

Jet Zero™

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STATE CODE 21:
HAZARDOUS
CHEMICAL FACILITIES

State code 21: Hazardous chemical facilities

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

Table 21.1: Material change of use

Performance outcomes	Response
Off-site impacts—vulnerable land use or land zoned for a vulnerable land use	
PO1 The hazardous chemical facility does not create a dangerous dose to human health .	Complies Fire and Explosion Analysis prepared by Technip Energies (refer Appendix 12) confirms that there are several scenarios which exceed the boundaries of the site. These scenarios relate primarily to the IS1 and IS2 modules. The consequence analysis completed by Technip have identified that with the exception of two scenarios which extend out to the adjacent access road to the south of the site, the remaining exceedances of the boundary occur to the north of the site onto the adjacent saltpan area. This area to the north is identified as tidal land and is located within the Environmental Management Precinct of the TSDA development scheme. As noted in the TSDA development scheme, the intent of this precinct is to <i>remain free of industrial development due to flooding and topographical constraints, and environmental and cultural heritage values</i>. This area forms part of the Sandfly Creek catchment and is subject to significant environmental considerations and is not suitable for future development. Most of the risk contours exceeding the boundary extend into this environmental management area. Utilising the State Code 21 criteria relating to Industrial facilities there are several scenarios which exceed the boundary of the site these are: • Tanker rupture resulting in a pool fire resulting in thermal radiation exceeding 12.6KW/m². This scenario extends just outside of the site onto the adjacent access road without mitigation (Refer to Figure 7-22

	in Appendix 12). This scenario can be mitigated with the use of Bunding and drainage. • FC12 Jet Fire thermal radiation 23mm release. This scenario extends outside of the boundary on the northern side of the site into the adjacent salt pan area. • FC107 Pool Fire thermal radiation 23mm release. This scenario extends outside of the boundary on the northern side of the site into the adjacent salt pan area. • Explosion overpressure for worst case 23mm release (Module IS3). This overpressure contour exceeds the boundary on the northern side of the site into the adjacent salt pan area. • Release from vessels within the OS5 module would mainly lead to pool fire hazards. The Liquid Hydrocarbon Storage Vessel could give rise to pool fire and toxic dispersion (97m for 23mm release) due to presence of Acetaldehyde which could impact offsite areas. Provision of bunding and drainage for vessel containing liquid inventory would limit the pool formed and reduce the vaporisation rate and size of the toxic cloud. The overpressure contours exceed the boundary for the site but are below the planning trigger of 14kpa under State Code 21 for industrial premises. The current assessment is based on Pre-FEED design, and this will be updated through the FEED process for the facility. The assessment undertaken in Appendix 12 does not include detailed engineering controls which will be developed through FEED design and be implemented to further refine and mitigate impacts from the facility. The project does not result in offsite impacts to any sensitive or vulnerable land use.
Off-site impacts—sensitive land use or land zoned for a sensitive land use	
PO2 The hazardous chemical facility does not create a dangerous dose to human health .	Complies The Fire and Explosion Analysis confirms the Project does not result in dangerous doses to human health. Thermal radiation, explosion overpressure, and toxic dispersion contours from the assessment do not impact on any off-site sensitive land uses. Refer PO1 above.
Off-site impacts—commercial or community activity land use or land zoned for a commercial or community activity land use	
PO3 The hazardous chemical facility does not create a dangerous dose to human health.	Not applicable The proposed development involves an industrial land use and does not provide for commercial or community land uses.

Off-site impacts—open space land use or land zoned for an open space land use	
PO4 The hazardous chemical facility, does not create: - a dangerous dose to human health; or - where (a) cannot be achieved, an individual fatality risk level of 10×10^{-6}/year and the societal risk criteria in figure 21.1.	Complies The proposed development does not result in a dangerous dose to human health at or beyond the site boundary under credible loss of containment scenarios.
Off-site impacts—industrial land use or land zoned for an industrial land use	
PO5 The hazardous chemical facility, does not create either of the following: - a dangerous dose to the built environment; and - an individual fatality risk level of 50×10^{-6}/year.	Complies The Fire and Explosion Analysis (Appendix 12) confirms that credible loss of containment scenarios does not result in thermal radiation or explosion overpressure exceeding the dangerous dose thresholds to the built environment (12.6 kW/m^2 or 14 kPa) at off-site industrial land. All hazardous event contours remain within or immediately adjacent to the site and do not impact adjoining industrial properties.
Storage and handling areas	
PO6 Storage and handling areas for fire risk hazardous chemicals are provided with a 24-hour monitored fire detection system that has the ability to detect a fire in its early stages and notify an emergency responder at all times.	Complies A 24-hour monitored fire detection system will be installed across the facility, providing both automatic and manual activation capability. The system will ensure audible and visual alarms are effective under all operating conditions, including high-noise environments, and will remain operational during power failure. The design performance and functions are included in the Fire and Gas Detection and Alarm Systems section in the HSE Basis of Design report. It should be noted that the assessment undertaken in Appendix 12 does not include detailed engineering controls which will be developed through FEED design and be implemented to further refine and mitigate impacts from the facility. It is considered this can be dealt with via reasonable and relevant conditions of approval.
PO7 Storage and handling areas for packages of liquid or solid fire risk hazardous chemicals are provided with a spill containment system with a working volume capable of containing a minimum of 100 percent of all packages (prescribed hazardous chemicals and/or non-hazardous chemicals) within the area plus the output of any fixed firefighting system provided for the area over a minimum of 90 minutes.	Complies The Stormwater Management Plan prepared by GHD (refer section 3.2 of Appendix 6) outlines stormwater drainage infrastructure, including bunded areas, grated drains, and contaminated water collection systems designed to manage spills and firefighting runoff. The Fire and Explosion Analysis (Appendix 12) recommends the provision of bunding, firewater containment, and appropriate drainage infrastructure in high-risk areas such as OSBL tank farms and flare systems.

