

**MAJOR PROJECT ASSESSMENT:
Hexham Train Support Facility
Maitland Road, Hexham
(MP07_0171)**



Director-General's
Environmental Assessment Report
Section 115Z (1) of the
Environmental Planning and Assessment Act 1979
September 2013

ABBREVIATIONS

AEP	Annual Exceedance Probability
AHD	Australian Height Datum
ARTC HRR	Australian Rail Track Corporation Hexham Relief Roads project
CMA	Catchment Management Authority
Council	City of Newcastle
Department	Department of Planning & Infrastructure
DGRs	Director-General's Requirements
Director-General	Director-General of the Department of Planning & Infrastructure
DPI	NSW Department of Primary Industries
EA	Environmental Assessment
EEC	Endangered Ecological Community
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
ECNM	Environmental Noise Control Manual
ESD	Ecologically Sustainable Development
ICNG	Interim Construction Noise Guideline
INP	Industrial Noise Policy
Minister	Minister for Planning and Infrastructure
NML	Noise Management Level
NoW	NSW Office of Water
NPWS	NSW National Parks & Wildlife Service
OEH	NSW Office of Environment and Heritage
ONVR	Operational Noise and Vibration Review
PMF	Probable Mean Flood
Proponent	Aurizon Ltd (previously QR National)
RMS	Roads and Maritime Services
SEPP	State Environmental Planning Policy
SSI	State significant infrastructure
TSF	Train Support Facility

Cover Photograph: Proposed Hexham Train Support Facility

© Crown copyright 2013
Published September 2013
NSW Department of Planning & Infrastructure
www.planning.nsw.gov.au

Disclaimer:

While every reasonable effort has been made to ensure that this document is correct at the time of publication, the State of New South Wales, its agents and employees, disclaim any and all liability to any person in respect of anything or the consequences of anything done or omitted to be done in reliance upon the whole or any part of this document.

*NSW Government
Department of Planning & Infrastructure*

EXECUTIVE SUMMARY

Aurizon Ltd (formerly known as QR National – the Proponent), currently have rail facilities at Kooragang Island within the Port of Newcastle. The existing rail facilities are used to maintain and refuel freight locomotives, however the Proponent claims these are not sustainable in the long term, given the future demand for export coal. The Proponent has plans to increase its train sets from currently 11 to 38 sets by 2019. The proposed growth in locomotives and wagons, driven by the requirements of the Hunter Valley Coal Chain, would drive the need for additional train servicing and maintenance facilities within NSW.

Australian Rail Track Corporation (ARTC) is encouraging rail transport operators to relocate outside of the port terminals to minimise rail congestion and improve efficiency in the transportation of coal to market. The Proponent has therefore identified a 255ha site at Hexham to develop a train support facility to service the Proponent's growing coal freight business in the Hunter Valley. The decommissioning of the existing Aurizon train facilities within the Port is being addressed by the Proponent as part of a separate application.

The train support facility would include construction of new connections to the Great Northern Railway, seven new train lines, buildings for the provisioning of locomotives and the maintenance of rolling stock, construction of a vehicular intersection and a new vehicular access road from the Tarro Interchange and internal vehicular access roads.

The capital investment value of the proposal is estimated to be \$126 million and would create in the order of 75 full time construction jobs and around 30 full time and part time operational jobs.

The Environmental Assessment for the proposal was placed on exhibition from 21 November 2012 to 21 December 2012. The Department received a total of 28 submissions, including 7 submissions from public authorities and 21 submissions from the general public. Although none of the public authorities objected to the proposal, they did raise issues for the Department's consideration including cumulative impacts with the adjacent ARTC Hexham Relief Roads project, changes to existing hydrology and flood levels, ecological impacts, traffic management, noise impacts, and air pollution. Eleven of the public submissions objected to the proposal, indicating concern over the potential for the proposal to adversely impact on wetlands and flora and fauna, flooding, noise and vibration, air pollution, and cumulative impacts.

A Preferred Infrastructure Report was submitted by the Proponent in April 2013 and a revised Report submitted in June 2013, describing amendments made to the proposal since the exhibition of the Environmental Assessment, and providing additional assessment of relevant environmental impacts in response to issues raised in submissions. Key amendments to the proposal include:

- lowering of tracks for a 800m section to mitigate adverse off site flood impacts;
- relocation of internal buildings and structures away from the flood pathway;
- realignment of the shunt-neck and turntable to reflect the revised building layout;
- relocation of the water control basins to reflect the changes to the drainage design;
- increase in bulk fuel storage for up to 630,000 litres of diesel fuel;
- stockpiling for approx 150,000m³ of acid sulfate soils or acid generating material;
- realignment of the construction access road to the site; and
- relocation of the internal access road.

The Department has assessed the Proponent's Environmental Assessment, and Preferred Infrastructure Report and Response to Submissions, in accordance with the objects of the EP&A Act and ecologically sustainable development, and considers that there are a number of constraints to the proposal that will need to be carefully managed. These constraints include construction traffic, access and noise, ecology, surface water hydrology, flooding and groundwater hydrology. To manage these constraints, the Department has recommended conditions of

approval relating to impact mitigation, monitoring and the implementation of environmental management plans.

The Department is satisfied that the impacts of the proposal can be managed to achieve acceptable amenity and environmental standards through the recommended conditions of approval. The proposal will provide improvements to the freight network efficiency of the Hunter Valley Coal Chain and will enable operation and capacity upgrades to the Port of Newcastle. On balance, the proposal is in the public interest and can proceed in a sustainable manner with overall benefits to the State's economy and minimal long-term residual impacts to the wider community and the environment. It is therefore recommended that the Minister for Planning and Infrastructure (or delegate) approve the Hexham Train Support Facility proposal, subject to conditions.

TABLE OF CONTENTS

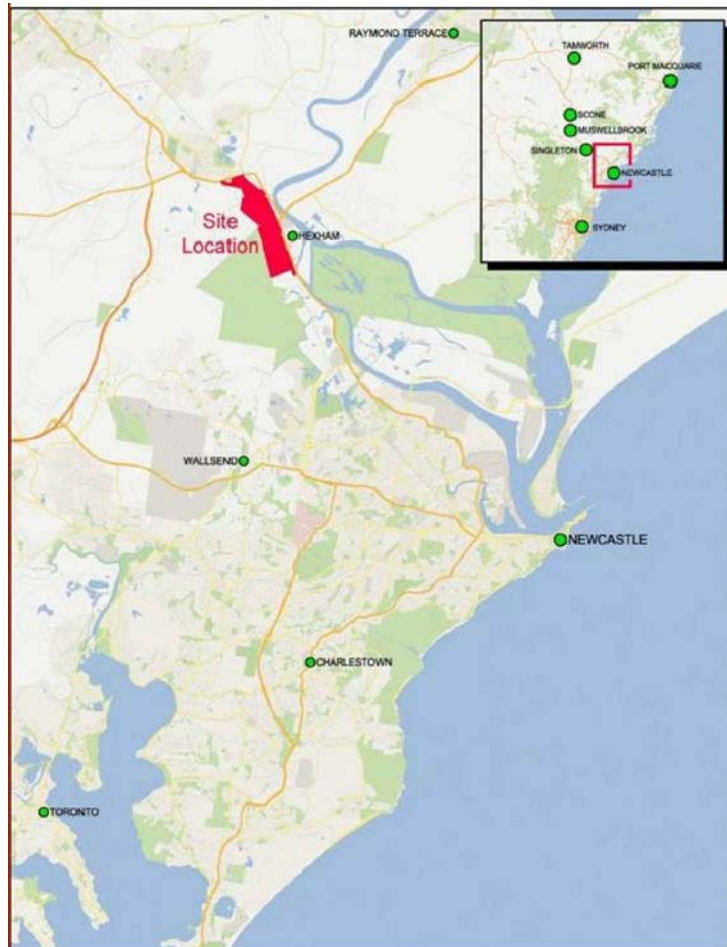
1.	BACKGROUND	4
1.1	Overview	4
1.2	Site Location and Existing Land Use	4
1.3	Surrounding Land Uses	6
2.	PROPOSED PROJECT	7
2.1.	Project Description	7
2.2.	Staging	9
2.3.	Project Need and Justification	11
3.	STATUTORY CONTEXT	12
3.1.	Major Project	12
3.2.	Transition to State Significant Infrastructure	13
3.3.	Approval Authority	13
3.4.	Permissibility	13
3.5.	Objects of the EP&A Act	14
3.6.	Ecologically Sustainable Development	14
3.7.	Commonwealth Approvals	15
4.	CONSULTATION AND SUBMISSIONS	15
4.1.	Exhibition	15
4.2.	Public Authority Submissions	16
4.3.	Public Submissions	17
4.4.	Proponent's Response to Submissions	18
5.	ASSESSMENT	19
5.1.	Hydrology	19
5.2.	Ecology	38
5.3.	Noise and Vibration	47
5.4.	Traffic and Access	54
5.5.	Heritage	60
5.6.	Other Issues	68
6.	RECOMMENDATION	73
APPENDIX A	ENVIRONMENTAL ASSESSMENT	74
APPENDIX B	SUBMISSIONS	75
APPENDIX C	PROPONENT'S RESPONSE TO SUBMISSIONS	76
APPENDIX D	RECOMMENDED CONDITIONS OF APPROVAL	77

1. BACKGROUND

1.1 Overview

Aurizon Ltd (formerly known as QR National – the Proponent) proposes to construct and operate a train support facility (TSF) and associated infrastructure at Hexham, NSW. The proposal site is located approximately 16km north west of Newcastle (refer **Figure 1**) in the Newcastle Local Government Area.

Figure 1: Project Location



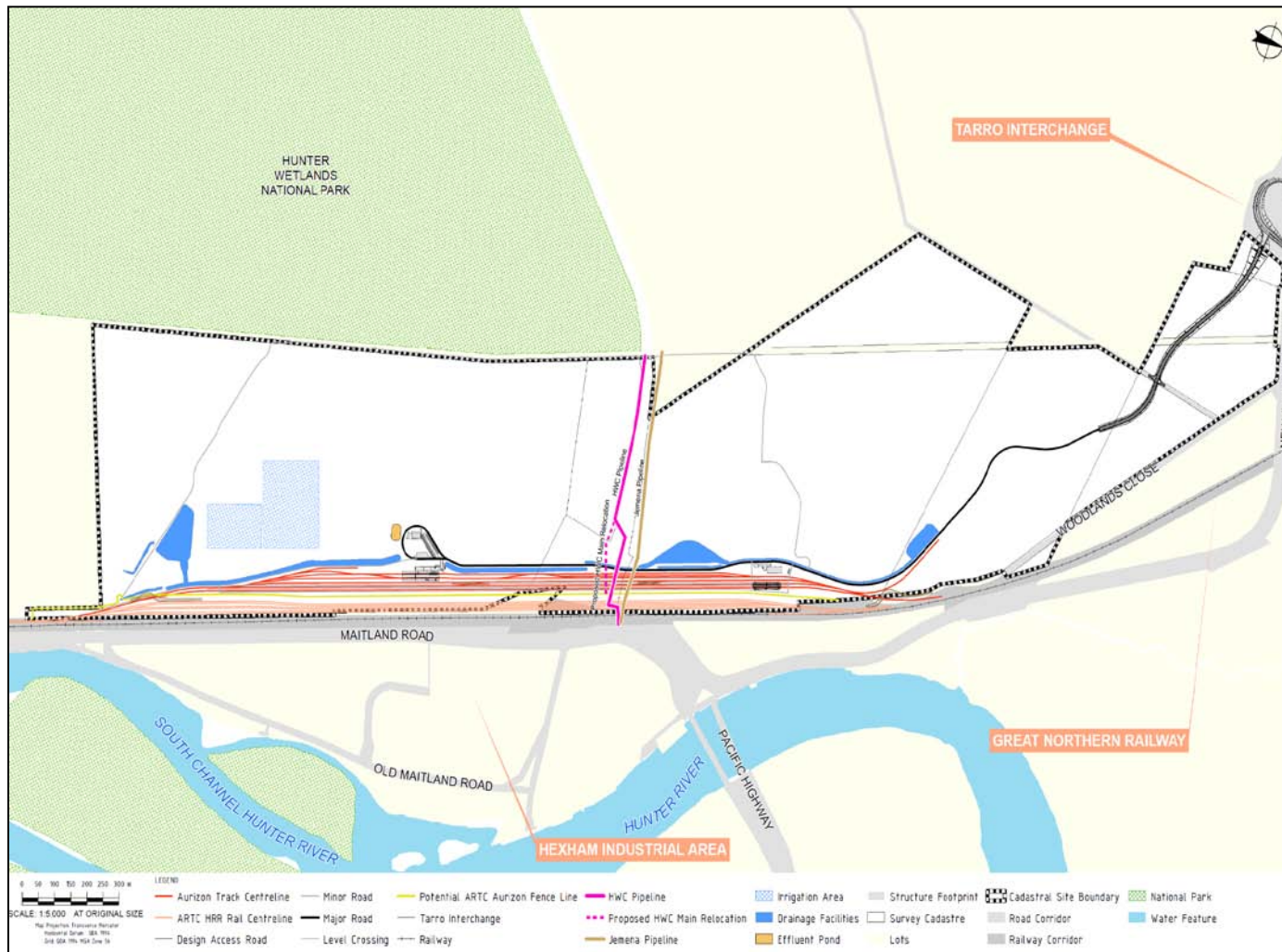
The capital investment value of the proposal is \$126 million, and it is planned to be constructed in two stages over approximately 24 months. During construction the proposal will generate around 75 jobs, and around 30 full time and part time jobs will be provided on site after construction.

The proposal is one of many in the area which aim to maintain and upgrade the rail network in the Hunter Valley. In particular, the proposal would provide a more efficient and cost effective method of supporting Aurizon operations within the Hunter Valley Coal Chain by providing daily train running requirements and rolling stock maintenance needs.

1.2 Site Location and Existing Land Use

The site is located to the west of the Hunter River at Hexham and is bounded by Maitland Road / New England Highway in the east and the New England Highway in the north (refer **Figure 2**).

Figure 2: Existing Site Layout



The Proponent has identified a 255ha study area (the site) at Hexham within the Newcastle Local Government Area to develop a TSF and relocate and re-establish its current train provisioning facilities outside of the Port.

Historically, the northern part of the site has been used for agricultural purposes, while the southern part has a long history of use for rail activities and coal storage, preparation, loading and unloading. The southern part of the site contains approximately 1.5 million tonnes of coal reject material, including coal tailings and chitter. Some structures remain on the site from previous uses, including concrete footings, a former dilapidated bath house and a control box / lunchroom.

Approximately one third of the site is used as a dairy manufacturing facility, including a wastewater treatment facility operated by Brancourts. Other uses on the site include small areas of cattle grazing and vacant industrial land. The site is located on a floodplain of the Hunter River and floodwaters over a 1 in 10 year flood event overtop the New England Highway into the site. The entire site has been categorised as a high hazard flood storage area and is predicted to be inundated during a 1 in 100 year flood event with the exception of an elevated portion of the site in the south western corner.

The site originally formed part of the Hexham Swamp Estuarine Wetlands. However, over the past 150 years the site has been disturbed by human activities such as coal stockpiling and washing, infilling of wetlands, construction of tailings ponds, and irrigation of waste water, and as a result the drainage patterns have been significantly altered. Hexham Swamp is an important flood storage area and is also known for its international ecological values and is recognised for containing a number of endangered ecological communities (EECs). Also, a small portion of the site is occupied by *State Environmental Planning Policy No. 14 – Coastal Wetlands* (SEPP 14 wetlands), which is connected to the surrounding wetland complex.

Table 1 lists the Lot and DP identifiers and property owners for the parcels of land that would be required for the construction of the proposal.

Table 1: Relevant land parcels and ownership details

Lot	Deposited Plan	Property Owner
101	DP1084709	Private
102	DP1084709	Aurizon
2	DP735456	Aurizon
10	DP735235	Aurizon
104	DP1084709	Aurizon
113	DP755232	Aurizon
1	DP155530	Aurizon
12	DP1075150	Aurizon
1	DP1062240	ARTC (to be acquired)
311	DP583724	Aurizon
1	DP128309	Hunter Water Corporation

1.3 Surrounding Land Uses

Land adjoining the site is generally used for rural activities, and environmental conservation further to the south and west, comprising the Hexham Swamp Nature Reserve (SEPP 14 Wetlands). Key infrastructure in the area includes the New England Highway to the north, and the Great Northern Railway and Pacific Highway to the east. The existing Hexham industrial area is located on the eastern side of the Pacific Highway. The corridor for the future M1 Freeway to

Raymond Terrace upgrade traverses the northern portion of the site. Timing for this extension is unknown at this stage.

There are a few rural residential properties scattered in the lands surrounding the site. The closest residential areas are located adjacent to the northern part of the site across the New England Highway at Tarro and Beresfield. The closest residents are located approximately 800 metres from the most northern point of the TSF footprint. There are, however, residents within 300 metres of the proposed new access road from the Tarro interchange.

The site is located immediately adjacent to a parcel of land that is proposed for the ARTC Hexham Relief Roads project, which would comprise the construction of five new relief roads (tracks) adjacent to the existing track at the Pacific Highway and Hexham Railway Station. It is anticipated that both the TSF and ARTC Hexham Relief Roads proposals would be constructed concurrently, if approved.

2. PROPOSED PROJECT

2.1. Project Description

The proposed TSF (as amended in response to submissions received during the public exhibition period) involves the construction and operation of a TSF occupying a 38ha portion of the site located parallel with the eastern boundary. This will include the construction of seven new train lines (tracks) parallel to the existing Mainline to accommodate trains for provisioning, servicing and maintenance. A Shunt Neck will be provided to allow trains to shunt back onto the Mainline. In total, 10.5km of new track will be constructed. Note that the decommissioning of existing Aurizon train facilities within the Port of Newcastle is being addressed by the Proponent as part of a separate application.

The key operational components of the proposal are listed in **Table 2** and the key construction components of the proposal are listed in **Table 3**. The proposal layout is shown in **Figure 3**.

Table 2: Key Operational Components

Aspect	Description
Rail Connections	Construction of new connections to the Great Northern Railway.
Alignment	Construction of seven new train lines (tracks) parallel to the existing Mainline, providing a total of 10.5km of railway track.
Buildings	- Provisioning Building, approximately 1,310m², to provide provisioning, inspections and unscheduled rolling stock maintenance on a 24 hour, 7 days per week basis. Operations to include replenishing locomotives with fuel, sand, water, oil and other consumables, general cleaning and cab preparation; - Combined Maintenance Building, approximately 2,750m², would include the TSF's main administration centre, and would have a metal roof, pre-cast walls and translucent wall sheeting, and generally operate between 06:00 hours and 22:00 hours weekdays, and possible 7 days per week; - Service Vehicle Garage, car park, truck unloading and wheel set storage area to be located adjacent to the Combined Maintenance Building and Administration Centre. Car parking to be provided for up to 50 cars and light vehicles in the main car park.
Roads and connections	- Construction of an intersection and a new access road from the Tarro Interchange, including a new road bridge over Middle Creek; - Internal access roads comprising of sealed single carriageway road; - A new third party access road would be constructed to the west of the site and would connect to an existing third party access road off Woodlands Close. The new road would allow existing road access to adjoining landholders to be maintained.

Aspect	Description
Utilities	The protection or diversion of existing utilities, and connection of the site to utilities for construction and operation.
Water Management	- The primary drainage system in the southern part of the site is a network of subsoil drain and surface collection pits routed to a drainage channel to the west of the tracks; - In the northern part of the site the water is proposed to infiltrate the permeable capping and flow above the low permeability clay subgrade to the adjacent open channel.
Wastewater Treatment Plant	Installation of a package Waste Water Treatment Plant with on-site effluent irrigation to be located within the internal road turning loop, adjacent to the Combined Maintenance Building.
Storage area	- A bulk fuel storage area with capacity for up to 630,000 litres of diesel fuel in seven 90,000 litre above ground, self-bunded fuel storage tanks; - Bulk storage of sand would be located adjacent to fuel storage area.
Stockpiling	Permanent stockpiling of up to approximately 150,000m³ of potential Acid Sulfate Soils or acid generating materials.

