Proposed Hutt City District Plan – Hearing Stream 2: Management of Hazardous Substances Risk and Reverse Sensitivity

Reverse Sensitivity Issues Affecting Fuel Infrastructure

As per the request made to the Fuel Companies by the Hearings Panel on 28 May, below is an index of the types of reverse sensitivity effects that can affect fuel infrastructure when encroaching, incompatible land uses, such as sensitive and residential activities and/or high populations, establish in close proximity. As detailed below, such situations can force infrastructure providers to curtail operations, limit capacity or install expensive mitigation measures.

Reverse sensitivity effects on fuel infrastructure can occur even where the facility is designed, constructed and operated in accordance with all relevant legislation and industry best practice, and can be triggered by complaints or increased sensitivity of the receiving environment to risk associated with storing and handling large volumes of hazardous substances.

As detailed in evidence presented to the Hearings Panel on 28 May, the Fuel Companies seek to avoid a situation where these types of reverse sensitivity effects could occur in relation to the four bulk fuel storage terminals located in the Seaview industrial area and the associated fuels wharfline, extending between Seaview Wharf and the Terminals, by implementation of risk management overlays and an associated rules and policy framework in the Proposed Hutt City District Plan.

REVERSE SENSITIVITY EFFECT	POTENTIAL RESPONSE	PRACTICALITY AND COST OF RESPONSE
Operational Constraint		
Operational Change: Where encroachment of sensitive or residential activities and / or increased populations results in unacceptable levels of risk, the terminal or pipeline operator may be required to take actions to reduce risk back to 'acceptable' levels[1].	Relocating petrol (the highest risk product) to storage tanks further away from the encroaching activity.	Costly infrastructure upgrades may be required to install new tanks and/or retrofit existing tanks relative to product stored e.g., specific mechanisms, such as vapour recovery units, specialised pressure vacuum relief valves and floating roof designs, are required for tanks storing petrol (as opposed to other product types) to prevent the build-up of hazardous vapour.
	Reducing petrol throughput.	Undermines the ability to meet demand for product and the effectiveness and resilience of the supply chain.
	Removing petrol storage entirely from the site.	Demand for product will need to be met elsewhere, either by another terminal less affected by encroachment or by new infrastructure in an alternative location. Operational cost of restricted product diversity is high. The practicality of storing product in an alternative location will depend on the availability of suitable alternatives, cost and connectivity to existing fuels infrastructure. The only other existing Terminals in the Wellington Region, at Mirimar and Kaiwharawhara, are already constrained and additional bulk petrol storage in those locations would be unacceptable in terms of risk. Where no in-region alternatives are available, product would need to be trucked from other regions resulting in increased supply and transport costs (e.g. increased heavy vehicle demand on road network, CO2 emissions etc), increased vulnerability to supply disruption and associated economic and social costs.
	Retrofit additional mitigation measures, such as gas detection or ducted overfill.	Capital costs and practicality range widely depending on existing infrastructure and the type of system required, and may not necessarily reduce risk as much as is necessary, on their own, without further mitigation measures being implemented. Many Terminals, including Mobil Seaview, will already have measures such as vapour detection in place,

[1] As detailed in evidence, references to 'acceptable' or 'unaceptable' levels of risk are made by way of reference to the New South Wales Hazardous Industry Planning Advisory Paper No 4, titled 'Risk Criteria for Land Use Safety Planning' ('HIPAP4').

		meaning the availability of further practicable risk mitigation measures will be limited.
	Restrict pipeline deliveries and/or co-ordinate around temporary activities involving large populations (e.g. markets or events)	The nature of shipping schedules, especially the significant costs associated with vessel demurrage mean that delays to discharge operations will incur large costs – as an example, a single day's demurrage charge can range from $30,000 USD to $60,000 USD dependant on supply chain, alternative vessel availability, and charter-party agreements. Delays in being able to commence discharge operations, or even the prolonging of the discharge through the lowering pressure (and thereby flowrate), would all result in these costs being incurred. The Wharfline is in use 1-2 times per week, for periods of up to 48 hours while multi-grade discharges occur. As this depends on operational factors, including shipping availability, it is not generally practicable to provide prior warning to neighbouring sites such as the Seaview Marina of intended use times.
Operational Flexibility: The need to ensure risk does not increase to unacceptable levels for neighbouring sensitive or residential activities and/ or high populations, limits the ability to reconfigure storage capacity and/or increase petrol throughput in response to demand.	No change to existing operational parameters, composition or ratio of products stored.	The ability to increase or reconfigure storage capacity in response to evolving demand and operational requirements is critical to maintaining the effectiveness and resilience of the supply chain. Restricted operational flexibility undermines the effectiveness and resilience of the supply chain.
Expansion Limits		
Prevention of expansion: The presence of nearby sensitive or residential land uses and/or high surrounding populations has the effect of limiting terminals to their existing risk profile and preventing the ability to grow and expand.	Provide new storage in an alternative location	Additional storage capacity may be needed to meet rising demand, adapt to product changes, or comply with regulations (e.g. increased minimum stock holdings). In practice, expansion is typically best undertaken within the existing terminal footprint due to cost, connectivity to existing fuels infrastructure, and the impracticality of developing new greenfield sites.

