

11.0 Hazard and Risk

The DGRs call for the identification of hazards and risks associated with construction and operation of the development. These risks are associated with dangerous goods likely to be used on site, land contamination, processes or activities that have the potential to cause harm to people of the environment and risks associated with bushfires and flooding.

The TSF project entails the storage of diesel fuel and other substances associated with the day to day operation of the facility. The Protection of the Environment Operations Act 1997 sets requirements for protecting the environment from pollution. The Contaminated Land Management Act 1997 regulates the investigation and clean-up of land contamination. When using and storing liquid substances legal obligations exist to:

- Ensure that water does not become polluted;
- Prevent spills and leaks to the environment;
- Minimise air pollution;
- Dispose of wastes appropriately;
- Report land contamination; and
- Notify the regulatory authority (local council or OEH if material harm to the environment occurs or if contaminated land poses a significant risk of harm.

There are a number of AS relevant to liquid chemical storage. The *Environmental Protection Manual for Authorised Officers: Bunding and Spill Management Technical Bulletin* (EPA, 1997) provided guidance on the storage of liquid substances which have the potential to cause environmental harm. This has been superseded by *Storing and Handling Liquids: Environmental Protection Participant's Manual* which was produced by the DECC.

The Guide relates to bulk storage as well as smaller container or package storage of liquid substances and includes fuels, oils, industrial chemicals, paints, solvents, pesticides, fertilisers, waste liquids, wash water and process liquids. It provides an overview of legal obligations under NSW environment protection law and guidance on how to meet those obligations. It outlines the minimum environmental protection requirements for the storage and handling of any liquid substance.

The TSF above ground diesel fuel storage tanks will comply with the Australian Institute of Petroleum Code of Practice: *The Design, Installation and Operation of Underground Petroleum Storage Systems CP4-2002*.

11.1 DANGEROUS GOODS

A preliminary risk screening assessment has been undertaken in relation to the storage of dangerous goods on the site in accordance with the requirements of *SEPP 33* and DP&I's guideline document "*Applying SEPP 33*".

All fuels and hazardous substances at the site will be stored in self bunded above ground tanks. The main hazardous substance to be stored at the site is diesel fuel. It is to be stored in 100,000 litre tanks. Two tanks are initially proposed with capacity for expansion to 400,000 litres. It is

anticipated that B-double deliveries will take place three to four times per day. Tanks will be located at the fuel storage farm on the west site of the site from where diesel will be pumped to the provisioning buildings. New and used oil will be stored in tanks with a capacity of up to 10,000-15,000 litres at the fuel storage farm.

New coolant will be stored in a 5,000 litre tank and used coolant in a 2,000 litre tank at the locomotive maintenance building. A 200 litre drum of petrol to be used for the maintenance vehicles will be stored at the service vehicle garage.

11.1.1 Preliminary Risk Screening

The purpose of the initial SEPP 33 risk screening is to determine if more detailed assessment is required. The risk screening assessment has been undertaken in accordance with the *guideline "Applying SEPP 33"*.

The TSF will have provision for diesel and smaller quantities of other fuels and other products required for the servicing of locomotives. These products fall under the category of dangerous goods as they can pose a risk to people, property or the environment, due to their chemical or physical properties.

Dangerous goods are defined by the Australian Dangerous Goods Code (ADG). The classification criteria used in the ADG is based on the United Nations Recommendations for the Transport of Dangerous Goods.

Petrol is the only substance to be stored that has a maximum threshold level. The amount to be stored is well below the maximum threshold level and therefore within acceptable limits and confirming that further assessment is not required.

Diesel and oils are classified as combustible C1 and C2 substances. They are only classified as Class 3 dangerous goods substances if they are stored with Class 3 substances. The development plan provides for a clear separation between the storage sites for diesel fuel, oils and petrol, accordingly the diesel and oil are not regarded as Class 3 and are not subject to a threshold.

An inventory of the substances to be stored and ADG threshold levels are set out in Table 53 below.