Table 3: Key Construction Components

Aspect	Description
Enabling Works	Preparatory activities, including fencing and vegetation clearing, to delineate the site and identify and establish work areas, as well as remediation as required.
Compounds	- A primary construction compound is proposed to be established at the northern end of the site and would be accessible from the main access road. The compound would be shared by Aurizon and the ARTC Hexham Relief Roads project. The compound area would be 29,450m² and would have a buffer of 50m to Middle Creek; - A secondary compound to be used solely for the TSF proposal is proposed to be established to the south of Middle Creek. A concrete batching plant would be located at the secondary compound for preparation of concrete for construction; - A third construction compound would be established in the south of the site to the immediate west of the main TSF footprint. This compound would be used for the handling and treatment of acid sulfate soils and contaminated materials; - Each compound would be constructed on a 700mm thick foundation, comprised of a 300mm thick sub base and 400mm thick road base. The compounds would be surrounded by a security fence and lockable gate.
Access	- ARTC will construct the main access road with a sealed finish for joint use by Aurizon and the ARTC Hexham Relief Roads project. ARTC will be responsible for constructing the road from the Tarro Interchange Intersection to the shared construction compound; - Aurizon will be responsible for extending the construction of the access road into the Aurizon site, including a bridge over Middle Creek; - The construction access road, connecting to the Tarro interchange, would be approximately 10m wide with a speed limit of 40km. The intersection at the interchange would allow right-in, (left-in for light vehicles only) and left-out movements only.
Earth and civil works	- Due to the poor bearing capacity of the existing soils, a significant amount of engineered fill and potential subsoil treatment will be required. It is expected that the revised design will require excavation of up to approximately 50,000m³ from the lowered section of track, which may include a substantive component of potential acid sulfate soils; - In addition to the excavation required for the lowering of the tracks there is likely to be bulk earthworks that will require the grading of the site with a cut across the remainder of the site of some 100,000m³. This may constitute fill material that is potentially acid generating.

Aspect	Description
	- Approximately 180,000m³ of engineered fill will be required to bring the site to required design levels and additional 30,000m³ for the construction of the main access road. The imported material will be transported to site by truck and will be compacted in layers to achieve desired heights; - Drainage structures such as culverts, drainage pits and pipes will be installed as part of the civil works.
Construction plant	Concrete batching plant and soil re-conditioning plant.
Water Management	- The proposed permanent stormwater basins will be constructed and used as sediment basins during construction. These basins will be available for management of groundwater extracted from excavation areas; - Where appropriate, stormwater collected in the detention basins during construction, including excess groundwater stored in the detention basins, will be used for fill compaction and dust suppression.

2.2. Staging

The TSF would be constructed in two sequential stages as follows:

Stage 1

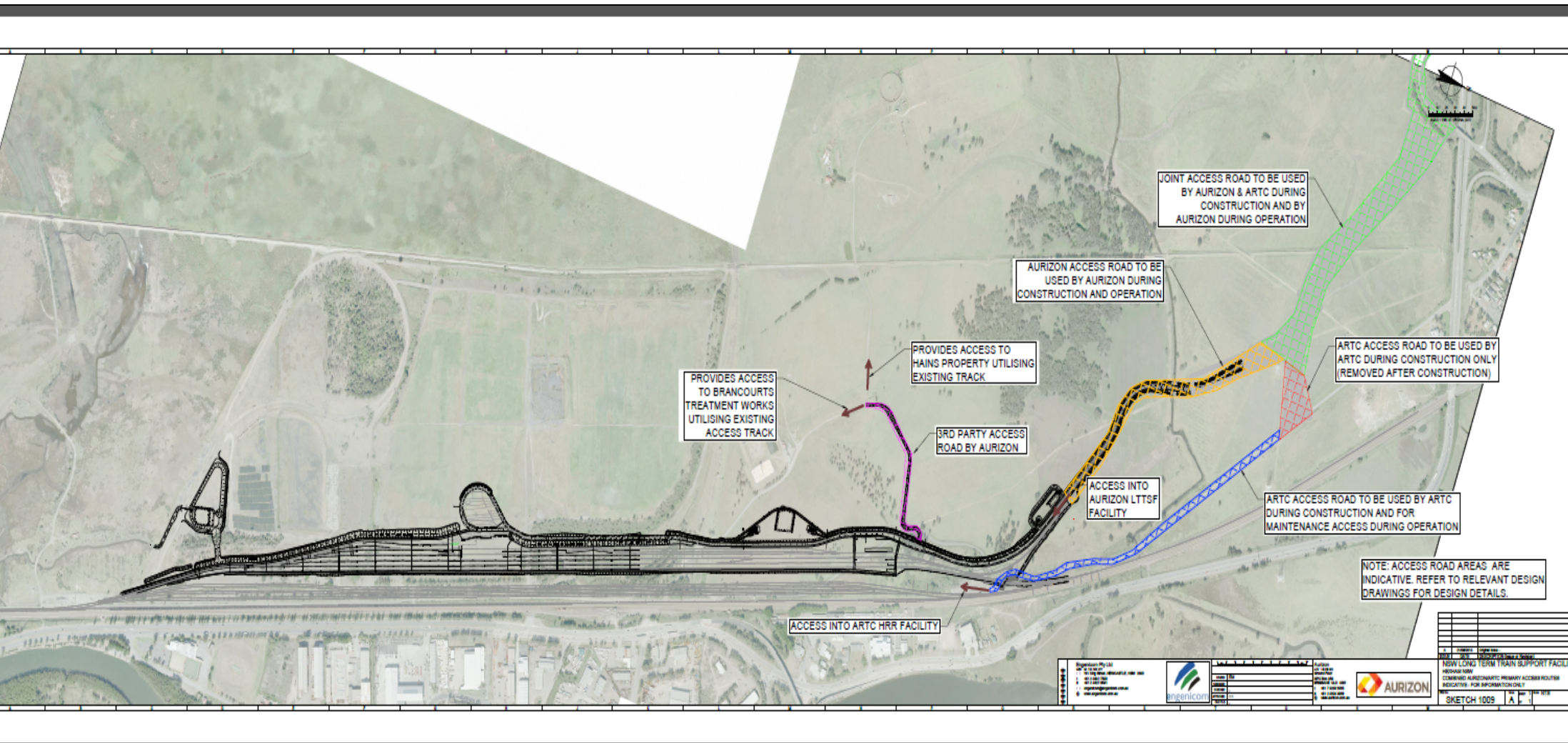
- Tarro Interchange, site access road and internal access roads;
- demolition of structures (including ruins; the control cabin and bath house; remnant trackwork; the coal preparation plant footings; and conveyor support footings);
- remediation in accordance with the Remediation Action Plan;
- civil work (including bulk earthworks, excavations and roads);
- mainline connections and crossover;
- bulk fuel storage;
- provisioning facility; and
- related railway tracks including the locomotive turntable.

Stage 2

- maintenance (wagon and locomotive) and Administration building;
- car parking and landscaping around the Administration building;
- sewage management system (including establishment of irrigation area);
- railway tracks related to maintenance facility; and
- locomotive wash building.

Train refuelling activities would commence at the completion of Stage 1, and full maintenance operations of the TSF would commence at the completion of Stage 2.

Figure 3: Project layout



2.3. Project Need and Justification

The Proponent currently has rail facilities at Kooragang Island, within the Port of Newcastle. The existing rail facilities are used for fuel provisioning and inspection of freight locomotives. Servicing of the locomotives is undertaken at a separate location at UGL Limited's Broadmeadow facility. In addition, the Proponent also operates a number of remote fuelling facilities on mine loading loops within the Hunter Valley.

As part of ARTC's *2012-2021 Hunter Valley Corridor Capacity Strategy*, rail transport operators located within the port are being encouraged to relocate outside of the port terminals to minimise rail congestion and improve efficiency in the transport of coal to market. The removal of the existing Aurizon locomotive facilities at Kooragang Island responds to ARTC's strategy and would assist in improving the efficiency of coal loading operations at the Port. This is supported by the Hunter Valley Coal Chain Coordinator.

The Proponent has identified that getting an appropriate configuration for rail access to the development of Kooragang Island Terminal 4 is complex, due to the constraints of current infrastructure and the environmentally sensitive areas around Kooragang Island. To counter this, the Department notes that the proposed TSF will support growth of the Hunter Valley Coal Chain by providing efficient refuelling and inspection facilities outside of the Newcastle Port Terminals.

The Proponent has plans to increase its train sets from 11 at present to 38 sets by 2019 to respond to its growing Hunter Valley coal freight business. The additional locomotives and wagons would drive the need for additional train servicing and maintenance facilities. The proposed TSF would service this growth and accommodate train servicing and maintenance facilities.

The Proponent has identified a parcel of land that is strategically located proximate to the Port and other major transport links, and with established rail links to mines in the Hunter Valley that could accommodate the relocation of its current rail servicing and maintenance facilities. The site would provide a single location for locomotives and wagons to be stabled and would provide a safe, clean and efficient working environment for Aurizon staff. The relocation of current facilities would help to alleviate the train queuing congestion currently experienced at Kooragang Island and would aid the process of continuous improvements associated with the Hunter Valley Coal Chain network.

Australia is the biggest coal exporter in the world and Newcastle Port is currently the largest coal exporting harbour in the world, exporting over 97 million tonnes of coal in 2009-2010. Efficient coal handling operations at the Port are vitally important to the local, state and national economies. Relocating existing facilities at the Port that are not required for port operations is consistent with more efficient use of existing infrastructure that is required to achieve this growth target.

The proposal is consistent with a key aim of the Hunter Regional Action Plan (that is aligned with *NSW 2021*) to unlock the region's productive potential. The focus of this aim is to build on the current strong contribution that the Hunter makes to the State and national economy, particularly in established local industries that have a competitive advantage, such as mining. Relocating the existing Aurizon services away from the Port would enable the Port to function more efficiently and assist with increasing productivity.

The Department notes that the need for the proposed TSF is driven by ARTC's encouragement to re-establish the current train provisioning facilities outside of the Port Terminals to minimise rail congestion, allowing for trains to be maintained and serviced away from port operations and alleviating congestion.

The draft NSW *Freight and Ports Strategy* (Transport for NSW, 2013) highlights the need for expansion of current port infrastructure such as the Kooragang Island coal loading berths to grow the NSW economy. Relocating services away from the Port that are not required to be co-located in the Port precinct would help to achieve this vision of growth. The proposal is consistent with the key messages of the draft NSW *Freight and Ports Strategy* that aims to tackle the inefficiencies and capacity constraints in current freight networks.

The Department notes that favourable public submissions were received during the exhibition of the EA from the Hunter Business Chamber, ARTC, Hunter Valley Coal Chain Coordinator, NSW Minerals Council, Newcastle Port Corporation and Pacific National who are in support of the proposal and the resultant positive economic impact.

The Department accepts that the relocation of services such as locomotive and wagon servicing and maintenance that can be undertaken away from the Port precinct would help to ease congestion and enable more efficient use of existing infrastructure at the Port for port related activities.

The Department acknowledges that a total of 54 sites were considered when identifying the most suitable site for the TSF, with seven sites examined in detail. The Department notes that the Hexham site was the preferred location due to its excellent accessibility to the routes between the coal mines and the Newcastle Port Terminals; its proximity to the Mainline; flat topography and little vegetation cover; separation from the main residential areas of Tarro and Hexham; its close proximity to the New England Highway; and use of existing disturbed land to minimise environmental impact.

Once the Hexham site was chosen a number of design investigations were undertaken to achieve an optimal TSF layout while minimising environmental impacts. In consideration of the matters discussed above, the Department is satisfied that the Proponent has established the need for the proposal with due consideration to alternatives, and considers the proposal to be justified.

3. STATUTORY CONTEXT

3.1. Major Project

In December 2007, QR National (the then Proponent for the proposal) submitted a Major Project Application under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Hexham Redevelopment Project, which comprised:

- a concept plan for a train support facility and associated industrial subdivision; and
- a project application a the train support facility.

The train support facility satisfied the criteria for a Major Project under Schedule 1, Clause 23 (1) of the (then) *State Environmental Planning Policy (Major Development) 2005*, being “development that has a capital investment value of more than \$30 million for the purposes of (b) railway freight facilities or inter-modal terminals”. The then Minister for Planning formed the opinion that the Hexham Redevelopment Project as a whole constituted a proposal to which Part 3A of the EP&A Act applies.

Director-General's environmental assessment requirements (DGRs) were issued for the Concept Plan and Project Application in February 2008 and re-adopted in March 2010. Subsequent to the issuing of the DGRs, the Proponent determined to proceed only with the Project Application. Therefore, an Environmental Assessment (EA), addressing the DGRs issued for the train support facility was prepared and submitted to the Department.

3.2. Transition to State Significant Infrastructure

Part 3A of the EP&A Act was repealed on 1 October 2011, with the creation of savings and transitional provisions. The transitional provisions (Clause 2 of Schedule 6A of the EP&A Act) provide that where DGRs have been issued for a project under Part 3A of the Act within two years before its repeal, Part 3A of the Act would continue to apply as long as an EA addressing the DGRs was submitted to the Department by 30 November 2012.

As identified above, DGRs were last issued for the project in March 2010 and the EA for the project was submitted to the Department prior to 30 November 2012. Consequently, pursuant to the transitional provisions, the statutory assessment of the proposal was progressed under Part 3A of the EP&A Act, including acceptance and exhibition of the EA.

On 16 August 2013, the Minister for Planning & Infrastructure declared the Hexham TSF proposal to be State significant infrastructure (SSI) pursuant to Clause 5(2) of Schedule 6A of the EP&A Act, which allows that *"development may be declared to be State Significant Infrastructure whether or not the development is a transitional Part 3A project"*.

Under the transitional provisions of the EP&A Act (Clause 5 (4) (c) of Schedule 6A), all statutory steps undertaken for the proposal under Part 3A of the EP&A Act including issuing of DGRs, preparation and exhibition of the EA, and submission of a Response to Submission Report would stand in for the purposes of the assessment of SSI under Part 5.1 of the EP&A Act.

3.3. Approval Authority

The Minister for Planning and Infrastructure is the approval authority for SSI under Part 5.1 of the EP&A Act. On 14 September 2011, the Minister delegated his approval functions to nominated staff of the Department where:

- the relevant local council has not made an objection; and
- there are less than 25 public submissions objecting to the proposal; and
- a political disclosure statement has not been made in relation to the application.

Of the 21 public submissions received, 11 submissions objected to the proposal. No objection was received from The City of Newcastle, and there has been no political disclosure statement made in relation to the proposal by the Proponent.

As such, the proposal may be determined by the Executive Director of Development Assessment Systems and Approvals.

3.4. Permissibility

The proposal is located on land zoned IN3 Heavy Industry, SP2 Infrastructure, and E2 Environmental Conservation under the *Newcastle Local Environmental Plan 2012*. The proposal is permissible in land zoned IN3 as it meets the definition of a freight transport facility, which is permissible with consent. However freight transport facilities are a prohibited land use in land zoned SP2 and E2.

Notwithstanding, clause 5(3) of Schedule 6A of the EP&A Act, states that *"despite anything to the contrary in any environmental planning instrument, any such development that is declared to be State significant infrastructure is taken to be development that may be carried out without development consent under Part 4"*. As the proposal is declared to be SSI, pursuant to the provisions of clause 5(3) of Schedule 6A of the EP&A Act, it can be carried out on any land without development consent.

3.5. Objects of the EP&A Act

Decisions made under the EP&A Act must have regard to the objects of the Act, as set out in section 5 of the Act. The relevant objects are:

- a) to encourage:
 - (i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,
 - (ii) the promotion and co-ordination of the orderly and economic use and development of land,
 - (iii) the protection, provision and co-ordination of communication and utility services,
 - (iv) the provision of land for public purposes,
 - (v) the provision and co-ordination of community services and facilities,
 - (vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats,
 - (vii) ecologically sustainable development,
 - (viii) the provision and maintenance of affordable housing, and
- b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State; and
- c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.

The objects of most relevance to the proposal are those stated in sections 5 (a)(i), (ii), (vi), (vii), and 5(b) and 5(c), noting that the proposal does not present significant issues in relation to communication and utility services, land for public purposes, community services and facilities, or affordable housing.

The Department has considered the need for the proper management of natural resources and the need to conserve ecological values in its assessment of the proposal, consistent with objects under sections 5(a)(i) and (vi). Consistent with object 5(a)(ii) in relation to the orderly and economic development of land, the Department has assessed the proposal against development controls and land use provisions provided in relevant environmental planning instruments and has considered the economic benefits and site suitability of the proposal. The Department has also publicly exhibited the proposal, consistent with the public participation objects of 5(c). The Department has assessed the proposal in consultation with and giving due consideration to the technical expertise and comments provided by other Government agencies (including local Council) on the proposal, consistent with the object of sharing of the responsibility for environmental planning between the different levels of government in the State, as per object 5(b).

The Department's consideration of the object under section 5(a)(vii) (the promotion of Ecologically Sustainable Development) is further detailed in **Section 3.6**.

3.6. Ecologically Sustainable Development

The EP&A Act adopts the definition of Ecologically Sustainable Development (ESD) found in the *Protection of the Environment Administration Act 1991*. Section 6(2) of that Act states that ESD requires the effective integration of economic and environmental considerations in decision-making processes and that ESD can be achieved through the implementation of:

- a) the precautionary principle;
- b) inter-generational equity;
- c) conservation of biological diversity and ecological integrity; and
- d) improved valuation, pricing and incentive mechanisms.

The principles of ESD have been addressed in the EA prepared by the Proponent. The Department considers that the technical assessments which assess the environmental impacts of the proposal, the conservative assumptions, contemporary assessment and compliance standards, and the detailed mitigation measures, are consistent with the principle of the precautionary principle. The Department is satisfied based on its assessment of the ecological impacts that the proposal would not result in significant impacts to ecology subject to the implementation of appropriate mitigation and monitoring measures. This is consistent with the objective of conserving biological diversity and ecological integrity.

The Department considers the proposal to be consistent with the principles of inter-generational equity and improved valuation, pricing and incentive mechanisms as:

- the proposal would improve existing rail network infrastructure and thereby help maximise haulage capacity and access to Newcastle Port for the Hunter Valley coal Chain Corridor, including reduced costs, minimising off-track time and improved reliability;
- the proposal would help ensure that rail haulage is undertaken in an efficient manner which would support the ongoing competitiveness and economic benefits of the coal and Port industries;
- the EA for the proposal has included a conservative assessment of the range of environmental issues relevant to the proposal including mitigation measures to manage residual impacts and to minimise the potential for significant or unintended residual impacts to future generations; and
- the proposal has been developed with consideration of feasible alternatives and determined as the option that would provide the best value for money with consideration to operational, environmental and economic constraints.

Based on this, the Department is satisfied that the proposal is consistent with the objectives of ESD.

3.7. Commonwealth Approvals

Approval is required under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act), where a proposal is deemed likely to have a significant impact on Matters of National Significance and is deemed a controlled action under that Act. A referral has been made in relation to the proposal to the Department of Sustainability, Environment, Water, Populations and Communities (DSEWPac) and the proposal was deemed not to be a controlled action on 20 March 2012 by DSEWPac (EPBC referral 2012/6285).

4. CONSULTATION AND SUBMISSIONS

4.1. Exhibition

Under section 75H(3) of the EP&A Act, the Director-General is required to make the EA of an application publicly available for at least 30 days. After accepting the EA, the Department publicly exhibited it from 21 November 2012 until 21 December 2012 (31 days) on the Department's website, and at the Department's Information Centre, the Nature Conservation Council, The City of Newcastle Chambers and Newcastle City Library. The Department also advertised the public exhibition in the Newcastle Herald on 21 November 2012 and notified landholders and relevant State and local government authorities in writing.

The Department received 28 submissions during the exhibition of the EA including 7 submissions from public authorities and 21 submissions from the general public and special interest groups. A summary of the issues raised in submissions is provided below.

4.2. Public Authority Submissions

Seven submissions were received from public authorities. None of these submissions objected to the proposal, but raised issues for the Department's consideration.

NSW Department of Primary Industries (DPI Fisheries and Office of Water):

- potential impacts on adjoining salt marsh areas due to the discharge of stormwater to the southern end of the site. Concerns that the assessment of the saltmarsh community is understated, with long-term effects allowing the introduction of less salt tolerant species. Notes that there will be some benefit as the existing area of wetland / saltmarsh complex will be under a management regime as an environmental offset;
- if the new southern crossover requires the construction of culverts or a bridge over the creek, Fisheries NSW should be involved in discussions in relation to blockage of fish passage matters and flow management;
- works within riparian zones should be designed and constructed to minimise potential impacts on hydrologic, geomorphic, and ecological integrity of watercourses;
- noted that excavations and watercourse crossings should be conducted in accordance with the *NOW Guidelines for Controlled Activities*;
- noted that all activities likely to intercept groundwater are required to be licensed;
- supported the proposal to line (preferred) or raise the stormwater treatment ponds; and
- requested that the Site Water Management Plans be developed in consultation with NOW and to include monitoring programmes, impact triggers, and response actions for all surface water and groundwater sources potentially impacted by the development.