Regulatory and Compliance Burdens		
Major Hazard Facility (MHF) Status: The terminals at Seaview are currently designated as 'Lower Tier' MHFs under the Health and Safety at Work (Major Hazard Facility) Regulations. Land use change resulting in a more sensitive receiving environment around the terminals (e.g. introduction of further sensitive activities) could result in a review by WorkSafe of that designation to 'Upper Tier'.	This would introduce a range of additional obligations under the MHF Regulations including a requirement for a site-specific Safety Case, that would apply over and above existing WorkSafe oversight and compliance requirements to minimise risk so far as reasonably practicable.	Upper-tier Major Hazard Facilities (MHFs) face significantly higher regulatory fees, administrative overheads, and compliance costs than lower-tier sites. Baseline regulatory fees for Safety Case assessment by WorkSafe are in the vicinity of $30,000 with ongoing higher annual levies and a requirement for 5 yearly reassessment of Safety Cases by WorkSafe. Additional costs are involved in the development and maintenance of a Safety Case for an upper tier MHF and additional community engagement and emergency response obligations apply.
AS 2885 Pipeline Standard: AS 2885 uses a risk-based framework that accounts for surrounding land use via Location Class and measurement length. Land use changes—such as higher population density, sensitive receptors (e.g. schools, marae), or new commercial development—can increase failure consequences and require reassessment of risk.	If risk becomes unacceptable, the pipeline operator must assess additional controls and implement those where practicable (e.g. deeper cover, physical protection, pressure reduction, rerouting).	The Seaview wharfline has recently been upgraded, primarily to improve seismic resilience, as well as to address weaknesses in legacy collar-welded joints and wharf movements, and to reroute sections of the pipeline away from sensitive activities (Kokiri Marae). The global cost of this infrastructure project is in the order of $55 Million dollars.
Amenity and environmental constraints		
Odour and Vapour Complaints: Sensitive activities such as childcare, hospitals, aged care or residential activities located near bulk fuel storage or fuel loading facilities are highly sensitive to hydrocarbon odours.	Air quality monitoring, operational curtailment during specific weather conditions or retrofitting of additional vapour management infrastructure.	The capital and maintenance cost of retrofitting mitigation measures to existing infrastructure varies widely. As above, given fuel deliveries vary depending on operational factors, including shipping availability, it is not generally practicable to restrict delivery times.

Noise Complaints: Terminal operations, including 24/7 product delivery trucks, loading pumps, manifold operations, and venting, generate elevated noise levels.	Retrofitting acoustic attenuation to fixed infrastructure (such as pumps or manifold)	The capital and maintenance cost of retrofitting mitigation measures to existing infrastructure varies widely.
	Restrict operating hours to day time only, when higher noise tolerance.	As above, given fuel deliveries vary depending on operational factors, including shipping availability, it is not generally practicable to restrict delivery times. Similarly, restrictions on timing of truck loading and access to terminal sites are not generally practicable.
Visual and Glare Impacts: High-mast lighting for 24-hour security and loading can result in reverse sensitivity complaints regarding aesthetics and light spill.	Measures to minimise light spill. Restrict loading to daytime hours.	High-mast lighting may not be able to be modified to meet expected lighting standards for residential development. Restricting terminal operations to daytime activities only is not generally practicable, due to operational factors, including shipping availability.
Constraints on Maintenance: Routine maintenance (e.g., tank degassing or grit blasting) can be limited or delayed due to proximity complaints about dust, emissions, or temporary noise.	Restrictions on timing of maintenance activities.	Taking tanks out of service is minimised as far as possible to avoid terminal supply interruptions and ensure compliance with minimum stock holding obligations. This means potentially noisy maintenance activities may continue after hours and at weekends, where compliance with relevant noise thresholds is met, to reduce the duration of works. Reduced compliance thresholds resulting from encroaching sensitive activities means maintenance activities take longer, resulting in increased costs associated with having equipment out of service for extended periods of time.
Physical risk to infrastructure (pipelines)		
Activities such as excavation, piling, drilling, or installation of services can result in coating damage, denting, or rupture of the pipeline if not adequately controlled. Relatively minor mechanical damage can create stress concentrations that increase the likelihood of delayed failure under operating pressure.	Implement formal controls around encroachment, permitting systems for ground disturbance, and clear identification of the pipeline location to prevent inadvertent strikes.	Fuel Companies cannot directly control third party activities. Implementation of a pipeline protection and notification corridor in the Hutt City PDP is sought to assist in managing these risks.