be used to isolate the vaporizer.

2.3.1.5 Axalta-Plascon Area

Axalta-Plascon will be using part of the current Plascon production area. Two existing 10ton tanks will be converted from water based materials to solvent based materials. Solvent will be loaded using a diaphragm pump from IBCs and drums into the tanks for blending from where they will be pumped to the process. The entire facility will be indoors. On site consumption of solvents etc. will not increase above the limits listed in this risk assessment.

The equipment and facilities in the current water based area will be upgraded and converted to be suitable for solvents, e.g. EX rated equipment, forced ventilation in the area etc.

2.3.2 STAFF AND SHIFT ARRANGEMENT

Manufacturing only takes place during the day shift. During the day there could be up to 170 persons present on the site. At night there is not expected to be more than five persons, including security.

3. HAZARD IDENTIFICATION

3.1 MATERIAL HAZARDS

3.1.1 HAZARDOUS MATERIALS ON THE SITE

The materials on the site were categorised according to SANS 10228 classes of dangerous substances, as detailed below in Table 3.1. A determination was made whether these materials could constitute a MHI risk that needed to be quantified further, refer to following sections.

Table 3.1: Summary of hazardous material inventories

	CAS number	SANS10228 [Ref 2] Classification	Maximum Inventory (t)	Maximum Release Quantity (t)	Annual Through-put (t)	Potential MHI Material (Yes or No)
Xylene	1330-20-7	3.1 Flammable liquid	2 * 14 m^3 tanks =± 20 t	**±20 t**	**±300 t**	Yes
n-Butyl Acetate	123-86-4	3.1 Flammable liquid	1 * 23 m^3 tank 1 * 14 m^3 tank **= ±44 t**	**±20 t**	**±450 t**	Yes
Toluene	108-88-3	3.1 Flammable liquid	1 * 23 m^3 tank **= ±20 t**	**±20 t**	**±200 t**	Yes
Fluidar 100	64742-89-8	3.1 Flammable liquid	1 * 14 m^3 tank **= ±12 t**	**±12 t**	**±100 t**	Yes
Butyl Cellosolve	112-07-2	3.1 Flammable liquid	1 * 23 m^3 tank **= ±20 t**	**±20 t**	**±200 t**	Yes
Methyl Proxitol Acetate	108-65-6	3.1 Flammable liquid	1 * 23 m^3 tank **= ±20 t**	**±20 t**	**±120 t**	Yes
Blended solvents	Mix	3.1 Flammable liquid	2 * 10 m^3 tank **= ±20 t**	**±10 t**	**Included above**	Yes
LPG	68476-85-7	2.1 Flammable gas	20 * 48 kg cylinders **= ±1 t**	**0.480 t**	**±6 t**	Yes
Nitrocellulose	9004-70-0	4.1 Flammable solid	**±**30 * 220 litre drums **(±**66 kg/drum excluding wetting agent) **= ±2 t**	**0.066 t**	**±14 t**	Yes

3.1.2 ENVIRONMENTAL HAZARDS

Assessment of environmental impacts is not included in this Major Hazard Installation risk assessment, as it should be addressed in an Environmental Impact Assessment for the site. Environmental hazards associated with the operations on this site should be addressed in an Environmental Management Programme.

3.1.3 HAZARDOUS MATERIAL INTERACTIONS

Some hazardous chemicals, when mixed, may result in flammable, explosive or toxic effects. Except in the case of a large warehouse fire on the Plascon site, it is only in the bulk off-loading area that materials are likely to be inadvertently mixed. Mixing of bulk solvents would likely only result in quality issues.

3.2 PAST ACCIDENTS AND INCIDENTS RELEVANT TO MAJOR HAZARDS

3.2.1 SITE

There have not been any significant accidents or incidents related to the MHI materials on the site in the last five years.

3.2.2 OTHER FACILITIES LOCAL AND INTERNATIONAL

Significant hazardous events have occurred at other similar or related installations around the world or with the MHI type materials that are used on site. Refer to Appendix 3.2 for selected accidents and incidents.

4. HAZARD ANALYSIS

A bow-tie analysis was undertaken to identify the failure events, their causes, consequences, as well as the preventative and mitigative measures in place on the installation.

Table 4.1 – Hazard Analysis

CONTAINMENT SYSTEM	CAUSES	PREVENTATIVE MEASURES IN PLACE	FAILURE	MITIGATION MEASURES	HAZARDOUS EVENT	OVERALL CONSEQUENCES
General		No smoking on the site except in designated areas Operators are trained and retrained where necessary to perform their allotted functions. There are regular internal audits and management reviews. Hazardous area classification has been done throughout plant. Integrity assurance for entire plant including preventative maintenance is in place. Earthing is checked annually. EX rated equipment used. Traffic calming measures, speed limits, etc. within site. Forklift driver training.		The site has emergency plans. Regular emergency drills are conducted. Firefighting facilities are provided and the site has its own backup storage supply of fire water.		For some fire and explosion incidents, domino effects on other equipment in the area are possible, which could lead to secondary fires or explosions.
Solvent offloading	Tanker design (inherent fabrication defect), material of construction failure e.g. stress corrosion cracking, physical impact damage, over-pressure burst due to impinging flame, valve sheared off.	As above (where applicable). Tankers maintained and inspected by suppliers. SOPs for offloading requiring an operator to be present at all times. Offloading points are clearly labelled.	Tanker catastrophic rupture or leak	As above (where applicable). Loading/unloading areas drain to a sump. Road tankers compartmentalised to minimise spill size.	Possible large spill. Possible flooding of the catchment pit if outlet is blocked. Formation of a cloud of flammable vapours. Possible flash fire or pool fire over the spilled material. Possible jet fire if leak is ignited.	Significant effects will most likely be limited to the Plascon site, depending on the location of the spill. Damage to plant, personnel and public are possible.

CONTAINMENT SYSTEM	CAUSES	PREVENTATIVE MEASURES IN PLACE	FAILURE	MITIGATION MEASURES	HAZARDOUS EVENT	OVERALL CONSEQUENCES
	Fatigue (excessive stress), corrosion, ageing, erosion, vibrations, buckling, over bending, stretching, twisting, driving away without disconnecting, impact damage.	As above (where applicable). Hoses are maintained by the plant. Tankers offloaded by gravity.	Offloading hose rupture or leak.	As above (where applicable). There is a manual valve that can be used to isolate the offloading hose.	As above.	Significant effects will most likely be limited to the Plascon site, depending on the location of the spill. Possible lethal effects both inside and outside the site.
Solvent transfer lines	Over pressurisation (liquid exposed to fire, surging, pumping against closed valve), corrosion, erosion, physical impact damage, flange/gasket failures (improper flange alignment, improper gasket centring, uneven bolt stress), weld failures, stresses (excessive loading, vibrations, hammer.	Lines are raised on a piperack. Lines are regularly inspected. Lines have non-return valves.	Transfer line rupture or leak.	There are emergency stop buttons that shut off pumps.	Possible large spill and formation of a cloud of flammable vapours. Possible flash fire or pool fire over the spilled material. Possible jet fire is leak is ignited.	Significant effects will most likely be limited to the Plascon site, depending on the location of the spill. Possible lethal effects both inside and outside the site.
Raw materials store	For steel/plastic drums and IBCs: operator drops container (forklift driver error and drop container/pallet or incorrect stacking of containers/pallets), container damaged by physical impact (forklift punctures container or object falls on container),	Store has forced ventilation. Store racking is orderly and housekeeping is good. Store has EX rated lighting. Store has strict ignition control. Forklift driver training. Building acts as a bund. Store has multiple smoke detectors which are inspected annually.	Large spill of flammable liquid.	Store has automatically activated in-rack sprinklers.	Formation of flammable vapours over the spill possibly migrate and find ignition source. Possible outcomes are: 1. Flash fire back to pool and small pool fire within the store. Small pool fire escalates to large pool fire eventually involving the entire store. Other drums in	Possible lethal effects both inside and outside the site.

CONTAINMENT SYSTEM	CAUSES	PREVENTATIVE MEASURES IN PLACE	FAILURE	MITIGATION MEASURES	HAZARDOUS EVENT	OVERALL CONSEQUENCES
	container mechanical failure (corrosion, container material of construction incompatible with contents), containers exposed to excessive heat (external fire or left in hot sun), IBC valve failures.				store overheat and burst explosively. 2. If vapours accumulate in the store and reach LEL concentration, possible confined explosion. Explosion inside confining structure can generate high pressures. A blast over-pressure shock wave generated. Other drums in store damaged, pool fire may ensue.	
	An external fire impinging on a nitrocellulose pallet, causes as described above.	As above (where applicable).	Nitrocellulose detonation.	As above (where applicable).	Explosion leading to a blast over-pressure shock wave. Other drums in store damaged, pool fire may ensue.	Significant adverse effects both inside and outside the site. Secondary fires and explosions are possible.
Production areas, including Axalta	Failure of solvent piping, or other equipment containing flammable materials (blenders, drums, IBCs, pots, etc.) within the production area.	Production area has strict ignition control. Zone 1 area, EX rated lighting, motors, etc. Production area has forced ventilation. Production area is orderly and housekeeping is good. Forklift driver training.	Large spill of flammable liquid.	Building acts as a bund. Some vessels are bunded. Production area has automatically activated sprinklers.	Formation of flammable vapours over the spill possibly migrate and find ignition source. Possible outcomes are: 1. Flash fire back to pool and small pool fire within the store. Small pool fire escalates to large pool fire eventually involving the entire store. Other drums in store overheat and burst explosively.	Possible lethal effects both inside and outside the site.

CONTAINMENT SYSTEM	CAUSES	PREVENTATIVE MEASURES IN PLACE	FAILURE	MITIGATION MEASURES	HAZARDOUS EVENT	OVERALL CONSEQUENCES
					2. If vapours accumulate in the store and reach LEL concentration, possible confined explosion. Explosion inside confining structure can generate high pressures. A blast over-pressure shock wave generated. Other drums in store damaged, pool fire may ensue.	
LPG manifold	Cylinder mechanical failure, internal corrosion, weld failure, impact damage (drops during offloading), over pressurization due to overfilling and excessive heat, valve seal leaks. Hoses and piping: excessive wear, mechanical failure, ageing and corrosion.	Cylinders are stored against a wall and secured in place. Individual cylinders are isolated when not in use. Cylinders inspected and maintained by supplier.	Rupture or leak of cylinder, hose or manifold or transfer piping to plant.	Ignition control in area of manifold. Automatic sprinklers over cylinder storage area.	Formation of a cloud of flammable vapours. Ignition due to: • hot work, • static spark discharges and lightning, • electrical faults, • smoking, leading to a vapour cloud explosion or flash fire. Possible jet fire if it is a leak that is ignited.	Possible lethal effects both inside and outside the site.
	LPG line leak or rupture or pilot light failure.	Lines are raised on a pipe rack. Lines are regularly inspected.	Accumulation of LPG vapours within spray booth.	There is a manual valve at the manifold that can be closed in case of a line leak.	Explosion inside confining structure can generate high pressures. A blast over-pressure shock wave generated.	Significant adverse effects limited to within site.

Refer to Appendix 4 for a summary of all the scenarios considered for modelling in this assessment, with associated key process data.

5. CONSEQUENCE ANALYSIS

Below are the consequence modelling results for the worst-case event for each material and selected additional events (*information on all incidents can be made available on request).*
Refer to the tables in the Appendix 5 in order to interpret the impact (damage) from the contours below.

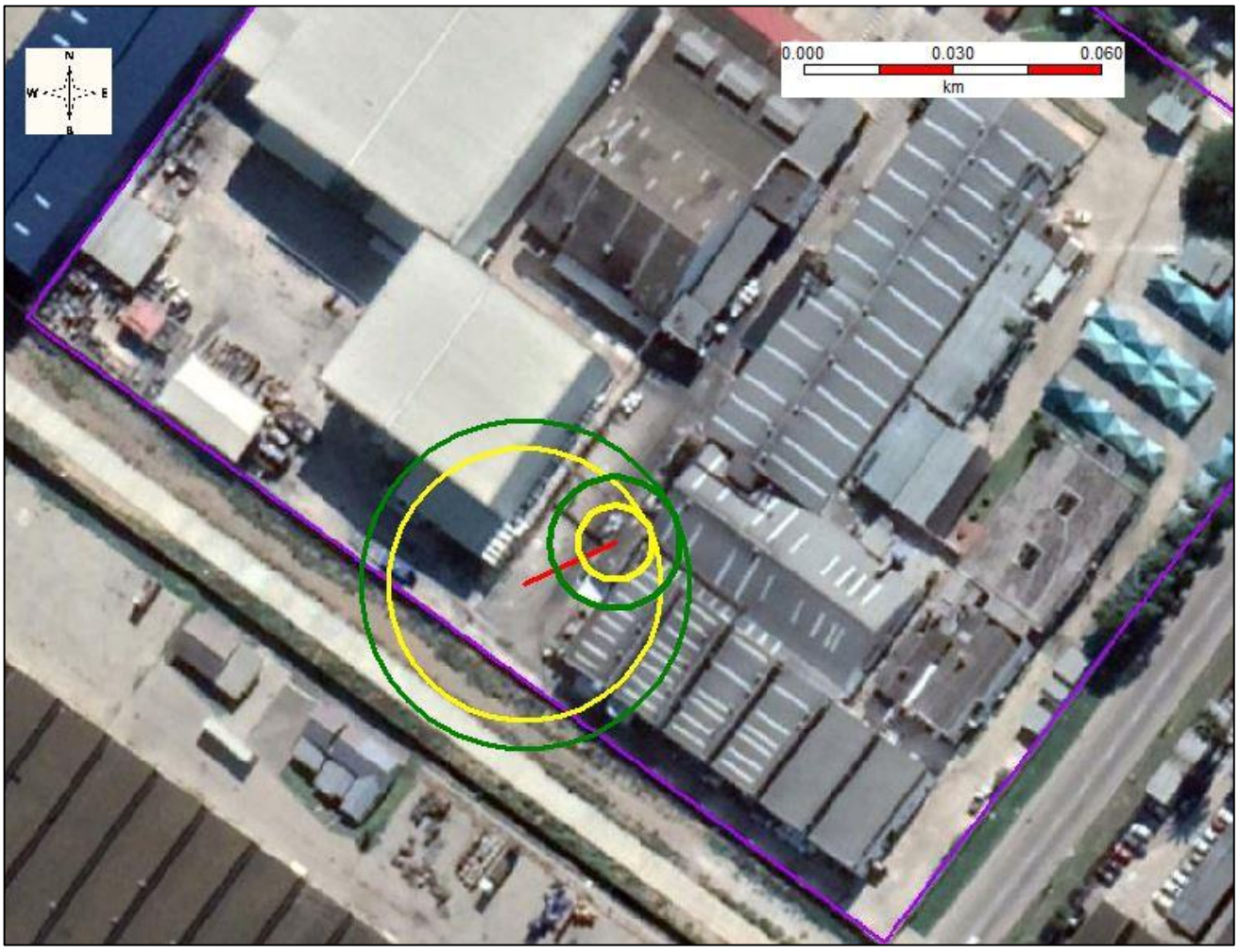
5.1 FLAMMABLE EVENTS

5.1.1 BULK SOLVENTS

Bulk solvents were modelled as toluene. Similar effects could be expected for the other solvents stored in bulk, e.g. Fluidar 100, xylene, n-butyl acetate, etc.

Figure 5.1.1.1 Solvent road tanker rupture – overpressure circles (delayed explosion)
Faint circles show maximum extent in any wind direction. Small bold circles are actual explosion for a west-south westerly wind.

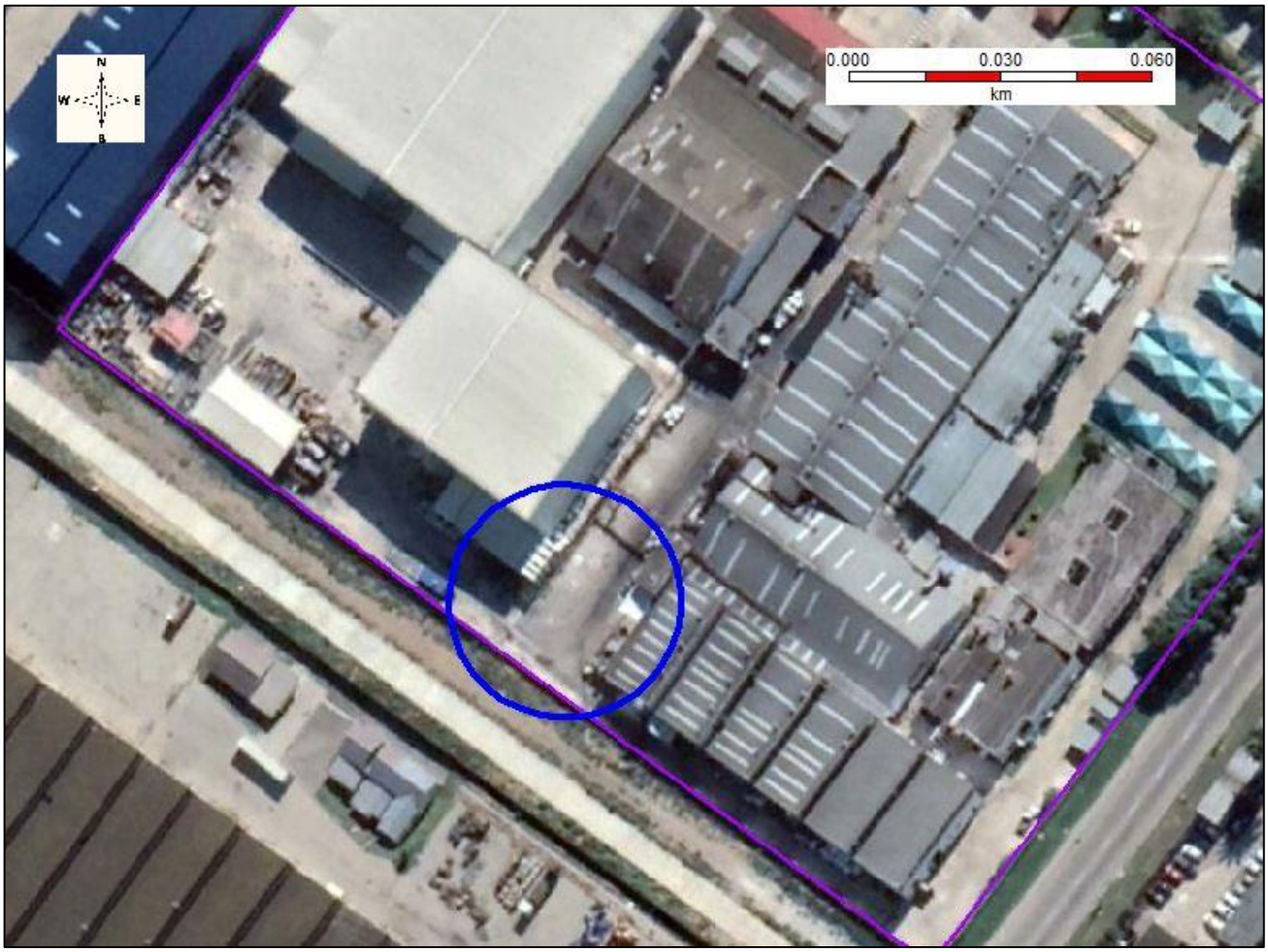
- **Green = 14kPa - MHI threshold, 1% lethality (33 m radius)**
- Yellow = 35 kPa – Likely domino effects (28 m radius)



This event may result in offsite effects, depending on the location of the road tanker along the length of the solvents tank farm area.

Figure 5.1.1.2 Solvent road tanker rupture – radiation circles (flash fire)

- **Blue = 0.5 LFL - MHI threshold, 1% lethality (23 m radius)**



This event may also result in offsite effects, depending on the location of the road tanker along the length of the solvents tank farm area.

5.1.2 DRUMMED SOLVENTS

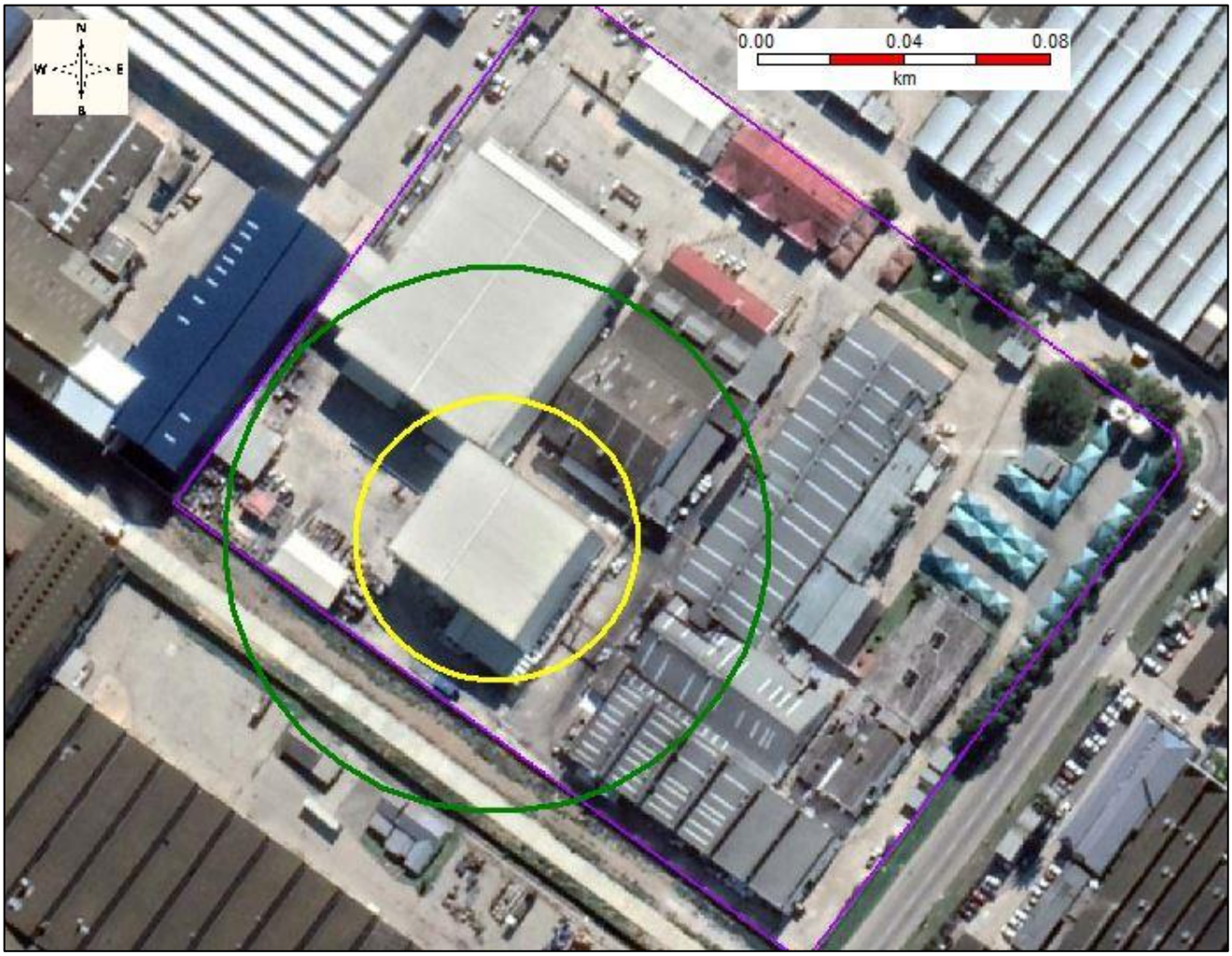
5.1.2.1 Raw materials store large spill and generation of flammable vapours – overpressure circles (confined explosion)

- **Green = 14kPa - MHI threshold, 1% lethality (46 m radius)**
- Yellow = 35 kPa – Likely domino effects (26 m radius)

Depending on the location of the explosion, this event may or may not lead to offsite effects. However, in either case the onsite effects would be severe, possibly resulting in the structural integrity of the building being compromised and leading to multiple personnel deaths.