Hunter-Central Rivers Catchment Management Authority (CMA):

- raised concern about potential groundwater impacts including drawdown that may result in Acid Sulfate Soils, and changes to the existing hydrology and flood levels;
- noted that the total loss of native vegetation and EEC must be offset, and raised concern about lack of detail in the EA relating to the offset of SEPP14 wetland;
- questioned how coal contamination will be remediated and managed;
- questioned predicted changes in flood patterns and increases in flood heights; and
- requested that groundwater, acid sulfate soil, and stormwater plans are to be implemented to a high standard and monitored for the life of the proposal.

Heritage Council of NSW:

- an Interpretation Plan to be included to the Non-Indigenous Cultural Heritage Management Plan to ensure salvaged building materials are used appropriately;
- the Proponent should forward details of the proposed Excavation Director to the Heritage Council for endorsement prior to the commencement of works; and should archaeological salvage excavation be required, the Excavation Director forward an archaeological research design and methodology to the Heritage Council for endorsement prior to the commencement of works; and
- at the end of archaeological works, the Proponent and Excavation Director to ensure that a final report detailing all archaeological works and finds are detailed.

The City of Newcastle:

- concern regarding the permissibility under zoning in the *Newcastle LEP 2012*, and the effectiveness of the offset on land zoned E2 Environment Conservation and its location adjacent to the proposed extension of the M1;

- requested that a hollow-bearing tree survey be conducted for the entirety of the site, rather than confined to the area of the northern offset;
- concern regarding the proposed on-site sewage management system and its proximity to sensitive receivers such as wetlands, a high groundwater table and the presence of nutrients and faecal coliforms in groundwater and surface water;
- concern that the proposal will significantly alter flood flow patterns and will not retain the floodway in a condition that is capable for the conveyance of essential flood flow;
- noted that the Proponent has had discussions with RMS concerning access to the New England Highway, and requested a dilapidation survey be undertaken for Woodlands Close pre and post development; and
- requested that the Proponent be required to pay a levy to Council based on the Newcastle section 94A Contributions Plan, 2009.

NSW Environmental Protection Authority (EPA) made comment that they are not the appropriate regulatory authority for the proposal under the *Protection of the Environment Operations Act 1997*.

Office of Environment and Heritage does not object, but made recommendations for stormwater management, flooding, biodiversity and aboriginal heritage, noting that it is unable to offer overall support for the proposal until the following issues were addressed:

- concern relating to adverse flooding impacts to existing developments;
- incomplete Aboriginal cultural heritage assessment and community consultation; and
- additional clarification of the targeted flora survey, including details on survey location, methodology, timing, seasonal / climatic conditions, duration, and habitats searched.

Roads and Maritime Service:

- all heavy vehicle access to the site should be via the existing New England Highway westbound off load/on load ramps at Tarro Interchange and the U turn facilities at Beresfield, and the proposed access road shall be designed and constructed to avoid any changes to the proposed M1 upgrade;
- all access roads shall be constructed by the Proponent in accordance with the *Austroads Guide to Road Design 2009* (with RMS supplements); and
- requires the preparation of a Traffic Management Plan.

4.3. Public Submissions

Twenty one submissions were received from the public. This included submissions from the following special interest groups:

- Hunter Bird Observers Club;
- Islington Village Community Group;
- NSW Minerals Council Ltd;
- Rio Tinto Ltd;
- Australian Rail Track Corporation Ltd;
- Hunter Valley Coal Chain Coordinator Ltd;
- Peabody Energy Australia Pty Ltd;
- Pacific National Pty Ltd;
- Hunter Business Chamber;
- Newcastle Coal Infrastructure Group;
- BHP Billiton Ltd; and
- Newcastle Port Corporation.

Of the 21 public submissions received, 11 (52%) objected to the proposal and 10 (48%) supported the proposal. The key issues raised in public submissions are listed in **Table 4**.

Table 4: Summary of Issues Raised in Public Submissions

Issue	Proportion of submissions (%)
Positive comments	
Project will alleviate terminal congestion	43
Improved Coal Chain efficiency	43
Project will benefit local employment	10
Concerns with the proposal	
Impacts on wetlands	40
Flooding concerns	40
Noise and vibration impacts	29
More appropriate sites could be found if further investigation undertaken	24
Health impacts of increased air pollution	24
Detrimental economic impact on nearby fisheries	19
Impacts on fauna	10
Impacts on flora	10
Cumulative environmental impacts of this and other proposals within proximity	10
Zoning inappropriate for land use type	10
Misuse of tax payer money	5
Impacts on Aboriginal heritage	5
Impacts on Non-Aboriginal heritage	5
Traffic concerns	5
Restricted property access and impact on emergency services	5
Visual impact concerns	5
Lack of community consultation	5

The Department has considered the issues raised in submissions in its assessment of the proposal, as detailed in **Section 5** of this report.

4.4. Proponent's Response to Submissions

In April 2013 the Proponent submitted a Preferred Infrastructure Report and Response to Submissions to the Department, providing detailed responses to issues raised and outlining amendments to be implemented to minimise and manage impacts associated with the proposal.

Preferred Infrastructure Report

The Proponent's Response to Submissions included a Preferred Infrastructure Report which detailed the following key changes to the proposal:

- vertical alignment has been altered (tracks have been lowered) for an 800m section of the railway track east of the Brancourts wastewater treatment facility in order to mitigate adverse off site flood impacts;
- horizontal alignment, including relocating the shunt-neck and removal of the turntable, has been changed to reflect the revised building layout;
- the location of the water control basins has been amended to reflect the drainage design, dependent on the ground conditions and track levels across the site;
- the location of the fuel farm, locomotive maintenance building, service vehicle garage and car park, and the internal road turning loop have been amended to move the buildings and structures away from what is now designated to be the floodway to a location that has a lower susceptibility to flooding;
- the design of the access road connecting the Tarro Interchange has been modified to accommodate the updated outcomes of the flood assessment and allow floodwaters to spill over the road. A new road bridge would be constructed to span over Middle Creek; and
- the design of the internal access road has been modified and the road would now be located further east to account for the relocation of the fuel farm, service vehicle garage and the car park.

5. ASSESSMENT

The Department considers the key issues associated with the proposal to be:

- hydrology and flooding;
- ecology;
- noise and vibration;
- traffic and access; and
- heritage.

These issues are considered in **Sections 5.1-5.5** of this report. Other issues associated with the proposal, including soils and soil contamination, visual amenity, waste, air quality, greenhouse gases, and socio-economic impacts, have been addressed in **Section 5.6**.

5.1. Hydrology

Flooding

The proposal is located within the Hunter River catchment, and the broader floodplain area of Hexham Swamp, upstream of Hexham Bridge. The proposed TSF has the potential to impact on flood levels, velocities and floodwater behaviour in the Hexham locality.

The Hunter River has a recorded history of flooding, the largest of which occurred in 1955. Major catchment flooding of the Hunter River system is the dominant flooding mechanism within the Hexham Swamp floodplain, and in major flood events the floodplain is subject to significant inundation. In smaller flood events, flow is contained within the banks of the Hunter and Williams Rivers. As flood magnitude increases, floodwaters overtop the natural and man-made levees, established as part of the Hunter Valley Flood Mitigation Scheme after the 1955 flood, and flow across the floodplain. The progression of flood flows through Hexham Swamp and surrounds is controlled by a number of features, including the Hexham Industrial Estate, the abandoned railway and the Chichester Pipeline, and a number of surface water drainage features (**Figure 6**).

The proposal site runs parallel to the New England Highway, and the site of the proposed ARTC Hexham Relief Roads project, at Hexham. The site is adjacent to agricultural properties, Hexham Swamp Nature Reserve and two SEPP 14 wetlands (of which part of one is located on the proposal site), while the industrial, commercial and residential areas of Hexham are located to the east, between the Highway and the Hunter River. Local topography is largely flat as is typical of a floodplain, with a raised area that consists of the old coal tailings stockpiles.

The site is categorised as a high hazard flood storage area, which is largely inundated during the 100 year Average Recurrence Interval event (known as the 1% Annual Exceedance Probability (AEP) event) at depths in the order of 1-2m AHD. The proposal site is not flood affected at the 20% AEP event, as the Hunter River remains principally in bank. At the 10%, 5% and 2% AEP events, flood waters spill over the New England Highway into Hexham Swamp via the northern end of the site. Overall, the general flood extent and behaviour is similar for each event, albeit with the severity of flood depths and velocities increasing with event magnitude.

An assessment of the potential flood impacts associated with the proposal was undertaken which assessed the likely impacts of earthworks and site filling on flood levels and velocities within the Hunter River Floodplain. The assessment identified adverse impacts to surrounding land owners and businesses as a result of the proposed civil works to construct the TSF.

These off-site impacts would occur principally as a result of the blocking of existing flow paths through the construction of the elevated access road, hardstands and rail embankments that would block flood connectivity to the broader floodplain. Impacts include increases in local peak flood water levels of up to 0.1m AHD at properties to the north of the proposal, 0.1-0.2m AHD

along a section of the Pacific Highway, and 0.2m AHD within the Hexham Swamp Nature Reserve during a 2% AEP event. Whilst impacts to flood velocities in the local flood plain were predicted to be typically less than 0.2m/s., within Purgatory Creek, to the north of the site, local peak flood velocities were predicted to increase to around 2m/s through the access road cross-drainage.

The significance of flooding impacts was noted by a number of stakeholders. Submissions from OEH, DPI and City of Newcastle identified significant issues with the potential flooding impacts of the proposal and the unquantified cumulative impacts from the adjacent ARTC Hexham Relief Roads project. These submissions requested the Proponent to investigate further design changes to minimise the flooding impacts of the proposal on surrounding lands.

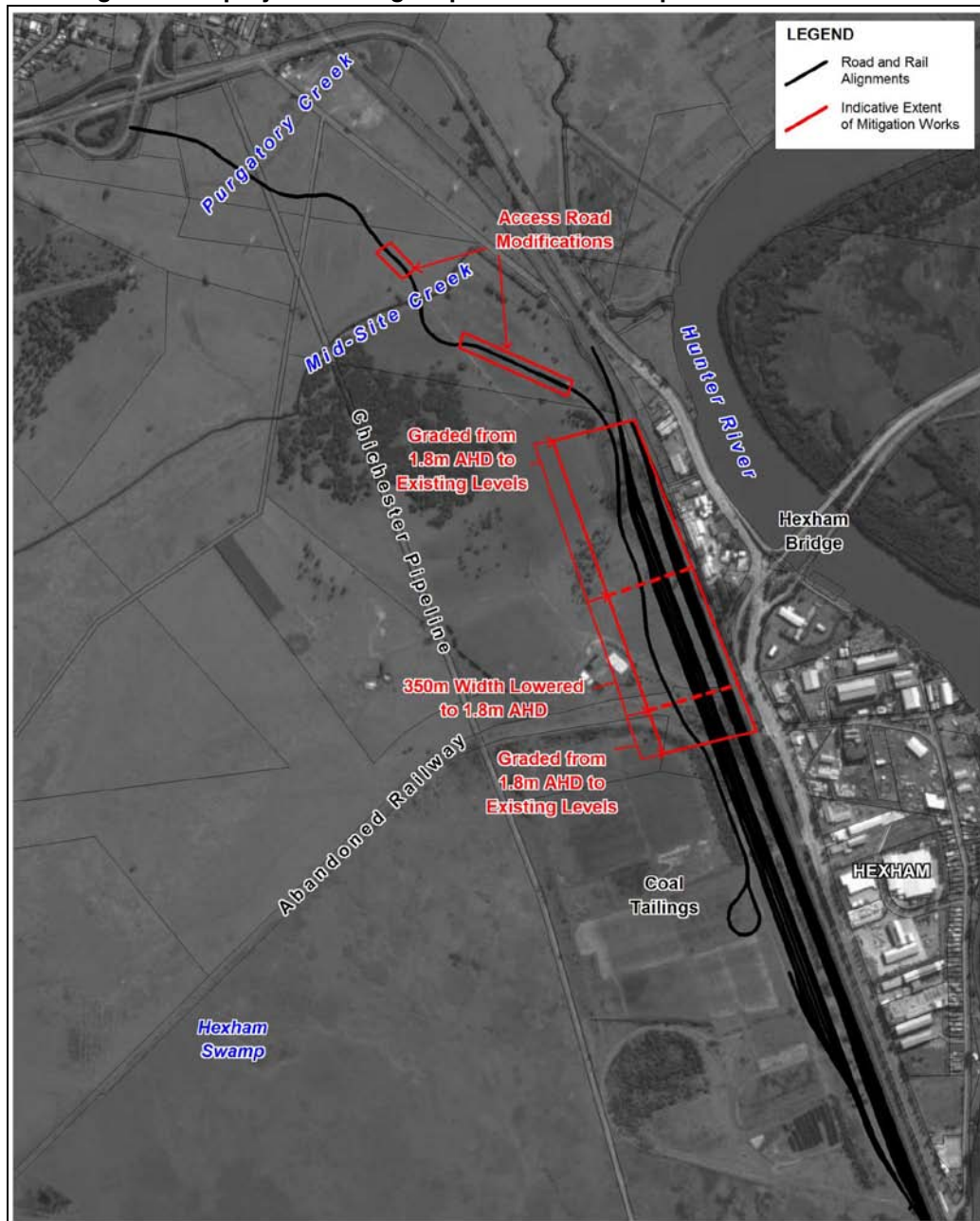
The Proponent responded by including flood mitigations and design changes as detailed in the Preferred Infrastructure Report. The proposed changes included the lowering of the vertical alignment (removal of an embankment) of an 800m section of the 7 new rail lines proposed to prevent the flood obstruction that the original design would have caused (**Figure 4**). This included a 350m length of track lowered to around 0.2m below the existing rail, with a design fill level of around 1.8m AHD and a top of rail level of around 2.0m AHD.

Design changes also included lowering of the surface elevation of sections of the new access road between the Tarro Interchange and Woodlands Close to approximately 1.4m AHD (an approximately 300m section) and 1.6m AHD (an approximately 100m section), located to the north of the proposal. The ARTC Hexham Relief Roads project also included design changes to remove flood obstacles from the floodplain to mitigate flood impacts on surrounding properties.

The Proponent undertook an additional flood assessment to quantify the changed level of impacts proposed through their design changes. The Joint Flood Impact Assessment considered the cumulative impacts of the proposal combined with the ARTC Hexham Relief Roads project, the potential future M1 extension and the shared access road alignment from the Tarro Interchange.

The assessment of the wider floodplain was based on a model developed previously for the Williams River Flood Study and was calibrated to three previous flood events, including March 1978, February 1990 and May 2000, of which the February 1990 event represented the largest of these flood events in the Hexham area. The Joint Flood Assessment stated that the February 1955 flood event represented the only event larger than the 1990 event for which calibration data was available on the Lower Hunter River. The February 1990 flood event was not simulated with the current study given the topographical changes in the Lower Hunter subsequent to the 1955 event and the limited influence of the proposed developments on floods of that magnitude.

The Joint Flood Impact Assessment considered the NSW Government's adopted climate change sea level rise benchmarks in relation to the effects of the proposal on flood levels and frequency, and also included preliminary flood emergency response management measures as part of the works.

Figure 4: changes to the project to mitigate potential flood impacts

In regard to the cumulative impacts of the proposal with the ARTC Hexham Relief Road project and M1 extension, modelling was only undertaken for the 1% AEP event as this is the event indicated for future development control. As the proposed M1 extension is above the proposed temporary construction access road level, the M1 extension embankment becomes the critical control point on peak flood levels upstream. The impact of the proposed access road is effectively drowned out such that increases in the peak flood levels are largely attributed to the M1 extension embankment. Consequently, the Proponent restricted its assessment of cumulative impacts for the proposal from the TSF and ARTC Hexham Relief Roads proposals.

Modelling indicated that the design changes proposed in the Preferred Infrastructure Report would mitigate the majority of flood impacts, as discussed below.

Regional and local flooding impacts

The Joint Flood Impact Assessment found that there were no significant impacts on regional flood behaviour with only a minor redistribution of flood flow occurring during a 1% AEP event as a result of the design changes presented in the Preferred Infrastructure Report. Increased flood flows through Hexham Swamp during such an event would raise modelled peak flood levels by a few centimetres, with a corresponding reduction in peak flood levels in Hexham. The assessment identified localised flood impacts in the Hexham locality for events in the order of a 5% and 2% AEP (refer to **Figures 5a-5h**).

The cumulative impacts of the proposal would have the greatest impact on modelled flood behaviour during a 5% AEP event, when the peak flood level upstream of the road alignment would be increased by 0.05m AHD to 0.1m AHD, with impacts as high as 0.4m AHD on the Aurizon-owned land at the western end of the access road. There is a modelled increase in peak flood levels of 0.05m AHD to 0.1m AHD along the Pacific Highway between Hexham Bridge and Hexham Bowling Club, to the east of the site, for events in the order of a 5% AEP and 2% AEP as a result of the proposed works.

An increase in peak flood levels of 0.02m AHD to 0.03m AHD would also be observed on surrounding land during a 2% AEP flood event as a result of the proposed developments, including a 0.02m AHD increase at a single residential property upstream of the access road on Woodlands Close (which forms the north-east boundary of the TSF site).

The modelling shows that the proposal has only a minor flood impact during a 1% AEP or greater event, as during flood events in the order of a 1% AEP or greater, under existing conditions the Hunter River and Hexham Swamp floodplains are otherwise fully connected. The proposal would create a small redistribution of floodplain flows to the west and an increase in level of around 0.02m AHD in Hexham Swamp in a 1% AEP event, while only minor impacts to peak flood level and velocity are predicted.

The Joint Flood Impact Assessment predicts that the proposals' impacts on off-site peak flood velocities for the modelled events would be insignificant, with only localised changes of up to 0.5m/s associated with localised flow redistribution around the proposed access road.

Increases in peak flood levels along the Pacific Highway adjacent to the TSF site would similarly be increased by between 0.05m AHD and 0.1m AHD for 5% and 2% AEP events respectively. The RMS has indicated that it is not concerned by this change in flood level, as the proposal would not significantly impact frequency or duration of flooding already experienced by the Pacific or New England Highways.

The flood impacts to local businesses located in Hexham are negligible. The businesses located along the Pacific Highway are elevated above the 2% AEP flood level and as such local increases in flood levels will have no impact to property.

Based on the modelling undertaken, the assessment concluded that the flood levels and flows would not be significantly increased as a result of the proposal during 10%, 5%, 2%, or 1% AEP flood events. It concludes that the proposal has lessened flooding impacts from the original design, would not have a significant impact on regional flood behaviour, nor would it cause a significant increase in peak flood levels of surrounding land or residential property or building.