Table 53: Inventory of the substances to be stored at the TSF

Substance	ADG Class	Storage Capacity	Packing Group	Threshold Capacity
Diesel	C1 (not stored with petrol)	500m ³	-	-
Oil	C2 (not stored with petrol)	15m ³	-	-
Petrol	3	0.2m ³	II	2.5m ³
Coolant	N/A	1m ³	-	-
Detergent	N/A	0.5m ³	-	-
Engine degreaser	N/A	0.15m ³	-	-
Chlorine	5.1	1.41m ³	-	7m ³

The ADG classes above refer to the following:

- 'Classes C1 and C2 ' refer to combustible liquids which are not classified as dangerous goods for transport purposes; and
- 'Class 3' refers to flammable liquids that meet specified flash point criteria.

11.1.2 Dangerous Goods Storage

The dangerous goods to be used at the TSF will be kept at various locations on the site. The main product falling within this category is diesel fuel which will be stored in above ground tanks adjacent to the B-double access loop road, oil will also be stored in above ground tanks at this location.

Petrol will be stored in above ground containers at the Vehicle Servicing Building. Oil, coolant, engine degreaser detergent will be stored in above ground containers at the Locomotive Maintenance Building. Refer to Figure 6 that identifies the proposed buildings.

11.1.3 Transport Screening

The cumulative impacts associated with the transport of dangerous goods can be deemed to be potentially hazardous when significant quantities of dangerous goods are transported in and out of a site. *Table 2 Transporting Screening Thresholds* with SEPP 33 specifies the minimum weekly or annual cumulative vehicle movements entering or leaving the site to be identified as being potentially hazardous. Of the hazardous substances to be stored on the site the only substance which is addressed within Table 2 (SEPP 33) is petrol. A total of 200 litres (approximately 0.15 tonnes) is to be stored at the site. Deliveries are expected to occur on a monthly basis.

Under the thresholds set out in Table 2 (SEPP 33) the cumulative annual and weekly vehicle movements are 750 and 45 respectively. The minimum quantities per load in bulk and packages are 3 and 10 tonnes respectively. As such the total tonnage for the substance storage and the total number of vehicle movements are well under the *Transport Screening Thresholds* in SEPP 33.

The TSF will have diesel fuel storage facilities in four above ground tanks with a total capacity of 400kL. There will be three to four B-Double fuel deliveries daily with each truck having a 57kL capacity. The total fuel transported to the TSF each week from the 21 truck deliveries will amount to 1,197kL. This amounts to 62,425kL of fuel being transported to the site over 12 months from 1,095 truck deliveries.

11.1.4 Dangerous Goods Risk Conclusion

The preliminary risk screening and transport risk screening carried out under SEPP 33 indicates that the development is not classified as potentially hazardous and as such a Preliminary Hazardous Assessment (PHA) is not required.

11.1.5 WorkCover NSW Notification

The amount of diesel fuel to be stored at the TSF exceeds the NSW WorkCover 100kL threshold for C1 combustible goods. As such a Notification of Dangerous Goods on Premises will be lodged with WorkCover NSW prior to construction being initiated.

11.2 BUSHFIRE

The site is located within Bushfire Prone Land on the Bushfire Prone Land Map see Figure 17. However given the nature of the proposed development, the cleared nature of the majority of the site and the adjoining lands, the nature of the proposed use and the materials involved in construction it is considered that bushfire does not represent a substantial threat. Additionally, the proposed evacuation route is generally located outside of bushfire prone land.

A Bushfire Safety Authority will not be required, having regard to the assessment pathway under the EP&A Act.

11.2.1 Assessment Requirements

As the development does not involve habitable dwellings, Special Fire Protection Purpose development or a habitable dwelling the proposed development is to be assessed by the consent authority under the provisions of Part 3A of the EP&A Act.

The assessment of the proposed development has been undertaken giving consideration to the NSW Rural Fire Service (RFS) document, Planning for Bush Fire Protection 2006 (NSWRFS 2006), referred to as PBP, and supporting RFS policy. A Bushfire Protection Assessment (BPA) has been undertaken by Ecological and is included as Appendix F.