5.1.2.2 Raw materials store entire store on fire – radiation circles (pool fire)

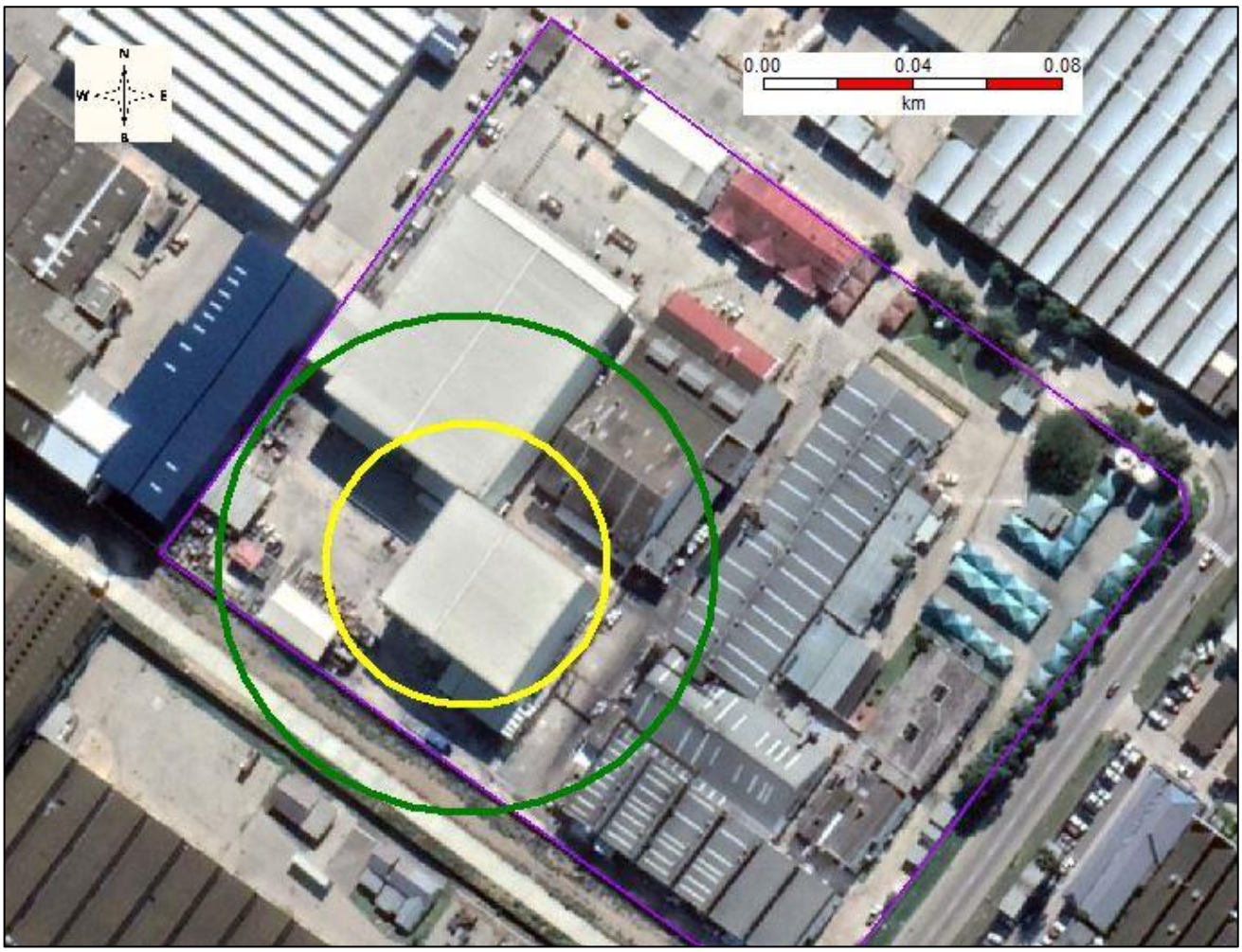
- Yellow = 37.5 kW/m^2 – Severe damage and domino effects (37 m radius)
- **Green = 12.5 kW/m^2 - MHI threshold, 1% lethality (74 m radius)**



5.1.3 NITROCELLULOSE

5.1.3.1 Nitrocellulose pallet detonation due to impinging external fire – overpressure circles (detonation)

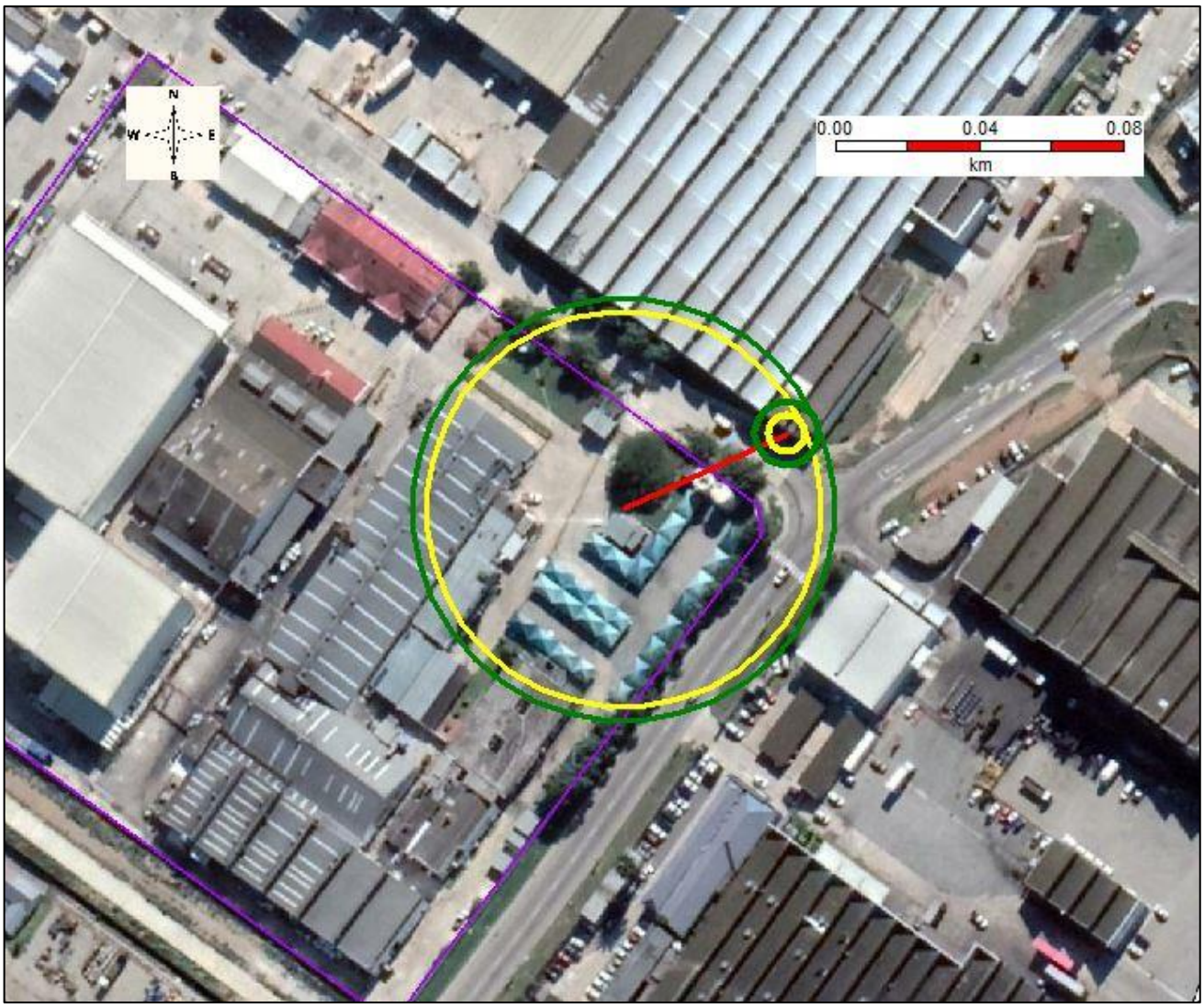
- **Green = 14kPa - MHI threshold, 1% lethality (68 m radius)**
- Yellow = 35 kPa – Likely domino effects (38 m radius)



5.1.4 LPG

Figure 5.1.4.1 LPG manifold rupture – overpressure circles (delayed explosion)
Faint circles show maximum extent in any wind direction. Small bold circles are actual explosion for a west-south westerly wind.

- **Green = 14kPa - MHI threshold, 1% lethality (59 m radius)**
- Yellow = 35 kPa – Likely domino effects (55 m radius)



This event may result in offsite effects, depending on the wind direction.

Figure 5.1.4.2 LPG manifold rupture – radiation circles (flash fire)

- **Blue = 0.5 LFL - MHI threshold, 1% lethality (52 m radius)**

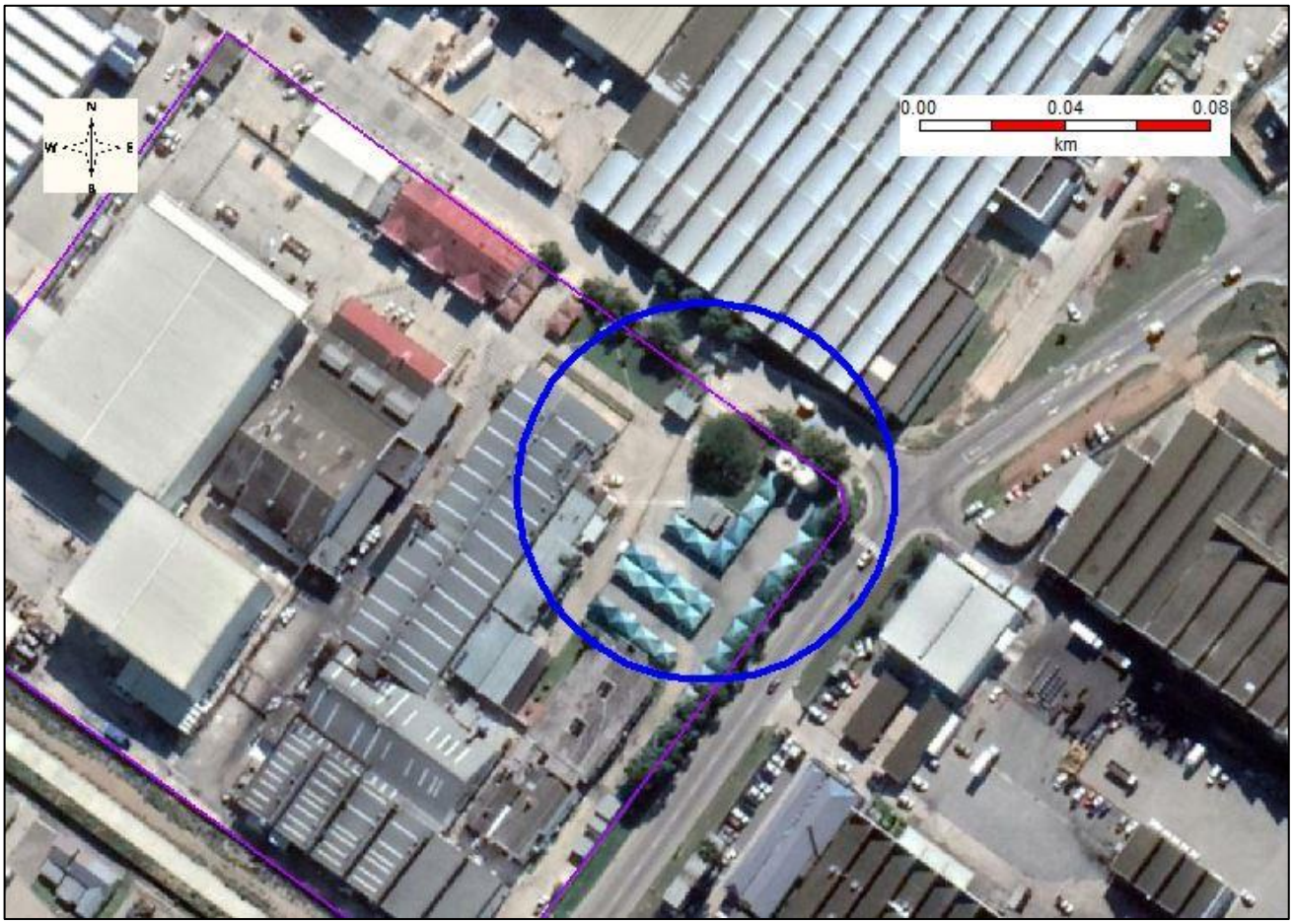
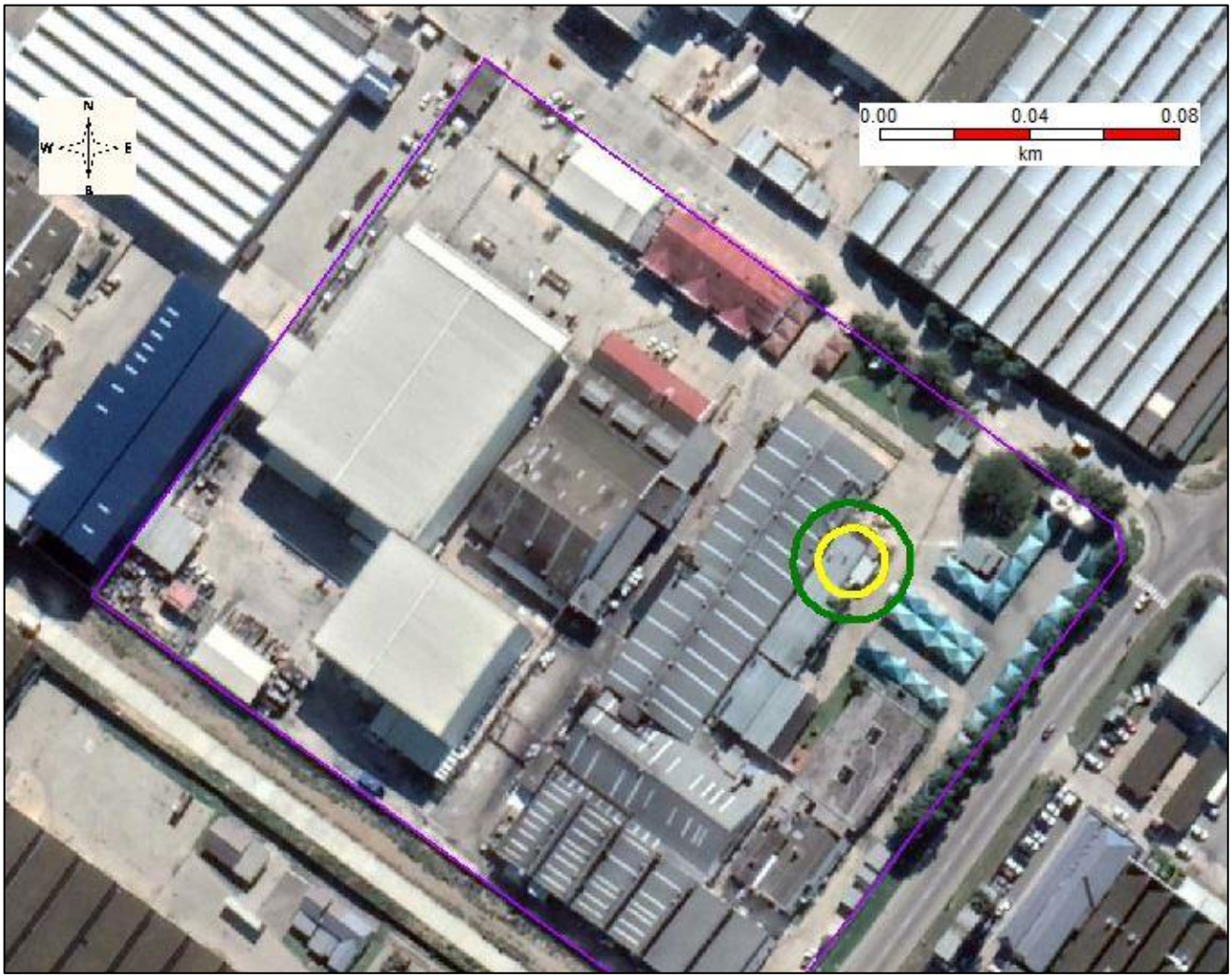


Figure 5.1.4.3 Confined explosion of LPG vapours within spray booth – overpressure circles

- **Green = 14kPa - MHI threshold, 1% lethality (16 m radius)**
- Yellow = 35 kPa – Likely domino effects (9 m radius)

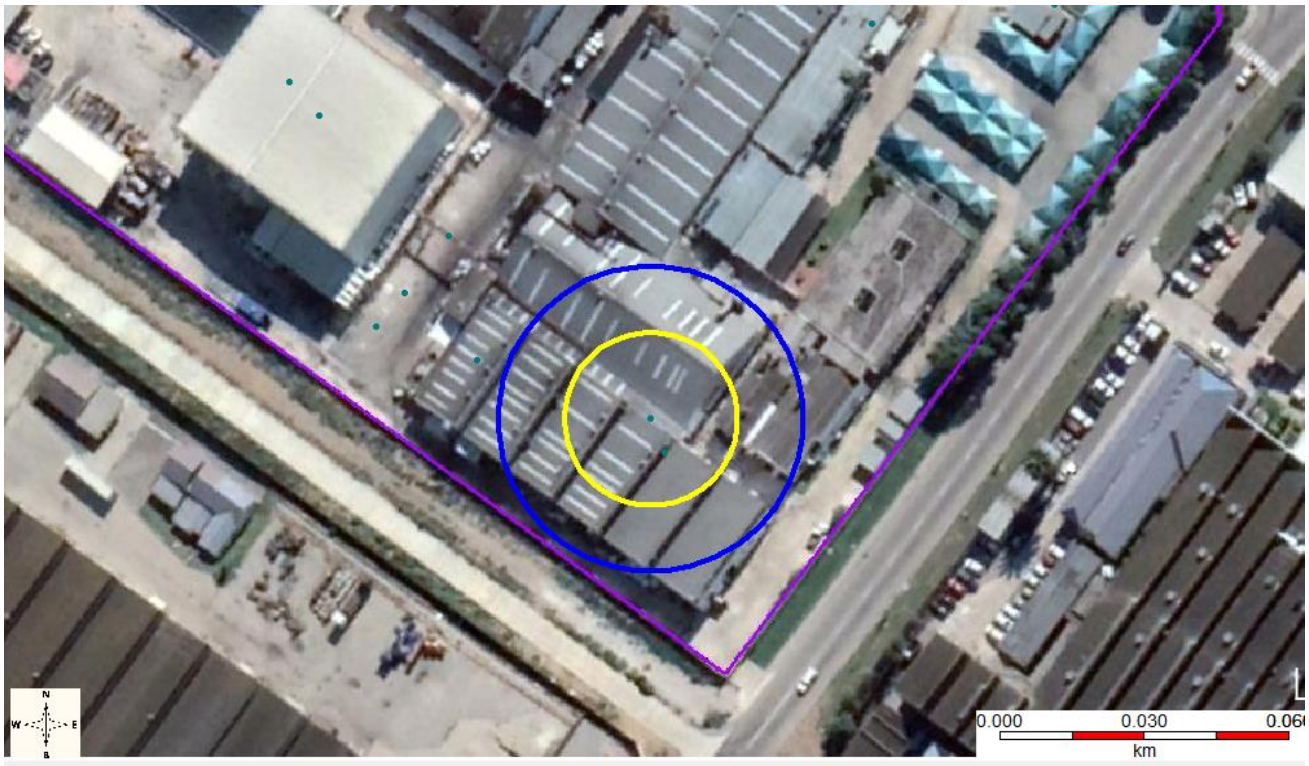


Offsite effects for this event are unlikely, however, onsite effects could be severe.

5.1.5 AXALTA FACILITIES

Figure 5.1.5.1 Accumulation and explosion of solvent vapours within the Axalta Area – overpressure circles (delayed explosion)

- **Blue = 14kPa - MHI threshold, 1% lethality (18 m radius)**
- Yellow = 35 kPa – Likely domino effects (32 m radius)

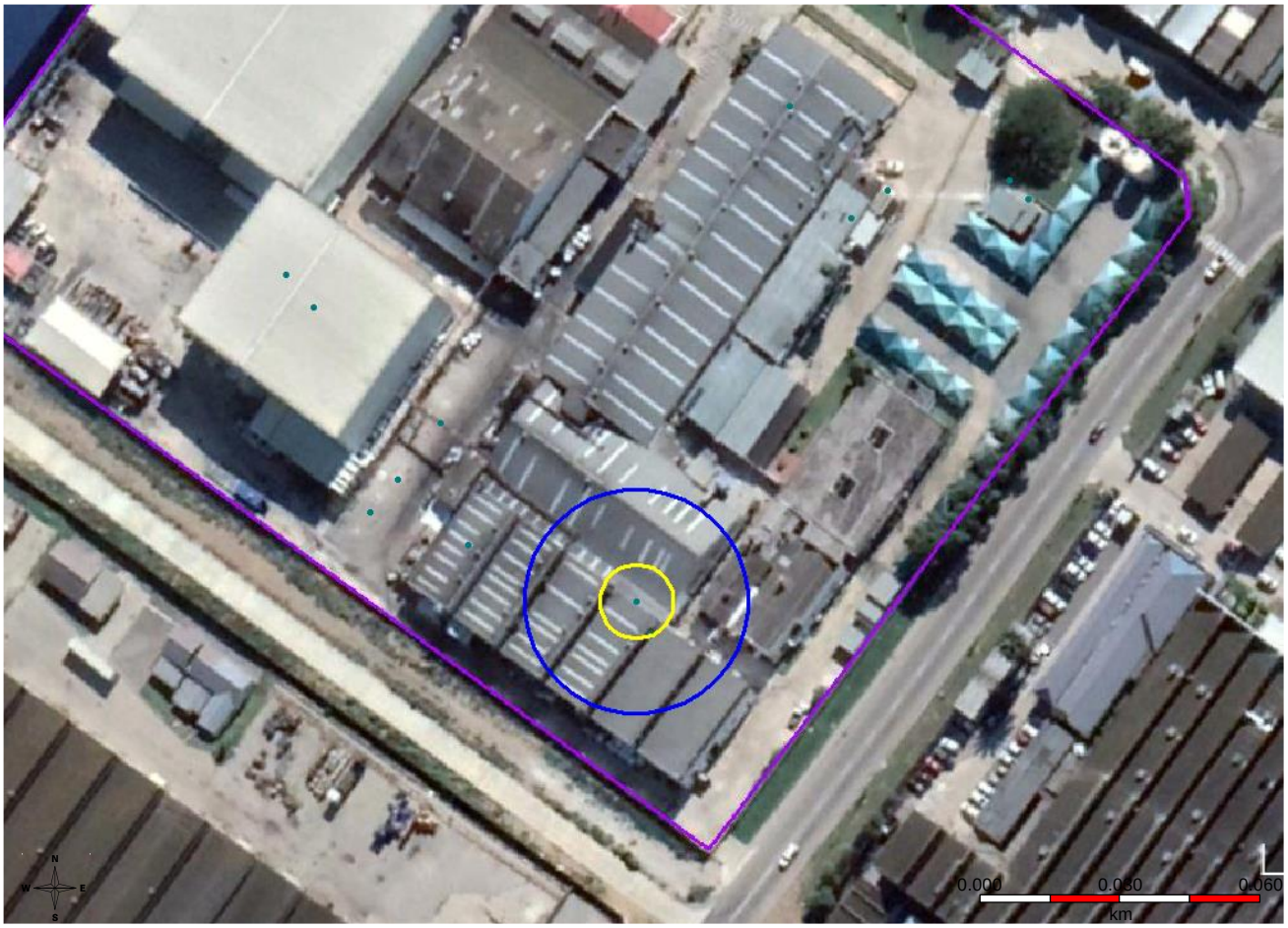


This event is not likely to result in significant in offsite effects.

After an explosion such as the above, or any other explosion event in the area (e.g. smaller event within the tank), it is possible that there may be a large amount of solvent spilled within the area and the walls and roof of the buildings may be damaged. Ignition of the pool of liquid is quite likely and with the walls and roof damaged there may be radiation effects outside the immediate area. However, this is not expected, on its own, to extend off site.

Figure 5.1.5.2 LPG manifold rupture – radiation circles (pool fire)

- **Blue = 12.5 kW/m2 - MHI threshold, 1% lethality (25m radius)**
- Yellow = 37.5 kW/m2 – domino failures(7m radius)



The above worst case results show that the Axalta-Plascon facilities are unlikely to result in catastrophic off site effects and therefore need not be considered MHI facilities whilst they are within the greater Plascon site. Should Axalta-Plascon at some stage in the future decide to separate out their facilities from the greater Plascon site, i.e. have their own access control boundaries such that Plascon become their neighbours, then this MHI conclusion may need to be revisited.

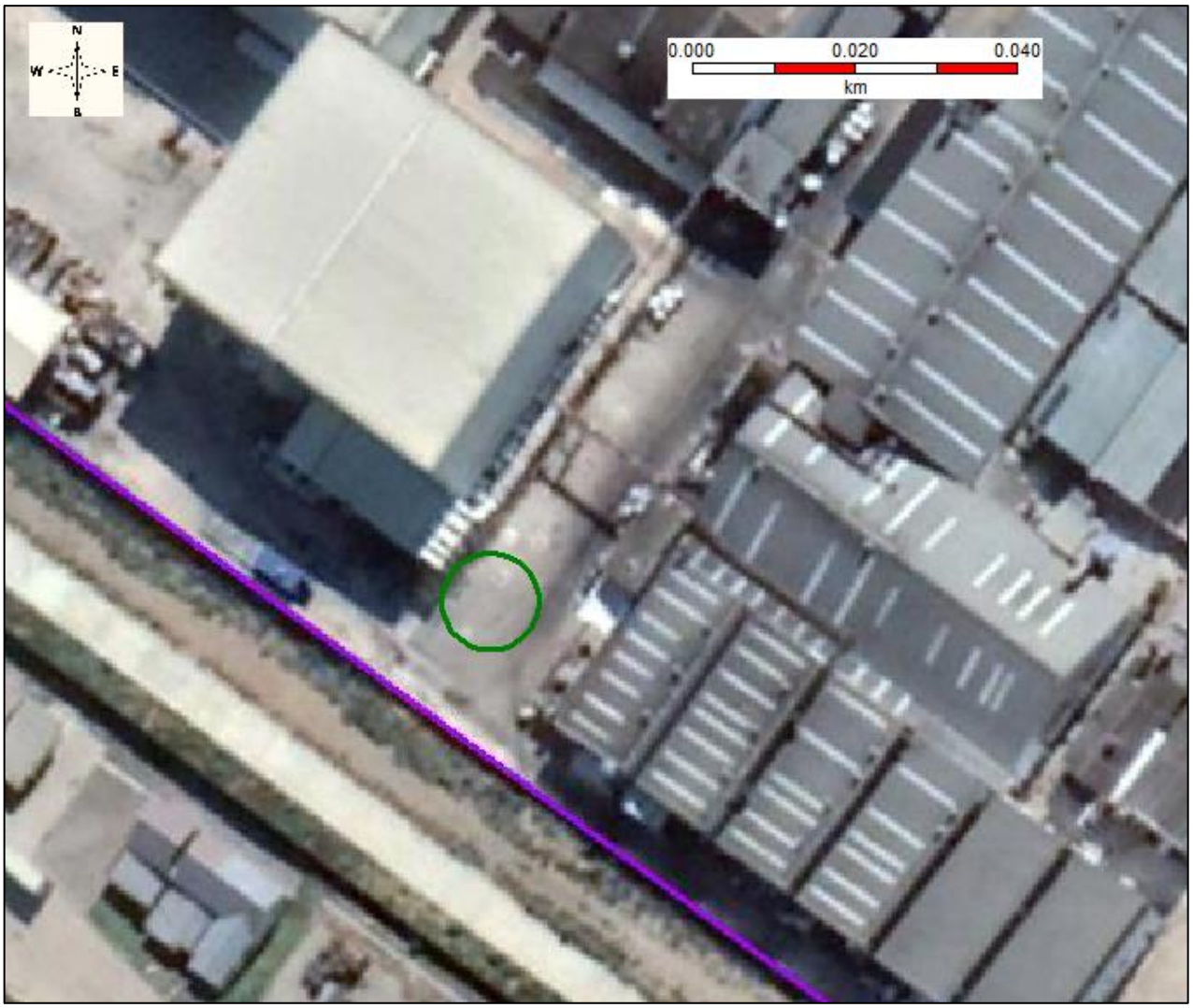
5.2 TOXIC EVENTS

There are no large quantities of extremely toxic materials stored or used on the Kansai Plascon Port Elizabeth site. As shown below, the worst case spill of solvents with a toxic component (e.g. toluene or xylene) could have limited lethal toxic effects, but these are negligible compared to the flammable effects. Smoke from a fire involving the materials stored on site will be noxious and the emergency services should take the necessary precautions.