Figure 5a: 10% AEP Peak Flood Depths Existing Conditions

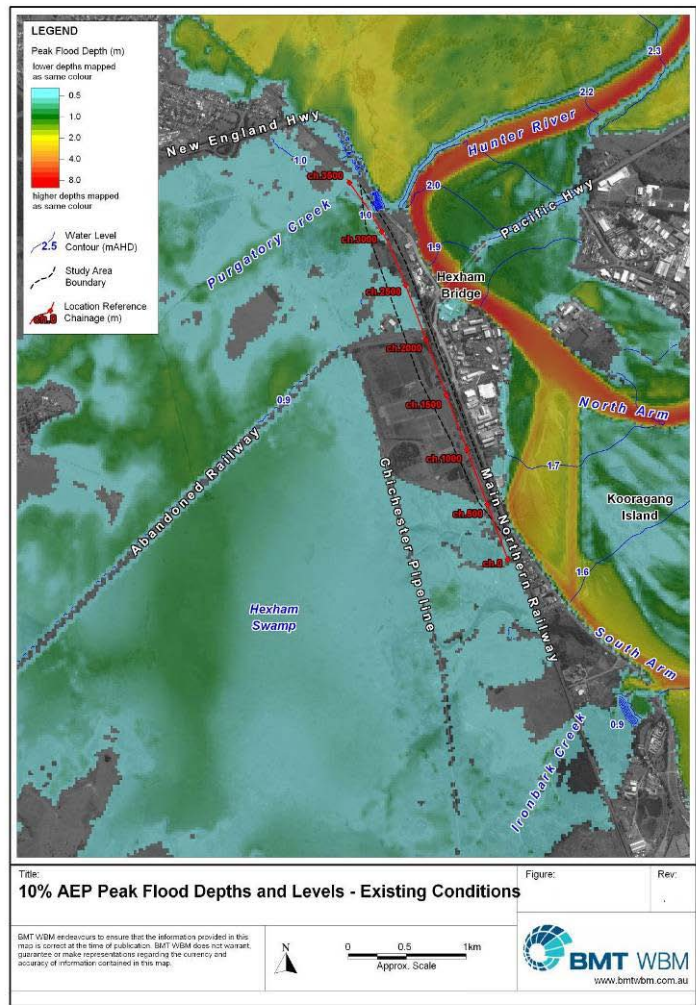


Figure 5b: Impact of Project on 10% AEP

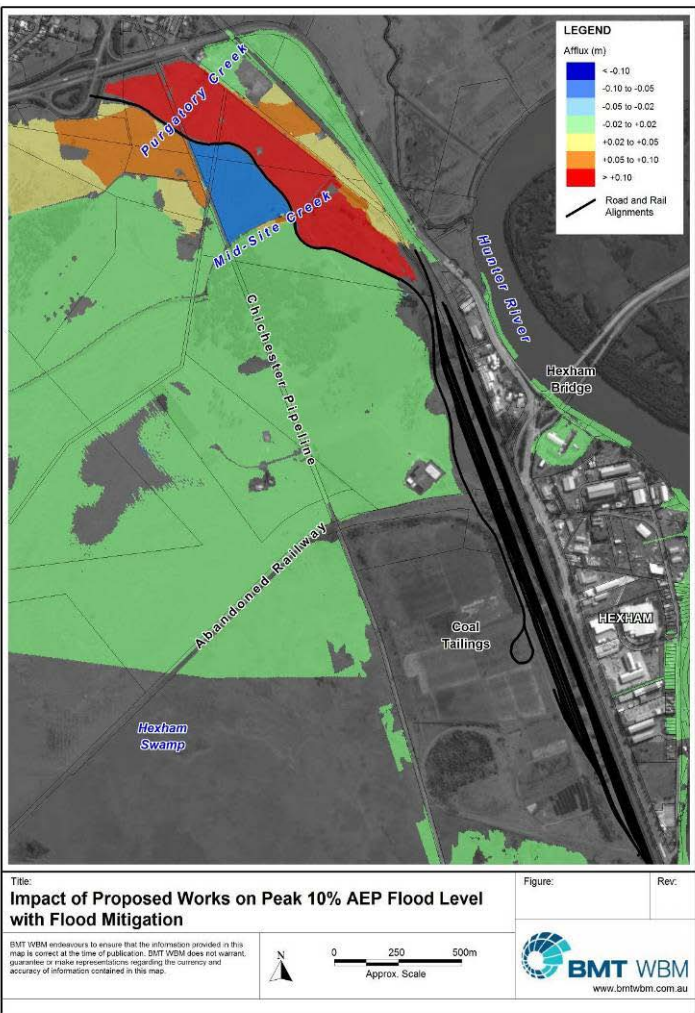


Figure 5c: 5% AEP Peak Flood Depths Existing Conditions

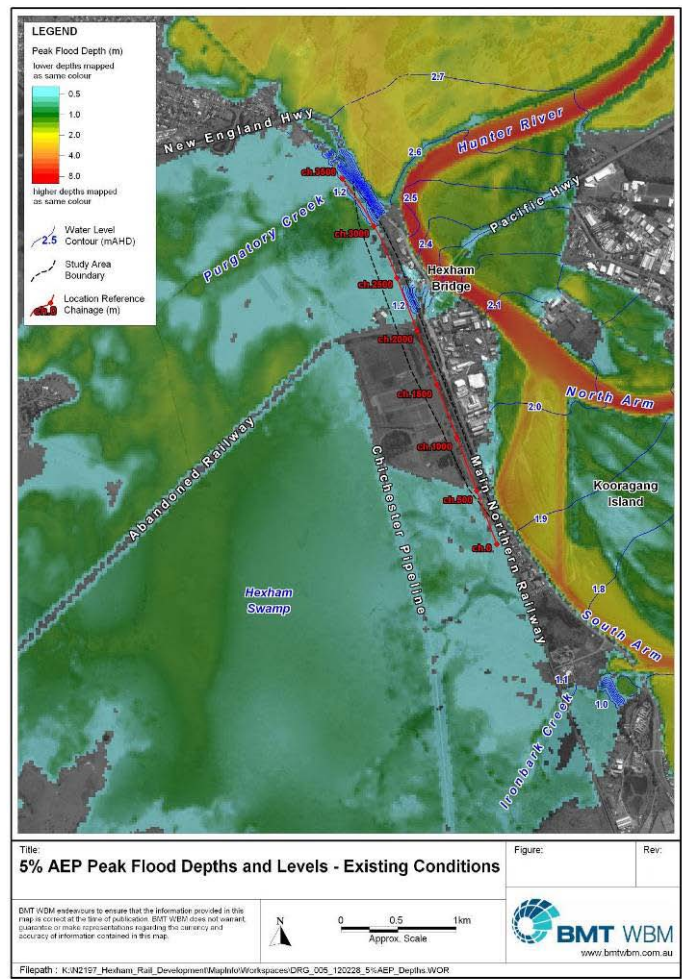


Figure 5d: Impact of Project on 5% AEP

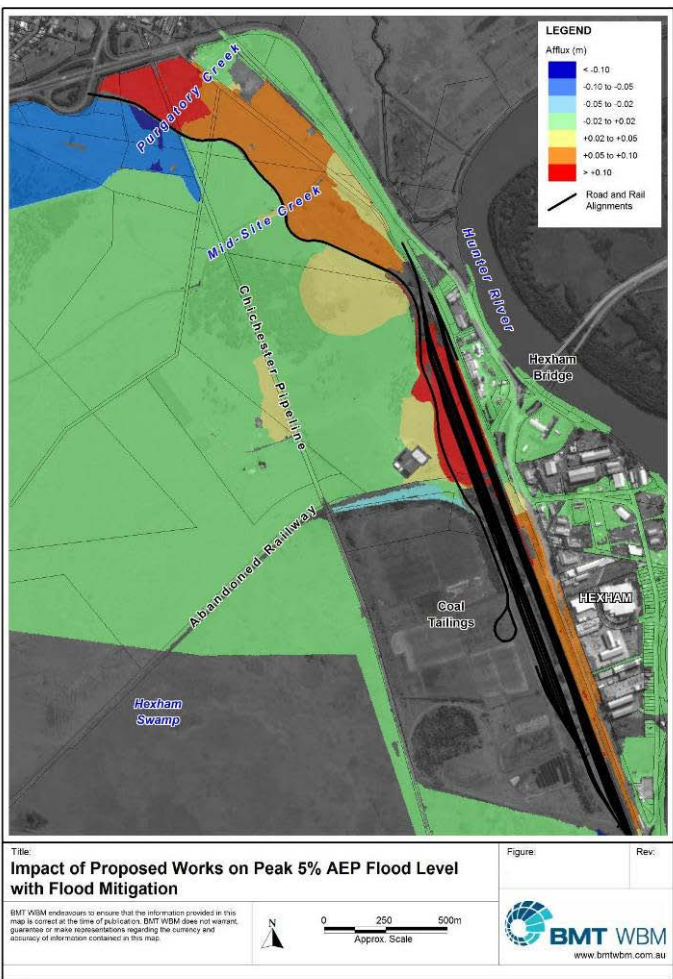


Figure 5e: 2% AEP Peak Flood Depths Existing Conditions

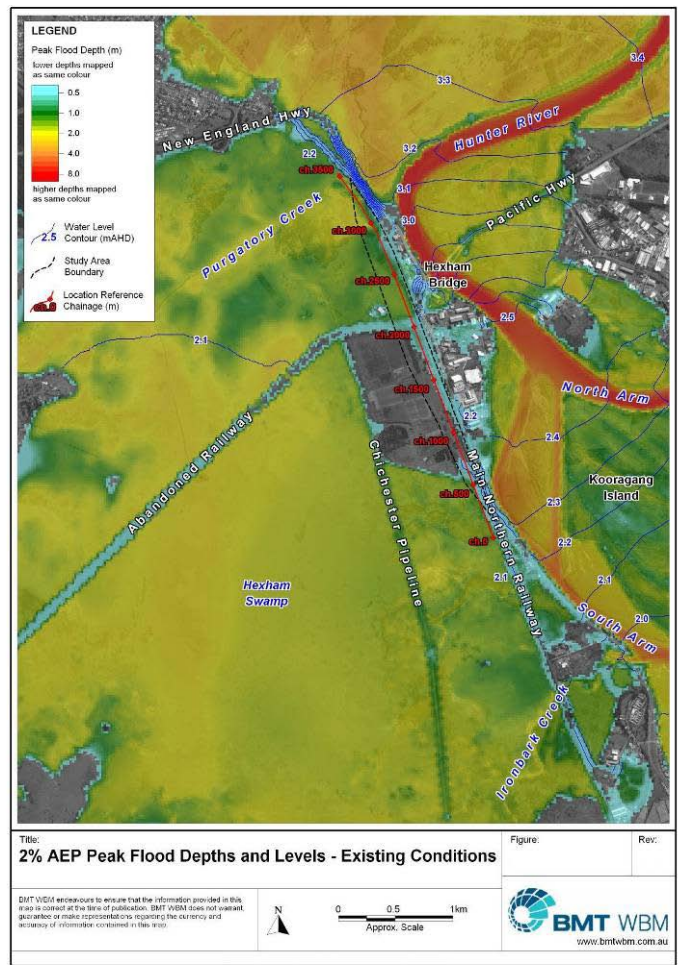


Figure 5f: Impact of Project on 2% AEP

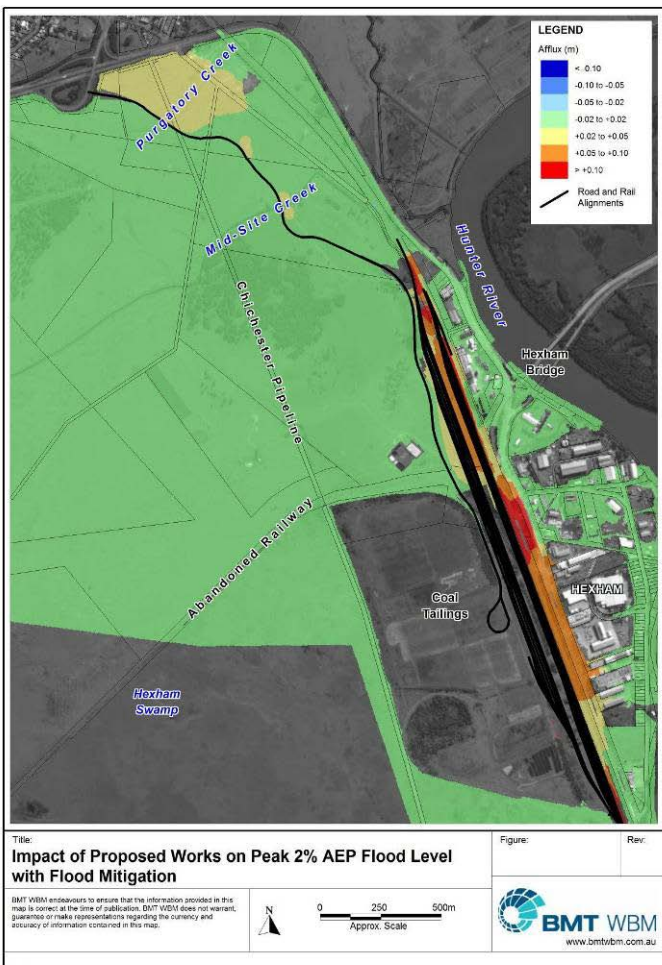


Figure 5g: 1% AEP Peak Flood Depths Existing Conditions

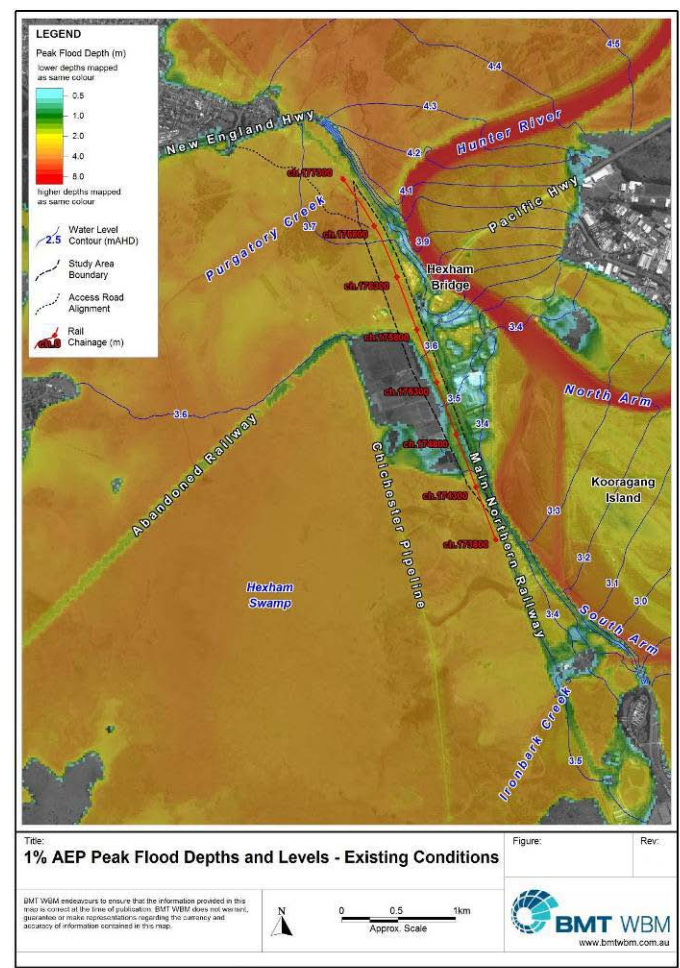
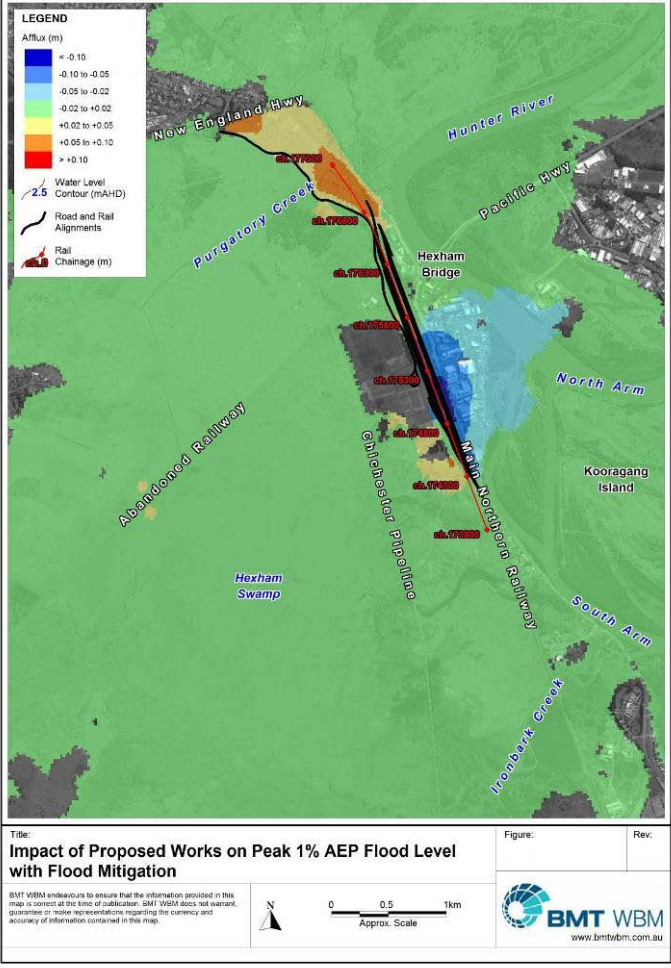


Figure 5h: Impact of Project on 1% AEP



Given the agencies' and the public's concerns regarding the potential impacts of the proposal on flooding, the Department commissioned an independent review of the flood assessment. This review concluded that:

- the local (4m grid) model used in the assessment of flood impacts associated with the revised design is a reasonable representation of existing design flow behaviour in the Hexham area;
- the 40m and 4m grid models used in the assessment are useful in determining the relative impact and magnitude of the cumulative impacts of the proposal and the ARTC Hexham Relief Roads project on flood levels;
- the models have utilised the best available information on flooding and the interpretation and application of the information is sound;
- the numerical flood modelling approach used to assess the likely impacts of the proposal and the ARTC Hexham Relief Roads project on flooding is sound;
- the predicted flood impacts are indicative of the likely impacts; and
- the proposed lowering of the train tracks to minimise flood impacts is acceptable.

However, the review noted that inconsistencies in the flow distributions and flood gradients between the regional scale (40 m) grid model and local scale (4m) grid model, along with the lack of suitable historical flood data in the Hexham locality to benchmark the model, suggests that the models are effectively un-validated in the vicinity of the proposal. Consequently, the accuracy of the predicted peak flood levels appears to be uncertain nearby the proposed project. Given this, the predicted extent of inundation and the number of properties affected is uncertain.

The duration of flooding in the area is dependent on the flood depth and the differential flood levels between the Hunter River and Hexham Swamp. The modelling shows that the duration of flooding for the area is in the order of several days for the 1% AEP event and up to a week for the probable mean flood. The predicted increases in flood depth are therefore unlikely to cause a noticeable difference in the duration of flooding as this is governed by the slow time to drain the area rather than flood depth.

In light of these potential uncertainties, the Department has recommended a condition of approval which requires the Proponent to design and construct the TSF so that it does not result in increases in flood levels on adjacent lands and on road and rail corridors greater than the levels predicted in the flood assessment. Limiting flood impacts to these levels would minimise the potential for adverse flood impacts to arise.

The flood impacts to local housing are restricted to a single property located upstream of the access road. At this location there is a modelled peak flood level increase of under 0.05m AHD at the 1% AEP event and a 0.02m AHD increase at the 2% AEP event. At other residential locations in the vicinity of the proposal, the flood impacts are negligible.

The Department has also recommended that the Proponent compare the actual extent, level and duration of future 1%, 2%, 5% and 10% AEP events against the predicted modelling impacts. Where impacts are found to exceed the predicted outcomes and adversely impact on properties, structures and / or infrastructure, the Proponent is required to develop and implement mitigation measures to reduce future flood impacts in consultation with NoW, City of Newcastle, and affected landholders.

In addition, the Department has recommended a condition of approval requiring the Proponent to consult with the affected landowner at Woodland Close to develop measures for managing and / or mitigating flood impacts to the residence located on the property.

The Department is satisfied that the residual flooding impact of the proposal would not significantly alter the current flood levels and, in the context of the benefits of the TSF, are considered justified.

On-site flooding

The proposal includes site elevations up to a level of approximately 3m AHD, with rail and building infrastructure at or above this level to remain above 2% AEP flood events. Rail and road infrastructure below this level would flood once the existing rail line is overtopped, which is likely during a 5% AEP or greater flood event. Flood depths across the site during a 2% and 1% AEP event would be over 0.5m AHD and below 2.0m AHD respectively. Flood velocities across the site during a 2% and 1% AEP event would be 0.5m/s to 1.0m/s and 1.0m/s to 1.5m/s, respectively.

Such depths and velocities have implications for the on site infrastructure, with the probable maximum flood (PMF) event likely result in extensive damage to this infrastructure.

Changes to the original design of the TSF require excavation works, up to 150,000m³ of excess treated Acid Sulfate Soils and possible acid-generating material may be created. It is proposed to permanently stockpile this material on elevated areas of the site. The stockpiles would be located above the 10% AEP flood level and where possible located above the 1% AEP level. The proposal would also include the on site storage of up to 630,000 litres of diesel in 7 x 90,000 litre above ground tanks, located at the provisioning facility and within the floodplain, at levels above the 1% AEP.

OEH noted that storage of hazardous and other materials in the floodplain remains a key area of concern. They state that the potential exacerbation of flooding impacts off-site from the storage of up to 630,000 litres of diesel and the treatment and storage of Acid Sulfate Soils and other potentially acid generating material may occur in a PMF, which will have an adverse impact on the receiving environment, being the wetland. OEH recommended that the Proponent investigate the logistical and legislative pathways to allow disposal of Acid Sulfate Soils offsite at a licensed waste facility. OEH also requested the assessment and inclusion of mitigation measures, as well as a formal project risk management assessment in accordance with AS/NZS ISO 2100:2009 to consider these risks. Also requested was the verification of the design standards and proposed levels of the components of the proposal in relation to flood events.

In its Preferred Infrastructure Report, the Proponent confirmed that the proposed treatment and storage of Acid Sulfate Soils will occur in locations situated above a 2% AEP magnitude flood and that the storage locations may become inundated and cause off-site flood impacts during larger events such as the 1% AEP. The Proponent also provided further information regarding the design of the electrical equipment and major components of the proposal in relation to the 1% AEP flood event, confirming that critical components of the fuel and electrical system have been designed above this event.

The Proponent provided a formal 'project risk management assessment' and Flooding Risk Assessment Report, which stated that the flooding risk to stockpiled Acid Sulfate Soils would be low and that where practical treated soils would be stockpiled above the 1% AEP, although the southern stockpile area would be affected by a 1% AEP event.