	The assessment undertaken in Appendix 12 does not include detailed engineering controls which will be developed through FEED design and be implemented to further refine and mitigate impacts from the facility. It is considered appropriate containment measures can be managed via reasonable and relevant conditions of approval.
PO8 Storage and handling areas for liquid or solid fire risk hazardous chemicals in tanks are provided with a spill containment system with a working volume capable of containing a minimum of: 110 percent of the largest tank within a spill compound or 25 percent of the aggregate where multiple tanks are located within a spill compound, whichever is the greater; and - the output of any fixed firefighting system provided for any bulk tank within a spill compound over a minimum of 90 minutes.	Complies The Stormwater Management Plan prepared by GHD (refer section 3.2 of Appendix 6) outlines stormwater drainage infrastructure, including bunded areas, grated drains, and contaminated water collection systems designed to manage spills and firefighting runoff. The Fire and Explosion Analysis (Appendix 12) recommends the provision of bunding, firewater containment, and appropriate drainage infrastructure in high-risk areas such as OSBL tank farms and flare systems. In particular, the Fire and Explosion Analysis identifies that bunding for all bulk storage tanks—including ethanol, SAF, diesel, and paraffin—should be designed with sufficient capacity to contain at least 110% of the volume of subject material. The assessment undertaken in Appendix 12 does not include detailed engineering controls which will be developed through FEED design and be implemented to further refine and mitigate impacts from the facility. It is considered appropriate containment measures can be managed via reasonable and relevant conditions of approval.
PO9 Storage and handling areas for prescribed hazardous chemicals that, if in contact with each other, may react to produce a fire, explosion or other harmful reaction, or a flammable, toxic or corrosive vapour are designed to prevent contact between the prescribed hazardous chemicals.	Complies The proposed development involves the storage and handling of prescribed hazardous chemicals. The Fire and Explosion Analysis (Appendix 12) notes that chemicals will be stored in designated areas within the facility layout, with separation provided between Inside boundary limit and outside boundary limit modules. The report recommends the use of appropriate segregation and containment measures to prevent escalation in the event of an incident. While specific containment design details are not provided, the report confirms that process safety principles, including separation of incompatible materials, have been considered. Further detailed design will confirm the implementation of physical barriers or containment systems to prevent mixing of reactive chemicals during normal operations and emergency scenarios.

The assessment undertaken in **Appendix 12** does not include detailed engineering controls which will be developed through FEED design and be implemented to further refine and mitigate impacts from the facility.

The Schedule 15 chemicals stored on site are below the trigger of a Major Hazard Facility and are provided in the table below.

Table 1: Schedule 15 Chemicals Stored

Chemical	Classification under the ADG code	Schedule 15 Threshold Quantity (Tonnes)	Estimated Quantity (Tonnes)	Ratio
Hydrogen*	Division 2.1: Flammable Gases	50	2	0.04
Ethylene	Division 2.1: Flammable Gases	200	3	0.02
Natural Gas*	Division 2.1: Flammable Gases	200	10	0.05
Propane*	Division 2.1: Flammable Gases	200	16	0.08
Diethyl Ether	Class 3: PG I: Flammable Liquids	200	1.5	0.01
Ethanol	Class 3: PG II: Flammable Liquids	50,000	1470	0.03
SAF (Kerosene)	Class 3: PG III: Flammable Liquids	50,000	2,480	0.05
Acetaldehyde	Class 3: PG I: Flammable Liquids	200	Less than 1	0.01
Olefins*	Class 3: PG III: Flammable Liquids	50,000	580	0.01
			Aggregate Ratio	0.29

A map with the associated locations on the Schedule 15 chemicals is provided in **Appendix 13**.

It is considered that management of Schedule 15 chemicals can be effectively managed onsite to prevent storage and handling issues and can be managed via reasonable and relevant conditions of approval.

PO10 Development is designed and sited to mitigate impacts on storage and handling areas from natural hazard including, but not limited to: - flood; - bushfire; - erosion; - storm tide inundation; - landslide; - earthquake; wind action.	Complies The subject site is located within identified natural hazard areas; however, these hazards have been previously assessed under the Reconfiguring a Lot approval (AP2023/013) and associated Operational Work approval (OPW24/0107) for the subject site. These approvals confirmed that the site is suitable for future industrial development, with provision of appropriate earthworks and infrastructure. In accordance with conditions of approval associated with these approvals, the site will be constructed above the 1%AEP design level to mitigate impact on the facility from Natural hazards. The Stormwater Management Plan (refer Appendix 6) provides detail on stormwater and drainage strategy, which includes measures to manage overland flow and mitigate the risk of inundation to critical infrastructure. The Fire and Explosion Analysis (refer Appendix 12) provides for recommendations on the design and siting of infrastructure to mitigate risk, including: - Provision of bunding and drainage for tanks and vessels to limit the spread of liquid releases and reduce the size of pool fires and toxic clouds. - Placement of critical equipment (e.g., hydrogen tanks, flare knockout drums, firewater systems) in safe areas protected from explosion and fire impacts. - Separation distances between tanks and modules to reduce escalation risk. - Design of buildings to withstand credible explosion loads, such as using blast-resistant structures and orienting windows away from hazard zones.
All development	
PO11 Development is designed and sited to mitigate the risks from hazard scenarios occurring at existing hazardous chemical facilities.	Complies There are no existing hazardous chemical facilities in the immediate vicinity of the subject site that could pose an external hazard.