5.2.1 TOXIC SOLVENTS (TOLUENE, XYLENE)

5.2.1.1 Map showing outdoor toxic lethality plumes for the rupture of a toluene road tanker.

- **Green = 1% Lethality effect zone (MHI threshold) – 5 m radius**



5.3 MHI CLASSIFICATION, NOTIFICATION AND REPORTING

5.3.1 CLASSIFICATION

The two criteria for a site to be classified as an MHI are:

1. Storage of a listed material as per GMR (See section 1)
2. Storage of a material which could cause a major incident that will affect the public

The table below summarises the classification findings for the Kansai Plascon Port Elizabeth site according to these two criteria.

	CRITERIA 1		CRITERIA 2			INSTALLATION MHI CLASSIFICATION
MATERIAL	**STORAGE QUANTITY (largest single vessel)**	**MHI ACCORDING TO GMR?**	**WORST-CASE INCIDENT***	**DISTANCE OF LETHAL (MHI) EFFECTS (m)**	**AFFECTING PUBLIC?**	
Bulk solvents (e.g. toluene)	20 t	No	Road tanker rupture	33	Yes	**Yes**
Drummed solvents	190 kg	No	Raw materials store pool fire	74	Yes	**Yes**
Nitrocellulose	66 kg	No	Detonation of pallet	68	Yes	**Yes**
LPG	48 kg	No	Manifold rupture	59	Yes	**Yes**

The Kansai Plascon Port Elizabeth site should be classified as a Major Hazard Installation.

*Note that the events listed above are not the only events that could cause offsite effects and therefore the sole reason for MHI classification. The events listed are merely the events with the farthest offsite effects.

5.3.2 NOTIFICATION OF MAJOR HAZARD INSTALLATION

As this facility is a Major Hazard Installation, notifications are required. The notifications should have been undertaken by Kansai- Plason after the 2019 MHI QRA as per the list below. If the notifications were done and proof retained then only the authorities (items 1&2) need be re-notified of this MHI update and public notifications need not be repeated:

1. A letter and copy of this risk assessment should be submitted notifying the local government, the Department of employment and labour Chief Inspector and Provincial Director, of the Major Hazard Installation and that the risk assessment has been conducted.
2. SDSs for the MHI materials indicated in the table above should be included in the notification.
3. Public notifications should be done by placing an advertisement in a local paper, putting up public notices, and contacting adjacent neighbours to inform them of the site's classification.

The full Plascon site should be reassessed again by 2024 (5 years), or earlier if major modifications are made, the installations are expanded, or a major incident occurs.

5.3.3 REPORTING OF EMERGENCY OCCURRENCES

Since the site is a Major Hazard Installation all incidents on the installations which require the emergency procedures to be activated should be reported to the local emergency services, as well as to the Provincial Director and National Chief Inspector. Such incidents should be recorded, and the register should be available for inspection. See MHI Regulation 7 (1).

5.4 EFFECT ON ADJACENT MAJOR HAZARD INSTALLATIONS

At high levels of explosion overpressure (35 kPa) and fire radiation levels (37.5 kW/m^2) process equipment integrity at nearby installations can be expected to be adversely affected.

5.4.1 DOMINO EFFECTS WITHIN THE SITE

Fires or explosions on site could cause failure of adjacent vessels or equipment, which could escalate the event. There are protective and preventative measures in place on the site. See section 9 for risk reduction measures to consider. Toxic events do not normally lead to direct domino failures.

5.4.2 DOMINO EFFECTS ON ADJACENT MAJOR HAZARD INSTALLATIONS

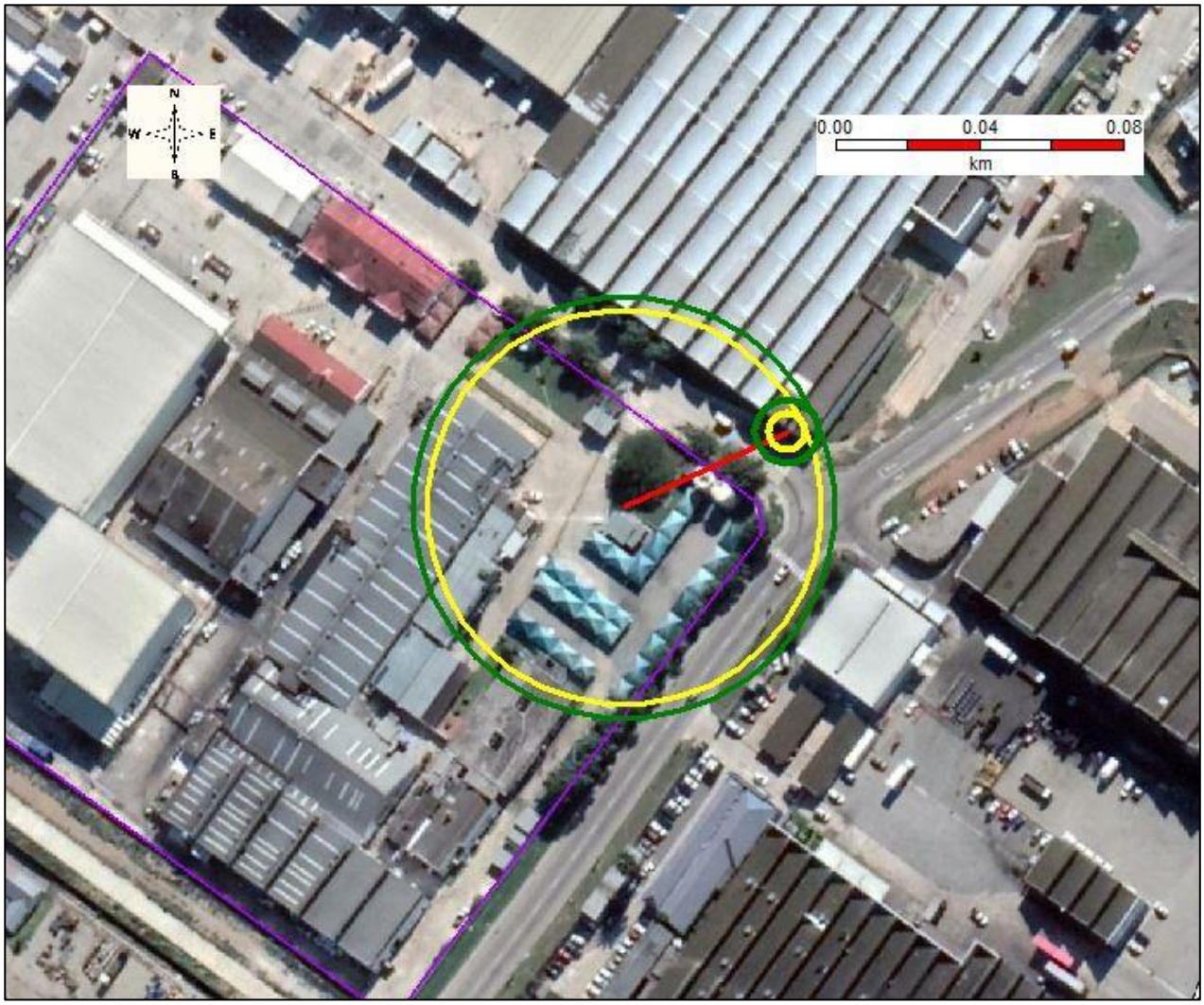
From section 5.1, it was shown that the worst-case potential domino impact zone extends 55 m. Any installation within this impact zone could be affected.

There are no known MHIs near the Kansai Plascon Port Elizabeth site.

Figure 5.4.2 Worst case event (LPG manifold rupture) potential domino effect zone (yellow contour)

- Yellow = 35 kPa – Likely domino effects (55 m radius)

Faint circle shows maximum extent in any wind direction. Small bold circle is actual explosion for a west-south westerly wind.



6. FREQUENCY ANALYSIS

Generic failure data, as well as data available from the site or similar sites is used to determine the likelihood of hazardous events.

Standard failure data can be adjusted according to the assessor's evaluation of the 'systemic organizational factors' in operation on site is (i.e. the perceived level of maintenance and housekeeping, and how effective the actual implementation of any process safety management system etc.).

The Kansai Plascon Port Elizabeth site was evaluated as being well managed and having many good safety procedures in place, but with some room for improvement. Failure data was therefore only slightly negatively adjusted.

A table with the frequency of each event can be found in the process data table in Appendix 4.

7. RISK CALCULATION

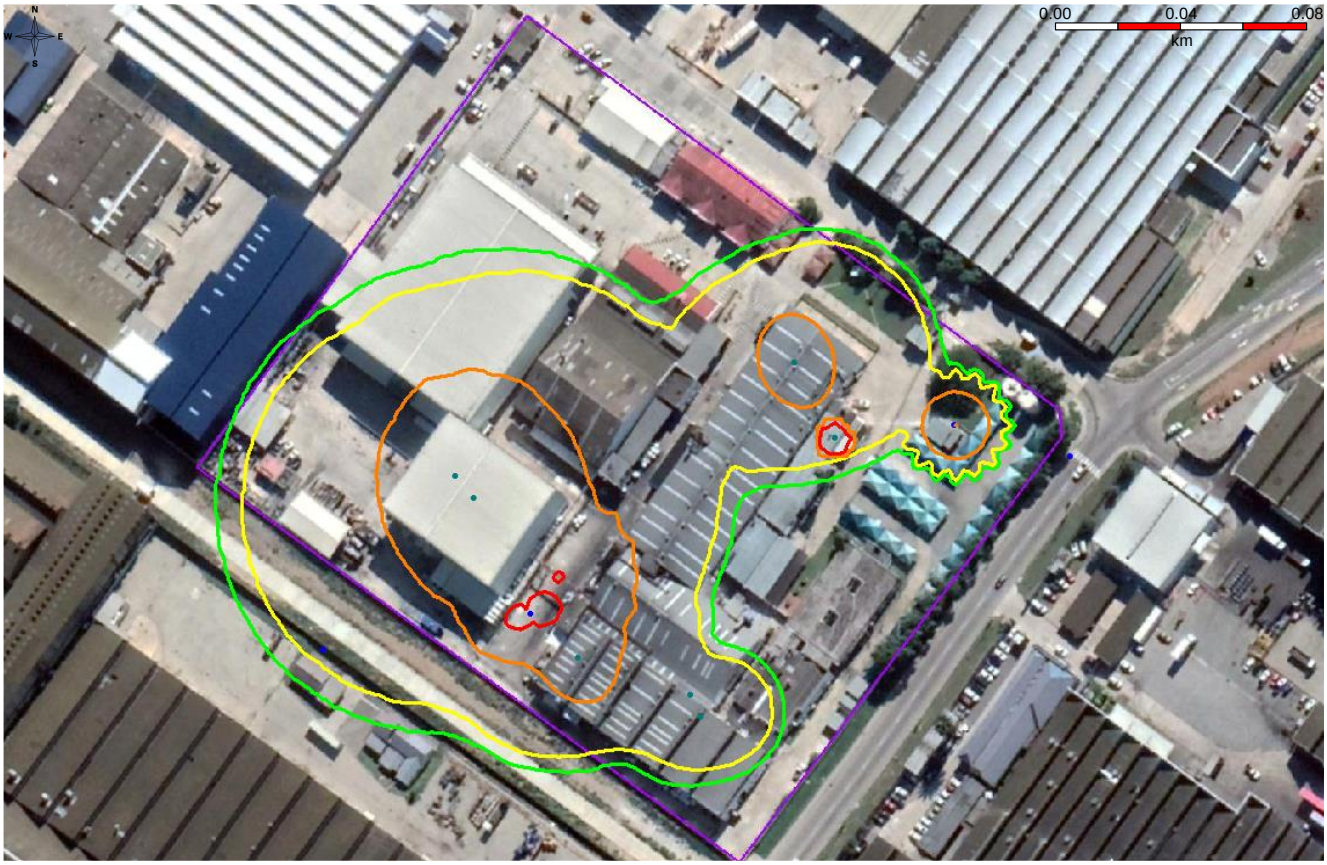
7.1 SAFETY RISK LEVELS

Two types of risk were evaluated in this risk assessment. They are outlined below and more details are presented in Appendix 7.

Individual risk: The chance that a particular individual at a particular location will be harmed. It is usually described in numerical terms such as "number of fatalities per person per year". The units are typically of one chance in a million of death per person per year and are shown as exponents i.e. 1 * 10^{-6} d/p/y. Criteria for individual risk are described in section 4.9.

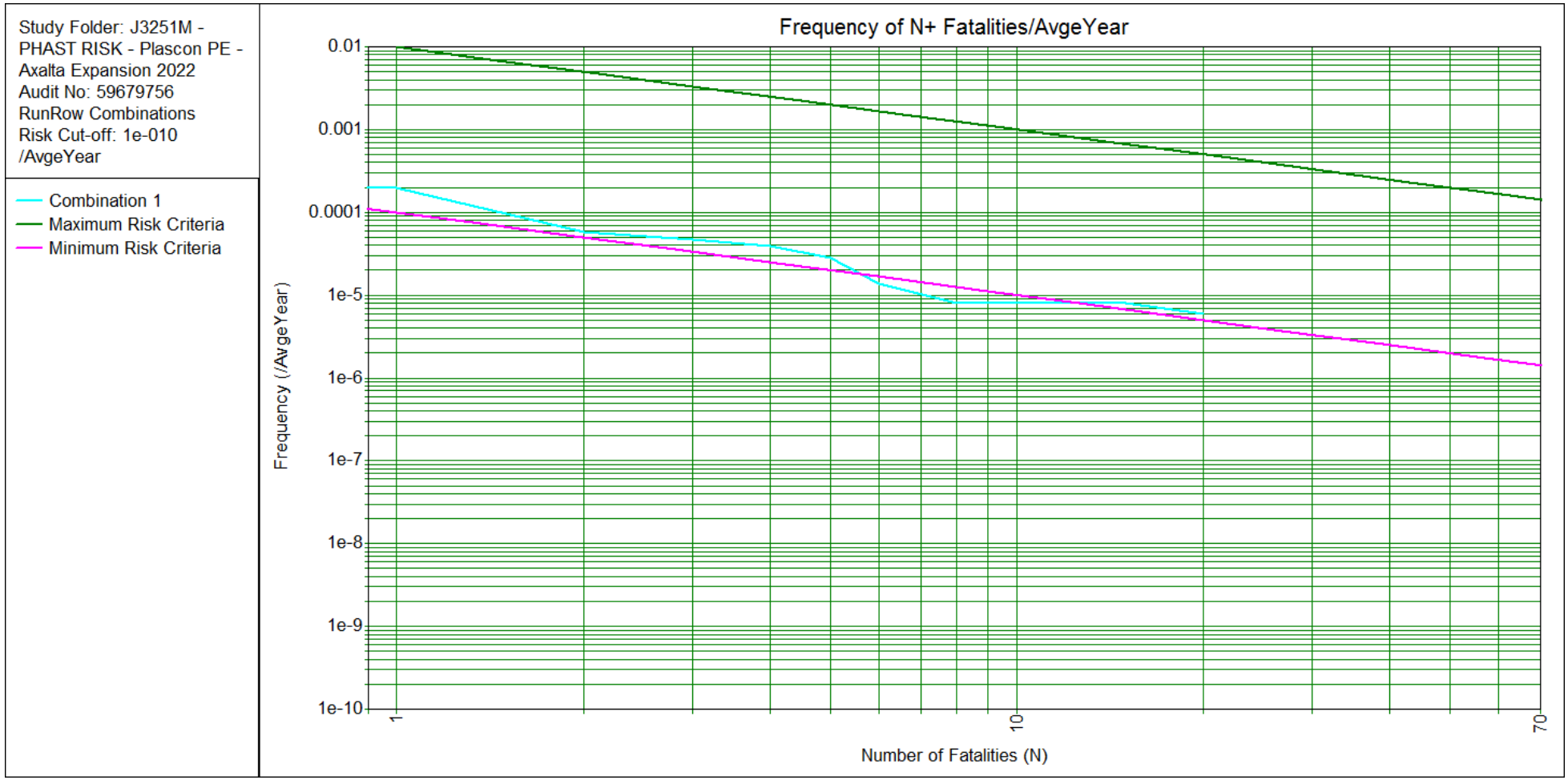
Societal risk: Societal risks do not focus on the risk to a single individual but consider the risk of numerous persons being killed for a given event. Societal risk considers each incident modelled and the corresponding numbers of persons affected, to provide an idea of the scale of an accident. Societal risks are considered to ensure that high likelihood events do not result in (relatively) large amounts of fatalities. Criteria for societal risk are described in section 4.9.

Figure 7.1.1 – Individual Risk Isopleths for the Kansai Plascon Port Elizabeth Installation
(Red= 1E-4 d/p/y, Orange= 1E-5 d/p/y, Yellow=1E-6 d/p/y, Green=3E-7 d/p/y)
Note: 1E-4 = 1 * 10^{-4} or 0.0001



No blue risk contours should be present within the site – as there are none, on-site risks are tolerably low, provided ALARP.
The red lines should not extend beyond the site boundary – as they do not, off-site risks are tolerably low, provided ALARP.

Figure 7.1.2 – Societal Risk F-N Curve for the Kansai Plascon Port Elizabeth Installation



The blue line for the installation risk **should not** be above the green risk criteria line and ideally below the pink line – societal risks are **tolerably low, provided ALARP.**

7.2 ENVIRONMENTAL RISKS

It should be noted that the assessment of environmental impacts in not within the remit of the MHI regulation nor the scope of an MHI Risk Assessment. Due to the location of the site in a flat industrial area, with bunding and curbing and no large water sources nearby, it is unlikely that even the largest of spills would have major environmental impacts. In the case of fire, there may be some soot fall out, that may have an impact on the environment.

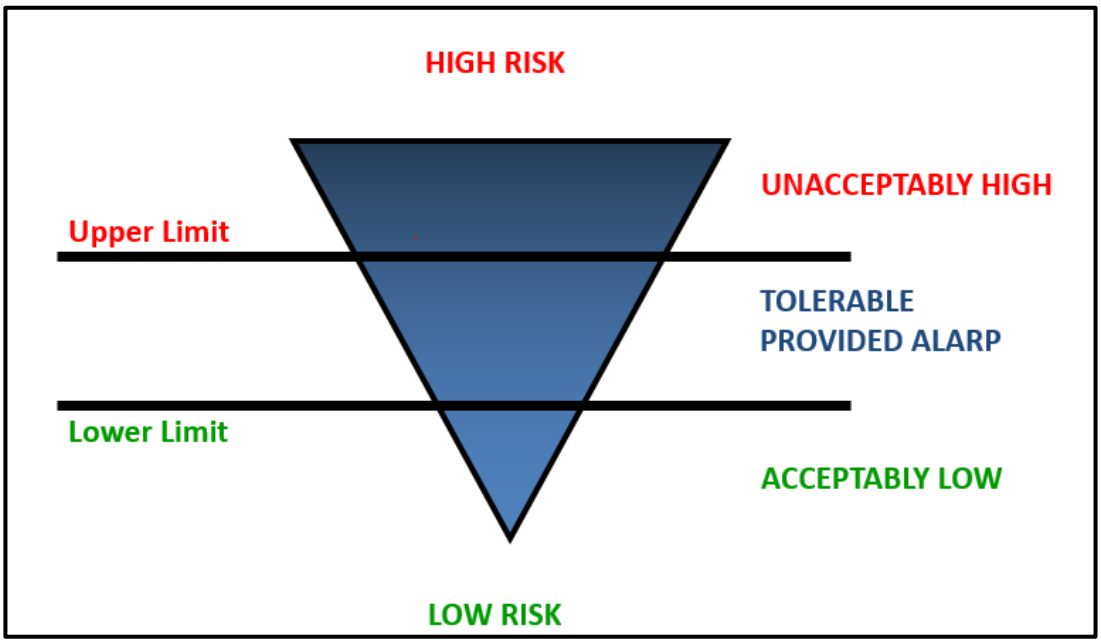
Note should be taken of the requirements of Section 30 of the National Environmental Management Act, as amended, (NEMA), which require various reports to be submitted in the event of any serious incidents on the installation. Safety, Health and Environmental management systems should be in place to facilitate the recording and reporting.

8. RISK JUDGEMENT

8.1 INDIVIDUAL RISK

Individual risk can fall into one of three broad categories:

- Intolerably high
- Tolerable provided ALARP
- Broadly acceptable



With respect to acceptability of risk there are no agreed (or legislated) numerical criteria applicable in South Africa. The United Kingdom's Health and Safety Executive's criteria is widely used. These criteria are well developed, conservative and yet not stringent to the point of inhibiting industrial development. See Appendix 8.1 for a discussion on the acceptability of risk and the UK criteria.

Table 8.1.1 Summary of UK HSE individual risk criteria

RISK CLASSIFICATION	EMPLOYEES WITHIN SITE (chances in a million (cpm) of being fatally affected in any one year)	PUBLIC PERSONS (chances in a million (cpm) of being fatally affected in any one year)
Intolerably high	More than 1000	More than 100
Tolerable Provided ALARP	Between 1000 and 10	Between 100 and 1
Broadly acceptable	10 or less	1 or less

Risk levels vary as one moves away from or toward each hazardous installation. Cumulative risk levels for some significant locations are presented in the table below. For each area, the material/equipment contributing most to the risk in each location is listed in the last column.

Table 8.1.2 – Individual risk levels at various locations

LOCATION	INDIVIDUAL RISK LEVEL (per million)	ASSESSMENT PER UK HSE CRITERIA	AREAS CONTRIBUTING TO THE RESIDUAL RISK
RISK TO EMPLOYEES (ON-SITE LOCATIONS)			
Solvents offloading area	471	**Tolerable Provided ALARP**	- Offloading hose ruptures and leaks.
LPG manifold	9	**Broadly acceptable**	- LPG cylinder ruptures. - LPG manifold ruptures.
RISK TO PUBLIC (OFF-SITE LOCATIONS)			
Aspen AOS boundary (south of the Plascon site)	1.4	**Tolerable Provided ALARP**	- Solvents raw materials store pool fire.
Newbolt Road	<0.001	**Broadly acceptable (Negligibly low)**	- LPG manifold ruptures. - LPG cylinder ruptures.

From the above table and the risk contours shown in Section 7.1, unmitigated location specific individual risk levels can be summarised as follows:

Onsite risk (employee risk): **tolerably low, provided ALARP** (i.e. Risk<$1*10^{-3}$ and >$1*10^{-5}$ deaths/person/year). Risk to employees are highest at the bulk solvent offloading area.

Offsite risk at the site boundary (risk to neighbours): **tolerably low, provided ALARP** (i.e. Risk<$1*10^{-4}$ and >$1*10^{-6}$ deaths/person/year). Risk to the public at the site boundary is highest near the southern site boundary.

Risks are broadly acceptable beyond ±30 m from the site boundary.

8.2 SOCIETAL RISK

Figure 7.1.2 indicates that societal risks are **tolerably low, provided ALARP**. The maximum number of fatalities for a worst-case scenario could be up to 23 persons. The likelihood of this is less than once in one hundred thousand years.

9. RISK TREATMENT

Technical and organizational recommendations do not form part of the Approved Inspection Authority (AIA) certification extended by SANAS for MHI risk assessment AIAs. This MHI report may suggest that certain risk reduction measures be considered, however these will merely be **suggestions** that the client is responsible for investigating further. The client should undertake their own risk reduction study, and then implement those measures that are deemed reasonably practicable.