Whilst the Proponent has committed to placing the new stockpiles above the 2% level, at the 1% level the proposed storage locations may become inundated and potentially cause off-site flood impacts. The Proponent therefore provided additional flood information as an addendum to the Joint Flood Impact Assessment, in response to agencies concerns over the new stockpile and its influence over the predicted flooding regime.

The additional assessment stated that in terms of the existing flow distribution, the locations of the proposed stockpiles provide for only limited obstruction to flow. The stockpile areas will be located on or within the shadow zone of the existing high ground, and accordingly it would be expected that the stockpiles would have limited impact on the broader flow behaviour during flood events. During the modelled 1% event flood waters flow from Hexham Swamp into the Hunter River between Hexham and Sandgate, overtopping the railway and Pacific Highway. The inclusion of

on-site soil storage reduces this flow path width by around 100m, over a total flow path width of almost 3km, hence the negligible impacts on regional flooding.

Notwithstanding the Proponent's assessment of the issues associated with permanent stockpiling on-site, the Department considers that given the risks of flood events in the locality and the sensitivity of the receiving environment, on site permanent stockpiling of Acid Sulfate Soils and acid generating materials is a high risk approach. The Department has therefore recommended conditions of approval that require on-site stockpiles to be free of Acid Sulfate Soils and acid generating material and validated as neutralised. They also must be protected by appropriate sediment and erosion control measures and must remain above the 1% maximum flood level.

The framework for treating, storing and monitoring of this material and relevant adaptive management measures and contingencies must be included in an Acid Sulfate Soil Management Plan, to be developed in accordance with the NoW and Hunter Central Rivers CMA and be approved prior to the commencement of construction. In addition, the Department recommends that the Proponent carry out regular water quality monitoring, as detailed in a Surface and Groundwater Monitoring Program and whose results shall be included in a Construction Soil and Water Management Plan and in the Operation Environment Management Plan.

The Proponent has prepared a provisional Flood Emergency Management Plan for the proposal to detail flood emergency response for personnel. The Proponent has advised that flood warnings issued by the Bureau of Meteorology and the State Emergency Services are given 24 hours in advance for Singleton and Maitland. For large flood events, there is a lag time of around 20 hours or more between the peak flood passing Maitland and arriving at Hexham. This would provide sufficient warning of a day in advance of when the Hexham Swamp and TSF site are likely to be inundated by Hunter River flood waters and consequently provide adequate time to evacuate personnel, and relocate any equipment off site.

Although the Flood Emergency Management Plan provides procedures for managing flood risk during construction and operation, and outlines actions to be undertaken during recovery from a flood event, the Department is of the opinion that more detailed, site-specific measures are required. To ensure appropriate flood emergency response measures are in place and provide for flood risks to be effectively managed, the Department considers that the Plan should be updated upon completion of the detailed design and has recommended a condition to this effect.

The assessment states that increases in local peak flood velocities at Purgatory Creek were shown to be mitigated through the inclusion of appropriate scour protection works in the vicinity of the access road crossing. To minimise potential impacts on Purgatory Creek and other watercourses that traverse the TSF site, the Department recommends conditions of approval that require the Proponent to design crossings in consultation with the DPI and City of Newcastle, that riparian areas are appropriately rehabilitated, and that these measures are included in a detailed Construction Soil and Water Management Plan that details the actions to be employed to minimise stream hydrology impacts.

The Department considers that implementation of the recommended conditions would minimise the potential for the construction and operation of the facility, in particular the crossing of Purgatory Creek and the stockpiles, to have an unacceptable level of impact on the hydrology and geomorphology of local watercourses.

The maintenance and administration buildings associated with the TSF would be constructed from flood compatible materials in accordance with the guidelines outlined in the NSW Government's *Floodplain Development Manual* (2005), while critical infrastructure, such as electrical supply and equipment, and the proposed fuel storage tanks would be elevated above the 1% AEP flood level. The Proponent's commitments in regard to elevation of compounds and storage of materials and equipment have been reinforced in the conditions of approval.

Based on these changes to the infrastructure design and the findings of the detailed flood modelling of the new design undertaken by the Proponent, the Department is satisfied that these changes would minimise the potential impacts to flood levels on surrounding land during design flood events and this view is supported by the Peer Review.

Although the proposal affects local flood behaviour, the Department considers that the degree of impact has been reduced to an acceptable level through the lowering of the train tracks and parts of the temporary construction access road, as well as the other mitigation measures committed to by the Proponent, and the Department's recommended conditions of approval. These conditions include:

- limiting flood impacts on adjacent lands to levels predicted by the flood assessment and provision for mitigations where predictions are exceeded;
- comparison of actual flood characteristics at the 1%, 2%, 5% and 10% levels as they occur, against those predicted by the flood assessment model;
- development of measures for flood management and mitigations, after consultation with the owner, for the affected property on Woodlands Close;
- placement of stockpiles above the 1% flood level; and
- management plans for Ground and Surface water, Flood Emergency, Soils, and for the Operation phase of the proposal.

Stormwater Management

The potential for construction and operation of the proposal to impact on water quality within watercourses traversing and adjacent to the proposal site was raised in agency and public submissions. Potential pollution sources associated the proposal include spills, vegetation clearing and earthworks (both of which have the potential to result in erosion and sedimentation) and effluent from on-site irrigation of waste and exposed Acid Sulfate Soils and acid generating material.

The Proponent has provided a Stormwater Management Plan that commits to implementing controls consistent with those set out in Landcom's *Managing Urban Stormwater: Soils and Construction* (2006) for sediment and erosion control.

The proposed stormwater system includes use of existing swales, installation of cess drains and floating wetlands to treat water prior to discharge. The areas relating to the provisioning building, bulk fuel transfer and combined locomotive and wagon maintenance facility will be roofed to minimise stormwater from coming into contact with contaminated areas. Hardstand areas within this area will be bunded such that any spills are contained and are able to be drained to a trade waste system which will be collected and removed offsite for disposal in a licensed facility.

Operational activities identified as potentially generating significant contamination to surface and groundwater (sediment, oil & grease and nutrient loads) will be isolated from the stormwater system. Where possible, runoff will be directed over gravel / ballast areas prior to entering the drainage system to encourage pollutant removal, infiltration and decreased run off rates. Given the porosity of the ballast, it is considered that reasonably heavy storms would infiltrate through the gravel and eventually drain to the cess drain running the length of the site.

Gross Pollutant Traps (GPT's) will be utilised to provide primary screening of stormwater. This will comprise formed concrete stilling basins with trash racks located at the outlet to basins. Areas draining directly to the ponds will utilise stormwater GPT's. The GPT's will be located offline to prevent re-suspension of material during larger storm events. A baffled outlet will be provided to trap hydrocarbons and other floating material in the GPT.

Figure 6: Drainage lines associated with the proposal site (Source: ARTC Hexham Relief Road)

Three water quality control ponds, lined with HDPE, are proposed across the site to facilitate removal of suspended solids. These ponds or basins are to feature floating wetlands which have been included to provide nutrient and enhanced sediment removal from stormwater discharged from the site. The floating wetland filters pollutants through root mats suspended from the water surface which acts as a biological filter to remove nutrients and heavy metals from stormwater prior to it being discharged from the site. Access roads are to be provided with road side swales that will provide treatment through flow attenuation and settling of suspended sediments.

Water discharged from the basins would be directed into the Hexham Swamp, the quality of which was shown as a result of MUSIC modelling undertaken as part of the assessment to be an improvement against existing water quality conditions within the parameters of suspended solids, total phosphorus, total nitrogen and gross pollutants that currently occur on-site. Predicted water quality demonstrates compliance with the Newcastle Development Control Plan 2012 targets.

Stormwater is proposed to discharge via several discharge locations into the Hexham Swamp. As discussed in **Section 5.2**, a water monitoring program for the TSF will be developed to monitor changes in hydrological regime associated with discharges to Catchment Two (which contains the Swamp Oak Forest EEC) in the northwest and to Catchment Five (which contains the Coastal Saltmarsh EEC) to the south (refer **Figure 7a and b**).

City of Newcastle noted that the Newcastle DCP 2012 requires that post development flows are designed such that peak runoff from the site for all flood events is not greater than the 'natural' drainage conditions. In order to meet this goal, the Department has included a condition of approval to this effect, with the stormwater design system to be developed in consultation with OEH and Council and with consideration of the Newcastle DCP 2012.

In the Preferred Infrastructure Report, the Proponent has committed to investigating further opportunities to manage stormwater flows on the site to assist in creating favourable hydrologic conditions that support rehabilitated and offset areas of significant ecological value. The Department considers that increases in surface water runoff and associated discharges from the TSF site may lead to changes to the hydrological regime of receiving catchments, in particular via Catchment Five and the EEC and groundwater dependent ecosystems to the south. The Department has subsequently recommended conditions of approval to monitor and manage water quality and flow and for the provision of contingency plans should adverse impacts be identified.

The proposed stormwater treatment system and containment system will be designed to provide adequate and efficient treatment of surface water runoff from the site through containing, collecting / treating and adequately disposing of the runoff. A maintenance framework will be provided to key agencies that will detail procedures to manage vegetation growth in drains, sediment and silt removal from basins, and maintenance of the floating wetlands and other stormwater treatment devices. A comprehensive monitoring programme will be undertaken to assess the performance of the surface water controls and to identify any unacceptable levels of impact. In the event that unacceptable water quality is identified, the following contingency measures would be implemented:

- identify source and rectify chemical use, storage, delivery, bunding systems etc;
- increased monitoring frequency and sampling points to identify the source of suspected degradation to water quality;
- review the Stormwater Management Plan to improve or rectify any identified problem; and
- if any component of the surface water management framework is identified as creating an unacceptable environmental impact, remedial actions will be established in close liaison with relevant agencies.

The Department supports this approach, and has recommended conditions of approval to strengthen the Proponent's commitments. The conditions include the preparation and implementation of a Stormwater Management Plan and a Construction Soil and Water Management Plan, to ensure that water quality is improved and that adverse impacts to the sensitive receiving environment are avoided.

Figure 7a: The stormwater management system, northern section

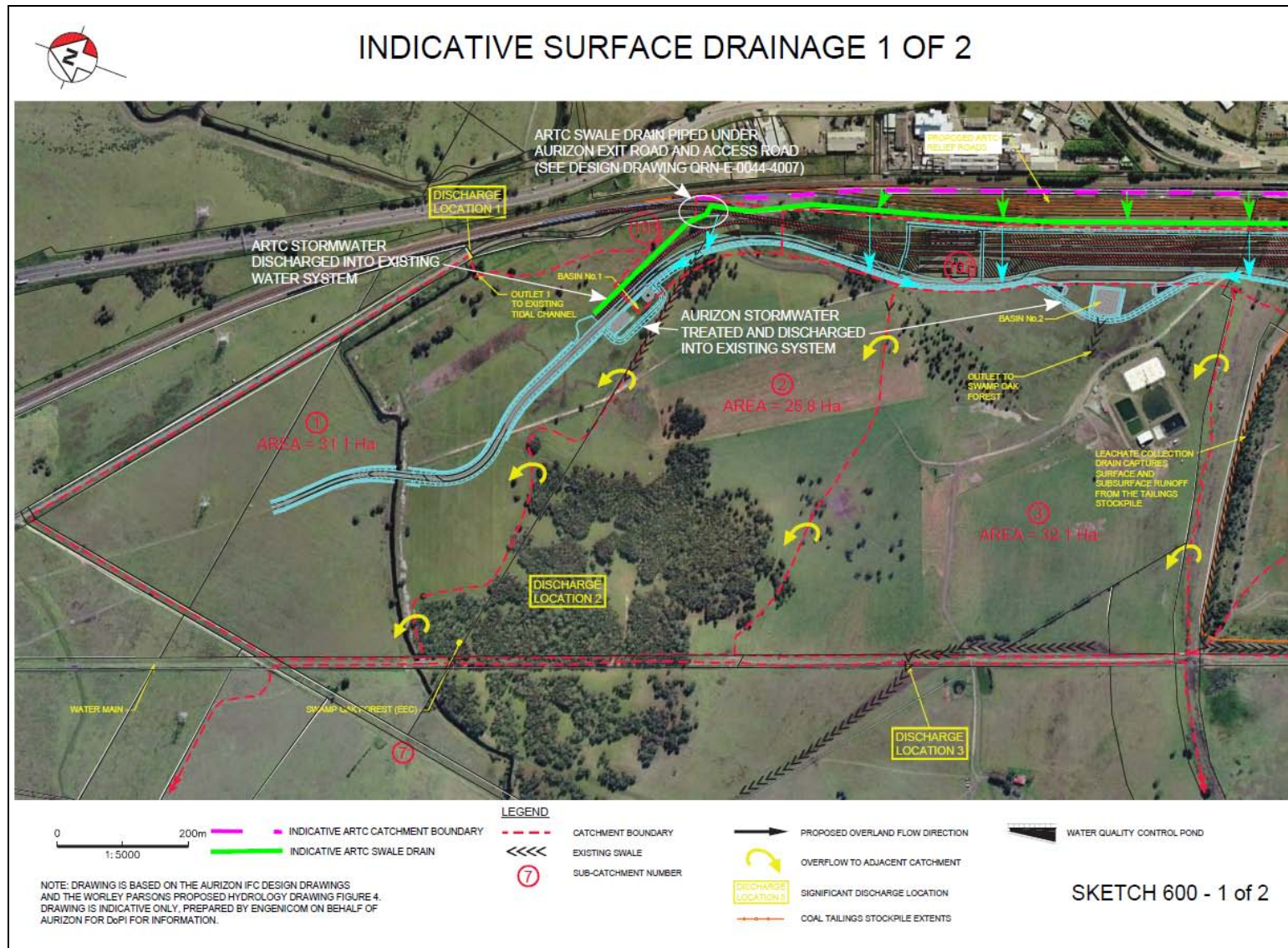
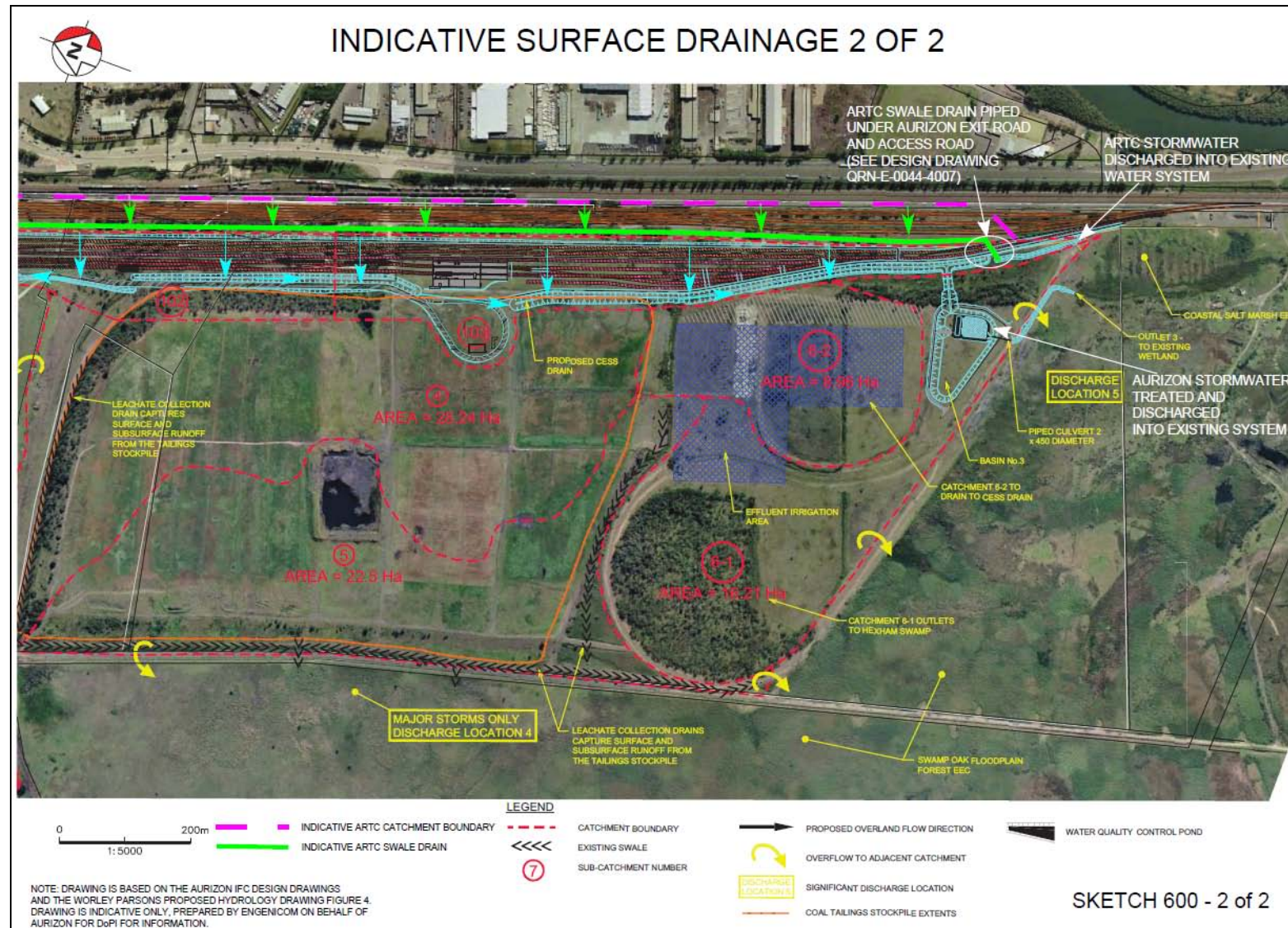


Figure 7b: The stormwater management system, southern section



Groundwater

Groundwater levels on the majority of the site are at or near the surface and typically controlled by surface water drainage features (refer **Figure 6**). The site has an extensive industrial history and has been used for agricultural and commercial / industrial land uses including grazing, wastewater treatment and associated effluent disposal, and for coal preparation. Site activities with potential to affect groundwater levels and quality include excavation and dewatering during construction, site filling, capping, and irrigation of effluent. Groundwater and surface water interaction may also occur due to the presence of a shallow groundwater table and the extent of the civil works.

Laboratory testing of groundwater and surface water samples has found existing elevated concentrations of heavy metals, nutrients and faecal coliforms. Elevated hydrocarbons were also detected. The groundwater contamination is likely to be associated with effluent irrigation from the Brancourts facility, leaching of contaminants from old fill materials, and localised sources.

OEH recommended that details of the proposed stormwater drainage swale be provided, including the stormwater runoff capacity considering the permanent standing water that may occur in the drains. The Proponent's Preferred Infrastructure Report states that the pit and pipe section to the south of the proposal includes an imported and compacted capping impervious layer that creates an effective separation barrier between surface waters and groundwater. The Proponent claims that seepage rates of groundwater into the surface water collection system will be very slow due to the natural 'clay' material.

In the northern section (lowered section of track), a permeable ballast layer within the rail formation would direct surface water flows to a proposed cess drain along the western edge of the TSF. As the formation would extend to a depth below the existing water table, infiltration of groundwater into the surface water collection system may occur. The Preferred Infrastructure Report states that the material underlying the rail formation would also consist of natural 'clay' materials and so seepage rates are expected to be low.

The assessment notes that the majority of groundwater and surface water interaction with Hexham Swamp and other groundwater dependent ecosystems on the western parts of the site occurs well away from the proposal area. As there are no proposed changes to the hydrogeology on this side of the site, impacts to groundwater levels on the western edge of the proposal are expected to be insignificant.

Despite this claim, the Department notes that there was no quantitative assessment of the extent of potential groundwater drawdown for the proposal. In their assessment, the Proponent suggests that excavations can be managed via routine construction methods to limit the extent of drawdown both outside and on the site. Suggested methods include the staging of excavations, recirculating water from excavated sections to a drainage blanket system within adjacent completed system, and use of sheet pile walls to cut-off flows into excavations, particularly for locally deeper excavations such as within the wetlands and maintenance buildings.

The Proponent has indicated that appropriate dewatering methods to limit drawdown will be subject to detailed design. The assessment also notes, with the exception of some locally deeper excavations, that the depth of predicted drawdown is generally within the depth of observed climatic fluctuation in groundwater levels and therefore provided that the drawdown is temporary, excavation works would be expected to have limited effect on water table levels.

Notwithstanding these assumptions, and the Proponent's commitments to limiting the impacts of dewatering, drawdown and potential subsequent impacts, the Department recommends that the Surface and Groundwater Monitoring Program for the proposal include contingency and ameliorative measures in the event that adverse impacts to groundwater are identified. This would result in the effective response to any potential or observed impacts prior to significant adverse effects on groundwater quality, hydraulics and groundwater dependent ecosystems arising.