The Building Code of Australia (BCA) does not provide for any bushfire specific performance requirements for the development types proposed. As such the Asset Protection Zone (APZ) and building construction requirements of PBP and AS 3959 Construction of buildings in bushfire-prone areas do not apply as deemed-to-satisfy provisions for bushfire protection. The general building fire safety provisions required by the BCA for the type of buildings proposed are accepted by PBP and RFS as acceptable solutions for the protection of occupants and the building from bushfires. However the aim and objectives of PBP still apply in relation to other matters of access, the provision of water and other services, emergency planning and landscaping.

11.2.2 Vegetation Types

In accordance with the requirements of the PBP the predominant vegetation class has been determined for a distance of at least 140m out from the proposed development.

The study area comprises disturbed lands, including significant excavation and filling, interspersed with areas of revegetation.

The southern part of the study area has a long history associated with coal stockpiling, loading and unloading and to this day the site contains a significant quantity of coal tailings. The remaining study area contains remnant, albeit highly disturbed, swamp oak forest, saltmarsh and freshwater wetland in the south, artificial freshwater wetlands (i.e. drains and ponds) and open pasture. Much of the site is currently subject to pasture improvement and cattle grazing.

The most significant vegetation communities and structures in vicinity in terms of potential fire behaviour are within the Swamp Oak Sedge Forest within the north western portion of the site, and the Swamp Oak Swamp Forest community within the designated Rehabilitation Area in the south west of the site. Both of these communities potentially present a forest hazard, however, significantly both of these areas are situated >140m from the proposed TSF building footprint.

There are areas of Saltmarsh in the southern extent of the site. This vegetation community and structure is not considered to constitute a bushfire hazard. The remaining notable hazard areas within proximity of the TSF proposal are constituted by Coastal Freshwater Wetland, Coastal Sedgeland, and other Grassland/Pasture areas.

Therefore, the predominant vegetation type influencing the development is categorised under PBP as Freshwater Wetlands and Grasslands. All of these hazard areas occur directly to the west of the TSF building footprint with varying degrees of management and separation. In all other directions is Managed Lands in the form of existing development and infrastructure.

11.2.3 Effective Slope

In accord with PBP the slope that would most significantly influence fire behaviour was determined over a distance of 100m out from the proposed development where the vegetation was found.

The entirety of the subject site and surrounds is considered to be flat lands, consistent with a low-lying wetland area. Whilst there are some localised depressions and topographic features throughout, the hazard has been classified in the PBP category of Upslope/Flat.

11.2.4 Asset Protection Zones

The BPA confirms that an APZ of 20m is achievable and able to be provided (as a minimum defendable space area) between the TSF proposal footprint and the surrounding Freshwater Wetland and Grassland vegetation, effectively the western boundary of the project area. The PBP does not provide for a specific APZ distance for the type of development proposed, however the proposed APZ exceeds the PBP acceptable solutions for residential development, as shown in Table 54.

The proposed APZ is considered adequate and compliant. The land is currently highly disturbed and partially managed, therefore further vegetation clearance will not necessary to establish the APZ.

Table 54: Asset Protection Zone and Bushfire Attack Level.

Direction	Slope	Vegetation	PBP Dwelling APZ	Proposed APZ	AS3959 Bushfire Attack Level (BAL)	Comment
West	Upslope/flat	Freshwater Wetland/Grassland	10m	20m	BAL -12.5 BAL-LOW (where >50m from hazard)	Due to existing management/disturbance, further clearing will not be required in order to establish APZ.

11.2.5 APZ Vegetation Management

The BPA confirms that vegetation and fuels within the APZ are to be managed to meet the intent and objectives of the performance requirements of an Inner Protection Area (IPA) as described within PBP. The following fuel management specifications are identified as a guide to achieve the PBP IPA performance requirements:

- No tree or tree canopy is to occur within 2m of the building;

- The presence of a few shrubs or trees in the APZ is acceptable provided that they are well spread out and do not form a continuous canopy and are located far enough away from the building so that they will not ignite the building by direct flame contact or radiant heat emission; and
- A minimal ground fuel is to be maintained to include less than 4 tonnes per hectare of fine fuel (fine fuel means any dead or living vegetation of <6mm in diameter e.g. twigs less than a pencil in thickness. 4 t/ha is equivalent to a 1cm thick layer of leaf litter).