9.1 ORGANIZATIONAL MEASURES

MHI facilities should put organisational measures in place to prevent risk events that could result in a MHI incident. Such organisational measures are known as a 'process safety management system' (PSM system) and covers many elements for example:

- Management leadership
- Safety documentation
- Integrity assurance
- Instrumented protection functionality
- Permit to work
- Management of change
- Operator training and procedures
- Mechanical protective systems
- Electrical protective systems
- Process protective systems

The organizational measures in place on the site have been reviewed in using a checklist which covers many aspects of such a PSM system. Kansai Plascon could consider implementing the following measures, as noted in the organisational measures checklist:

Aspect	Element	Review evaluation	Recommendation
Safety Documentation	Change / Modification control procedure	MOC procedure is currently being implemented.	Plascon could consider including instructions to review major process safety hazards in the proposed MOC procedure.
	Management of change procedure includes specific instructions for review of major process safety hazards.		
Integrity assurance	Loading hoses and arms inspected and tested	Currently not done. Hoses are replaced only if leaking. Offloading done by gravity, relatively low pressure.	Plascon could consider implementing scheduled inspections of offloading hoses.
Operator reliability	Major hazard awareness training program	Currently not done.	Plascon could consider providing employees with training on the major hazards associated with the materials stored and handled at the facility.

9.2 TECHNICAL MEASURES

Technical recommendations do not form part of the Approved Inspection Authority (AIA) certification extended by SANAS for MHI risk assessment AIAs. This MHI report may suggest that certain risk reduction measures be considered, however these will merely be **suggestions** that the client is responsible for

investigating further. The client should undertake their own risk reduction study, and then implement those measures that are deemed reasonably practicable.

The following technical risk reduction suggestions can be considered:

Plant Area	Risk mitigated	Risk reduction suggestion
Solvents offloading area	Pipe or pump ruptures or leaks due to impact damage.	Plascon could consider erecting additional impact protection around the solvent pumps that are unprotected from vehicle traffic.
	Hose ruptures or leaks.	Plascon could consider storing offloading hoses on dedicated cradles, off of the ground. Also, see organisational measures regarding offloading hoses above.
Raw materials store	Fires and explosions within the store.	Plascon should consider segregating certain hazardous materials from the general stacking area where mainly flammable liquids are stored. For example: 1. Nitrocellulose, which could detonate if heated by an external fire, should ideally not be stored in between flammable/combustible liquids. 2. Class 6 (toxic) materials should ideally not be stored in between flammable liquids, as a fire could generate highly toxic smoke. Plascon could consider referring to SANS standard "SANS 10263-0:2017, The warehousing of dangerous goods" for further guidance.
LPG manifold	External fires impinging on LPG cylinders.	Plascon should consider removing all combustible materials that are stored within the LPG manifold caged area.
	Likelihood of cylinder failures and consequences of manifold failures.	Plascon could consider reviewing whether the total inventory of LPG cylinders could be reduced, based on cylinder turnover. Reducing the amount of cylinders present on the site, or the quantity of cylinders connected to the manifold at a time could reduce the consequences and likelihood of an LPG release.
	Rubber hose failures.	Plascon should consider inspecting the rubber hoses connecting the cylinders to the manifold, or replacing the hoses on a schedule, based on the mean time to failure.

9.3 DEMONSTRATING ALARP

Risks that are higher than "Broadly Acceptable", but lower than "Intolerable", fall into the "tolerable, provided ALARP" range. Risks in this range are considered "Tolerable", **only** if further risk reduction is impractical or if its cost is grossly disproportionate to the improvement gained.
The following installations at the Kansai Plascon Port Elizabeth facility present risks in the tolerably low, provided ALARP range:

-LPG manifold installation
-Bulk solvents offloading
-Raw materials store
-Production areas

Proving ALARP is not considered part of the MHI risk assessment. A separate ALARP study may be required, based on the judgment of the local authority and the duty holder (Kansai Plascon).

10. LAND USE PLANNING

There is a twofold responsibility placed on the local authorities when dealing with an MHI (See MHI regulation 9).

- To should ensure that the existing MHI facility presents sufficiently low risks to existing neighbouring facilities and communities.
- To ensure that new developments within the area potentially affected by the MHI are suitable for the risk level in the area, e.g. no hospitals near very hazardous plants.

The site is situated on industrially zoned land and is surrounded by other industries. Land-use planning restrictions are suggested as follows:

Development Type	Description	Suggested separation distance
Industrial use	Workplaces with buildings with <100 occupants and <3 storeys per building.	No land-use planning restrictions
	Workplaces containing buildings with >100 occupants and 3 or more storeys per building.	Not within the **orange** contours (None - these contours do not extend beyond site boundary)
Residential	Any housing developments, even those with less than 30 dwellings per hectare, except small infill projects of one or two units which could be allowed.	Not within the **orange** contours (None - these contours do not extend beyond site boundary)
	High density developments such as large blocks of flats, informal housing, etc.	Not within the **yellow** contour (30 m from site boundary)
Other	Hospitals, old-age homes, crèches, schools, large outdoor entertainment facilities (theme parks, sports stadia), etc.	Not within the **green** contour (45 m from site boundary)

Figure 10.1 – Map of Land Use Planning Zones.

ORANGE – within the orange contour is the Inner Zone (None - these contours do not extend beyond site boundary)
YELLOW – between the yellow and the orange contour is the Middle Zone (up to 30 m from site boundary)
GREEN – between the green and the yellow contour is the Outer Zone (up to 45 m from site boundary)

Note that the above are merely suggestions and any decisions regarding land-use planning are entirely the responsibility of the local authorities.

11. EMERGENCY RESPONSE PLANNING

11.1 ON SITE EMERGENCIES

These can be emergencies that only have effects within the site boundary. There are Emergency Procedures for the Kansai Plascon Port Elizabeth facility, and the procedure has been reviewed. The plan was found to be well suited to the hazards found on the site. Some ideas for improvement have been suggested below:

- The procedures need to be updated for the Axalta facilities.
- The procedures need to be reviewed and updated every 3 years.
- The owner or employer should sign the site emergency procedure.

Plascon could consider the following:

1. Including the review period for the emergency plan in the document.
2. The plan is a spreadsheet with 15 different worksheets, each with a particular topic. Plascon could consider review the ordering of the sheets in the plan, to follow a more sequential layout. Some sheets are duplicates.
3. Including information on the training of personnel, visitors and contractors in the emergency plan. Site induction is not mentioned.
4. Including information in the plan relating to the frequency of emergency drills (ideally at least annually), as well as the need for drills together with the fire department.

5. Indicating the need to inform the relevant authorities of every occurrence, which has brought the MHI aspects of the plan into action, of actual MHI incidents as well as of near misses.
6. Including information regarding which neighbouring facilities need to be contacted if offsite effects are expected, including contact numbers, who will contact them, and what will be communicated.
7. The plan should be signed by the Chief Executive Officer.
8. Including the name, job title and contact number of the emergency controller.
9. Including the location of the emergency control centre, what equipment should be available at the control centre, who is responsible for maintenance of this equipment, and an alternative control centre location in case the designated centre is compromised.
10. Including the location of the emergency equipment and who is responsible for maintenance of this equipment.
11. Including the procedures for testing of the fire/evacuation alarm.
12. Including the evacuation map showing the assembly point, an alternative assembly point if the first point is unsafe, and an offsite assembly point.
13. The actions of First Response Teams (fire wardens) could be specified in more detail, e.g. go to assembly point, don suitable PPE, approach the location of the emergency, isolate releases, activate firefighting systems, etc., in a single concise section.
14. The emergency services (fire department) telephone number was not in the plan provided.
15. Plascon could consider referring to the newly published “SANS 1514 – Major Hazard Installation : Emergency response planning” standard for guidance when reviewing their emergency plan.

11.2 OFF SITE PUBLIC EMERGENCIES

Kansai Plascon Port Elizabeth should communicate with the local emergency services to ensure that an off-site emergency plan is in place for the installation (see MHI Regulation 9). The off-site plan is the responsibility of the local authorities.

11.3 ANNUAL EMERGENCY DRILL

MHI Facilities are required to have an MHI type drill to test the emergency response plan at least once a year. This ideally needs the involvement of local emergency services (and preferably any other industries in the area that may be affected). Kansai Plascon Port Elizabeth should ensure that they conduct such drills, even without the presence of the local emergency services, and keep record thereof.

12. CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations for this MHI RA of the Kansai Plascon Port Elizabeth facility:

12.1 CONCLUSIONS

Consequence Analysis and MHI Classification

- Due to the presence of certain hazardous materials and their associated offsite effects the Kansai Plascon Port Elizabeth site should be classified as a major hazard installation.

- The Axalta-Plascon modifications do not constitute an MHI as they are not expected to possibly generate accidents with catastrophic offsite impacts. The modifications only add marginally to the on-site risks.

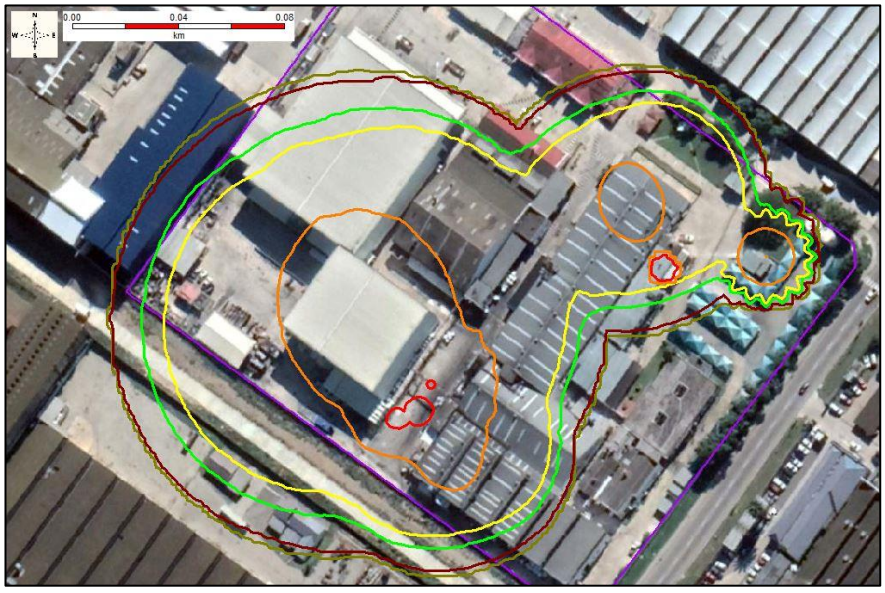
- The following installations within the Kansai Plascon Port Elizabeth have been found to be MHI installations:

Installation	Worst case incident	Distance To 1% lethality (m)
Bulk solvents (e.g. toluene)	Road tanker rupture	33
Drummed solvents	Raw materials store pool fire	74
Nitrocellulose	Detonation of pallet	68
LPG	Manifold rupture	59

- There are no known declared Major Hazard Installations in the vicinity within the domino effect range of worst-case events (55 m), therefore offsite domino effects are not a major concern.

Risks

- **Individual Risk Isopleths for the Kansai Plascon Port Elizabeth Installation**
  Red= 1E-4 d/p/y, Orange= 1E-5 d/p/y, Yellow=1E-6 d/p/y, Green=3E-7 d/p/y)



- Risk levels to individuals near the facility can be summarised as follows:

  - Onsite risk (employee risk): **tolerably low, provided ALARP** (i.e. Risk<$1*10^{-3}$ and >$1*10^{-5}$ deaths/person/year). Risk to employees are highest at the bulk solvent offloading area.

  - Offsite risk at the site boundary (risk to neighbours): **tolerably low, provided ALARP** (i.e. Risk<$1*10^{-4}$ and >$1*10^{-6}$ deaths/person/year). Risk to the public at the site boundary is highest near the southern site boundary.

  - Risks are broadly acceptable beyond ±30 m from the site boundary.

- Risk reduction should be explored by Kansai Plascon. The following organisational risk reduction suggestions have been made in section 9.1 of this report:

Aspect	Element	Review evaluation	Recommendation
Safety Documentation	Change / Modification control procedure Management of change procedure includes specific instructions for review of major process safety hazards.	MOC procedure is currently being implemented.	Plascon could consider including instructions to review major process safety hazards in the proposed MOC procedure.
Integrity assurance	Loading hoses and arms inspected and tested	Currently not done. Hoses are replaced only if leaking. Offloading done by gravity, relatively low pressure.	Plascon could consider implementing scheduled inspections of offloading hoses.
Operator reliability	Major hazard awareness training program	Currently not done.	Plascon could consider providing employees with training on the major hazards associated with the materials stored and handled at the facility.

- The following technical risk reduction suggestions have been made in section 9 of this report:

Plant Area	Risk mitigated	Risk reduction suggestion
Solvents offloading area	Pipe or pump ruptures or leaks due to impact damage.	Plascon could consider erecting additional impact protection around the solvent pumps that are unprotected from vehicle traffic.
	Hose ruptures or leaks.	Plascon could consider storing offloading hoses on dedicated cradles, off of the ground. Also, see organisational measures regarding offloading hoses above.
Raw materials store	Fires and explosions within the store.	Plascon could consider segregating certain hazardous materials from the general stacking area where mainly flammable liquids are stored. For example:

		3. Nitrocellulose, which could detonate if heated by an external fire, should ideally not be stored in between flammable liquids. 4. Class 6 (toxic) materials should ideally not be stored in between flammable liquids, as a fire could generate highly toxic smoke. Plascon could consider referring to SANS standard "SANS 10263-0:2017, The warehousing of dangerous goods" for further guidance.
LPG manifold	External fires impinging on LPG cylinders.	Plascon could consider removing all combustible materials that are stored within the LPG manifold caged area.
	Likelihood of cylinder failures and consequences of manifold failures.	Plascon could consider reviewing whether the total inventory of LPG cylinders could be reduced, based on cylinder turnover. Reducing the amount of cylinders present on the site, or the quantity of cylinders connected to the manifold at a time could reduce the consequences and likelihood of an LPG release.
	Rubber hose failures.	Plascon could consider inspecting the rubber hoses connecting the cylinders to the manifold, or replacing the hoses on a schedule, based on the mean time to failure.

- Societal risks are **tolerably low, provided ALARP**. The maximum number of fatalities for a worst-case scenario could be up to 23 persons. The likelihood of this is less than once in one hundred thousand years.

Emergency Plan

- There are Emergency Procedures for the Kansai Plascon Port Elizabeth facility, and the procedure has been reviewed and suggestions made in APPENDIX 11. The plan was found to be well suited to the hazards found on the site.

- In terms of the regulations, off-site emergency planning is the responsibility of the local authorities, with involvement from the operating personnel at the facility when developing the plan.

Land Use Planning

- Since there could be offsite effects Town Planning should be made aware of which areas could be affected, in order to manage the approval of new developments in the vicinity of this MHI.

- The following land use planning restrictions have been suggested in section 10 of this report:

Development Type	Description	Suggested separation distance
Industrial use	Workplaces with buildings with <100 occupants and <3 storeys per building.	No land-use planning restrictions
	Workplaces containing buildings with >100 occupants and 3 or more storeys per building.	Not within the **Inner Zone** (None - these contours do not extend beyond site boundary)

Residential	Any housing developments, even those with less than 30 dwellings per hectare, except small infill projects of one or two units which could be allowed.	Not within the **Inner Zone** (None - these contours do not extend beyond site boundary)
	High density developments such as large blocks of flats, informal housing, etc.	Not within the **Middle Zone** (30 m from site boundary)
Other	Hospitals, old-age homes, crèches, schools, large outdoor entertainment facilities (theme parks, sports stadia), etc.	Not within the **Outer Zone** (45 m from site boundary)

Uncertainties and sensitivities

- A fire within the raw materials store could generate toxic smoke. However, since the materials stored are mostly solvents, this toxic smoke is likely to be similar to any fire in a paint warehouse. With over 400 chemicals present in the store, the exact nature of the compounds is impossible to predict. There are no large quantities of any particular toxic component, i.e., no chlorides or sulphates and limited nitrogen. Generally, the smoke from such a fire tends to rise up rapidly and disperse in the upper atmosphere due to the heat generated in the fire. However, should there be an extremely strong wind that knocks the cloud back down to the ground, persons in the area exposed to the cloud would need to be protected or evacuated.

12.2 RECOMMENDATIONS

The following recommendations have been made:

1. The Kansai Plascon Port Elizabeth should be considered a Major Hazard Installation.

2. The Axalta-Plascon modifications need not be considered an MHI while part of the greater Plascon operating site. However, should Axalta separate out its operations from within the Plascon access controlled area, then it MHI status will need to be reviewed.

3. A copy of this risk assessment should be available on the site at all times for inspection by the authorities.

4. The relevant authorities (i.e. local Fire and Emergency services, Provincial Department of employment and labour and National Department of Labour) should have been notified by Plascon after the 2019 MHI QRA. They need to be re-notified by way of a copy of this updated risk assessment and SDSs, with a covering letter from Kansai Plascon Port Elizabeth.

13. Public notification should have been done with the 2019 MHI Report and Kansai Plascon should have retained proof of notifications. See section 5.3.2. If this has been done, then public notification need not be repeated for this updated report.

5. Kansai Plascon Port Elizabeth should inform their Health and Safety Committee of the results of this risk assessment.

6. On-site emergency procedures for the site have been reviewed (See section 11). The plan was found to be well suited to the hazards found on the site, with some suggestions for improvement, e.g. update to include Axalta-Plascon facilities.

7. Kansai Plascon Port Elizabeth should confirm that the local emergency services have an off-site emergency plan in place.

8. Given the **tolerably low, provided ALARP** risk levels, risk reduction measures should ,continue to be explored and implemented. Some possible improvements have been suggested in section 9.

9. The Kansai Plascon Port Elizabeth facility could affect land-use planning. Land use planning restrictions apply within 45 m of the facility. See section 10.

10. MHI Regulation 7 states that incidents and near misses have to be recorded and reported to the authorities. Kansai Plascon Port Elizabeth should comply with this regulation.

11. This MHI facility should be reassessed 5-yearly, (i.e. due 2024), or earlier if major modifications are made, the installations are expanded, or a major incident occurs.

13. PROOF OF COMPETENCY

Refer to the certificates in Appendix 1.4.

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APPENDICES

APPENDIX 1

APPENDIX 1.2 THE MAJOR HAZARD INSTALLATION REGULATIONS

During the 1970's and 80's there were many catastrophic events around the world related to the large scale production and storage of hazardous chemicals (e.g. Flixborough, Bhopal, Seveso, Mexico City to name a few). Many public persons outside the actual chemical sites were adversely affected by explosions, fires and the release of toxic gases. In many cases (e.g. Bhopal) this was compounded by the fact that the public as well as the emergency services had no idea of the types of chemicals on the sites and therefore no idea of how to respond when the events occurred. In some cases (Bhopal and Mexico City) the situations were compounded by the fact that residential developments (particularly low cost or informal settlements) had been allowed to develop right next door to these chemical factories.

In an attempt to prevent the reoccurrence of such disasters there was a trend in the 1980's and 90's around the world to implement legislation to control such situations. The so-called Seveso Directives in Europe and their implementation in the United Kingdom as the CIMAH and COMAH regulations are a good example of how these laws have been implemented.

When the first round of legislation was published in Europe the focus was on getting companies to notify (i.e. the government and interested and affected parties now knew where the installations were). The second round of legislation required companies to perform risk assessments of their operations and to submit these for scrutiny to the authorities. The most recent round of legislation is focussed on requiring companies to provide evidence that they are managing their risks adequately.

When the South African laws were compiled, the authors took cognisance of the regulations in other countries and any difficulties that had been experienced. The regulations tried to address these difficulties. For example, in Europe there was a tendency for some companies to keep just less than the threshold quantities to avoid having to comply. For this reason, the South African legislation does not set a lower limit on the quantities of substances that should be considered.

Ultimately the objective behind registering a site as a MHI is to ensure that the local authorities know what hazardous chemicals and hazards are out there, have emergency plans in place in case of an incident and have adequate information to control developments to suit (e.g. planning a suitable school, hospital or old age home near a hazardous chemical site). Companies are also better equipped to know what their risks are and can manage them accordingly.

The Major Hazard Installation Regulations falling under the Occupational Health and Safety Act of 1993 were promulgated on 16 January 1998. Although these regulations were revised in July 2001, the fundamental requirements remain in force [Ref. 1].

Part of these regulations require existing facilities and all new facilities, who have hazardous materials on their sites, to conduct a risk assessment to indicate their potential for causing major hazardous events (i.e. hazardous events of catastrophic proportions that can affect employees and the public outside the perimeter of the facility). This risk assessment should be reviewed every 5 years.

The risk assessment, which indicates why the installation is a major hazard installation, should then be presented to the National, Provincial and Local Authorities. The authorities have a responsibility to ensure suitable risk levels and separation distances between new installations, new residential developments, sensitive areas such as hospital etc. The public in the area of an MHI should be notified and for new installations persons have 60 days to make submissions to the relevant authorities.

The regulations are not prescriptive in terms of the classification of MHI's. Should anything occur which does indeed impact on the general public; the onus will lie with the management of the facility to prove why the installation is not classified as a major hazard and why the associated precautions / plans etc. were not implemented.

In South Africa there is other legislation (i.e. other regulations under the OHS Act) that govern assessment of hazards for employees. There is also legislation for environmental effects inside and outside a facility. Therefore, the focus of the MHI regulations is on the direct physical and chemical impacts of chemical installations on the public at large. An MHI assessment is therefore not a detailed audit of all the possible risks to plant equipment and operating personnel etc., but focuses rather on those hazardous events that could have a "significant" impact outside the installation boundary. Long terms environmental aspects (e.g. ground water contamination) and long-term health hazards (e.g. carcinogens) are therefore not within the scope of MHI considerations.

Terms frequently used in this report and the interpretation / meaning attached to each of these terms can be found in the Major Hazard Installation regulations.
Definitions of some other terms are listed below.

Hazard	A situation that has the potential to harm people, the environment or physical property, through a fire, explosion or toxic release (e.g. the use, storage or manufacture of a flammable or toxic material).
Hazardous Incident or Event	An occurrence due to use of plant or machinery or from activities in the workplace, that leads to an exposure of persons to hazards (e.g. the rupture of a vessel and loss of containment of flammable or toxic material –also referred to as a hazardous event).
Causative events	Occurrences that give rise to hazardous incidents (e.g. failure of a temperature indicator or pressure relief, etc.)
Consequences	The physical effects of hazardous incidents and the damage caused by these effects;
Severity	The seriousness of the consequences (e.g. death or injury or distress).
Risk	The overall probability of a particular type of consequence of a particular type of incident affecting a particular type of person.
Acceptability	The evaluation of the risk in comparison to certain known level of risk in other areas.

APPENDIX 1.3 CLASSIFICATION AS A MAJOR HAZARD INSTALLATION

An installation is classified as a major hazard installation if:

- More than the prescribed quantity (as per Schedule A in the General Machinery Regulations under the OHS Act [Ref. 1]) of any substance is kept on site in one fixed vessel.

- Where the form and quantity of any substance is such that it has the potential to cause a major incident (i.e. an incident of catastrophic proportions).

This classification therefore rests on defining what are considered to be 'catastrophic' consequences of major incidents. There is no clear definition and the interpretations can vary widely. ISHECON cc has adopted an interpretation that declares in this context that:

> *"A catastrophe constitutes any hazardous event which exposes members of the public to harmful effects of such a magnitude that a typical healthy adult would suffer some adverse health effects and a more vulnerable person could possibly be fatally injured."*

The above interpretation is converted into a consequence-based quantification criterion of 1% chance of fatalities from major hazardous events.

The focus of the legislation is on immediate acute effects due to hazardous chemicals. Therefore, only hazardous chemicals are considered and not the effect, for example, of hot high-pressure water or the potential energy in elevated water storage structures etc. If a material is not listed as hazardous in the South Africa Legislation (i.e. SANS 10228 [Ref. 2]) or in international databases such as materials safety datasheets, then it is not considered as contributing to a potential major hazard under this legislation. As there is other legislation (Environmental and Health legislation) governing chronic exposure to chemicals and long-term health effects (e.g. carcinogens) this is also not included in MHI classifications.

If there are potential incidents (e.g. gas releases, explosions or fires) that could generate effects at the site boundary but the magnitude of the effects are less than any of the levels of consequences listed below, then the installation is clearly NOT a Major Hazard Installation (i.e. fatalities are not expected). Although there would be effects, they are not considered significant enough to be catastrophic:

- Thermal radiation from fires: 4kW/m^2 for 1 minute [severe injuries, but no fatalities e.g. blistering of skin, second-degree burns] as per *API 521* [Ref 3] this is tolerable for a few minutes without protection. This is also a World Bank Standard [Ref 4] for what is considered potentially painful but not lethal.

- Blast overpressure from explosions: 7kPa [building damage, may be uninhabitable, injuries from glass etc but no direct fatalities] as per UK *HSE* consultation distances for developments [Ref 5].

- Toxic gas dose: ERPG 2 concentration for 1 hour (Emergency Planning Response Guidelines [acute health effects, but no fatalities] as per *America Industrial Hygiene Association 1990*.

If, however the effects exceed the following criteria the consequences are significant (1% or more chance of fatalities) and the installation is a major hazard installation.

- Thermal radiation from fires: 12.5kW/m^2 for 1 minute > 1 % fatalities [Ref 4], 5 seconds to pain, ignites normal clothing in 60 seconds [Ref 5].

- Blast overpressure from explosions: 14kPa, collapse of walls and structures [UK HSE required separation distance between developments].

- Toxic gas dose: Equivalent of ERPG 3 concentration for 1 hour and/or < 1% fatalities if using a probit equation for a typical healthy population.

In the range between the above insignificant and catastrophic levels, the MHI classification depends on the particular circumstances prevailing on the site and the characteristics of its surroundings population.