The Department considers that the Proponent would need to undertake immediate action in the event that Acid Sulfate Soils are exposed and has therefore recommended that the Construction Soil and Water Management Plan include contingencies in the event that groundwater levels fall below the top of areas defined as possessing potential Acid Sulfate Soils. The Department has also recommended that the Soil and Water Management Plan includes an Acid Sulfate Soils Management Plan consistent with the *Acid Sulfate Soils Manual* (Acid Sulfate Soils Management Advisory Committee, 1998) and that this Plan details the procedures for handling, treating and managing such soils.

In regards to the treatment and disposal of groundwater, the Department has recommended a condition which prohibits the discharge and land application of dewatered groundwater unless in accordance with an Environment Protection Licence. The Department has also recommended that the Construction Soil and Water Management Plan include details on the methods for the treatment and disposal of groundwater.

Effluent system

The Proponent's assessment states that there is no regional sewer connection sufficiently close for connection to the proposal site, such that an on site effluent disposal system would be required. The assessment notes that the majority of wastewater from the proposal would be domestic treated wastewater from personal activities (i.e. water closets, kitchens, bathrooms and laundries), with only a small component originating from wagon wash water. The treated effluent would be released into an irrigation area to be located within the internal road turning loop, adjacent to the Combined Maintenance Building and Administration Centre.

The City of Newcastle does not support the approach for the management of effluent treatment. Its submission stated that the proposed sewage management system has considerable constraints including proximity to sensitive receivers, a high groundwater table and existing water quality issues, and expressed concern over the environmental impacts associated with effluent disposal, particularly when making reference to the domestic effluent disposal guidelines. City of Newcastle suggested that the Proponent should investigate potential for connection to reticulated sewer and demonstrate that the feasibility of this has been thoroughly assessed.

The Proponent's Preferred Infrastructure Report states that the proposed effluent disposal system would include design requirements to accommodate the expected irrigation rates. The report concludes that the majority of seepage from the irrigation zone would be directed to Basin Three via the proposed drains and would therefore have minimal impact upon groundwater levels in the vicinity of this irrigation area. Monitoring proposes to include physical parameters (including pH, electrical conductivity and suspended solids), oil and grease, nutrients (including total phosphorus and total nitrogen) and a full suite of metals. Management measures include the placement of a suitable clay loam fill to form the surface of the irrigation area to improve soil properties and minimise the potential for the groundwater pollution, and installation of catch drains / bunds upslope and downslope of the irrigation area to prevent rainfall run-on and run-off.

The Proponent states that the proposed effluent disposal system has been designed with reference to the current *Environment and Health Protection Guidelines: "On-site Sewage Management for Single Household"* (Ref 2) and AS/NZS 1547:2012 *On-site domestic-wastewater management* and has taken into consideration the proposed effluent treatment system design parameters provided in the assessment and the relevant site constraints.

OEH questioned the location of the Acid Sulfate Soil treatment area adjacent to the proposed wastewater irrigation area. The EA for the proposal noted that the disposal area would be filled and regraded to meet design standard requirements, and that there would be physical separation from the existing Brancourts irrigation area to the north and that the two systems would operate independently.

The Proponent's Preferred Infrastructure Report notes that the system would include design requirements to accommodate the expected irrigation rates but does not provide details relating to the capacity of the receiving environment to accommodate the irrigation rates or the post-treatment nutrient levels. There is also currently a lack of detail surrounding the capacity of the proposed irrigation area to uptake predicted flows and nutrients of the treated effluent, in particular in regards to the cumulative impacts to surface water quality of existing wastewater irrigation activities of the adjacent industry. The effluent assessment, should the system go ahead, has recommended management controls and monitoring procedures in order to minimise potential adverse environmental and human health impacts from the proposed effluent irrigation area.

The Proponent acknowledges that whilst the sewer connection would provide a lower risk solution for the management of wastewater, they consider that connection of the sewer is not currently feasible given the small wastewater loads that are expected to be generated during operation of the TSF. The Department disagrees with this statement, given the proximity to stockpiles of the proposed effluent disposal area, the existing sewerage treatment area from the Brancourts facility, and the cumulative effect upon the receiving environment that will be impacted by increased nutrient levels that may enter the wetland.

Given that the City of Newcastle does not support the effluent system, and that the effluent system including disposal by irrigation will require approval from the City of Newcastle, the Department recommends that the Proponent continue to investigate alternative options including the use of existing sewerage infrastructure in the vicinity of the proposal site. The Department considers that further exploration should be undertaken during the detailed design phase to sufficiently explore this avenue for the disposal of wastewater and has included a condition to this affect.

Should the effluent system be required, the Department has recommended conditions requiring the preparation of plans and monitoring programs consistent with agency and Council submissions, that are relevant to the other measures required for mitigating and managing surface and ground water quality impacts.

Creek Crossings

There are two creek crossings required for the proposal which are associated with establishment of the construction access road across Purgatory Creek and the access road crossing Middle Creek. The Proponent has indicated that the crossings would incorporate new culverts of equivalent hydraulic capacity to the existing crossings. OEH stressed the importance of maintaining the existing hydraulic capacity and waterway area to minimise impacts on aquatic flora and fauna and to maintain existing hydraulic conditions which in turn would minimise impacts on creek geomorphology. The Department agrees with the concerns raised by OEH and has recommended a condition of approval in this regard.

The Department recognises that there is the potential for blockages to occur during the construction of the proposed culvert. Consequently, the Department has recommended conditions of approval which require the Proponent to clear all waterway blockages arising from the construction of the TSF.

Concern regarding the impact crossings on fish passage and aquatic habitats was raised by DPI. To minimise potential impacts on Purgatory Creek and other watercourses that traverse the project area, the Department, in response to concerns raised by DPI, has recommended that:

- all watercourse crossings be designed in consultation with the DPI and that City of Newcastle be consulted on the design of the Purgatory Creek crossing;
- all crossings are to be consistent with the NoW's *Guidelines for Controlled Activities, Policy for Fish Friendly Waterway Crossings* and *Policy and Guidelines for design and Construction of Bridges, Roads, Causeways, Culverts and Similar Structures*;
- riparian areas are to be restored and rehabilitated in consultation with the DPI; and

- the Construction Soil and Water Management Plan to detail the measures to minimise stream hydrology impacts, including measures to stabilise bank structures and details of buffer zones adjacent to waterways.

The Department considers that implementation of the recommended conditions would minimise the potential for the construction and operation of the TSF to have an unacceptable level of impact on the hydrology and geomorphology of local watercourses.

5.2. Ecology

The proposal is located within the Watagan to Stockton “Green” Corridor identified in the *Lower Hunter Regional Strategy*. Kooragang Nature Reserve and Shortland Wetlands are located approximately 4km to the east and 2km to the south of the site. Together, these wetlands are designated as a Ramsar wetland, within the Hunter Estuary Wetlands complex. Locally, the primary habitat connectivity to the site occurs to the south west which is connected to wetland habitats contained within the Hexham Swamp Nature Reserve (refer **Figure 8**).

The EA generally describes the study area as having experienced a long history of impacts from industrial and agricultural land uses, mainly from the coal industry, that included on-site coal stockpiling, infilling of wetlands and drainage lines, construction of tailings ponds, drainage swales and irrigation of waste water effluent. As a result of this disturbance history, the ecological integrity of the site is considered to be generally poor. In addition, existing infrastructure including the Pacific Highway, New England Highway, and the Hexham Industrial area form barriers to habitat and floodplain connectivity to the east and north of the site.

Despite this industrial legacy, the study area contains small patches of isolated remnant vegetation, some of which are listed under the *Threatened Species Conservation Act 1995* (TSC Act). The study area also contains ecological values in the form of three Endangered Ecological Communities (EECs) and SEPP 14 wetlands which are associated with habitat for threatened species.

The proposal has the potential to impact upon flora and fauna within and adjacent to the study area during both construction and operational phases. Direct impacts would be associated with clearing of native vegetation that include EECs and SEPP 14 wetland areas for construction of new buildings, railway tracks and construction compounds, and changes to the hydrological environment associated with flooding. Noise and light spill may also directly impact upon surrounding fauna and habitat.

On-site stockpiling of Acid Sulfate Soils and acid generating material may indirectly impact flora and fauna and habitat via adverse surface water quality leaving the site upon completion of the TSF. Groundwater Dependent Ecosystems that include EECs may be indirectly impacted from the altered hydrological regimes which include impacts from groundwater draw-down and from changes to the frequency and quantity of flood water inundation. Water quality may also be affected by dewatering activities during construction and operation of the facility.

The Department has considered the Proponent's ecological assessment and the supplementary material and is satisfied that the level of assessment is sufficient to enable the Department to form a view of the existing biodiversity values within and adjoining the proposal footprint, and likely extent and significance of impacts associated with the construction and operation of the TSF. Whilst the majority of both direct and indirect impacts on biodiversity will occur during construction, the Department considers that there is an ongoing risk to vegetation communities and the Hexham Swamp Nature Reserve from adverse water quality leaving the site, and groundwater drawdown that may affect Groundwater Dependent Ecosystems.

- *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) survey guidelines for Nationally Threatened Species.

Flora Species

A total of 268 flora species were recorded across the site and 86 of these were introduced species. Targeted threatened flora searches did not identify any threatened flora species within the study area. One threatened flora species, *Zannichellia palustris*, listed as endangered on the TSC Act is considered to have potential to occur on the site but was not recorded during the surveys.

OEH requested further clarification on the targeted flora surveys, and in particular the survey timing and location for *Asperula asthenes* (Trailing Woodruff), *Lindernia alsinoides* (Noah's False Chickweed), and *Maundia triglochinoides* (Small Water-ribbons). A revised ecological assessment has addressed this request and provided justification as to the adequacy of the survey that has been undertaken. It is noted that *Asperula asthenes* is usually recorded in high quality undisturbed riparian areas and near riparian areas containing moist forest to rainforest types on alluvium and that these habitats are not represented within the study area. *Lindernia alsinoides* occurs in swampy sites in sclerophyll forest and coastal heath and neither of these habitats is present on the site. *Maundia triglochinoides* grows in swamps and shallow fresh water on heavy clay and is detectable for most of the year. It usually occurs in high quality habitat with well established native riparian vegetation, which is not represented on the site. In addition, the species would have been flowering when surveys were undertaken making the species easier to detect. Given the lack of suitable habitat for these species to be present, it has been concluded by the Proponent that they have very limited potential of occurring on site.

The Department accepts the justification provided by the Proponent for the targeted flora surveys and is satisfied that an appropriate level of survey has been undertaken to identify these species on the site. However, due to the potential habitat for threatened species to occur within the locality, the Department has recommended a condition of approval requiring the Proponent to develop a procedure for dealing with unexpected finds of threatened species during construction, including stopping works, and implementation of appropriate management measures.

Fauna Species

Fauna surveys identified a total of 168 fauna species, including 9 amphibian species, 128 avian species, 25 mammal species and 6 reptile species. Of these, a total of 20 threatened or migratory fauna species were either recorded or are considered to have potential to occur on the site. A total of 11 threatened fauna species have previously been recorded in the study area with a further 6 considered likely to occur. One threatened species, *Pteropus poliocephalus* (Grey-headed Flying-Fox), was recorded during the field survey undertaken for the proposal.

The study area generally constitutes foraging or intermittent refuge habitat. Several surveys for the Green and Golden Bell Frog have been conducted within the study area over a three year period however the presence of the species has not been detected. At best, wetland habitats within the study area potentially support intermittent movements and foraging by the Green and Golden Bell Frog, although this has not been confirmed with any sightings. The proposal would impact approximately 3.74ha of marginal Green and Golden Bell Frog habitat but 20.89ha of habitat would be conserved in the proposed offset area to the south.

A submission from The City of Newcastle raised the issue of noise and lighting impacts associated with the proposal. The proposal would operate 24 hours per day and as a result there is potential for light spill during evening and night periods. Whilst the study area currently has artificial light encroaching from the east and north via the Pacific and New England Highway during the night, the proposal would create additional night-time light which will potentially modify the habits of some fauna species including microbats, amphibians and nocturnal birds. As the site will be operational on a 24 hour basis, the Proponent recognises the requirement to reduce lighting impacts associated with the proposal. All exterior lighting will be directional and mounted

in a manner to keep light at specific locations so as not to escape or reflect to areas unnecessarily. Overall, the Department considers that artificial light impacts are unlikely to be detrimental to species that use the site.

In its Response to Submissions Report, the Proponent stated that construction and operational noise emissions are predicted to be within relevant guidelines at the closest residential receivers. They concluded that effectiveness of bird and animal calls may be reduced during both construction and operation when these species are located close to the proposal, with the outcome that noise may mask some calls, including distress calls, resulting in higher predation rates. There may also be a reduction in frog breeding activity as breeding males are unable to be heard and attract a mate from external populations, when calling in close proximity of the site. Whilst noise and lighting impacts may locally modify the habits and movements of fauna around the site and site edges, the assessment considers that these changes are unlikely to result in any negative impacts on fauna. Overall, the Department considers that given the marginal habitat, and the disturbance history of the site, the impacts associated with light and noise emissions from the proposal are unlikely to be significant.

To minimise the impacts on fauna species, the Department has recommended a number of conditions in relation to limiting clearing and undertaking pre-clearing surveys, and specific fauna mitigation measures, as well as the requirement to prepare a Construction Flora and Fauna Management Plan which details the measures for managing fauna impacts.

Additionally, although the Green and Golden Bell Frog was not recorded during targeted surveys, there is potential habitat for this species occurring both on site and locally. Consequently, the Department has recommended a condition of approval requiring the Proponent to prepare a management plan outlining the strategies that would be implemented in the event that the species is identified during construction.

Endangered Ecological Communities

The survey identified 4 native vegetation communities present on the site that corresponded to the following 3 EECs and as shown in **Figure 9**:

- Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions;
- Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions; and
- Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions.

The proposal would require the removal of 12ha of native vegetation including 7.74ha of EEC, and would disturb 4.63ha of SEPP 14 wetland No.833 located in the middle of the site. The extent of impacts on vegetation types and corresponding EEC's are presented in **Table 5**. A total of 12.2% of all EEC's located on the site will be impacted by direct clearing.

Figure 9: Endangered Ecological Communities in the vicinity of the proposal

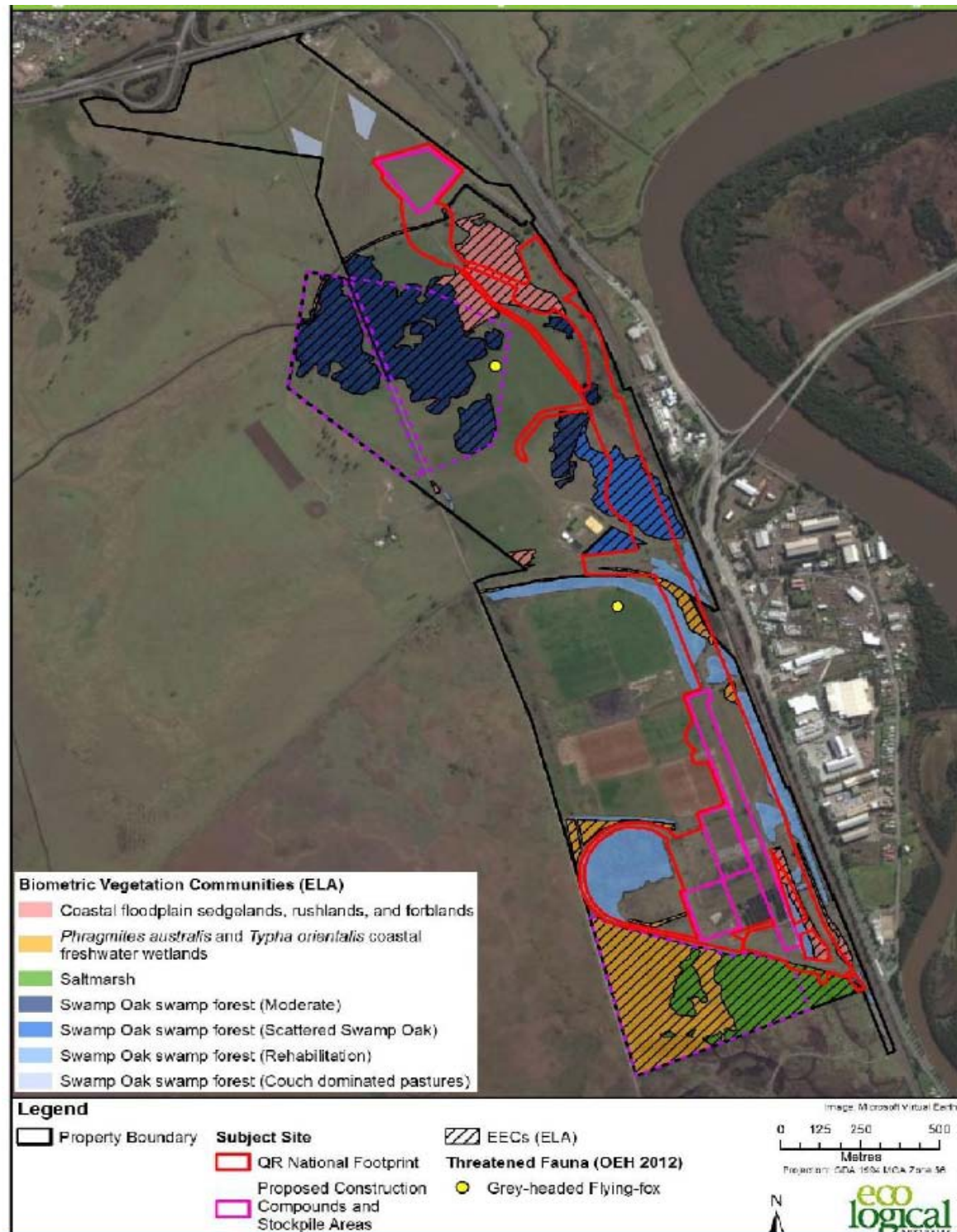


Table 5: Extent of impact of TSF

Biometric Vegetation Type	Area Vegetation Community Impacted (ha)	Corresponding EEC	Area EEC impacted (ha)
Coastal floodplain sedgelands, rushlands, and forbs	2.07	Freshwater wetland on coastal floodplain	2.07
Phragmites australis and Typha orientalis coastal	1.32	Freshwater wetland on coastal floodplain	1.32
Saltmarsh in estuaries of the Sydney Basin	0.35	Coastal saltmarsh	0.35
Swamp oak swamp forest fringing estuaries	8.26	Swamp oak forest on coastal floodplain	4.0
*approx. half of this community meets the definition of an EEC			
Total impacted	12.0 ha		7.74 ha

Impacts to EEC's were raised as an issue in agency and public submissions, including impacts such as clearing, fragmentation and edge effects, changes to the hydrology and increased risk of contamination from the stockpiling of Acid Sulfate Soils and acid generating materials on site.

Although the proposal would result in the clearing of 7.74ha of 3 EEC's, the Department accepts that this is minor in the regional context. The cumulative impact of the proposal and the adjacent ARTC Hexham Relief Roads project is expected to have minimal impact on the region's biodiversity, with less than 4% of the localities total EECs expected to be removed cumulatively. The Department notes that the vegetation to be impacted is fragmented and is not important for the long-term survival of the communities in the locality.

Although the construction of the proposal has the potential to introduce edge effects into new areas, the impacts are unlikely to increase given the recommended conditions of approval. The conditions require mitigation measures such as weed and sediment control, and biodiversity offsets that will extend the connectivity of rehabilitated wetland areas connecting to the Hunter Wetlands National Park.

Groundwater Dependent Ecosystems

The native vegetation communities within the study area, including both terrestrial and wetland communities, are Groundwater Dependent Ecosystems. There are two areas of SEPP 14 wetland within the study area, one located approximately in the middle of the site and the other in the south west corner. The proposal would impact approximately 44% (or 4.63ha) of the wetland in the middle of the site (Wetland No.833). The wetland in the south west corner adjoins the Hexham Swamp Nature Reserve which is part of the Hunter Wetlands National Park. This Wetland would not be directly impacted, although its ecological integrity remains at risk from lack of ongoing management and for the potential to be indirectly impacted by runoff associated with the construction and operation of the proposal. The wetland communities contain wetland species *Phragmites australis*, *Bolboschoenus Caldwellii*, and *Typha orientalis*.

The proposal has the potential to impact upon Groundwater Dependent Ecosystems due to:

- increased velocity and volume of runoff to estuarine areas;
- ponding of stormwater and floodwaters;
- drawdown of groundwater level as a result of infilling; and
- runoff and flooding of stockpiles of contaminated material and acid sulfate soils.