11.2.6 Construction Standards

Table 54 provides an assessment of the Bushfire Attack Level (BAL) on the proposed development. The determination of the BAL was made in accordance with Method 1 of AS 3959-2009 Construction of buildings in bushfire prone-areas. The BAL is based on known vegetation type, effective slope and managed separation distance between the development and the bushfire hazard.

The proposed TSF is rated as BAL-12.5 (>20m from the hazard) and BAL-LOW (where >50m from the hazard).

The building construction provisions within AS 3959 do not apply to the type of development proposed as a deemed-to-satisfy requirement under the BCA. Due to the type of development and compliance with BCA requirements for building fire, it is generally accepted that the development will survive bushfire attack. The BAL assessment above provides an understanding of the bushfire attack the building could experience in a worst-case bushfire scenario. The BAL assessment provides a platform on which to develop any further recommendations specific to the bushfire threat or the proposed building, if deemed appropriate.

To ensure building survival, the BPA includes the following additional recommendations where implementation is possible:

1. Weepholes, vents and openable portions of windows be screened against the entry of embers with steel mesh with maximum aperture of 2 mm;
2. Weather strips to external doors (side-hung);
3. Nylon brush seals around roller doors; and
4. Preventing or sealing gaps at joins of metal sheeting for walls and roof to prevent the entry of embers.

11.3 FLOODING

The TSF is located within the floodplain of the lower Hunter River and is in a high risk flood storage area. There is the potential for flood waters to inundate the TSF site and the surrounding land. In severe floods the depth of inundation across surrounding lands can be substantial and floodwaters can be at elevated levels for several days.

A Flood Emergency Response Plan (FERP) is included in Section 7 of the Flood Impact Assessment located at Appendix G. The primary objective of the FERP is to reduce the threat that floods pose to the safety of people living and/or working on or adjacent to flood affected land.

The critical flooding mechanism for the site is the overtopping of the New England Highway immediately north of the site. The flooding assessment shows this would occur at the 10% AEP flood. Flood of greater severity will cause overtopping of the Pacific Highway downstream of Hexham Bridge.

The development includes regrading of site elevations up to a level of around 2.65m AHD. Rail and building infrastructure that is situated at or above this level will remain flood free in the 2% AEP event, which has a peak level of around 2.2m AHD. Under the developed conditions the site will be largely flood free at the 2% AEP event, but inundated during a 1% AEP design event.

For large flood events a lag time of 20 hours can be expected between the peak flood passing Maitland and arriving at Hexham. Given the ample warning, there is time for staff to relocate stock and equipment to higher ground prior to the oncoming flood. There is also opportunity to move rollingstock to higher ground.

Given the length of time available evacuation of the site during a flood event is unlikely, as staff should be advised not to enter the site when a major flood warning is in place for the Lower Hunter River. In the event that flood evacuation is required, potential evacuation routes have been identified within Figure 38.

11.4 CONTAMINATION

A Preliminary Contamination Assessment (PCA) has been completed by Douglas Partners, attached as Appendix J. The PCA was undertaken to assess past and present contaminating activities, report on site conditions, and provide a preliminary assessment of site contamination. A level of contamination has been found on site from the previous industrial and rural land uses. A RAP has been prepared to support the contamination assessment and is included in Appendix J of this EA. The site is expected to be suitable for the proposed industrial development of the TSF from a contamination perspective, following additional investigation, remediation and validation as required.

For details of asbestos contamination associated with the demolition of existing structures or the excavation or disturbance of filled areas refer to Section 9.9 of this EA. Appropriate removal and validation of asbestos at the site is addressed within the Statement of Commitments (C3).

An assessment of odour impacts has been considered within both the PCA and the RAP documents contained within Appendix J. Aesthetic considerations (odours and staining) will also be taken into account when validating areas of remediation. Areas exhibiting objectionable odours relating to site contamination will not be considered to be satisfactorily remediated.

Both on and offsite impacts from leachability of metals and erosion have been considered with the PCA. It is considered that there is a potential for offsite migration of groundwater and surface water containing elevated heavy metals, nutrients and faecal coliforms. There is also a potential for migration of hydrocarbons via groundwater from the former refuelling area. Measures to manage potential impacts to human health and the environment as a result of potential offsite impacts will be required. This could be achieved through appropriate management via a WQMP which will be part of the CEMP. Refer to Section 9.4 for further detail.