APPENDIX 1.4 RISK ASSESSMENT PROCESS AND AIA ACCREDITATION

I*SHE*CON is an Approved Inspection Authority by the Department of employment and labourfor the risk assessment of flammable, explosive and toxic substances (Number MHI-001). This is dependent on I*SHE*CON's quality management system for an inspection body being accredited against ISO/IEC 17020 by SANAS (Number MHI-008). (See certificates below)

This study has been carried out in accordance with SANS 1461:2018 – Major hazard installations – Risk Assessments and ISHECON Work Procedures WP301 – MHI RA Assignment Administration and WP302 – MHI RA Methodology. This study has been carried out by an appointed risk assessor, in accordance with ISHECON Work Procedure 102- Training and appointment of personnel. The risk assessment has been approved by a signatory listed on the SANAS certificate.

I*SHE*CON uses a software package for quantitative risk assessment, PHAST RISK, under license from DNV in the UK (www.dnv.com). This study has been done on Version 6.7.

employment & labour
Department:
Employment and Labour
REPUBLIC OF SOUTH AFRICA

National Department of Employment and Labour
Republic of South Africa

APPROVED INSPECTION AUTHORITY

Registered in accordance with the provisions of the Occupational Health and Safety Act, Act 85 of 1993, as amended and the Major Hazard Installation Regulations.

THIS IS TO CERTIFY THAT:

ISHECON CC

has been registered by the Department of Employment and Labour as an Approved Inspection Authority: Type A, to conduct Major Hazard Installation Risk Assessment, in terms of Regulation 5(5)(a), of the Major Hazard Installation Regulations.

CONDITIONS OF REGISTRATION:

- *The AIA must at all time comply with the requirements of the Occupational Health and Safety Act, Act 85 of 1993, as amended.*
- *This registration certificate is not transferable.*
- *This registration will lapse if there is a name change of the AIA or change in ownership.*

CHIEF INSPECTOR

Valid from: 13 June 2021
Expires: 12 June 2025
Certificate Number: CI MHI 0001

APPENDIX 1

sanas
South African National Accreditation System

CERTIFICATE OF ACCREDITATION

In terms of section 22(2) (b) of the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act, 2006 (Act 19 of 2006), read with sections 23(1), (2) and (3) of the said Act, I hereby certify that:-

ISHECON CC
Co. Reg. No.: 1999/029022/23
MODDERFONTEIN

Accreditation Number: **MHI0008**

is a South African National Accreditation System Accredited Inspection Body to undertake **TYPE A** inspection provided that all SANAS conditions and requirements are complied with

This certificate is valid as per the scope as stated in the accompanying scope of accreditation, Annexure "A", bearing the above accreditation number for

THE ASSESSMENT OF RISK ON MAJOR HAZARD INSTALLATIONS

The facility is accredited in accordance with the recognised International and National Standards

ISO/IEC 17020:2012 AND SANS 1461:2018

The accreditation demonstrates technical competency for a defined scope and the operation of a management system

While this certificate remains valid, the Accredited Facility named above is authorised to use the relevant SANAS accreditation symbol to issue facility reports and/or certificates

Mr M Phaloane
Acting Chief Executive Officer

Effective Date: 13 June 2021
Certificate Expires: 12 June 2025

This certificate does not on its own confer authority to act as an Approved Inspection Authority as contemplated in the Major Hazard Installation Regulations. Approval to inspect within the regulatory domain is granted by the Department of Employment and Labour.

ANNEXURE A

SCOPE OF ACCREDITATION

Accreditation Number: MHI0008

TYPE A

Permanent Address: ISHECON CC H6 Pinelands Office Park Maxwell Drive Modderfontein Ekurhuleni Gauteng 1645 Tel: (011) 201-4783 Cell: 082 348 0070 Fax: 086 549-0878 E-mail: bothad@ishecon.co.za		**Postal Address:** P O Box 320 Modderfontein Ekurhuleni Gauteng 1645 Issue No.: 13 Date of Issue: 11 June 2021 Expiry Date: 12 June 2025
Nominated Representative: Mr CF Botha	**Quality Manager:** Mr CF Botha **Technical Manager:** Mr DJE Rademeyer	**Technical Signatories:** Mr DJE Rademeyer Ms DC Mitchell Mr CF Botha

Field of Inspection	Service Rendered	Codes and Regulations
Regulatory: The supply of services as an Inspection Authority for Major Hazard Risk Installation as defined in the Major Hazard Risk Installation Regulations, Government Notice No. R692 of 30 July 2001	Major Hazard Installation Risk Assessments for the following material categories: 1) Explosive chemicals 2) Gases: i) Flammable Gases ii) Non-flammable, non-toxic gases (asphyxiants) iii) Toxic gases 3) Flammable liquids 4) Flammable solids, substances liable to spontaneous combustion, substances that on contact with water release flammable gases 5) Oxidizing substances and organic peroxides 6) Toxic liquids and solids	MHI regulation par. **5 (5) (b)** i) Frequency/Probability Analysis ii) Consequence Modelling iii) Hazard Identification and Analysis iv) Emergency planning reviews SANS 31000 SANS 31010 SANS 1461:2018

Original Date of Accreditation: 13 June 2005

ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM

Accreditation Manager

APPENDIX 2.2. TOPOGRAPHY AND METEROLOGY

TOPOGRAPHY

The risk assessment software emission distribution package (PHAST RISK 6.7), does not take into account topography such as hills and valleys, nor local thermal conditions (upward currents due to heat generated by industries). However the surrounding land is classified according to its “surface roughness” which influences dispersion modelling.
The surface roughness parameter describes the roughness of the surface over which a vapour cloud is dispersing, and is a measure of the fluctuating velocity as a fraction of the mean velocity 10 m above ground.

Type of Surface	Roughness Length (m)
Open water, at least 5 km	0.0002
Mud flats, snow; no vegetation, no obstacles	0.005
Open flat terrain; grass, few isolated objects	0.03
Low crops; occasional large obstacles, x/h > 20	0.10
High crops; scattered large obstacles, 15 < x/h < 20	0.25
Parkland, bushes; numerous obstacles, x/h < 15	0.5
Regular large obstacle coverage (suburb, forest)	1
City centre with high- and low-rise buildings	3

METEOROLOGY

WIND AND WEATHER INFORMATION

PORT ELIZABETH WIND AND WEATHER DATA (2013)
(Temperatures from Weather SA and wind from SA Weather Bureau)

	Total	Humidity (C)	Air Temp (C)	Surface Temps (C)
NIGHT				
F1.5	39.3	79	16	26
D4.5	10.7	79	16	26
Total	50.0			
DAY				
B3	15.7	65	26	26
D4.5	15.3	65	26	26
D8	19.0	65	26	26
Total	50.0			

There are three Pasquill stability conditions are normally applicable namely:

- Unstable: Sunny hot day (A, B, C).
- Neutral: Overcast day or night (D).
- Stable: Clear, cold night (E, F).

APPENDIX 3.1 PROPERTIES OF HAZARDOUS MATERIALS

EXPLOSION, FLAMMABILITY AND REACTIVITY HAZARDS

Compound	BP at 1 atm (degC)	Density at 20deg C kg/m3	Vapour Press @ 20 deg C (Pa)	Flash Point (deg C)	Flammable (Y/N)	Flammable limits in air (vol %)	Auto-ignition Temperature (deg C)	Reactivity (H/M/L)
LPG	-40	590	Gas	-100	Y	2 – 9.5	450	L
Toluene (a typical solvent)	110	866	2900	4	Y	1.27 - 7	480	L
Nitrocellulose	Decomposes at 170 degrees	1.66	<1	-18	Y	1.9 - 36	170	L

HEALTH HAZARDS ASSOCIATED WITH CHEMICALS

With respect to the detrimental health effects of chemicals on the public, it is really only the inhalation effects that are relevant. Skin contact and ingestion effects are only applicable to workers who are in immediate contact with the chemicals.This assumption has been confirmed for any of the sites, as there are no large storage vessels that could fail leading to either a spray or pool of immediately harmful liquid flowing off site.

Compound	Hazardous Breakdown / Combustion Products	Inhalation Acute	Inhalation Chronic	Ingestion Contact Acute	Ingestion Contact Chronic
LPG	Carbon mon / di - oxide	Drowsiness and asphyxiation	None	Frostbite	None
Toluene (a typical solvent)	Carbon monoxide	Vertigo, narcosis, coma, cardiac arrest, if aspirated pulmonary oedema	Headaches, nausea, cognitive dysfunction, liver and kidney damage	Eye burns and damage, ingestion similar to inhalation	Dermatitis and defatting
Nitrocellulose	CO, CO_2, oxides of nitrogen.	Irritation, dizziness, narcosis.	Aggravate pre-existing kidney and liver disease.	Eye and skin irritation. Sore throat, abdominal pain, nausea, vomiting, diarrhoea, liver damage.	Kidney and liver disease.

TOXICITY INFORMATION

Compound	Odour Threshold (ppm)	Time Weighted Average OEL *** (ppm)	Short Term Exposure Level *** (ppm)	Immediately Dangerous to Life and Health **** (ppm)	LC 50 (30 mins)	ERPG 1 Value ***** (ppm)	ERPG 2 Value d (ppm)	ERPG 3 Value (ppm)	PROBIT k1 ~~	PROBIT k2	PROBIT n
LPG	6	600	750								
Toluene	0.17	50 sk	150	2 000		50	300	1000	-6.794	0.408	2.5

** - TWA Threshold Limit Value – the time weighted average for a worker exposed 8 hours per day for a 40 hour week

*** - STEL short term exposure limit for a worker exposed to not more than the TWA but with a maximum of 4 excursions to this limit per day for a maximum duration of 15 minute each with at least 60 minutes between exposures

**** - IDLH (Immediately Dangerous to Life and Health) a value that is believed on the basis of research to be immediately harmful to human health, i.e. irrecoverable damage to health within 30 minutes exposure

***** - The ERPG (Emergency Response Planning Guidelines) values are established by the American Hygiene Association and are based on a 60 minute exposure. The three categories have the following implications in terms of effects on people:

- ERPG1 - below this concentration only minor irritation should be experienced by almost all persons
- ERPG2 - below this value no permanent harm
- ERPG3 - below this value permanent harm possible but fatalities are unlikely

ERPG values (and TEEL values) can be found through the AIHA website or the US Department of Energy website or the US EPA website.

d - where ERPG values or TEEL values are not available they have been derived using a DOW chemical guideline where ERPG2 = STEL or 3 * TWA, ERPG3 = LC50/30 or 5 * ERPG2, ERPG1 = Odour threshold or ERPG2/10, if there are different values the lower more conservative value has been used

~~ - Probit is an estimation of chance of death from exposure to a concentration of toxic material (c in ppm) for a period of time (t in mins)
PROBIT = k1 +k2 *ln (c^n t).Probit equation is based on actual or experimental data and can be found in literature references, e.g. the TNO Purple Book.

APPENDIX 3.2 ACCIDENT AND INCIDENT INFORMATION

The accident data below is extracted from Lees [Ref 8] and the IChemE Accident Database version 4 of 1999 [Ref 9] and Loss Prevention Bulletins.

Material	Date	Event	Deaths	Injuries
Acetone (a typical solvent)	Feb-11	Acetone was used to wash out a drum during which it was rinsed through shaking and turning over. The result was that the emptied acetone ignited and caused a pool fire.	0	0
Acetone (a typical solvent)	Apr-00	Acetone transferred from an outside storage tank to inside a building,A heated section of a pipe in between two cold zones was gradually expanded until pressure blew out a section of compressed fibre gasket at a joint.	0	0
Acetone (a typical solvent)	Nov 1988 UK	Drum of acetone spilled from forklift.Employees clean spill but ignition occurred leading to large fire.	1	6
Acetone (a typical solvent)	Aug 1989 UK	Fire		10
Ethanol (a typical solvent)	Dec-04	A static discharge lead to a flash and fire accident during the addition of bags of crystalline oxalic acid while shaking out the last of a plastic bag.	0	1
Ethanol (a typical solvent)	Dec-04	A static discharge lead to a flash fire and explosion when a dry powdery product in was to be added to ethanol in 1000 litre stirred vessels.	0	2
Ethanol (a typical solvent)	Jun-03	A static discharge occurred while an ingredient was being added to a reactor ingredient set, igniting flammable fumes	0	1
Ethanol (A typical solvent)	2013	A road tanker collided with a passenger vehicle resulting in an explosion and fire.	4	22
Methanol (A typical solvent)	Dec-11	During a summer thunderstorm, a fire and explosion occurred when lightning struck a storage tank, which was filled with 354 tonnes of methanol.	0	0
Methanol (A typical solvent)	Dec-04	A static discharge occurred leading to a fire when a crystalline product was being shovelled out of a plastic bag through a manhole into a 1000 litre steel reaction vessel containing methanol, when the remaining crystals were shaken out of the plastic bag.	0	2
Methanol (A typical solvent)	Dec-04	An organic powder added by shovel loads to distilled acetone and methanol, resulting in an explosion which occurred inside the vessel and a small fire which broke a glass coil condenser.	0	0
Methanol (A typical solvent)	Dec-01	A tanker of methanol was offloaded in a way which resulted that the actions of the operator using the emergency off switch instead of the proper procedure resulted in the autonomous systems to incorrectly manage later (transferal of methanol to other sections) processes. Though the design was the reason this was possible, the operator acted in the way which was most convenient rather than the correct procedure.	0	0

Methanol (A typical solvent)	Apr-06	Workers repairing damage done by hurricanes accidentally caused an explosion which lead to the total release of the tank of methanol. The ignition is thought to be the sparking from a cutting torch used nearby.	2	1
Methanol (A typical solvent)	Feb-05	Static Ignition of material due to frictional interactions of dynamic processes	0	2
Methanol (A typical solvent)	Aug-04	A runaway reaction in the reactor of a chemical plant led to an explosion due to a build-up of gas released by the reaction.	1	112
Nitrocellulose	Unknown	Three children lit a fire which involved 1500-1700 tonnes of flammable nitro cellulose in an outside area.	0	
Nitrocellulose	Unknown	An explosion occurred during kneading of pigmented nitrocellulose chips.	0	
Nitrocellulose	Unknown	An explosion occurred during the production of nitrocellulose varnish, this was due to the friction and heat of the mixture being added, when the presence of water was insufficient.	0	
Nitrocellulose	Unknown	Nitrocellulose dust collected on the top of the lid, leading to an explosion on the inner side of the lid.	0	
Nitrocellulose	Unknown	A nitrocellulose explosion occurred as a result of the interactions and dynamics inside a high speed disk agitator, when the centre piece had insufficient dynamic change for the mixture.	0	
Butane (similar to LPG)	04-Sep-90	A large set of consequential interactions including equipment, safety device and other individually minor failures lead to a combined effect which devastated an Butane Plant, all of which is generally the fault of poorly maintained equipment.	0	
Butane (similar to LPG)	Unknown	A missing isolation blank during a welding job led to ignition of flammable gas but without significant injuries.	1 injuries	
Butane (similar to LPG)	Unknown	A release of glycol vapour to atmosphere occurred due to a flaw in design, where a low level reading and a temperature reading were arranged in an incompatible way, the result being that the glycol was overheated and became vapour under pressure.	1 injuries	
LPG Propane	Nov 1983	Restaurant gas tank exploded	14 deaths, 27 injuries	
LPG Propane	Jun 1983	During road transport offloading the hose coupling broke.Fire.	1 death	
LPG – propane/LPG propane mix	Sept 1990	Road tanker vapour cloud fire	68 deaths >100 injured	
LPG – propane/LPG propane mix	May 1978	Storage vessel BLEVE	7 deaths 10 injured	
LPG – propane/LPG propane mix	April 1975	Road tanker fireball	17 deaths 34 injured	

LPG	1974	Incorrect road tanker hose connection, failure, gas release, flash fire, tanker explosion.Water deluge failed after 10 minutes.	2 deaths
Propane and LPG	IChemE	Most of the incidents reported are transportation events, road tanker accident, derailments, pipeline failures etc. There are some storage tank incidents.	
LPG	04-Jun-07	A major fire occurred when a new can crushing machine was installed at a factory, thought to be the source of the fire, with hundreds of aerosol cans propelled into the air.	
LPG	2007	A fractured pipe in a gas room lead to two massive explosions and a fire in an aerosol filling factory.	11 deaths 100 injuries
LPG	2007	Flooding lead to a perimeter wall collapse and consequently a supply pipe was ruptured, Liquefied gas was spread by the flood water, the ignition source may have been a spark created on isolation of the electrical supply. Many onlookers engulfed in a fireball.	10 deaths 27 injuries
LPG	2007	A leak from LPG tank was spread across a factory when a supervisor turned lights on and ignited what was a massive explosion in a cosmetics factory.	3 deaths 20 injuries
LPG	2007	A forklift battery ignited a leak from 49 tonnes of LPG and various other flammables in a factory, this due to the non-compliance with the LPG code of practice, requiring suitably explosion proof equipment, of which the 48 volt forklift battery was not acceptable.	0
LPG	11-May-04	Corroded pipes leading to an LPG leak in the basement are the cause of an explosion which injured 30 and killed 9 in Glasgow	9 deaths 30 injuries
LPG	2007	An LPG heater fell over and emitted a grey cloud before it exploded in a public area, injuring more than 300 and killing 75.	75 deaths 300 injuries
LPG	02-Feb-07	An LPG tanker exploded when its brakes failed and it careened into the side of a mountain	50 deaths 65 injuries
LPG	16-Apr-01	An explosion and fire occurred when vapour escaped and was ignited on a hydrocarbon refinery. The leak occurred due to corrosion which inspections had not noticed.	0
LPG	Nov-84	A leakage of LPG followed by ignition lead to a devastating set of domino explosions.	544 deaths 7000 injuries

APPENDIX 4 FULL LIST OF INCIDENTS CONSIDERED AND PROCESS DATA

SCENARIO NAME	MASS INVENTORY (kg)	MATERIAL	TEMP (C)	PRESSURE (bar)	PHASE	EVENT FREQUENCY
1. Solvents RT catastrophic rupture	36414	Solvents	23	0	1 Liquid	2.85E-07
2. Solvents RT compartment large leak	5202	Solvents	23	0	1 Liquid	1.42E-08
3. Solvents RT compartment small leak	5202	Solvents	23	0	1 Liquid	**2.85E-06**
4. Solvents offloading hose rupture	5202	Solvents	23	0	1 Liquid	**9.98E-04**
5. Solvents offloading hose leak isol 120s	22	Solvents	23	0	1 Liquid	**8.99E-03**
6. Solvents offloading hose leak isol 1200s	219	Solvents	23	0	1 Liquid	**9.98E-04**
7. Solvents transfer line after pump rupture isol 1200s	19941	Solvents	23	0	1 Liquid	**1.80E-04**
8. Solvents transfer line after pump rupture no isol	19941	Solvents	23	0	1 Liquid	**2.00E-05**
9. Solvents transfer line after pump leak isol 1200s	1098	Solvents	23	0	1 Liquid	**9.00E-04**
10. Solvents transfer line after pump leak no isol	19941	Solvents	23	0	1 Liquid	**1.00E-04**
11. LPG cylinder rupture	48	LPG	23	0	1 Liquid	**4.00E-05**
12. LPG cylinder large leak	48	LPG	23	0	1 Liquid	**4.80E-04**
13. LPG cylinder small leak	48	LPG	23	0	1 Liquid	**1.20E-03**
16. LPG manifold/vapouriser rupture	480	LPG	23	0	1 Liquid	**2.00E-05**
17. LPG manifold/vapouriser leak	480	LPG	23	0	1 Liquid	**1.00E-04**
18. LPG vapour line rupture	480	LPG	23	0	0 Vapor	**3.00E-05**
19. LPG vapour line leak	480	LPG	23	0	0 Vapor	**1.50E-04**
20. LPG spray booth internal explosion	3	LPG	360	0.001	0 Vapor	**2.00E-04**
22. Solvents production building south pool fire	4390	Solvents	23	0	1 Liquid	**1.70E-04**
23. Solvents production building north pool fire	6322	Solvents	23	0	1 Liquid	**1.67E-04**
24. Solvents raw materials store pool fire	112500	Solvents	23	0	1 Liquid	**2.03E-04**
25. Solvents production building south confined explosion	6	Solvents	360	0.001	0 Vapor	**1.70E-05**
26. Solvents production building north confined explosion	8	Solvents	360	0.001	0 Vapor	**1.67E-05**
27. Solvents raw materials store confined explosion	78	Solvents	360	0.001	0 Vapor	**2.03E-05**
29. Nitrocellulose pallet fire and detonate	243	Nitrocellulose	360	0.001	0 Vapor	**2.03E-05**
30. Axalta 10t Tank internal explosion	0.36	Solvents	23	0	0 Vapor	**2.00E-05**
31. Axalta area pool fire	20000	Solvents	23	0	1 Liquid	**2.00E-05**
32. Axalta area confined explosion	26	Solvents	23	0	0 Vapor	**1.00E-06**

There are other hazards that are typically considered during a design risk assessment of a new chemical installation, such as pollution, violent release of energy, noise, aesthetics etc. For the purposes of the assessment of major hazards, the focus of the legislation is on the instantaneous detrimental effects. The hazards of noise (low level, not explosions) are not immediate and therefore do not form part of the MHI hazards (note these are addressed in other assessments). In a similar vein, chronic exposure to chemicals is a long term hazard. It is not a Major

Hazard Installation issue, and is rather covered under the Hazardous Substances Regulations and occupational health risk assessments. The hazards associated with the violent release of energy (kinetic or potential) were also not considered (e.g. overpressure burst of air receiver or collapse of structures etc). Pollution should be considered under the Environmental Management Plan for the installation.

TYPICAL CAUSES OF EVENTS

Primary cause events

Most hazards are due to loss of containment events and possible causes are the following:

Failure of equipment:

- Deterioration of the equipment integrity (physical impact damage, material of construction failure e.g. stress corrosion cracking) followed by thorough inspections throughout the life of the equipment.
- Deterioration of the plant integrity (material of construction failure) causing a rupture of equipment and piping. This may be as a result of a crack developed in the piping or equipment material due to fatigue from vibration, stress corrosion cracking or an inherent fabrication defect not detected during X-ray inspection. Such a rupture could then be initiated by, e.g., a pressure surge, or external damage from actions of people. Failure is normally in the form of small cracks. The best assurance against failure is correct design, specification, fabrication and construction procedure followed by thorough inspection, but this is no guarantee against the possibility for material of construction to fail.
- Uncontrolled pressure rise: in the pipes and vessels due to liquid blocked-in between two isolation valves, or liquid exposed to fire, or compressor discharge pressure being higher than expected, due to surging, etc. Lines can be protected by bursting discs. Alternatively run away reactions or the mixing of incompatible chemicals can also lead to reactions inside vessels/containers leading to over pressurization or the release of toxic gases
- Failures of the preventative equipment e.g. computer controls, control instruments and hardware trips.
- Failure of the protective / mitigative hardware barrier equipment e.g. deluge water,

Failure of systems:

- Failure of the preventative systems through human or management system errors (e.g. inadequate instruments).
- Failure of the protective / mitigative systems through human and procedural errors. E.g. creation of an open end through incorrect venting or opening of drain valves.

Secondary cause events

Possible causes for ignition (fire & explosions) of flammable or combustible materials are:

- Hot work
- Static spark discharges and lightning
- Electrical faults
- Smoking
- Failure of nitrogen blanketing systems.
- Ingress of foreign oxidising materials (e.g. air or strong acids) into the system containing flammable materials and then some form of ignition of the mixture. This is generally caused by inadequate purging during shut down and start-up operations. The source of ignition is often hot work tools during maintenance, warming up procedures, static or high process temperatures.

Possible causes for toxic exposure or gassing of people from released materials are:

- Not wearing personal protective equipment
- Lack of awareness
- Failure to evacuate

- Inadequate provision of gas escape facilities on site (only for toxic gases).

Minor and rare causes

Since the assessment mainly deals with the major hazards of explosion, fire and toxic releases, the following causes were excluded:

- Small general leaks, which may include valve spindle seal leaks, leaks due to normal wear, or improper maintenance.
- Natural events (earthquakes, storms, floods, etc.)
- External or internal sabotage as a result of personnel grievances.
- Aeroplane crashes into facility.

APPENDIX 5 CONSEQUENCE ANALYSIS

MAGNITUDE OF SOURCE TERM

In terms of the rate of release the following are generally applicable:

For vessels including road tankers or drums, the following scenarios are usually considered;

- complete rupture,
- a large hole the size of the largest appurtenance (typically 25 - 52 mm),
- a small hole the size of a typical flange leak or valve stem leak (typically 1 - 10 mm).

For pipes:

- complete severance (full bore),
- a small leak (the size of a typical flange leak, 10 mm).

These scenarios were used to evaluate the consequences using a modelling package called PHAST RISK (version 6.7). This package has built in fluid dynamics simulations and prior to simulating the consequences, accurately calculates the flows due to ruptures, leaks etc. based on pressures, temperatures, pipe diameters and material properties.

In terms of the duration of incidents where specific information is not available or calculable, the duration was estimated using the British Health and Safety Executive (HSE) standards [Ref. 5]:

5 seconds	for normal lifting and re-seating of relief valve
1 minute	for automatic detection and isolation e.g. in the event of a pipe rupture and rapid de-pressurisation leading to a plant trip
5 minutes	for remotely operable isolation e.g. operator responds to panel alarm and can isolate either on the panel or at strategically located external isolation valves.
20 minutes	operator is required to isolate manually directly at or very close to the source of the release e.g. required to don a BA set and move through vapour cloud to close a valve.