The assessment states that there are no modifications to proposed tidal zones or channels conveying tidal waters. Run-off from minor rainfall events will be channelled through vegetated swales, gross pollutant traps and water quality control ponds before being discharged via one of five discharge points. Two of the discharge locations drain to EECs, No. 2 discharge point will release run off to the Swamp Oak Forest and No.5 discharge point to the Coastal Saltmarsh. With

regard to the Swamp Oak Forest a substantial increase in inundation times could have an impact on species composition, however the modelled increase of inundation from every two years to annual inundation is unlikely to result in such a change. The Proponent believes that with appropriate management and mitigation that significant impact to this community is unlikely.

DPI (Fisheries) raised concern about the potential for an increase in freshwater inputs (stormwater) to impact adjoining saltmarsh areas, and potential change to species composition of this community and other Groundwater Dependent Ecosystems. There is concern that an increase in freshwater inputs would leach salt from the soil and provide conditions for freshwater species to dominate the community.

With regard to the saltmarsh community an increase in freshwater discharge to a saltmarsh environment has the potential to change species composition over time as those saltmarsh species that tolerate freshwater become more dominant. The receiving environment in this case is a 300m long man-made channel that discharges to a broader saltmarsh area that receives freshwater from Hexham Swamp and saline tidal water from a culvert under Maitland Road. Tidal waters inundate the broad saltmarsh area as well as the man-made drain.

The Department accepts that over time there may be changes to the species composition of the saltmarsh within the existing drainage channel as a result of low flow freshwater inputs from minor rainfall events but no changes to the broader saltmarsh area is expected as it will continue to receive tidal flushing. The Proponent has committed to the monitoring of Groundwater Dependent Ecosystems and a protocol will be developed to trigger adaptive management measures should significant changes to the ecosystem occur.

The Department notes that an assessment of impact of Swamp Oak Forest in the proposed offset area has been undertaken to determine if there are any indirect impacts to this community from retention and dissipation of floodwaters. The area of remnant Swamp Oak swamp forest in the north of the study area contains significant biodiversity values, as it contains 682 hollow bearing trees which provide habitat for hollow obligate Microchiropteran bats.

Although the impervious surface area draining to this EEC would increase from 0.3ha to 0.49ha, the additional runoff would be insignificant as the area also receives run-off from the surrounding Hexham Swamp. The assessment determined that indirect impacts to this community would be negligible and that groundwater levels are unlikely to change. The Department is satisfied that the assessment undertaken to determine indirect impacts on the Swamp Oak Forest is satisfactory and supports the findings that the impacts would be negligible.

The Joint Flood Impact Assessment, discussed in **Section 5.1**, clarified that whilst there would be no expected changes to the tidal flushing regime, the volume of freshwater inputs during a one year flood event would increase from 3,200m³ at present to approximately 11,400m³ once the site is developed. During a 10 year event the expected volume would increase from 24,200m³ at present to approximately 34,600m³ once developed. As discussed, design changes such as lowering of the tracks have mitigated much of the associated hydrological impacts however the access road component from the Tarro interchange may introduce indirect impacts to directly adjacent Groundwater Dependent Ecosystems.

The access road would be constructed at a height that allows some of the floodwater to overtop the road however a bridge would also be constructed at Purgatory Creek to ensure cross-flows beneath the road for all rain events. The modelling showed that the larger 1% and 2% floods would inundate the entire area regardless of the presence of a road. However for the 5% event the flood obstruction presented by the road would increase the extent of flooding and result in more ponding of floodwater than would result if the road was not constructed. Whilst most of the area contains exotic vegetation, the increased ponding may affect a patch of Coastal Floodplain Sedgeland vegetation but this would not lead to a long term change in this community.

As discussed previously, the Department notes that the Proponent proposes to treat and permanently stockpile excess Acid Sulfate Soils, and potentially acid generating material and stormwater run-off on site, below the 1% AEP flood level. The Acid Sulfate Soils Management Plan and the Stormwater Management Plan states that this will be achieved via detention basins, swales, floating wetlands and Acid Sulfate Soil management to avoid flows of contaminated water into the Hunter Wetland National Park. OEH acknowledges that this is a high risk approach, and advises the Proponent to investigate off site disposal of Acid Sulfate Soils to reduce these risks.

OEH also noted that whilst steps have been taken to avoid direct discharge of contaminants into the National Park, it suggests an adaptive management approach be undertaken to manage stormwater quality and quantity so that any changes can be appropriately managed.

The Department notes that stormwater can otherwise be appropriately managed but notes that the mobilisation and discharge of sediment and contaminated water into adjacent sensitive ecosystems may occur in the event of a 10% flood or greater. It is the Departments view that the impact of this occurrence will be greatly increased if the Proponent stockpiles Acid Sulfate Soils on-site, and in particular if stored below the 1% flood level.

To ensure that water leaving the site will not impact on Groundwater Dependent Ecosystems, the Department has recommended conditions that specify the management of stockpile sites, including provision for the treatment of Acid Sulfate Soils before stockpiling, and for the soil stockpile to be stored above the 1% AEP. In addition, the Department's conditions include the preparation of a Groundwater Monitoring Program, and water monitoring protocols and adaptive management measures should exceedences of water quality thresholds occur. The Department also recommends that a Surface Water and Groundwater Monitoring Plan be prepared and implemented and that the plan is submitted annually following the completion of construction.

OEH also raised concerns regarding the integrity of surface and groundwater systems to provide ongoing support for Groundwater Dependent Ecosystems and threatened species. A key concern included the potential for impacts on groundwater during construction and whether 'drawdown' may result in creating Acid Sulfate Soils and the potential for adverse water quality leaving the site. In its groundwater technical report, the Proponent concluded that there would be some risk of lowering the water table due to localised dewatering involved primarily during the construction phase. However, the extent of potential drawdown is expected to be limited to areas proximate to the design footprint and is predicted to fall within seasonal groundwater level variations.

The Department notes that potential impacts from groundwater drawdown can be limited by incorporating measures into the detailed design and construction methodology such as limiting the depth of excavation and the extent of dewatering in any one period. Therefore the Department recommends that the Proponent provides details of control measures to minimise drawdown of groundwater within a Construction Soil and Water Management Plan. The Department is satisfied that the Proponent has assessed the potential ecological impacts associated with groundwater drawdown and is proposing measures to prevent impacts from eventuating.

Modifications to existing drainage lines and flooding could impact on groundwater dependent ecosystems. The Proponent states that the proposal is unlikely to impact on the existing water quality of the Groundwater Dependent Ecosystems, including the SEPP 14 wetlands and Hexham Swamp Nature Reserve. To minimise the potential impact on Groundwater Dependent Ecosystems the Department has recommended conditions that require the Proponent to:

- monitor and assess changes to Groundwater Dependent Ecosystems;
- develop and document contingency measures to be implemented if changes to groundwater ecosystems are observed; and
- implement a surface and groundwater monitoring program including the monitoring of surface water quality and groundwater depths and flows, and documentation of the contingency measures that would be employed should adverse impacts on surface or groundwater hydrology arise.

Offset strategy

To compensate for the loss of biodiversity values associated with the clearing of native vegetation, the Proponent has prepared an Offset Strategy including a total of 53.58ha of native vegetation and habitat on-site, with existing Swamp Oak forest and phragmites communities being the key protected areas. Security of the proposed offset area will be managed through a Conservation Management Plan implemented by a Conservation Agreement in accordance with the *National Parks and Wildlife Act 1974* (NP&W Act).

The northern offset site is currently heavily grazed and would require weed treatment and stock management, in addition to re-establishment of native vegetation to return it to Swamp Oak forest. The Proponent states that it will consult with OEH regarding the adequacy of the northern offset site, to ensure the site contains the required ecological values to justify the use of a conservation agreement under the NP&W Act. The Proponent has indicated that if OEH deems this to be insufficient, then a Planning Agreement under the EP&A Act will be entered into.

A BioBanking Assessment has been undertaken in accordance with the *Interim Policy on Assessing and Offsetting Biodiversity Impacts of Part 3A Developments* (DECC, 2010) to calculate the credits required to offset the impact associated with the proposal and the credits generated by the proposed offset (refer **Table 6**). An evaluation of the impacts and offsets was undertaken using the *BioBanking Assessment Methodology* (DECC, 2008). A total of 447 credits would be generated by the offsets for the proposal and 387 credits would be required to offset the loss of vegetation, thus resulting in an overall credit surplus of 60.

Table 6: Credits corresponding to vegetation impacts

Biometric Vegetation Type	Area Vegetation Community Impacted (ha)	Credits required to offset impacts of clearing
Coastal floodplain sedgeland, rushlands, and forbs	2.07	41
Phragmites australis and Typha orientalis coastal	1.32	19
Saltmarsh in estuaries of the Sydney Basin	0.35	7
Swamp oak swamp forest fringing estuaries	8.26	320
*approx. half of this community meets the definition of an EEC		
Total impacted	12.0 ha	387

In response to concerns from OEH regarding changes to saltmarsh species composition, the impact to the saltmarsh communities was recalculated using a more conservative assessment approach. This approach assumed that all of the saltmarsh in the affected drainage channel has a change in species composition. The more conservative approach was undertaken to ensure the saltmarsh credits being generated to determine the requisite offset would account for such a change in composition. Initially the impact to the 0.35 ha of saltmarsh was calculated as requiring 7 credits, which would equate to an offset of 20 credits. The revised and more conservative approach, assuming a worst-case scenario of all saltmarsh being lost, resulted in an additional impact of 0.15ha. This in turn would equate to 3 offset credits, which would mean the balance would still remain in the positive.

OEH stated in its submissions on the proposal that it was generally satisfied that the impacts have been appropriately assessed under the *BioBanking Assessment Methodology* (DECC, 2008) but requested that the tool was re-run to address some operational issues. The BioBanking Tool was re-run and accommodated details of the final design footprint, which results in a surplus of 60 credits. The Department notes that the mechanism for securing and maintaining the offset is being negotiated between the Proponent and OEH.

The Department is satisfied that the ecological impacts associated with the proposal have been appropriately assessed using the BioBanking Assessment Methodology and notes the positive

outcome of surplus credits. To further ensure that the proposed Biobanking site provides the best biodiversity outcomes and that no other offsets are required, the Department has recommended the preparation of a Biodiversity Offset Package in consultation with the OEH and Hunter-Central Rivers CMA, and that this be submitted for the approval of the Director-General. The Package must detail the process for securing the biodiversity values in perpetuity. The Package must also incorporate measures for addressing and incorporating offset measures arising from any changes in biodiversity impacts, and be finalised within 12 months of the commencement of construction.

In addition to the recommendations regarding the protection of threatened flora species, EEC's, biodiversity values and Groundwater Dependent Ecosystems, the Department has recommended the Proponent implement the following measures to minimise impacts on native vegetation:

- develop and implement a Construction Flora and Fauna Management Plan which sets out the mitigation measures for managing impacts to native vegetation (and fauna);
- limit vegetation clearance to no greater than 12 ha, including freshwater wetlands;
- establish "no go" areas at freshwater wetland and coastal saltmarsh sites outside of the construction area;
- undertake pre-clearing surveys; and
- implement measures for the progressive re-vegetation of areas temporarily disturbed during construction.

The Department considers that with the implementation of the measures outlined above, impacts on native vegetation and biodiversity values can be adequately mitigated and / or offset, and should not pose a constraint to approval of the proposal.

The Department is satisfied that the Proponent has considered the ecological sensitivities of the site and incorporated these into the footprint of the TSF and overall proposal. The Department accepts that although there would be loss of native vegetation, including EEC and SEPP 14 wetlands, that the Proponent has avoided and minimised the impact as far as possible through design considerations, has applied suitable mitigation measures and has committed to offset commitments in response to direct impacts. The Department is satisfied that the ecological impacts of the proposal can be appropriately managed and offset such as not to result in significant impacts to surrounding vegetation and broader conservation areas.

5.3. Noise and Vibration

The proposal has the potential to generate noise from on-site activities during construction and operational phases. A noise impact assessment has therefore been undertaken for the proposal in accordance with the following relevant noise guidelines:

- *Industrial Noise Policy* (INP) for operational noise impacts;
- *Interim Construction Noise Guideline* (ICNG) for construction noise impacts;
- *Road Noise Policy* for road noise and sleep disturbance impacts; and
- *Environmental Noise Control Manual* (ECNM) for sleep disturbance considerations.

Vibration was assessed with reference to the *Environmental Noise Management – Assessing Vibration: a technical guide, DIN 4150 Part 3:1999 Structural Vibration: effects of vibration on structures* and *BS 6472 1:2008 guide to evaluation of human exposure to vibration in buildings – Vibration sources other than blasting, 2008*.

The Department accepts these guidelines as the relevant assessment framework for the type of facility proposed, given the proposal would not result in the introduction of increased rail traffic volumes to the network. The *Rail Infrastructure Noise Guideline* (EPA, 2013) (RING) does not apply to the proposal as the guideline states that projects involving maintenance facilities for rolling stock should be assessed in accordance with the INP.

The existing noise environment at residential receptors is considered urban in character and is influenced by traffic noise from the Pacific and New England Highways and the Main Northern Rail Line.

Construction activities would generally be restricted to standard daytime work hours with some works required in non-standard work hours during rail possessions and utility relocations. Construction is expected to extend for a period of approximately 18 months and be undertaken in two stages. Stage one would involve all major earth works and civil works as well as drainage and access arrangements across the site. At the completion of Stage one, at approximately 12 months from the commencement of construction, it is expected that the locomotive provisioning (refuelling) facility would be completed and could commence operation concurrently with the remainder of the construction works (construction Stage two), which would comprise the combined maintenance facility and the laying of ballast and track for the associated railway lines.

The purpose of the proposal is to cater to the demands of locomotive and rolling stock provisioning and maintenance for Aurizon. During the operational phase, it is expected that the site would operate at any time of day on a 24-hour, 7-day a week basis (although not necessarily on a continuous basis). Operational activities that are likely to contribute to the total noise from the site include stationary idling locomotives, moving the locomotives around the site for servicing within the provisioning facility and maintenance shed, train shunting, use of forklifts, hand power tools, truck power off, locomotive washing facility and the wagon placement tractor. Some of these activities would be undertaken within buildings that would act as a noise barrier.

The EA for the proposal included a specialist noise and vibration assessment which assessed potential impacts at nine locations closest to the proposal. These locations were identified as being representative of the nearest surrounding receivers that had the potential to be impacted by noise associated with the proposal and include residential properties, a place of worship, and a school. These locations are identified in **Figure 10**.

Figure 10: Nearest Sensitive Receivers (EA, 2012)



The submission from The City of Newcastle questioned whether the proposal would result in increased train volumes and requested an assessment of associated future noise impacts. In addition, public submissions raised concerns regarding noise generated during the operation of the proposal, in particular train braking noise. As part of its Response to Submissions Report, the Proponent presented a revised noise and vibration assessment which included:

- consideration of cumulative impacts from the concurrent operation of the proposal and the ARTC Hexham Relief Roads project;
- an updated construction noise impact assessment taking into account construction activities associated with the proposal, being crushing and concrete batching; and
- an updated cumulative noise assessment considering updated construction activities and concurrent construction of the ARTC Hexham Relief Roads project.

The findings of the Proponent's revised noise assessment as presented in the Response to Submissions are summarised below.

Operational Noise

The revised operational noise impact assessment was prepared to meet the requirements of the INP which was used to generate project specific noise criteria (intrusive criteria for residences and amenity criteria for land use). The revised assessment found that worst case noise generated during the operation of the TSF would not exceed project specific noise criteria at any of the nearest sensitive receiver locations, as identified in **Table 7**. The revised assessment also indicated compliance with INP sleep disturbance criteria at each of the receivers (refer **Table 8**).

Table 7: Predicted Operational Noise Levels (dB(A))

Receiver Location	Period	Predicted Noise Level LAeq(15 minutes)	Project Specific Noise Criteria LAeq(15 minutes)
R1 – Hain Property	Day	35	46
	Evening	35	46
	Night	35	45
R2 Lynch Property	Day	<35	60
	Evening	<35	50
	Night	<35	45
R3 – New England Highway	Day	45	60
	Evening	45	50
	Night	45	45
R4 – Old Maitland Road (North)	Day	44	45
	Evening	44	45
	Night	44	44
R5 – Old Maitland Road	Day	43	45
	Evening	43	45
	Night	43	44
R6 – Old Maitland Road (South)	Day	42	45
	Evening	42	45
	Night	42	44
R7 – Maitland Road	Day	<35	60
	Evening	<35	50
	Night	<35	45
R8 – Church Old Maitland Road	Day	421	Place of worship internal (when in use) - 40
	Evening	421	
	Night	421	
R9 – Tarro Primary School	Day	<351	School classrooms internal - 35
	Evening	<351	N/A
	Night	<351	N/A

Note 1: External noise levels predicted. As a conservative estimate, the difference between external to internal noise levels with a dwelling comprising of standard construction and windows open for adequate ventilation is 10dB. Therefore, it is expected that at the external noise level predicted, the relevant internal noise criteria would be achieved at R8 and R9.

Table 8: Predicted Peak Noise Levels (Night Time)(dB(A))

Receiver	Predicted Noise Level Night Time LAeq (15 minute)	Sleep Disturbance Noise Criteria LA1 (1 minute))
R1 Hain Property	<45	56
R2 Lynch Property	<45	62
R3 New England Highway	61	62
R4 Old Maitland Road (North)	46	54
R5 Old Maitland Road	51	54
R6 Old Maitland Road (South)	54	54
R7 Maitland Road	49	62
R8 Church Old Maitland Road	N/A	N/A
R9 Tarro Primary School	N/A	N/A

The revised noise assessment predicted that the proposal would not contribute to cumulative operational noise levels at nearest sensitive locations beyond the noise levels predicted to result from the ARTC Hexham Relief Roads project by itself, apart from at one location (R5). At this location, a marginal increase of 1dBA is predicted to result from the proposal above and beyond the noise levels predicted to result at this receiver from the ARTC Hexham Relief Roads project.

The Proponent clarified that whilst the facility would enable more efficient servicing and maintenance of existing train traffic, the facility itself would not result in the generation of additional train traffic on the line. The Proponent has assessed the operational noise impacts of the proposal based on the INP, which the Department accepts as the relevant assessment framework for the type of facility proposed. The proposal would not result in the introduction of increased rail traffic volumes to the network, so the noise assessment framework under the RING or its predecessor the *Interim Guideline for the Assessment of Noise from Rail Infrastructure Projects* (DECC, 2007) (IGANRIP), which require assessment of rail noise associated with increased rail traffic, would not apply. Neither guideline applies to developments involving maintenance facilities for rolling stock (including stabling yards and shunting operations), and therefore do not apply to this proposal. Consequently, the Department is satisfied that the Proponent has applied a suitable assessment approach to the assessment of operational noise associated with the proposal.

The Department is satisfied that the Proponent has undertaken a conservative operational noise assessment in accordance with the requirements of the INP. This has included consideration of applicable meteorological conditions, establishment of project specific noise criteria (intrusive criteria for residences and amenity criteria for land use) based on site monitoring of background noise levels and modelling of representative operational noise scenarios (including shunting operations involving train braking noise).

Based on the assessment undertaken, the Department is satisfied that noise generated by the proposal would not exceed applicable noise criteria at nearest sensitive receivers during the operation of the proposal including sleep disturbance criteria in the night time period. Notwithstanding, at a number of receivers (R3, R4 and R5), noise levels are predicted to being either just below or right on the criteria, including in the sensitive noise time period in relation to sleep disturbance criteria (at R3 and R6). Consequently, the Department has recommended a condition requiring that a noise and vibration compliance assessment be undertaken to confirm the predictions of the noise assessment, within 12 months of the commencement of operation of the TSF. The assessment is required to verify the noise performance of the facility (including peak noise generation during the night time period) and where exceedances are predicted to provide a mechanism for rectifying and providing mitigation to ensure that noise criteria are achieved.

The Department notes that whilst the noise impact assessment detailed impacts to surrounding residential receivers as well as a place of worship and educational land use, potential impacts to recreational space within the Hexham Swamp Nature Reserve have not been assessed. Under the INP, the nature reserve would be classified as a 'passive' recreational area subject to an

'acceptable' noise criteria of 50 dB(A) and 'maximum' criteria of 55 dB(A) when in use. Whilst impacts to the reserve have not been formally assessed, based on the predicted noise levels at other nearby receivers (the maximum noise level being predicted at any receiver being 45 dB(A)), the Department is satisfied that noise levels associated with the proposal would pose a low risk of exceeding the noise criteria applying to the reserve and is unlikely to affect its noise amenity. Notwithstanding, the Department has included a requirement for impacts to the reserve to be confirmed as part of the operational noise verification assessment for the TSF.

With respect to cumulative impacts during operation of the TSF, based on the Proponent's assessment the Department is satisfied that the proposal would not constitute a significant contributor of cumulative impacts to surrounding receivers. Noise contributions from the TSF are not predicted to change the noise levels predicted to result from the ARTC Hexham Relief Roads project by itself, apart from at one location (R5), at which the TSF is predicted to result in a one dB(A) increase above the noise predictions from the ARTC Hexham Relief Road project.