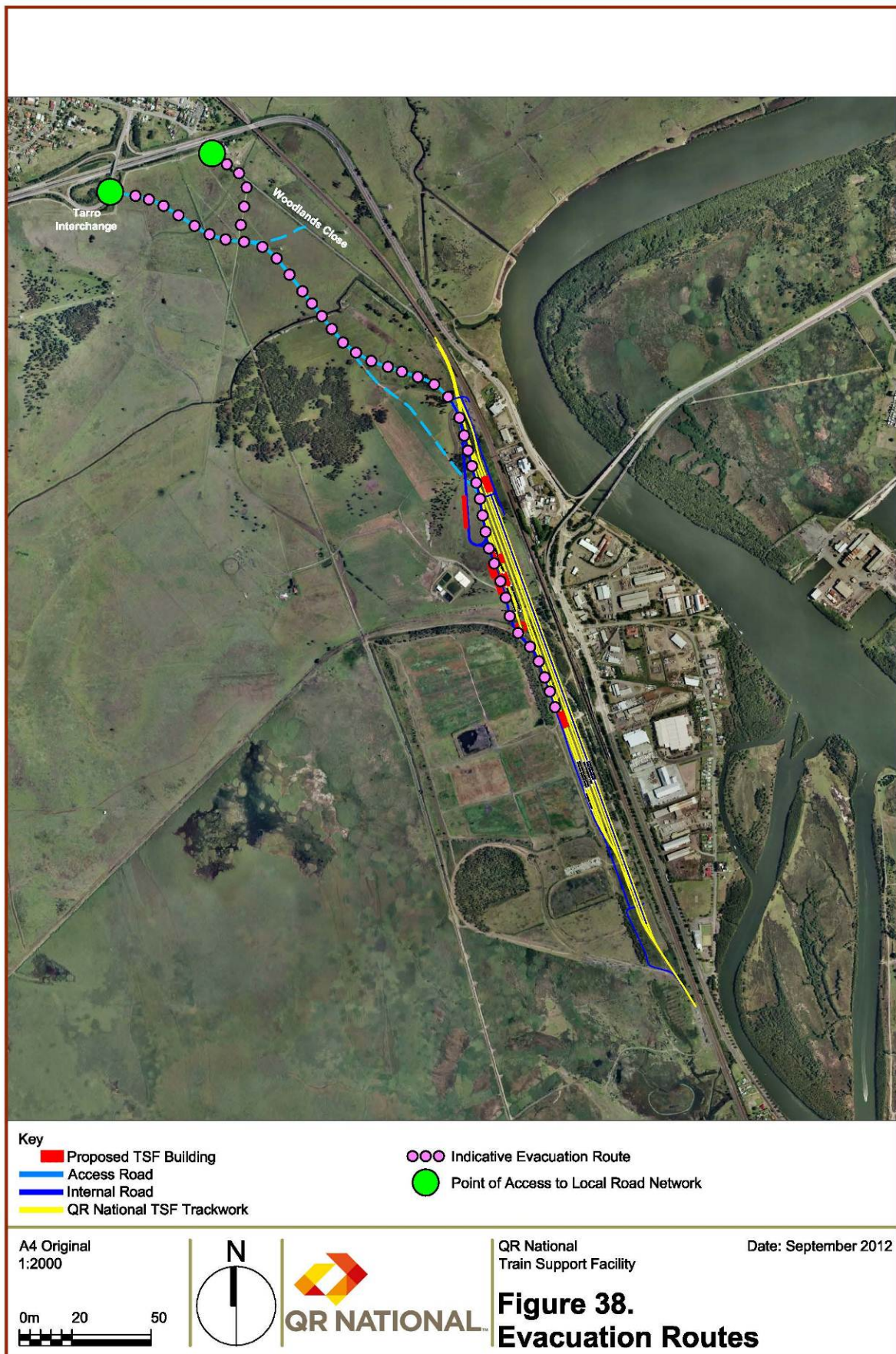


Figure 38: Potential evacuation routes from Hexham