DISPERSION

Dispersion of gas clouds is governed by the prevalent weather conditions including:

- Wind speed and direction (essentially horizontal mixing)
- Stability of the atmosphere (essentially vertical mixing)

The latter is essentially the extent to which wind turbulence, which is responsible for the dispersion, is suppressed or assisted. On cold windless nights, cold air is trapped close to the surface of the earth and any gas release will

not be easily dispersed. On the contrary, on a hot summer's day there is generally a lot of turbulence in the air due to heating of the earth's surface and the air in contact with it. This aids dispersion of gases. These conditions had been labelled with the letters A to F.

The principal results from dispersion calculations are the concentrations at ground level at various distances downwind from the release source. In addition concentration isopleths in the vertical and horizontal planes can also be obtained. There are many dispersion combinations, due to the different probabilities of weather stability's and wind speeds. The wind direction was considered only for the eight major wind directions and the percentage of time that the wind is blowing in a particular direction was used to determine the final risk levels.

Following dispersion of the vapour the flammable or toxic concentrations can be determined at certain key distances from the installation. The effects will also be determined at these key distances.

FLAMMABLE EFFECTS

The following overpressures are usually considered in a risk assessment, and a pressure of 14 kPa is taken as the MHI fatality threshold for explosions.

TABLE 5.1 – Levels of Damage at Key Explosion Overpressures

Over-pressure (kPa)	**Injuries / Fatalities**	**Structural Damage**	**Other**
100	100 %	Typical blast wall design limit	
70	> 90 %	Almost complete demolition of plant 100% damage	
35	Eardrum Rupture	80 % damage	
14	**< 1%**	**40% damage**	**HSE development separation distance**
7	Injuries, no fatalities	5 % damage	
4		Minor structural damage	HSE safe housing consultation distance
0.7			Maximum missile distance
0.3	Loud noise	Large glass windows break	

An explosion generally produces missiles as well as over-pressure wave. With respect to missiles it is unlikely that they will travel kilometres to affect the public directly, and moreover the large area of possible strikes means that the probability of a public fatality is so low that it is generally not worth considering as a major hazard.

The consequences of fires are damage to equipment and radiation burns to people. In terms of burns there are two aspects that are important, namely the intensity of the radiation and the duration of exposure. In quantifying the magnitude of a fire the information is presented in the form of radiation intensities for simplified specific exposure times. It is assumed that 1 minute is insufficient time to escape from the source of the threat. In this regard the following radiation guidelines have been used.

TABLE 5.2 – Levels of Damage at Key Fire Radiation Levels

Radiation Intensity kW / m2	Exposure Limit (time)	Consequence
75	5 secs	100% lethal
37.5	1 min	100 % lethal, will damage process equipment and structures
15	1 min	50 % lethal, permissible structure exposure level
12.5	**1 min**	**< 1 % lethal**
4	1 min	No fatalities expected
1.6		Pain Threshold, typical flare design limit
1.2	Unlimited	Equivalent to midday sun

This means that any person in the 37.5 kW/m^2 radiation circle for a minute is likely to be fatally burned, while there is a 50% chance of those persons between the 12.5 and 37.5 kW/m^2 radiation circles being fatally burned within a minute. Outside of the 12.5 kW/m^2 radiation level there are less than 1% fatalities. A level of 4 kW/m^2 is taken as the MHI fatality threshold for huge fires close to open public areas where shelter or escape is unlikely and a level of 12.5 kW/m^2 is taken as the threshold for small fires or where there are buildings and structures that provide some shielding between the public and the source of the fire.

EVENTS INVOLVING FLAMMABLE MATERIALS

The release of a flammable material can result in many different effects depending on the particular circumstances of the release. A pressurized release (e.g. pipe leak) that is ignited immediately and close to the source will result in a jet (liquid) or torch (vapour) fire. If the liquid is not ignited or it is not pressurized at the point of release it will from a pool on the ground. Vapours will evaporate off the pool. Multiple factors may catalyse the speed at which vapours are released; such as the volatility of the material, increased surface temperature, increased wind strength and/or spill surface area. In the case of release of vapour or liquefied gases a cloud of vapour or vapour with entrained liquid droplets (mist) will be formed directly.

This cloud of flammable vapour (either from the pool or directly from the vapour release) can drift with the wind and disperse. If the cloud disperses to below its lower flammable limit then it cannot be ignited. However, while it is dispersing the area of the cloud where the vapour is below the upper flammable limit and above the lower flammable limit can be ignited. If the cloud is in an open uncongested, unconfined area a vapour cloud fire or so called “flash” fire will result. The fire will “flash” back from the point of ignition to the point of release. At the point of release there will now be either a jet fire or pool fire or both.

However, if the cloud of flammable gases has drifted into areas where it is confined within pipe work, plant structures, buildings, vessels, forests etc. the ignition may lead to a vapour cloud explosion. The strength of the explosion will depend on the properties of the material involved. However, another critical factor is the particular layout of the congested / confined areas in which the gas is located. Within one release event there may be areas where the gas is extremely confined and other areas where the gas is out in the open. Each of the pockets of ignited gas may have different effects: some may explode while others are essential flash fires. The direction in which the gas burns through the areas (i.e. the manner in which the flame front is broken up by obstacles) may also result in different flash fire zones or explosions with strength effects.

The consequences of each of the flammable hazardous events are radiation burns, blast and shock wave damage and possible damage due to missiles. In general, every flammable release will have radiation and explosive effects. However, depending on the type of release either the radiation or the over-pressure

(explosion) effects will dominate the severity of the consequences. For example the explosive effects of a jet fire are negligible in comparison with the radiation effects and vice versa for a confined vapour cloud explosion. With condensed phase explosions (e.g. explosives or certain organic peroxides – NOTE, not present on this site) it is the over-pressure element as well as ground vibration that can have significant effects.

The major consequence of an explosion is the shock wave effect. The shockwave shatters glass, damages equipment and can cause fatalities; either directly through rupture of bodily organs, or indirectly through structures collapsing onto people. The consequences of fires are damage to equipment and radiation burns to people. In terms of burns there are two aspects that are important, namely the intensity of the radiation and the duration of exposure. Details of the overpressures and radiation levels that lead to specified degrees of harm are present in APPENDIX 5.5.

TOXIC EFFECTS

In addition to probit equations, it is often useful to have a single number or single concentration of toxic vapours that can be used as a first approximation to the extent of dangerous exposure. For example there is the concentration which is deemed to be Immediately Dangerous to Life and Health (IDLH) and it is the concentration that can cause significant harm to almost all persons within 30 minutes of exposure.

Another single number that is often used is the Emergency Response Planning Guidelines that were developed by a consortium of chemical companies under the auspices of the American Industrial Hygiene Association. These guidelines indicate the maximum exposure concentrations that can be endured for 60 mins (i.e. a reasonable evacuation period) with certain levels of effects.

ERPG 1 - only mild irritation will result
ERPG 2 - no permanent damage
ERPG 3 - no life threatening health effects (Possible permanent damage)

Often the ERPG3 and IDLH concentrations are often similar. Generally emergency services would consider evacuation of persons who could be exposed to ERPG 2, ERPG 3 or IDLH concentrations depending on their resources. Therefore, the local emergency services need to know the distance at which the gas concentration would drop below this concentration under both probable and well as worst-case release scenarios.

APPENDIX 6 LIKELIHOOD ANALYSIS

OPERATOR AND EQUIPMENT FAILURE DATA

1. Equipment Failure

Most of the failures leading to potential major hazards are associated with loss of containment as a result of vessel or pipe rupture, or due to leaks. For the purpose of this assessment ruptured vessels and pipes tank were considered as representing the worst-cases. Failure data was taken from the manual published by the Dutch Government Committee for the Prevention of Disasters viz. "Guidelines for Quantitative Risk Assessment" CPR 18E (1999) [Ref 22], known in the industry as the Purple Book. Examples of the frequency data used are presented below.

Note: 1E-8 = 1 * 10^{-8} or 0.00000001

EQUIPMENT	FAILURE	FREQUENCY Failures/year
Full containment atmospheric tank (i.e. semi-explosion and missile penetration proof double containment tank)	instantaneous release	1 E-8
Atmospheric tank with protective outer shell	- instantaneous release - small release to secondary container	5 E-7 1 E-4
Single walled atmospheric containment tank	- instantaneous rupture - 10 minute release of entire inventory - 10 mmhole	5 E-6 5 E-6 1 E-4
Pressure vessel	- instantaneous rupture - 10 minute release of entire inventory - 10 mmhole	5 E-7 5 E-7 1 E-5
Process vessels and reactors	- instantaneous rupture - 10 minute release of entire inventory - 10 mmhole	5 E-7 5 E-7 1 E-5
Pipes Ø < 75 mm	- Rupture - leak	1 E-6 /metre 5 E-6 /metre
Pipes 75 mm <Ø < 150 mm	- rupture - leak	3 E-7 /metre 2 E-6 /metre
Pipes Ø > 150 mm	- rupture - leak	1 E-7 /metre 5 E-7 /metre
Pumps (canned)	- catastrophic failure - leak	1 E-5 5 E-5
Pressure relief valve fails open		2 E-5
Storage of explosives	Mass detonation	1 E-5
Road tanker (atm)	- instantaneous rupture - large leak - hose rupture - hose leak - arm rupture	1 E-5 5 E-7 4 E-6 /hour 4 E-5 /hour 3 E-8 /hour

EQUIPMENT	FAILURE	FREQUENCY Failures/year
	- arm leak	3 E-7 /hour
Road tanker (pressure)	- instantaneous rupture - large leak - hose rupture - hose leak - arm rupture - arm leak	5 E-7 5 E-7 4 E-6 /hour 4 E-5 /hour 3 E-8 /hour 3 E-7 /hour

2. Human Failure

Source	Person	Task Level	Failure Rate Prob of Error
ICI	Operator	Simplest	$1*10^{-4}$
		Routine	$1*10^{-3}$
		Should take care, e.g. a checklist is needed	$1*10^{-2}$
		Non routine	$1*10^{-1}$
		Checking another operator	$1*10^{-1}$
	Supervisor	Checking an operator	$1*10^{-2}$
Du Pont	Operator	Simple	$1*10^{-3}$
		Checking another operator or shift change-over	$1*10^{-1}$

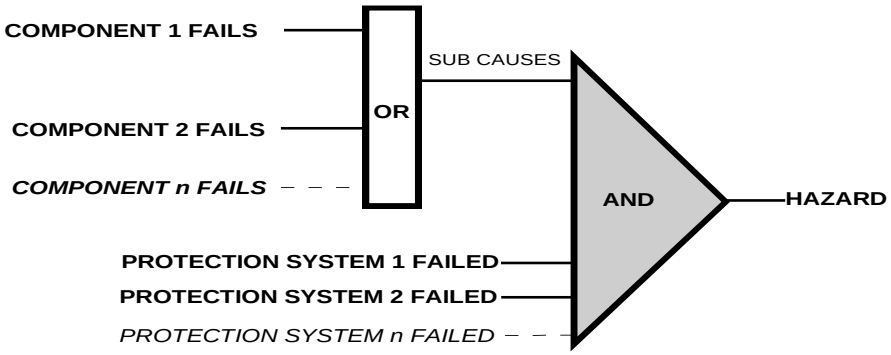
3. Organizational Measures and System Failures

The standard of maintenance, the implementation of operating and emergency procedures and the general safety management systems in place on site can have a significant effect on the failure rates used. Pitblado (Ref. 19 pg 115) states that one can adjust generic data based on an assessment of the particular plant effectiveness at maintenance, safety systems etc. The basic standard of safety should be 1, i.e. neutral if good maintenance, operating and emergency procedures in place. Many plants fall below this standard; hence failure data should actually be increased up to a maximum of one order of magnitude. For those that are of world class standard and have much more that the basic safety systems in place the failure data can be reduced by up to one half an order of magnitude.

Measures in the organisation to reduce the major risks have been evaluated, and suggestions for improvements made in section 9.1 of this report.

4. Simple Fault Trees

For most events in this study the simple failure rates above were not sufficient to estimate the final likelihood of a hazardous event. This is due to the layers of protection provided on the plant. Simple fault trees were compiled for most events. A fault tree is essentially a logic diagram, which represents the development of events from the root causes with failure data in terms of their frequency or probability of occurrence to the final 'top' event or hazard as illustrated below.



For these risk assessment very simple fault trees were compiled. For example the following were included:

- the generic equipment failure data (as listed above)
- the number of drums, tankers, lengths of pipeline etc,
- the amount of time that the equipment is On-site and in use (e.g. for road tankers)
- the ability of operator to respond or not or to cause failures (e.g. for stopping transfer if alarms provide warning),
- the likelihood of failure of any automated shut off valves, excess flow valves, ventilation, scrubbers or any ESD's etc the general perceived level of Safety Management on site (see systems failure above).

APPENDIX 7 RISK CALCULATION

INDIVIDUAL RISK

Individual risk: The chance that a particular individual at a particular location will be harmed. It is usually described in numerical terms such as "number of fatalities per person per year" or "one fatality per person per, e.g. 1000, 10 000, 100 000, $10^{6,}$ etc. years". The units are typically of one chance in a million of death per person per year, and are shown as exponents i.e. $1 * 10^{-6}$ d/p/y.

Assessment of individual risk does not take into account the total number of people at risk from a particular event, or the possibility that people may take action to escape the effects of a toxic gas or fire etc. The individual risks were determined based on the combination of frequency or likelihood of events and their severity, taking into account ignition probabilities and the distribution of the weather conditions in terms of stability, wind speed and direction.

The individual risks can be plotted on a map of the site.This has been done and is shown on **Figure 7.1.1** for the all the activities on the installation. On the map all the areas where risks are lower than $1 * 10^{-7}$ d/p/y lie outside the $1 * 10^{-7}$ d/p/y risk contour (i.e. the green line), and the same for the other higher risk contours.The map easily allows one to see where certain risk levels e.g. $1 * 10^{-6}$ extend beyond the site boundary.

SOCIETAL RISK

Individual risk referred to above considers the risk to a typical individual but does not consider how many individuals could be affected.Communities have a strong aversion to large events, which lead to multiple fatalities. Therefore, the frequency of events that lead to multiple fatalities should be suitably low.The F-N curve attempts to represent this concept graphically and to set some standards.The graph shows the frequency of accidents on the 'y-axis', and the maximum number of fatalities that could result from this accident on the 'x-axis'
Societal risk includes the population in the vicinity, and estimates the chances of numbers of people being harmed by an incident. The likelihood of the primary event (an accident at a major hazard plant) is still a factor, but the consequences are assessed in terms of level of harm and numbers affected, to provide an idea of the scale of an accident in terms of total numbers killed or harmed. Estimates of the societal risks incorporate the population distribution during day and night, as well as the location of people indoors or outdoors. (See the table below for the population data used). The results are presented in the form of an F-N curve.This plots the number of persons potentially fatally affected by every one of the potential events on site, against the frequency with which these levels of fatalities can be expected to occur

POPULATION ESTIMATIONS

The area around the site was split into zones such as each of the neighbours, or the general surrounding industrial area, residential areas, open spaces etc. The population in each area was either estimated from a count of houses or based on known information such as employee records or the typical population density was used for that type of area, e.g. typical industrial areas have a density of between 40 -100 persons per hectare depending on the type of activity. For this information the guidelines in the Green Book 1992 [Ref 23] were used. The Green book also suggests guides on day versus night time occupation of certain areas, e.g. 100 % of a population would be in a residential area at night but during the day 70% leave to go to work. A probability that people would be indoors was assigned to each population area, based on the guidelines Green Book 1992. See Table 5.10.1 below.

Night / Day	Area	Population	Density (persons / m2)	Fraction indoors
Day population	Plascon	170	0.0045	0.9
	Industrial	561	0.0040	0.9
	Open Land	3	0.0006	0
Night population	Plascon	5	0.0001	0.99
	Industrial	140	0.0010	0.99
	Open Land	1	0.0002	0

Being indoors gives protection that is affected by the air exchange rate in building and the time it takes to clear a room of gas after an event. For normal buildings this study used an air exchange rate of 4 ACH (Air Changes per Hour) and a tail time of 1800 sec.

APPENDIX 8 RISK ASSESSMENT CRITERIA

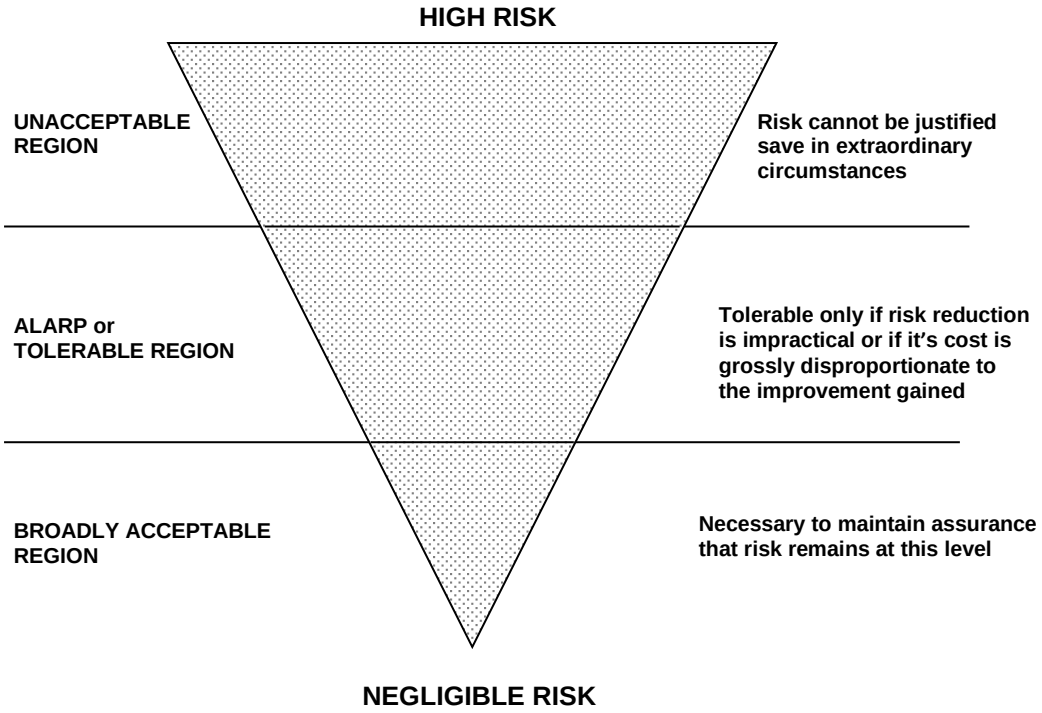
INDIVIDUAL RISK

Risks that major hazard installations pose to persons are usually represented quantitatively as the chance in any one year of a typical person being fatally affected by an accident on the site. The acceptability of chemical risks is related to the other risks to which persons in society are exposed. Risks that are accepted voluntarily by persons are often quite high while risks that are not voluntarily accepted, e.g. the risk of so called acts of God, are quite low. The table below shows some risks that individuals tolerate.

ACTIVITY / HAZARD	RISK *
Becoming a homicide victim (RSA)	410 chances in a million
Becoming a traffic fatality (RSA)	220 in a million
Becoming a traffic fatality (UK)	6 in a million
Becoming a victim of some other accident (e.g. drowning, electrocution UK)	2.5 in a million
Being struck by lightning (RSA)	1.5 in a million
Being struck by lightning (UK)	0.05 in a million
Being struck by a falling aircraft (world-wide)	0.01 in a million

- - approximate risk rounded-off data UK from “Reducing Risks, Protecting People” , Traffic RSA AA 1997, Crime CIAC SAPS 2004/5

Once an approximation of the risk has been made it is possible to judge that risk according to agreed criteria and establish if it is acceptable or unacceptable to persons who may be affected. In many cases there is no clear and easy distinction between what is acceptable and unacceptable. There is a zone between these two extremes where risks could be tolerated provided they are as low as reasonably practicable (ALARP). The installation whose risks fall into this category, need to prove that they have done everything reasonably practicable to reduce risk. The ALARP principle in illustrated below:



The dividing lines between the zones, e.g. unacceptable and tolerable, can be set at different levels depending on the situation e.g. who is affected, whether they also receive benefits in addition to the risks etc.

In residential areas, a public risk level of 10^{-6} chances of death per person per year (i.e. 10^{-6} d/p/y = one in a million chances of death in one year) is accepted in the United Kingdom as being a broadly acceptably risk to which people could be exposed [Ref. 8]. This risk is more than 10 times higher than the risk of being struck by lightning in the UK and is therefore considered virtually negligible. In the UK, public risk levels in excess of 10^{-4} d/p/y are considered to be unacceptable, and immediate attention should be given to reducing the risk. In the area between 10^{-4} and 10^{-6} risks are tolerable but not negligible and therefore some form of risk management program should be instituted with the aim of reducing risks within the constraints of what is practicable and reasonable. This range is referred to as the ALARP range, i.e. risks should be as low as reasonably practicable

In industrial areas the risk levels should be similarly low. However, it is possible that slightly higher risks could be tolerated than in residential areas provided everything reasonably practicable has been done to reduce the risks. This assumes that employees at neighbouring industrial sites are generally fit, healthy, able to be trained in emergency procedures etc. Within the broader manufacturing industry in the UK, the average employee serious injury rate is $2.3 * 10^{-5}$ d/p/y. The risks that a new installation poses to employees of adjacent industrial installations should not exceed the risk to which they would normally be exposed at work. The individual risk to employees of neighbouring installations should therefore be below $1*10^{-5}$ d/p/y. (Note ideally it should be below the $1*10^{-6}$ d/p/y as these persons are also members of the public).

SOCIETAL RISK

In the case of major hazard installations the more persons that are potentially exposed to the effects of accidents the greater will be the absolute number of persons that could be affected by any one event. In terms of fatalities there is no distinction between employees and the public, i.e. 100 deaths is serious whether it is employees or public persons. Major hazard installations that are located in remote uninhabited areas will pose

lower societal risks that the same industries located near residential areas, despite the fact that both industries could pose identical individual risks.

In all communities there is an aversion to large accidents that affect many people at once. For example in South Africa we appear to 'tolerate' a road accident fatality rate of about 30 persons per day. It is only the very large accidents where typically 10 or more persons are affected that may jog our awareness and make us consider that the road traffic accident situation is 'intolerable'. The same would apply to major hazard installations. Therefore in addition to considering the risks to a typical individual near an installation, it is important to consider the possible impact on the absolute numbers of persons potentially exposed. This gives an indication of how many persons could possibly be affected in any one accident.

There has been a debate internationally about whether employees should also be included as part of the population. The Health and Safety Executive in the United Kingdom has adopted the principle that workers located on a major hazard installation subjected to Occupied Building Controls will be excluded from societal risk assessments. As there are no binding Occupied Building Regulation in RSA, employees on the site were included in the societal risk evaluation.

The UK HSE's have recommended societal risk guidelines [Ref 15]. The criteria are that there should be no chance that more than 50 persons could be fatally affected by accidents on the site more often than once in 5000 years. The criteria are presented in the form of an F-N curve. This shows the number of persons potentially fatally affected by each and every one of the potential events on site and the frequency with which these levels of fatalities can be expected to occur.

KANSAI PLASCON	Ref no:	G-SHERQ-015P
	Rev. no:	1.00
	Revision date:	09-10-2019
	Approved by	A.MESANI

KANSAI PLASCON PROPRIETARY LIMITED

EMERGENCY RESPONSE

SITE: PORT ELIZABETH

Address: 2-4 Bedford Street, Neave Township, Port Elizabeth, 6001

ALARM SIGNAL

FIRE ALARM	**Electronic intermittent sound**
EVACUATION ALARM:	**Continuous electronic sound over Public Address System**

ALARM SIGNALS

INTERNAL EMERGENCY ORGANISATION

JOB TITLES	NAMES	EXT /SHORT CODE /CELL
Switchboard	Weziwe Habe	1400
Head : Manufacturing	Ian Johnson	(+27)832650336
Manager : Technical Development	Ralton Bentley	(+27)824870649
Manager: SHERQ	Anele Mesani	(+27)733681843
Stand- in Manager : Logistics	Robert Vermuelen\ M. Lukwe	(+27)833002353
Manager: Maintenance	Rodrick Neilson	(+27)748898213
ICT Department	David Rapoo	(+27) 833719062
HR Department	Nevah Titus	(+27)829974488
Manager : Factory Technical	Ralton Bently	(+27)824870649
Manager :Packaging and RMS	Realton Pullen	(+27) 820821870
Nurse :Occupational Health	Annelize Jacobs	(+27) 833994138
Officer: SHERQ	Luyanda Zondani	(+27) 632156830
Fidelity Site manager	Bennie Baloyi	(+27) 718900214
Brandfin: CCTV Control room	On Duty	1438

EMERGENCY ORGANISATION AND TELEPHONE NUMBERS

FIRE	FATALITY OR INJURY	ATTACK OR BOMB THREAT/EXPLOSION
Advise Emergency Controller Give following: a. Exact location b. Type and size of fire Await instructions	Advise Emergency Controller Give following: a. Exact location b. Type, severity and number of injuries c. Cause, if known If there is no danger the clinic sister and First Aid ers will stay in the clinic	**BOMB THREAT** Complete check list Advise Emergency Controller **ATTACK OR EXPLOSION** Advise Emergency Controller Keep calm and keep low Await instructions from controller

GENERAL

- **Do not divulge details of incidents to anyone without the authority of the Emergency Controller**

- **Keep lines clear for incoming and outgoing emergency calls**
- **No vehicles to enter or exit site**

SWITCHBOARD OPERATOR

FIRE	FATALITY OR INJURY	ATTACK OR BOMB THREAT/EXPLOSION
Activate the nearest Break Glass If alarm not available, scream "FIRE" Notify switchboard(Dial 1400) (Gate House after hours @ 1440) Try to extinguish with fire fighting equipment on hand (Computer room personnel ensure that fire protection is on automatic) **IF OUT OF CONTROL:** Leave and close doors including both steel doors **DON'T LOCK DOORS:** Make sure that no-one is left behind	Notify switchboard(Dial 1400) (Gate house after hours @1440) Make person as comfortable as possible Summon First Aid Leader Render First Aid **DO NOT REMOVE BODIES WITHOUT SA POLICE PERMISSION OR UNLESS BODIES ARE THREATENED BY FIRE**	**BOMB THREAT** Notify Emergency Controller **ATTACK OR EXPLOSION** Notify switchboard (Dial 1400) (Gate house after hours @1440) Await instructions Refer : G-SHERQ-001N

OBEY YOUR EVACUATION AND FIRE CONTROLLER

- **Do not divulge details of incidents to anyone without authority of the Emergency Controller**
- **Keep lines clear for incoming and outgoing emergency calls**

PERSON AT SCENE OF INCIDENT

FIRE	FATALITY OR INJURY	ATTACK OR BOMB THREAT/EXPLOSION
Notify switchboard(Dial 1400) Evacuate immediate area and isolate fire hazards Try to extinguish fire with equipment on hand ONLY IF YOU ARE TRAINED to do so Do not put your own safety at risk If forced to retreat, close doors, Ensure that electrical appliances are Switched off, start shutdown procedures (computer room warden to switch fire protection system to automatic) Do not use water where electrical equipment is involved Give the order to evacuate on the instruction of the Emergency Controller Keep Emergency Controller fully informed of all progress and developments	Notify switchboard(Dial 1400) (Gate house after hours @ 1440) Make injured as comfortable as possible Do not aggravate injuries by moving injured unless their safety is threatened or given instruction the police Determine type, severity and number of injuries Contact Clinic sister or SHERQ Manager Contact Emergency services/ Ambulance Contact police in case of fatality	Follow instructions of Emergency Controller Maintain calm and control Do not interrupt caller or try to transfer call Keep people away from windows In the event of a bomb threat, ask personnel to check work areas, toilets, passages and kitchens for foreign articles Give the order to evacuate on the instruction of the Emergency Controller People to disperse once out of the building

EVACUATION CONTROLLERS

Name	Department	Extention number	Name	Department	Extention number	Name	Department	Extention number

EVACUATION CONTROLLERS

BOMB THREAT CHECKLIST

STEP 1:

Date: …….. Time call received: ……..……..
Call received by: ……..…….…… Department
Public telephone? **(YES/NO)** ……..……..……..……..
Details of threat: ……
……..
……..
When is it set for? ……..……..……..……..
Where is it? ……..
Reasons for planting bomb? ……..
Who are you? …… Time call ended: ……
Appearance of bomb
Visible or camouflaged

STEP 2:

Notify Emergency Controller or Site Manager

STEP 3:

Calmly record the following:
Voice on telephone: Man/woman/child …… Age: ……..
Conduct: Excited/nervous/calm/angry/coherent/polite/emotional
Characteristics: Loud/soft/intoxicated
Speech: Fast/slow/clear/impediment
Vocabulary: Excellent/good/fair/vulgar
Accent: Afrikaans/English/Local/Foreign/Other
Background noise: Factory/machines/traffic/trains/aircraft/music/office machines quite or party
……..
Is the caller familiar with the layout of the premises? ……
Any knowledge of personnel/management activities? ……
……..
Did you recognise the voice? (Give details) ……
……..

BOMB THREAT CHECKLIST

PERSON WHO MAKES DISCOVERY OF SUSPICIOUS ARTICLE

- Indicate the location of the article with an item of clothing, upturned chair or similar indicator
- **DO NOT TOUCH OR INTERFERE WITH THE ARTICLE IN ANY WAY**
- Remove yourself from the scene (out of line-of-sight and at least 20 metres away)
- Report the article to a Manager or Fire or Evacuation controller

FIRE WARDENS

- Ask the switchboard to notify the Emergency Controller
- Evacuate everybody from the immediate vicinity and cordon off an area within a 20 metre radius of the article
- Maintain calm and control

EMERGENCY CONTROLLER

- Evaluate the situation and inform the Division Heads
- Notify the SA Police, ambulance, fire and traffic departments
- Ensure that no-one approaches the article
- Order a full or partial evacuation if justified (full evacuation should only be ordered after careful consideration)

REMEMBER THAT IF THE ARTICLE IS AN EXPLOSIVE DEVICE, IT MAY HAVE BEEN PLANTED TO CAUSE THE EVACUATION OF PEOPLE FAST OR TO AN AREA WHERE A SECOND BOMB IS PLANTED, EVACUEES SHOULD THEREFORE DISPERSE RATHER THAN CONGREGATE

See evacuation instructions

DISCOVERY OF A BOMB OR SUSPICIOUS ARTICLE

DO NOT ACT UNLESS ON THE INSTRUCTIONS OF AN EVACUATION CONTROLLER
LISTEN CAREFULLY TO ALL INSTRUCTIONS
REMAIN QUIET AND CALM

WHEN ALARM IS SOUNDED	
ALL PERSONNEL	**Emergency Controller**
Switch off all electrical equipment Open doors to vent any blast Secure valuables and documents Remove high heeled shoes and gather personal belongings (keys, handbags, briefcases, parcels, etc) Ensure that visitors are looked after	Maintain calm and order Supervise a superficial search of stations and general areas for anything foreign or out of place. Report any findings to a Site Manager Allocate escorts to visitors and/or any handicapped persons and collect First Aid equipment, if available, on floor Server room warden to switch fire protection system to automatic

EVACUATION INSTRUCTIONS	
ALL PERSONNEL	
Move towards escape route on the instruction of a warden (see floor plan) Proceed along the escape route **DO NOT RUN** Move in single file Report at rendezvous and disperse	

SECURITY PERSONNEL

- Check ground floor areas (including escape routes from the building) for foreign or unaccountable articles - report finding to Emergency Controller/Fire Co-Coordinator
- Prevent entry or re-entry to the building, clear area for emergency vehicles and notify Division Head of their arrival

EVACUATION PROCEDURES - BOMB THREAT / EXPLOSION

DO NOT ACT UNLESS ON THE INSTRUCTIONS OF AN EVAC CONTROLLER
LISTEN CAREFULLY TO ALL INSTRUCTIONS
REMAIN QUIET AND CALM

WHEN ALARM IS SOUNDED	
ALL PERSONNEL	**EVAC CONTROLLER**
Switch off all electrical equipment, if safe to do so **CLOSE DOORS** Secure valuables and documents Remove high heeled shoes and gather personal belongings (keys, handbags, briefcases, parcels, etc), if safe to do so Listen for further instructions	Maintain calm and order Allocate escorts to visitors and/or any handicapped persons Collect micro phone from SHERQ office for communication Server room personnel to switch fire protection system to automatic

EVACUATION INSTRUCTIONS	
ALL PERSONNEL	**EVACUATION CONTROLLER**
Move towards escape route on the instruction of a warden (see floor plan) Proceed along the escape route **DO NOT RUN** Move in single file Convene at the assembly area	Give evacuation order (on authorisation from Emergency Controller) Personnel to move to the assembly point Once outside, take roll call and re-occupy the building only when the all-clear announcement is received

SECURITY PERSONNEL

- Prevent entry or re-entry to the building
- Clear area for fire tenders and other emergency vehicles (notify Emergency Controller of their arrival)
- Help to maintain calm

EVACUATION PROCEDURES - FIRE

FIRE	FATALITY OR INJURY	ATTACK OR BOMB THREAT/EXPLOSION
RECORD: Exact location Type and extent of fire **ADVISE:** Fire Dept - give stand number Street address Fire Fighters Top Management **EVALUATE:** Threat to life **ACTION:** Alert evacuation wardens Order full or partial evacuation, if necessary	**RECORD:** Exact location Number of injured, type and severity of injuries Also identify and the cause **ADVISE:** First Aid leader Ambulance Police (if fatality) Management **DO NOT REMOVE BODIES WITHOUT POLICE PERMISSION OR UNLESS BODIES ARE THREATENED BY FIRE**	**BOMB THREAT** Advise management Advise SA Police (10111) **DECIDE:** Credible or not **ACTION:** Ignore search/partial search or evacuate (full or partial) or search and evacuate simultaneously **ATTACK/EXPLOSION:** Advise SA Police, security management, ambulance Evaluate seriousness Alert Wardens Evacuate (if necessary) Isolate affected area Use guards

GENERAL

- When ordering evacuation due to a **NON ACCIDENTAL** occurrence, evacuees should be instructed to disperse
- Ensure easy access of emergency vehicles
- Prior to evacuation of the computer room, ensure that the fire protection system in the computer room is switched to automatic
- In the event of evacuation, ensure that security prevents unauthorised re-entry to the premises. Advise Traffic Department if public roads are to be used or congestion caused
- Ensure feedback from fire fighters
- **DISCOVERY OF A BOMB OR SUSPICIOUS ARTICLE** - See previous instructions
- If an evacuation takes place, security guards will remain at their posts

EMERGENCY CONTROLLER

NOTIFICATION PROCEDURE

The individual discovering the spill or release will immediately notify the Emergency Controller:
Name

or in his absence: SHERQ Manager

Site Emergency Controller:

INFORMATION TO BE PROVIDED TO THE EMERGENCY CONTROLLER or SHERQ MANAGER

- Source and location of spill/release
- Type and description of spill/release
- Estimate of quantities of material involved
- The extent of any actual or potential pollution
- Any actual or potential injuries or property damages

IN THE EVENT THAT ASSISTANCE IS REQUIRED IN CLEANING UP A SPILL,
CONTACT: Enviroserv @ (011) 45654971 or 0800192783

GENERAL:

- Do not approach a spill release without suitable PPE
- Keep ignition sources away from any spill or release
- Also refer to Emergency Spill Procedures attached to back of these documents

Also Refer to ISO 14001 Procedures

P-SHERQ-008 Emergency Prepardeness

SPILL OR RELEASE OF HAZARDOUS MATERIAL

GENERAL OFFICE GUIDE

Air Conditioners:	**Ensure that all air conditioners are switched off before leaving the offices.**
Canteen:	**Contact Supervisor re functions, lunches, teas, etc**
Carports:	**SHERQ**
Courier Services:	**Receptionist**
Electrical Repairs:	**Maintenance Department**
Emergency Numbers:	**See Emergency No's and Site**
Flexitime:	**Changes must be approved by Executives only**
Furniture:	**Purchases, moving about of furniture - must be cleared with Executives and/or Departmental Managers**
Gatehouse Guards:	**Report to Manager : SHERQ**
Hotline:	**Tip Offs Anonymous 0800 004 815**
Access control:	**Human Resources**
Leave and Sick Leave Forms:	**Leave and sick leave forms must be completed and approved by employee and departmental manager Heads and handed to Human Resources Department**

GENERAL OFFICE GUIDE

NATURAL DISASTERS

EARTHQUAKES / TREMORS

Indoors

- In the event of an earthquake remain calm & move to the centre of the building. Await instrutions from the Emergency coordinator. If the evacuation alarm is sounded, evacuate to the assembly point
- While moving stay away from windows and hanging objects which may fall.
- If you need to move down the stairs, be careful as some of the staircases might be affected. Hold on to the handrails.

- If its not safe to evacuate,get under protective structure such as a sturdy table or desk
- Move to an inner wall or corridor.
- Watch for falling objects.
- Stay away from tall shelves and objects that can topple over
- Stay away from windows,sliding glass doors,mirrors.
- Await instructions from the Emergency coordinator.

Outdoors

- Stay outside.
- Move away from the building,walls,power poles and lampposts.Electric power lines are a serious hazard - stay away from fallen lines.If possible, proceed cautiously to an open area.
- Do not walk next to the wall, trees or anything that might fall on you.
- Await instructions from the Emergency coordinator.

After an earthquake

- Remain calm. Don't panic. Wait until all motion has stopped. Do not run down stairs.
- Be prepared for additional shockwaves & follow instructions from the Emergency coordinator.
- Do not use cellphones,except to report serious injuries.
- Be prepared to evacuate the site if instructed to do so. (The decision to evacuate from the site will be based upon the severity of the earhquake and damage to buildings).
- The Emergency coordinator will provide instructions for immediate actions by available means.
- Do not enter any building that is deemed or looks unsafe.
- A roll call will be done to ensure that all staff members have been accounted for.

SEVERE THUNDERSTORMS / HAIL /LIGHTNING

- When you hear thunder or see lightning, go indoors.
- Do not walk next to trees, building, walls, wires fences and power lines.
- Sometimes lightning can trigger fire alarm, do not evacuate. Wait for the evacuation alarm.
- Stay indoors until after the storm or hail.

FL(FLOODING

- An alarm will be sounded, if ordered to evacuate or if rising water is threatening, go to higher ground.
- Do not walk on water that is more than ankle deep.
- If you are in a vehicle do not drive through flooded areas.

GENERAL:

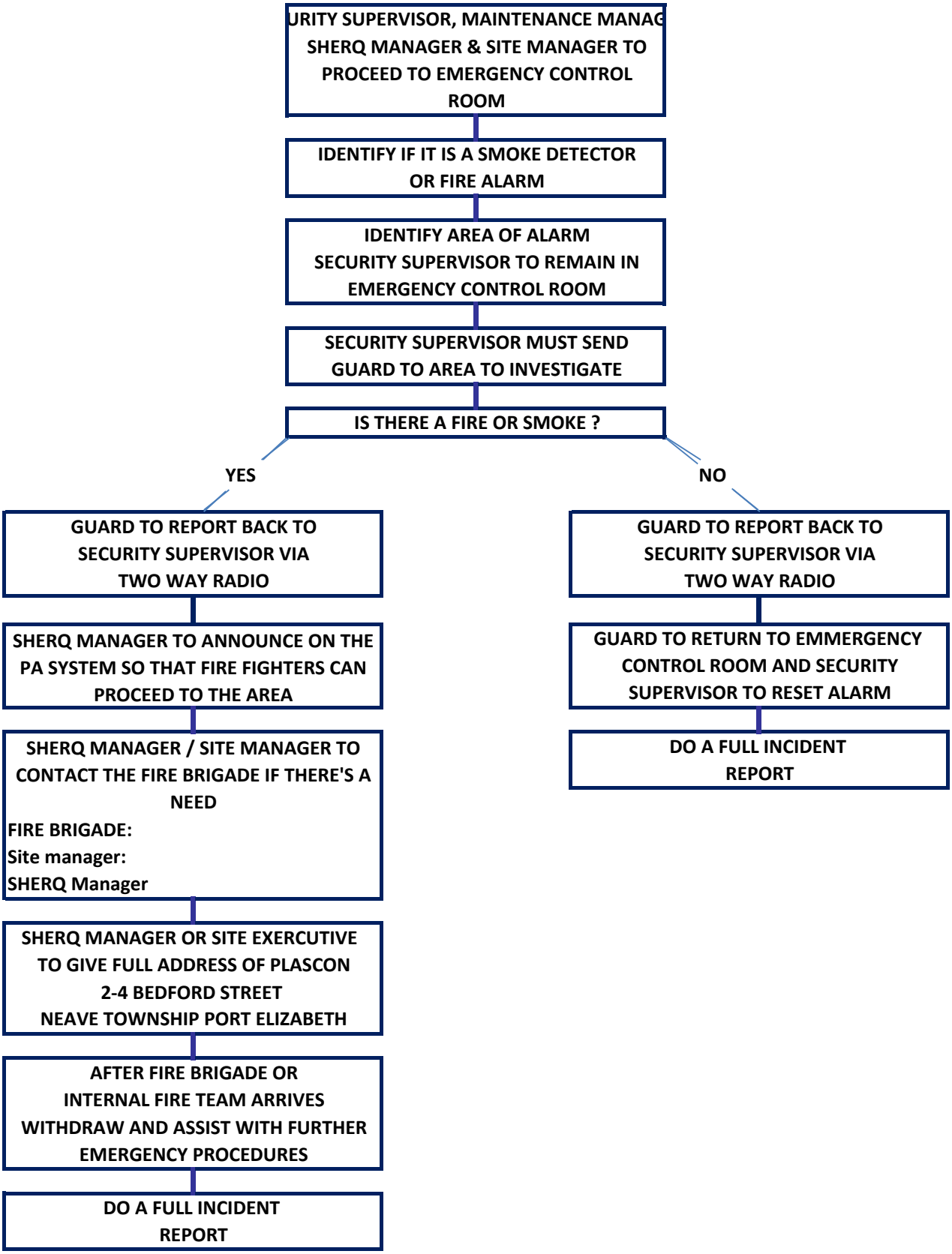
ASSIST PEOPLE WITH SPECIAL NEEDS,IF ITS SAFE TO DO SO.
REMAIN CALM & ALERT
ALWAYS LISTEN FOR INFORMATION & INSTRUCTIONS FROM THE EMERGENCY COORDINATOR
DO NOT USE CANDLES, MATCHES, OR OTHER OPEN FLAME EITHER DURING OR AFTER THE EARTHQUAKE BECAUSE OF POSSIBLE GAS LEAKS.

GENERAL OFFICE GUIDE

Office Equipment:	**Executives only**
Office Cleaning:	**SHERQ - daily**
PC Problems:	**IT**
Petty Cash:	**Finance - daily**
Plants(Flowers):	**SHERQ - External contractor**
Garden:	**SHERQ - External contractor**
Smoking:	**Cottage next to the assembly point**
Stationery:	**To contact admin supervisor**
Telephone Exchange:	**Open Monday to Friday 07h30 to 17h00 - closed weekends**
Visitors:	**Monday to Friday Gate 4 - Reception - normal** **Monday to Friday Gate1 & 4 - Deliveries**
Waste Paper Bins:	**SHERQ - External contractor**

GENERAL OFFICE GUIDE

FIRE OR SMOKE DETECTOR ALARM



SECURITY PROCEDURE FOR FIRE OR SMOKE DETECTOR ALARMS

Appendix E: Comments and responses report

Table 1: Comments Received

Theme	Commenter	Comment	Response
Specialist Study – Air Quality / AEL	NMBM	Please consider inclusion of a map showing a 5km radius around the site.	A Map has been included in the specialist assessment report.
Specialist Study – Air Quality / AEL	NMBM	Process flow diagrams for both operations should be included in the specialist report.	Process flow diagrams have been included into the specialist assessment report.
Specialist Study – Air Quality / AEL	NMBM	Impacts on the environment and human health need to be included in the report.	Impacts on the environment and human health are addressed in the Basic Assessment Report.

Environmental Assessment, Changes and Expansion to the Axalta Plascon Paint Manufacturing Facility

Background Information Document (BID)

Proponent: Kansai Plascon

Document Purpose

The purpose of this document is to inform interested and affected parties of the proposed development and provide them with sufficient information to lodge an interest in the project.

In terms of regulation 41(2) published in Government Gazette No. R982 under Section 24(5) of the National Environmental Management Act (act 107 of 1998), all Environmental Assessments are required to inform potential Interested and Affected Parties (IAPs) of the proposed activities.

This document serves as the first notification in the process and is intended to allow interested parties to (i) register their interest in the project and receive regular updates on the progress, and (ii) raise initial comments or concerns related to the proposed activities.

You are therefore encouraged to register as an IAP by completing the registration form attached hereto and submitting it to:

Attention: Evert Jacobs
Email: admin@proportiodivina.co.za
Tel: 069 808 1431

Register Via WhatsApp on the number above. Please ensure to include the details as per the registration page.

What is an Environmental Assessment?

In terms of listing notices 1, 2 and 3 of the Environmental Impact Assessment regulations of 2014, the required environmental auhorisation process is described in Government Gazette Numbers R983, R984 and R985 as amended in 2017. Activities listed in Listing Notice 1 requires a Basic Assessment Process, whereas activities listed in Listing Notice 2 requires a full Scoping and Environmental Impact Assessment Process.

In terms of this project, the proposed activities are listed in Listing Notice 1 and therefore requires a Basic Environmental Assessment.

The specific activity triggered, that requires Environmental Authorisation, is as follow:

- Listing Notice 1 activity 34: The expansion, or changes to, existing facilities or infrastructure for any process or activity where such expansion, or changes to, will result in the need for a permit or license or an amended permit or license in terms of national or provincial legislation governing the release of emissions, effluent or pollution, excluding […]

Public Participation Process

In terms of the EIA Regulations, interested and affected parties should be provided with an opportunity to participate in the Environmental Authorisation process through providing comment on the proposed activities and reports provided as well as by raising potential issues and concerns to be addressed as part of the Environmental Authorisation Process.

In order to participate in this process, please register your interest by supplying the Environmental Assessment Practitioner with a copy of the completed registration form provided (last page of this document).

Once a draft Basic Assessment Report has been compiled, it will be available for public comment for a duration of 30 days, by registering as an Interested and Affected Party you will be notified of the documents when they become available for public review.

The consultant responsible for conducting the Environmental Assessment is Proprtio Divina Environmental Services and contact details of the Environmental Assessment Practitioner is provided in the first column of this page.

Project Description

Axalta Plascon produces automotive paint for the vehicle manufacturing industry which is a large economic driver in the Nelson Mandela Bay area. Axalta now proposes to include solvent based paints in their production process. Kansai Plascon does produce solvent-based paints at present under an existing Atmospheric Emissions License. This increase in the production necessitates a change in the site facilities to be able to produce solvent based paints at an approximate capacity of 4000 tons per year in addition to the current production.

The production process for results in solvent-based paints produced through mixing of several solvents and chemicals to produce the final product. The production process involves the following steps:

1. Receipt and storage of input materials (solvents, resins, and other chemicals).
2. Loading of mixing facilities with different volumes of ingredients.
3. Mixing of the combined substances by an operator.
4. Colouration and tinting of the product.
5. Testing of the product.
6. Filling of containers with approved product.
7. Storage and transportation of filled containers to clients.

The mixing process takes place in a series of tanks where substances are added sequentially. This stirring action, and the nature of the solvents and volatile chemicals result in the release of vapours that requires ventilation. The stirring process is manually controlled by the operator and the facility is equipped with a stack to vent vapours from the tanks.

Axalta Plascon therefore seeks to amend the Atmospheric Emissions License operated by Kansai Plascon by utilising the existing processes on site and amending the emissions permitted.

The proposed facilities to be constructed and installed at the site will include the following:

- The existing infrastructure on site will be re-purposed to allow for the expansion and a clearcoat manufacturing plant will be installed in the re-purposed areas.
- This plant will have containment facilities in the form of a bund with a sump to control any spills and leaks that may occur during the manufacturing process.
- To allow for ventilation and removal of vapours produced during the mixing process, a dedicated stack will be constructed.
- To insulate some of the mixing tanks from vapours released, Axalta Plascon proposes to make use of nitrogen (due to its inert properties) as a barrier to prevent unwanted contamination of product mixes.
- The provision of nitrogen to the required mixing area will be either through a pipeline or by installation of smaller nitrogen tanks at strategic locations.
- Tanks are cleaned using solvents and the resultant effluent are distilled on site for storage and re-use. The associated distillation, handling and storage facilities will form part of this expansion. These facilities are existing but will be expanded.
- Facilities for the temporary waste handling and storage will be required for the resultant sludge that is produced in the cleaning process. These are existing facilities but the volumes will be increased.

Impacts to be Assessed

The following impacts will be assessed as part of the Basic Assessment process:

- Atmospheric emissions resulting from the facility
- Risk to groundwater contamination
- Safety risk of the facility in terms of the facility being classified as a major hazard installation

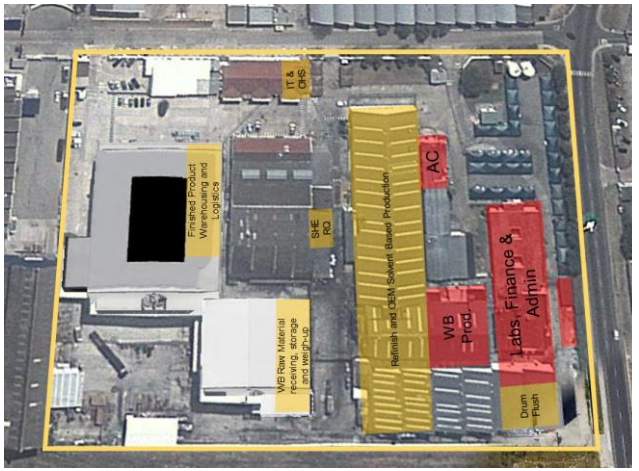
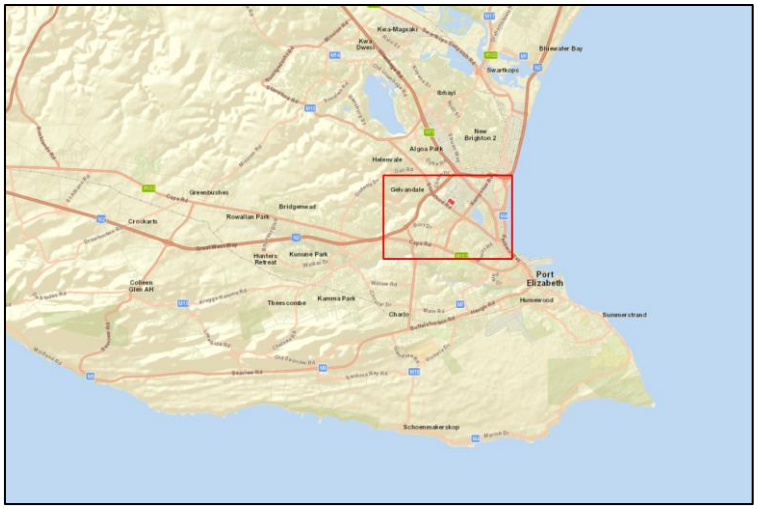


Figure 1: Operations at the site indicating Kansai Plascon facilities in orange and Axalta Plascon in red.

Location of the Proposed Activity



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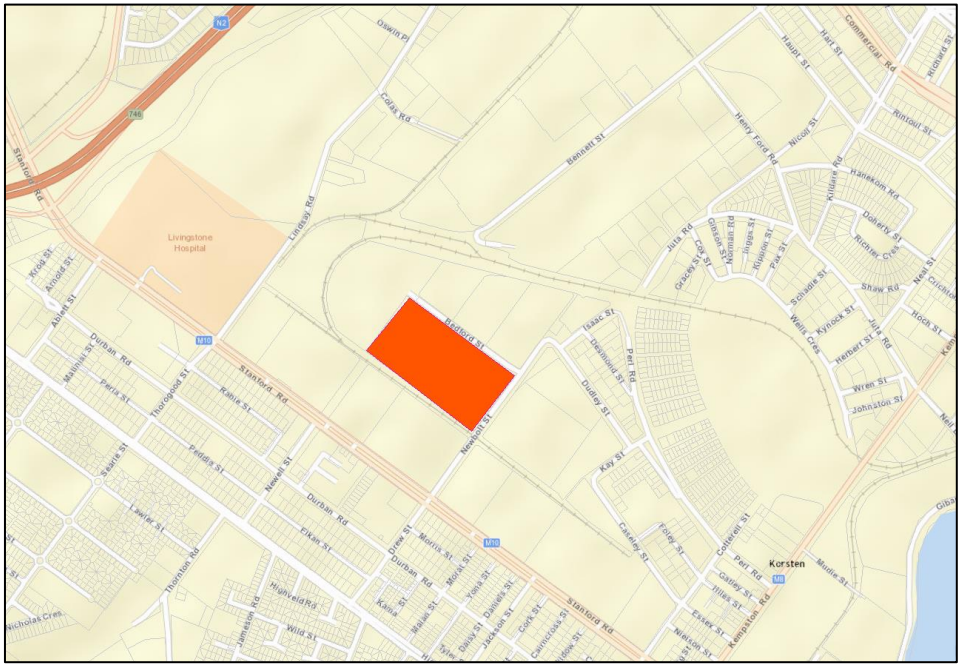
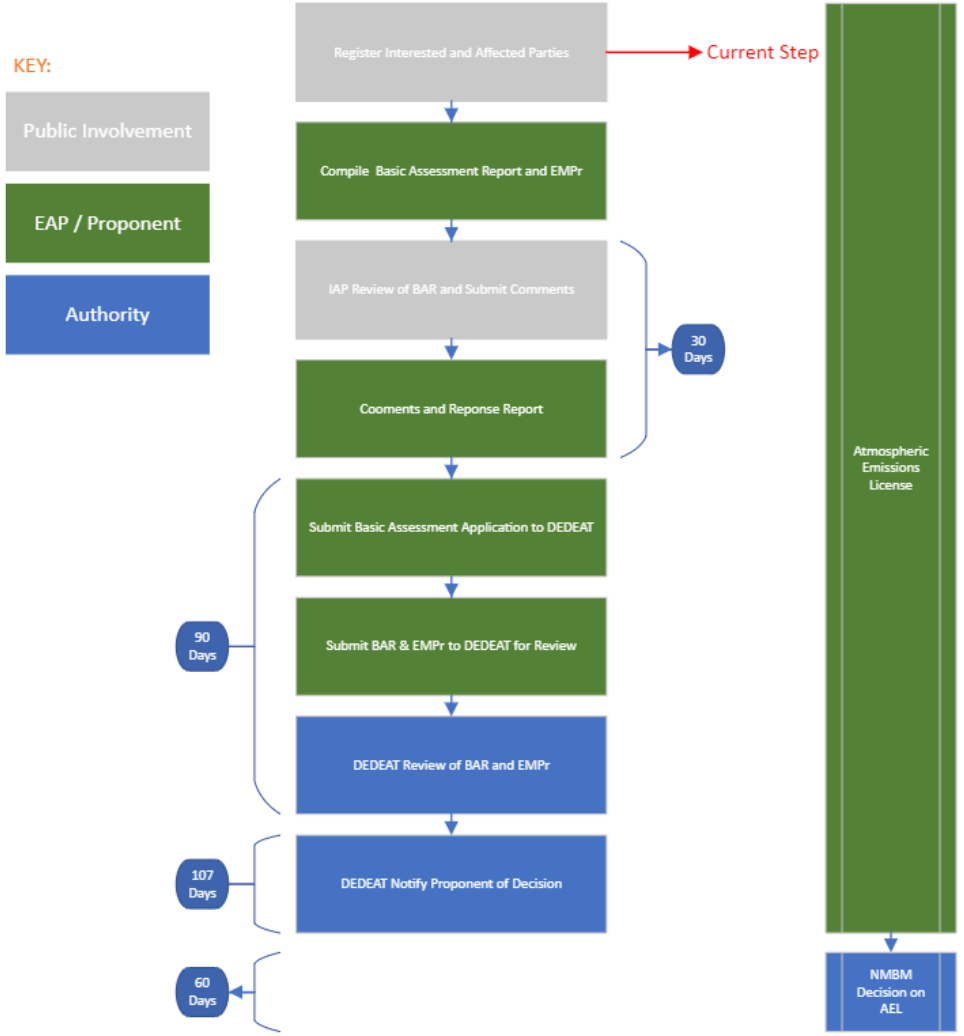


Assessment Steps



PROPORTIO DIVINA
environmental services

Registration Form

Name: _____

Surname: _____

Tel No: _____

Email: _____

Concern Noted:

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Appendix F: Environmental Management Programme (EMPr)

1. Environmental Management Plan

Introduction

This Environmental Management Plan has been compiled for the upgrade of the facility in support of the amended AEL. Construction activities will be minimal and will require some modifications to the existing infrastructure with some demolition required. Construction impacts are therefore not considered to be of major significance although some items below will address construction management as well.

Purpose of the EMP

The purpose of this Environmental Management Plan is to provide measures for environmental management on site in terms of the following:

- Describe potential mitigation measures and management actions to reduce environmental impacts identified in the Basic Assessment.
- Provide guidance on the monitoring during implementation and operation.

Objective of the EMP

The overall objective of this Environmental Management Plan is to provide pragmatic measures to manage impacts that may arise from the expansion of the facility.

Scope of the EMP

The scope of this EMP is only applicable to the construction and operational phase and operations and does not cover decommissioning of the facility. Although construction will be required to install the infrastructure, the scale of the construction is considered to be minimal. Operational monitoring requirements are included in the mitigation measures.

Roles and Responsibilities

Operator / Owner

Due to the size and nature of the proposed changes the responsibility of implementation of this EMP fall on the Managing Director of the Kansai Plascon facility. In the event that the Managing Director delegates his responsibilities to subordinates or contractors, the Managing Director will remain responsible for overall compliance to the measures contained herein. The managing Director must ensure that an environmental auditor is appointed, at the cost of the Kansai Plascon to measure compliance to the authorisations and permits (EA and AEL).

Environmental Auditor

The environmental auditor will be responsible for measuring the compliance to this EMP, the EA and AEL.

Environmental Awareness and Induction

Kansai Plascon shall ensure that all employees are educated in terms of the requirements of this EMP. The responsible parties must also ensure regular refresher training where required.

Auditing and control

Where required, the activities will be audited by an independent auditor/specialist with sufficient knowledge of the issues related to the AEL, EA and MHI to monitor compliance to the implementation of the mitigation measures.

Management Measures

The management measures have been determined to reduce the potential impacts resulting from the facility changes and these are summarised in tabulated format below for ease of reference.

Activity / Potential Impact	Mitigation	Responsible Party	Monitoring Frequency
General			
Awareness Training Operators and employees who are not versed in the environmental requirements may cause poor operating conditions	Plascon/Axalta shall ensure that all employees are educated in terms of the requirements of this EMP.	Managing Director	Monthly Addressed to ensure all parties know their responsibilities
Complaints Register Maintain a register documenting complaints.	A complaints register will be kept on site and will include complaints and responses and actions to address complaints.	Managing Director	Ongoing
Agreements and Compliance Agreements to enforce compliance.	The parties will ensure an agreement is in place to enforce compliance to the EA and AEL to all parties operating on site.	Managing Director	Prior to commencement of activities.
Construction Phase			
Waste Management Management of construction waste generated during the commissioning	All construction waste must be disposed of at a registered landfill	H&S	Monthly / as needed
	Verify monthly that construction waste has been removed to a registered facility	H&S	Monthly
Cement mixing	Cement mixing must be done in a controlled manner and all cement water contained on site.	H&S	Monthly
Noise Noise during construction	Construction hours will be limited to the hours of 7am to 7 pm.	H&S	Monthly
Operational Phase			
Waste Management Operational Waste Generated	All waste generated, not intended for re-use, and general operating waste must be disposed of at a registered landfill site.	H&S	Monthly

Waste inventory	A waste inventory must be kept to keep records of output material, recycled/re-used materials and waste.	H&S	Monthly
Gas Installation Installation and operating of fuel infrastructure.	All fuel/solvent infrastructure will be installed by a registered professional and certificates of installation be retained.	H&S	1 Week prior to commissioning.
Safety Procedures Training and ensuring safety of operators	Kansai/Axalta shall implement a health and safety system that includes regular training and awareness.	H&S	Monthly
	All employees will be issued with the required health and safety PPE for their respective roles.	H&S	Monthly
	The mitigation measures and recommendations of the MHI Study must be implemented and incorporated into the current safety plans.		Prior to commencement
Air Quality Regular Inspection of units	Kansai/Axalta will inspect the facilities regularly (at least annually) to ensure they are operating at the installation specifications.	H&S	Annually
Monitoring of stack emissions	Annual stack emissions monitoring should be conducted as determined by a specialist.	H&S	Annually
	All equipment will be regularly serviced	H&S	As determined by equipment specifications
Monitoring of Emissions **Annual stack emissions monitoring**	Annual monitoring of stack emissions to be reported to the authorities.	Managing Director	Annually

Appendix G: Other information

G1: EAP CV

Professional Experience

Evert Jacobs

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environmental services

PROFESSIONAL CV

1. Personal Details

Family Name: Jacobs
First Names: Evert Philippus
Nationality: South African
Email: evert_p_jacobs@outlook.com
Mobile: +27 82 326 9325

2. Education

Institution/Date	Degree(s) obtained
University of Port Elizabeth	Bachelor of Science (BSc.)
University of Port Elizabeth	Honours Degree (BSc. Hons)
Nelson Mandela Metropolitan University	Master of Science (MSc.)

3. Professional Registration

1. South African Council for Natural Scientific Professions (400128/10)
2. Environmental Assessment Practitioners of South Africa (2019/1992)

4. Language Proficiency:

Language	Read	Speak	Write
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent
French	Basic (learning towards B- Level)	Basic (learning towards B- Level)	Basic (learning towards B- Level)

5. Specific experience in Africa:

I have executed projects in the following countries:

1. South Africa
2. Mozambique
3. Zambia
4. Namibia
5. Botswana
6. Lesotho

7. Togo
8. Democratic Republic of Congo
9. Mauritania

In addition to these countries, I am also currently assigned to projects in the SADEC region not listed above and I also have experience in projects in South America, the Middle East and Australia.

6. Professional Experience Record (Selected assignments only):

My experience listed is a summary of the roles and responsibilities I had during my employment at the following institutions:

1. 2002 – 2003: African Conservation Ecology Research Unit – Research Assistant
2. 2003 – 2008: SRK Consulting – Environmental Scientist
3. 2008 – 2021: Hatch Africa – Senior Environmental Advisor
4. 2021 – present: Proportio Divina Environmental Services – Independent Environmental and Social Contractor.

I have been involved in environmental management of development projects for the last 18 years. I have experience in mega and large infrastructure, mining, and energy projects specifically in guiding development from concept phase through to construction execution including construction setup and management.

My experience includes construction environmental management, permitting strategies for mega projects in various countries, Environmental and Social Impact Assessments (ESIA), mining permits and licenses, monitoring protocols for water quality and air quality, environmental management plans and construction management, environmental auditing and compliance monitoring against international standards, Geographical Information Systems (GIS), Water Use License Applications, ecological research and ecological processes that have been combined in my work related experience.

I have also assisted operations with their compliance and monitoring as well as with implementation of sustainability projects. I have international experience in Africa, the Middle East, South America, and Australia and have supervised adherence to international standards (IFC, World Bank, AfDB etc.) and international conventions (e.g. London Convention, UNFCC etc.) through the various engineering standards associated with project development stages (such as stage gates used by mining companies and other industries). I have successfully managed projects that have been investigated by the Environmental Management Inspectorate (green scorpions) with no findings reported.

6.1. Experience with direct Climate Change and Adaptation scope

Date:	2015 - 2021	**Description:**
Location:	Botswana	

Company:	Botswana Oil	**BOL Coal to Liquids Development:** As part of the Botswana Oil technical advisory team, I was responsible for advising the client on the social and environmental performance requirements throughout the project development phase which commenced with a project definition stage. In this regard my roles included review of the carbon restrictions committed to by the government in terms of global agreements and how these implicated the development which was significant. This was done within the environmental framework developed as part of the project.
Position:	Environmental Advisor	
Date:	2021	**Description:**
Location:	South Africa	**Confidential:** As part of a project due diligence for a mining client I was required to comment on the impacts of South Africa's new climate change regulations and provide an estimate of carbon taxes for the re-instatement of a metals refinery.
Company:	Confidential	
Position:	Environmental Advisor	
Date:	2022	**Description:**
Location:	SADEC Region	**Various projects:** As part of my current contract, I am tasked with review of projects where funding has been provided for climate resilience as well as integration of climate change into integrated environmental systems for government and private projects.
Company:	AfDB	
Position:	Environmental Advisor	

6.2. General Experience in Environmental and Social Management including climate impacts

Date:	2014	**Description:**
Location:	Togo, West Africa	**Togo Rail:** This project involved scoping of the ESIA process and screening of a new Greenfields rail line connecting the northern border of Togo to the Port of Lomé as part of a pre-feasibility assessment. Included in this project was an options analysis of the stockpile locations for iron ore export facilities. My role was to conduct an initial assessment using available land cover data to inform the route determination and scoping of the social impact based on the number dwellings that would require relocation. The IFC guidelines were used in determination of the feasibility costs and ultimate relocation and environmental requirements for the project.
Company:	Ubu Invest	
Position:	Environmental Manager	
Date:	2016	**Description:**
Location:	Mpumalanga and Gauteng	**Mozambique – South Africa LNG supply line:** This project involved a pre-feasibility study review of a 2000 km LNG pipeline from the Gas fields in

	Provinces; South Africa	Northern Mozambique to Gauteng in South Africa. I provided expert ecological and environmental input into the route alignment options and was also in charge of project management for the South African portion of the project. The project formed part of a multi-country (Mozambique and South Africa) review and included a social and environmental sensitivity analysis, heritage review, social review, ecological review and legal and permitting analysis of the pipeline route alignment proposed.
Company:	Keben and Associates	
Position:	Environmental Manager	
Date:	2017 – 2021	**Description:**
Location:	Botswana	**BOL Coal to Liquids Development:** I formed part of the team assisting Botswana Oil with the development of a coal to liquids facility to supply fuel to the local Botswana market. My role was to assist the project team in ensuring that international design as well as environmental and social standards were included into the project planning aspects as the development progresses. Part of this role was reviewing and compiling a permitting strategy for the coal mining, transport, CTL development and supporting infrastructure for the entire facility as well as development of the environmental framework to allow the client to evaluate technology suppliers which focused on environmental legislation and environmental risks.
Company:	Botswana Oil Ltd	
Position:	Environmental Advisor	
Date:	2014 – 2018	**Description:**
Location:	Northern Cape, South Africa	**Phase 1 Rail Construction Supervision:** I was responsible for management of contractors and auditing of several contractors on site against environmental authorisations, environmental management plans, water use licenses and their environmental policies and procedures against the client standards. As part of this role, I managed the construction setup where the Environmental Management System setup was conducted to enable auditing and reporting to the national Department of Environmental Affairs.
Company:	Transnet Capital Projects	
Position:	Environmental Manager	

6.3. Specific Experience in Environmental and Social Assessment

Date:	2012-2013	**Description:**
Location:	Matola; Mozambique	**Matola Export Terminal:** The Matola coal and magnetite terminal studies considered expansion of the facility to handle 20 Mtpa of product. I served as the project Environmental Manager responsible for compiling a permitting strategy and directing specialist investigations prior to the start of the environmental authorisation. This project progressed into a bankable feasibility study that included a full ESIA completed against international standards and included dredge modelling and impacts on the marine environment. Part of my role included management of the
Company:	Grindrod Logistics	
Position:	Environmental Manager	

		environmental consultants (a joint venture between a local company and an internationally recognised ESIA consultant) and I was responsible for commencement of the monitoring programmes during early stages (pre-feasibility) to ensure that international standards can be met. This project proceeded to construction utilising international funding.
Date:	2012-2016	**Description:**
Location:	Northern Cape, Free State and Eastern Cape Provinces of South Africa	**Nqgura Manganese Export Corridor:** I served as the environmental manager for the project team appointed by Transnet Capital Projects to conduct pre-feasibility and feasibility studies for upgrading of their manganese export corridor between Hotazel in the Northern Cape of South Africa to the Port of Ngqura situated in Port Elizabeth. The Environmental Services team was appointed to conduct the environmental studies for this project to enable the permitting processes required for ESIA's for the rail corridor as well as port facilities. This role included the management and coordination of several permitting processes for Environmental Authorisation, Water Use Licenses, Borrow pits and Atmospheric Emissions Licenses for a Greenfields port terminal and 800 km of rail and grave relocations. The project was completed against the client stage gate requirements which included adherence to international standards and included setting up of monitoring protocols during pre-feasibility.
Company:	Transnet Capital Projects	
Position:	Environmental Manager	
Date:	2009-2010	**Description:**
Location:	Saldanha Bay, South Africa	**Phase 1B Dredging:** My role was managing of the environmental assessment process to obtain authorisation, managing of the construction teams, and dredging contractors to comply with the relevant standards and authorisations as well as managing of environmental consultants to monitor marine water quality parameters prior to and during dredging activities. This included drafting of environmental specifications, auditing of the specifications and authorisations, EIA quality control, monitoring protocols and management plans and managing changes to project descriptions and ensuring permits were in place to allow for dredging activities to be completed successfully. Part of my role included stakeholder management of parties who were concerned about the nearby Langebaan Lagoon, a RAMSAR listed site. This required convening the Environmental Monitoring Committee (EMC) that reported to stakeholders on the project performance.
Company:	Transnet Capital Projects	
Position:	Environmental Manager	
Date:	2020	**Description:**

Location:	Free state Province, South Africa	Matjabeng WWTW: I was responsible for coordinating the environmental and social assessment and associated applications to license wastewater treatment facilities.
Company:	Matjabeng Local Municipality	
Position:	Environmental Manager	
Date:	2021	**Description:**
Location:	Patensie, South Africa	**Kwaggaskloof Package Facility:** I am assisting the client with a retrospective environmental assessment following construction of a warehouse that was in contravention of the legal requirements. The purpose of the project is to assess any potential impacts, license the facility in terms of the relevant environmental regulations and facilitate the process with the government licensing authority.
Company:	Kwaggaskloof Citrus	
Position:	Environmental Manager	

6.4. Experience of E&S in Operation

Date:	2012	**Description:**
Location:	Saldanha Bay, South Africa	**Saldanha Bay Reverse Osmosis Plant:** My role included drafting of the environmental specifications and monitoring protocols needed for establishing an environmental baseline prior to the operational phase as well as auditing of contractors and internal teams against the authorisations, permits, specifications and company and project policies. I compiled the operational specifications and audited the commissioning requirements during handover.
Company:	Transnet	
Position:	Environmental Manager	
Date:	2018	**Description:**
Location:	Sishen, South Africa	**Kumbua Iron Ore Asbestos Options Analysis:** I assisted Kumba Iron Ore with an options analysis to determine disposal options for asbestos removal on mining sites. The asbestos contamination resulted from years of rail transport and when Kumba took over a rail portion overlying an iron ore resource, the disposal of the material prevented projects and mine expansion. I used my asbestos experience gained during construction removal on Transnet projects to assess the options for asbestos disposal using the Hatch 4 Quadrant Analysis Tool.
Company:	Kumba Iron Ore	
Position:	Environmental Manager	
Date:	2012	**Description:**
Location:	Saldanha Bay, South Africa	**Phase 1A Air Quality:** The project involved installation of dust mitigation systems and monitoring of dust fall and particulate matter in and around

Company:	Transnet	the Port of Saldanha. My role was managing of the monitoring programmes and providing input into the dust mitigation procedures and systems to ensure compliance with standards and permitting requirements. Included in this role was a critical review of all monitoring reports and results and determination of dust fall limits for iron ore.
Position:	Environmental Manager	
Company:	Transnet	
Position:	Environmental Manager	

6.5. Experience with MDBs

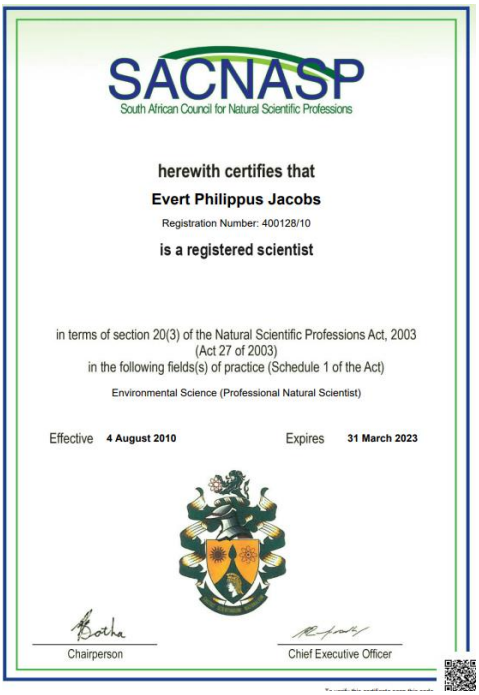
Date:	2021	**Description:**
Location:	African Regions	**Confidential:** As part of a part-time contract, I am responsible for review of environmental and social safeguards compliance and advising the bank on requirements as part of development scope. This role requires assessment of projects against international standards and participation with European investment banks and financial institutes.
Company:	AfDB	
Position:	E&S Consultant	
Date:	2014	**Description:**
Location:	Kolwezi, Zambia	**Lumwana Copper:** I was the environmental specialist responsible for a technical environmental and social review of the mine construction and expansion activities under IFC funding. This involved a quarterly review of construction activities and site operations, monitoring data for air quality and water quality, waste management and site operational practices.
Company:	Standard Bank, Standard Chartered Bank	
Position:	Technical Environmental and Social Reviewer	
Date:	2015	**Description:**
Location:	Tete; Mozambique	**Revobue Mine:** I was responsible for conducting technical reviews of the environmental and social studies to date to determine the acquisition risks. The role included a country specific review of the environmental requirements as well as a review against world bank, IFC standards and equator principles.
Company:	Standard Bank	
Position:	Technical Environmental and Social Reviewer	
Date:	2015	**Description:**
Location:	Lubumbashi; Democratic	

	Republic of the Congo	**Kipoi Copper Mine:** I was tasked with an IFC review of the Kipoi copper mine (heap leach process) operational activities as part of a proposed expansion of the mine. The project included review of the site Environmental Management Systems, monitoring data (water quality, air quality, groundwater), waste management and site management practices in order to secure funding under IFC guidelines for expansion of the facilities.
Company:	Standard Bank	
Position:	Technical Environmental and Social Reviewer	
Date:	2016	**Description:**
Location:	Mpumalanga Province; South Africa	**Eskom Mine Acquisitions:** I formed part of the technical team appointed to conduct an IFC and equator principles review of the Eskom coal mines owned by Anglo PLC that were put up for sale. I was responsible for the environmental risk assessment and environmental and social reviews associated with 4 active coal mines and additional unexploited resources.
Company:	Standard Bank	
Position:	Technical Environmental and Social Reviewer	

7. Other Skills:

- Geographical Information Systems – advanced modelling and mapping of engineering challenges and disaster risk management.
- Advanced MS Office.
- Project Management and use of MS Project.
- Ecological Specialist.

Appendix 1: Professional Registration Certificates



SACNASP
South African Council for Natural Scientific Professions

herewith certifies that
Evert Philippus Jacobs
Registration Number: 400128/10
is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following fields(s) of practice (Schedule 1 of the Act)
Environmental Science (Professional Natural Scientist)

Effective **4 August 2010** Expires **31 March 2023**

Chairperson Chief Executive Officer

Environmental Assessment Practitioners Association of South Africa

Registration No. 2019/1992

Herewith certifies that

Evert Philippus Jacobs

is registered as an

Environmental Assessment Practitioner

Registered in accordance with the prescribed criteria of Regulation 15. (1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Effective: 01 March 2023 Expires: 29 February 2024

Chairperson *Registrar*

SAQA