With the cumulative contributions from the TSF and the ARTC Hexham Relief Road project, a noise level of 52 dB(A) at day time and 51 dB(A) at night time at receiver R5 is predicted, which would remain well under the rail traffic noise triggers of 65 dB(A) and 60 dB(A) under the IGANRIP assessment framework (which the ARTC Hexham Relief Road project is subject to). No change to peak noise levels (sleep disturbance criteria) are predicted as a result of cumulative contributions from the two proposals.

The Department is satisfied that the cumulative contribution from the TSF would not lead to adverse noise outcomes for the ARTC Hexham Relief Road project. Notwithstanding, the Department has required that cumulative contributions from the TSF be confirmed as part of the operational noise verification assessment for the facility.

Construction Noise

The construction noise assessment predicted noise levels at nearest sensitive locations under four representative construction scenarios: road construction; demolition, clearing and drainage; rail works; and building works, with concrete batching and crushing added to the relevant combination of plant and equipment modelled for each scenario. The revised construction noise assessment was found to not exceed relevant noise management levels under the ICNG at sensitive receiver locations under any of the construction scenarios, during standard construction hours. The only exception to this is a predicted exceedance of 2 dB(A) at receiver location R6 during the construction of rail works, due to the use of the tamping machine (machine used to pack the track ballast under railway tracks).

With respect to cumulative construction noise, the Proponent's revised assessment predicts that noise generated from the concurrent construction of the proposal and the ARTC Hexham Relief Roads project would comply with noise management levels for standard construction hours at all assessment locations with the exception of the following:

- R2 – exceedance of 4 dBA during road construction for the ARTC Hexham Relief Road project;
- R5 and R6 – exceedance of 9-10 dBA during demolition and clearing works for the ARTC Hexham Relief Road project;
- R5 and R6 – exceedance of 4-6 dBA during rail works (significant contribution by both projects); and
- R5 and R6 – exceedance of 1 dBA during building works (significant contribution by both projects).

The Proponent has committed to the preparation of a Construction Noise Management Plan, which would include requirements to monitor and implement mitigation measures where construction noise goals are exceeded. Considering that minimal exceedances of the relevant noise management levels are expected during standard construction hours, the Department considers the management approach proposed by the Proponent to be appropriate.

The construction noise assessment undertaken for the proposal was limited to an assessment of potential noise impacts during standard (daytime) construction hours. The Proponent has indicated that assessment would be undertaken, and approval to undertake work outside of normal construction hours would be sought from the relevant authorities, when required. The Department considers that, as the Proponent has stated that out of hours works will be required during rail possessions and utility relocations, this matter must be considered and management measures put in place, in readiness for these events. The Department has therefore recommended a condition that the Proponent prepare and implement a management plan for each rail possession where construction works are being undertaken, which includes the following minimum requirements:

- a description of the works to be undertaken;
- a justification for the works to be undertaken;
- timing and duration of the possession;
- an out-of-hours work protocol for the assessment, management and approval of works outside of standard construction hours;
- a construction noise impact statement; and
- a consultation and notification process for affected sensitive receivers.

Whilst the assessment indicates compliance with the relevant noise management levels under the ICNG guidelines for the majority of receivers (with the exception of receiver R6, where a 2 dB(A) exceedance is predicted), the Department notes that significant exceedances are predicted when accounting for cumulative construction activities with the ARTC Hexham Relief Road project. In addition, the Department notes that there would be a period when construction activities for the proposal would occur concurrently with the operation of the provisioning facility (for approximately the last 6 months of construction), which could lead to additional cumulative noise impacts during the construction phase. Based on the exceedances predicted for cumulative construction activities during standard construction activities, the Department considers that similar exceedances may occur during works outside of standard construction hours.

To ensure that construction impacts associated with the proposal are appropriately defined prior to the commencement of construction and adequately managed during the construction phase, the Department has recommended a detailed framework of conditions requiring:

- a detailed Construction Noise and Vibration Management Plan to be prepared, which includes consideration of cumulative impacts and the period of construction when concurrent operation of the provisioning facility would occur, procedures for notifying sensitive receivers of construction activities, and a program and procedures for construction noise and vibration monitoring;
- consideration of impacts to surrounding land use including the Hexham Swamp Nature Reserve (which as with the operational noise assessment was not formally assessed by the Proponent's construction noise assessment) and other sensitive land use such as the church and schools, including specific measures to minimise disruption of these land uses in consultation with these receivers. Measures may include the provision of respite or the scheduling of high noise generating activities outside of sensitive periods agreed to between parties; and
- scheduling of construction activities and determination of mitigation measures in consultation with Proponents of other construction works, with consideration of concurrent and cumulative impacts (including coordinated community consultation and response to complaints, where possible).

Given the duration of construction works, concurrent construction activities associated with the ARTC Hexham Relief Road project, and requirement for periods of works outside of standard construction hours, the Department accepts that there is likely to be periods of adverse construction noise at surrounding receivers. However, with the implementation of the conditions framework as proposed, the Department is satisfied that the construction noise impacts of the proposal can be appropriately managed such as to not result in significant construction noise impacts for the duration of the works.

Road Traffic Noise

The assessment of road traffic noise was confined to traffic noise on the New England Highway as access from the highway to the TSF would be via a private access road (that would be constructed as part of the proposal). As per the requirements of the Road Noise Policy, traffic noise on private haulage roads is required to be assessed under the INP, and this noise source was included in the operational noise assessment undertaken for the proposal.

Given existing daily traffic volumes on the New England Highway (approximately 52,000 annual average daily traffic in 2011), the Proponent's assessment identified that the additional traffic generated by the proposal during construction (an additional 340 vehicles per day at worst case) and operation (an additional 106 vehicles per day at worst case), would result in a negligible change to existing traffic volumes or existing road traffic noise levels. The Proponent has committed to the preparation of a Construction Noise Management Plan, which would be implemented to ensure the proposal is compliant with construction noise goals and to identify measures for controlling noise and vibration. The assessment indicated that even considering cumulative traffic generated from the ARTC Hexham Relief Road project, negligible changes to existing road traffic noise levels would be expected.

Vibration

The Proponent's assessment identified that during construction the nearest vibration generating construction activities (vibratory rolling during access road construction) would occur within 215 m of residence R3. At this distance a peak particle velocity level of <0.1 mm/s is predicted, which is predicted to be below the level of human perception and cosmetic damage.

During operations, the major potential for vibration is predicted to be from slow moving trains on the proposed tracks. Vibration from this source is predicted to result in a peak particle velocity level of <0.3 mm/s at a distance of 26 m from the rail line. The closest residential receivers to train tracks associated with the proposal are located approximately 138m at R6 (New England Highway properties). At these distances operational vibration levels from the proposal are predicted to be below the level of human perception and cosmetic damage.

The Proponent's assessment concluded that given the existing separation distances to nearest sensitive receivers, vibration generated during the construction or operation of the proposal (even considering cumulative impacts from the ARTC Hexham Relief Road project) would be below relevant criteria for both human perception and cosmetic damage.

Based on the Proponent's assessment the Department is satisfied that road traffic noise and vibration generated by the proposal during construction and operation would pose a low risk of exceeding relevant criteria or posing significant impacts. Therefore, the Department has focused its assessment on the operational and construction noise impacts of the proposal.

5.4. Traffic and Access

Site Access

Existing vehicular access to the site is provided via the New England Highway / Woodlands Close intersection, and Woodlands Close. The existing New England Highway / Woodlands Close intersection only provides for left-in and left-out vehicular movements and has limited sight distance for traffic travelling west because of the railway overpass, which the RMS considers to be a safety concern.

To the west of Woodlands Close is the Tarro Interchange, a grade separated interchange which provides local access to Tarro and Beresfield from the New England Highway. The existing access arrangements to the site are shown in **Figure 11**.

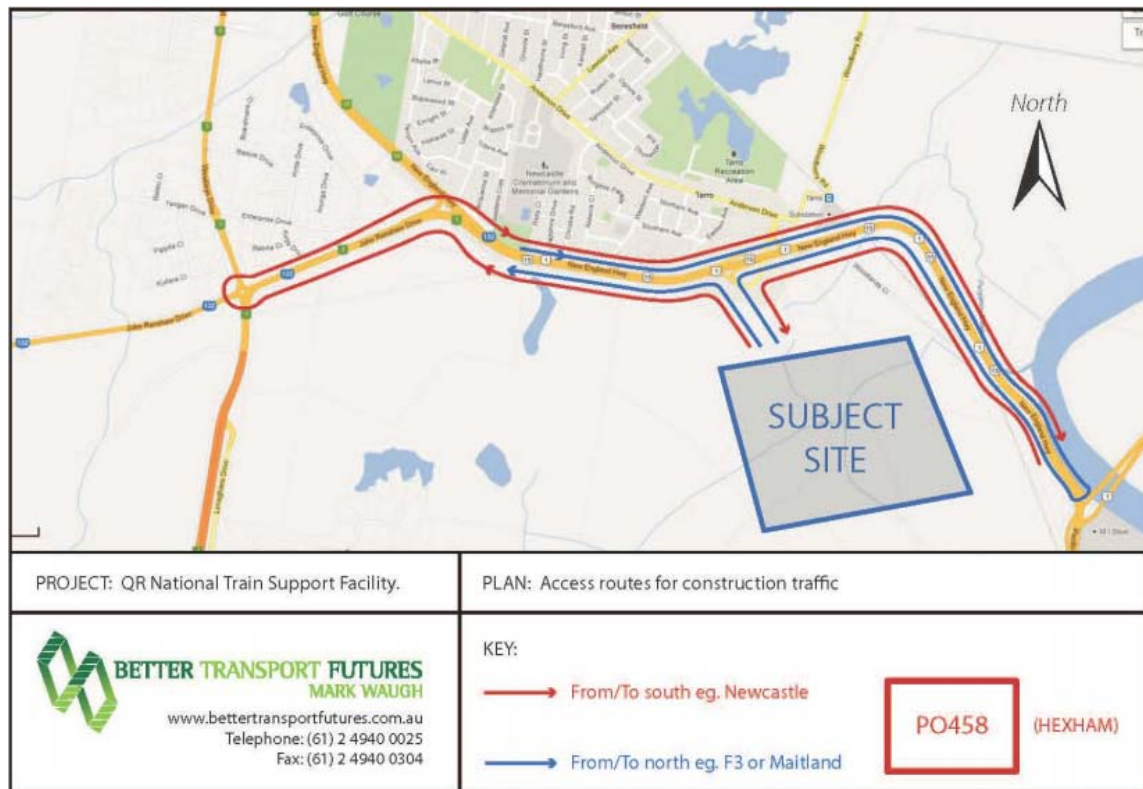
Figure 11: Existing Site Access

Vehicle access to the proposal will be via a new access road connecting to the Tarro Interchange. New site access arrangements would comprise:

- a new T-intersection connecting to the Anderson Drive intersection with the New England Highway (referred to as the Tarro Interchange); and
- a new private haulage road from the T-intersection to the site.

The new T-intersection and private haulage road would be constructed as part of Stage one of the proposal. During the period of construction of the new T-intersection and site access road (approximately 12 weeks), access to the road construction works would be provided via the existing intersection between the New England Highway and Woodlands Close. The movement of vehicles in and out of the site via Woodlands Close for this work would be undertaken in accordance with a Traffic Control Plan, prepared in accordance with the RMS *Traffic Control at Worksites* manual. The Proponent has identified that it may be necessary to require the closure of the left hand lane on the New England Highway with an appropriate speed reduction zone. This would be subject to a separate approval process through Council.

For the remainder of the construction period and ongoing operation, site access would be provided via the new T-intersection and private haulage road. Construction workers will enter and exit the site via the new access point on the Tarro Interchange as will materials and plant movement. It is expected that peak movements would generally occur before the morning peak hour on the adjacent road network and in a similar manner the majority of construction staff would leave the site following the afternoon peak on the New England Highway. The New England Highway east and west bound would provide the primary access to vehicles accessing the site as shown in **Figure 12**. The proposed new T-intersection and private haulage road would also service vehicles associated with the ARTC Hexham Relief Roads project.

Figure 12: Site Access Via the New England Highway During Construction (Source: EA, 2012)

The internal roads associated with the TSF will be designed in accordance with Council requirements. All roads will operate under a posted speed limit of 60 km per hour to the site access, and will then reduce speed internally in accordance with site specific requirements.

It is considered that all construction workers vehicles will be able to park off the public highway and as such this matter has not been given further consideration. Dedicated on-site parking will be provided in marked parking bays in accordance with Australian Standards. Up to 50 parking spaces will be provided on site during operation of the facility.

The alignment of the new access road to the site would cross the proposed alignment of the Richmond Vale Rail Trail, a combined pedestrian and cycleway proposed by Council to be located within Hunter Water Corporation land in a north-south direction. The alignment of the new access road would also skirt the northern boundary of the proposed M1 Freeway to Raymond Terrace upgrade from John Renshaw Drive to the Pacific Highway at Heatherbrae, where the M1 Freeway upgrade proposes to cross the Great Northern Railway. The location of the new access road with respect to these future proposals is shown in **Figure 13**.

Figure 13: Location of New Site Access Road (Source: EA, 2012)

RMS raised no objection to the proposed access arrangements including proposed new intersection connection to the Tarro Interchange and made a number of recommendations in relation the construction of the road works (including requirement for construction traffic management plans, the use of the New England Highway / Woodlands Close intersection only during the roadwork's construction period, and potential impacts to the proposed M1 Freeway extension). The OEH submission requested that the proposal design not preclude future plans for the Richmond Vale Rail Trail. City of Newcastle made recommendations in relation to construction traffic management plans, the new access road being retained as a private road, and road dilapidation surveys of roads proposed to be used during construction. Potential traffic delays and intersection performance were also raised as concerns in public submissions.

The Department has assessed the site access arrangements proposed and considers these to be acceptable as it would result in less disruption to traffic on the New England Highway and provide

for safer traffic movements than if the existing New England Highway / Woodlands Close interchange was utilised. The use of the existing left-in left-out intersection has the potential to result in queuing at the intersection with flow on effects on the New England Highway and would potentially encourage unsafe movements into the highway. A dedicated site access for traffic via a new intersection is therefore considered to provide a more favourable traffic outcome and the Department notes that the new access arrangements are supported by the RMS.

RMS recommended the incorporation of conditions requiring site access via the existing New England Highway / Woodlands Close intersection to be limited to the construction period of the new road works only (approximately 12 weeks) and that site access be switched to the new intersection and access road after this. The Department supports this requirement and has incorporated recommended conditions in this regard.

It is acknowledged that there is the potential for construction heavy vehicle movements to impact on the integrity of Woodlands Close and the Tarro Interchange. Consequently, the Department has recommended a condition of approval which requires the Proponent to undertake road dilapidation assessments of these roads prior to and upon completion of construction. In the event that damage has occurred, the Proponent is required to restore or reinstate the roads to the satisfaction of the relevant road authorities. The Department has also recommended that the Proponent be required to repair any road pavement failures arising from construction traffic movements no later than 48 hours following notification by the relevant road authority, to ensure that the safety of other road users is not compromised.

In addition, to ensure that the new site access road is designed with consideration to the future proposals for the Richmond Vale Rail Trail and the M1 Freeway extension, the Department has recommended conditions requiring that any changes to the M1 Freeway to Raymond Terrace upgrade concept design, necessitated by the road proposal would be at the Proponent's cost and that the proposal design not preclude the location of the future Richmond Vale Rail Trail. These requirements are consistent with the recommendations of the RMS and OEH.

Traffic Impacts

A specialist traffic impact assessment was undertaken as part of the EA to assess the potential of the proposal to generate additional road traffic during construction and operation, and associated impacts on road network function and intersection performance. The traffic impact assessment also considered cumulative impacts with the adjacent ARTC Hexham Relief Road project and the proposed future M1 Freeway to Raymond Terrace upgrade.

The traffic assessment identified that during the 18 month construction period, peak traffic generation would occur during an approximately 2-4 month period. This peak would be associated with the proposed civil works including the importation of fill to provide a level platform on which to construct the rail formation and buildings. Peak traffic generation was predicted to be in the order of 380 movements per day or 190 vehicles (comprising 70 light vehicles and 120 heavy vehicles), refer to **Table 9**.

Table 9: Construction vehicle movements

	<i>Daily number of vehicles</i>	<i>Total two-way movements</i>
Light vehicles	70	140
Heavy vehicles	120	240
Total movements	190	380

Assuming similar traffic generation by the ARTC Hexham Relief Roads project, cumulative traffic generation during peak construction was estimated to be in the order of 760 movements per day. The traffic assessment identified that of these 760 movements, 150 movements per day (on week days) would comprise construction vehicle personnel entering the site prior to 7.00 am to commence works and exiting the site after 6.00 pm following the completion of works. The traffic

assessment included intersection performance modelling of the upgraded Tarro Interchange during the AM and PM peaks and concluded that at these traffic volumes, the intersection performance would remain at an acceptable level (level of Service of A or B) with no significant queuing delays resulting as a result of cumulative traffic from the proposal and the ARTC Hexham Relief Roads project.

Outside of peak periods, the assessment identified that remaining traffic generation volumes (610 movements per day) would be spread over the primary delivery periods of between 9.00am and 3.00pm. This would equate to some 102 vehicle per hour on average (or 51 vehicles entering and 51 vehicles exiting per hour) during peak times. The assessment identified that outside of peak hours, traffic flows on the New England Highway are approximately 1,000 vehicles per hour less than the flows during the peak periods, indicating significant spare capacity for additional traffic movements. On this basis, the assessment concluded that the additional traffic generated during cumulative construction of the proposal and the ARTC Hexham Relief Roads project would not significantly impact on the performance or capacity of the New England Highway.

To manage construction traffic impacts during the construction phase so as to minimise disruption to road traffic, pedestrians, infrastructure and surrounding receivers, the Department has recommended a range of conditions including the requirement for a detailed Construction Traffic Management Plan to be prepared in consultation with relevant road authorities. The Construction Traffic Management Plan would detail measures to be implemented in relation to traffic control, pedestrian access and minimising traffic disruptions. A recommendation has also been made for pre-and post-construction dilapidation surveys of public roads used by construction traffic to assess and where required remediate any damage to these roads resulting from construction related traffic. The Department is satisfied that with the implementation of these recommended conditions, the construction traffic impacts of the proposal can be managed consistent with acceptable standards.

During the operational phase, the assessment predicted that the proposal would generate approximately 106 vehicle movements per day (comprising 30 staff vehicles, 3 fuel deliveries and 20 other delivery vehicles). This would equate to 53 in bound and 53 out bound movements a day and approximately 3 vehicles per hour on average (based upon a typical 8 hour day for the delivery of supplies), refer to **Table 10**. Staff would work on a shift basis which would reduce the peak demand on the adjacent road network. Based on existing traffic volumes on the New England Highway (approximately 52,000 annual average daily traffic), these volumes were considered unlikely to result in significant traffic impacts on the public road network and the Tarro Interchange intersection would continue to operate at a level of service of A with minimal delays and congestion.

Table 10: Traffic flows associated with the proposed operational phase of the TSF

Demand	Number per day (inbound and outbound)	Total per day
Staff	30	60
Fuel	3	6
Delivery vehicles	20	40
TOTAL	53	106

The Department is satisfied that the Proponent has undertaken a conservative traffic assessment considering cumulative impacts from the ARTC Hexham Relief Road project, including a worst case construction scenario for both developments experiencing bulk material delivery and peak vehicle movements simultaneously. Based on the Proponent's assessment, including the modelling of intersection performance based on cumulative peak traffic predictions, the Department is satisfied that traffic generated during the construction of the proposal is unlikely to significantly affect intersection performance or road network function on the New England Highway. Given existing traffic volumes on the New England Highway (approximately 52,000 annual average daily traffic), the Department is satisfied that the traffic volumes generated by the

proposal are unlikely to significantly affect the capacity of the highway during construction and notes that worst case volumes would be limited to the peak construction period of up to around 4 months with traffic volumes expected to be much lower for the remaining construction period. Furthermore, traffic volumes are expected to be lower than predicted during the peak construction phase, with peak construction periods between the proposal and ARTC Hexham Relief Road project likely to overlap for a limited period only.

Given that traffic volumes are predicted to be approximately the equivalent of some 3 vehicles per hour during operation of the facility, the Department is satisfied that the proposal would not pose a significant disruption to traffic (including road capacity or intersection performance) during the operational phase. Whilst the Proponent's traffic assessment did not include formal assessment of potential cumulative impacts from operational traffic associated with the ARTC Hexham Relief Roads project, the Department is satisfied given the low volumes of operational traffic generated by the Development in comparison with existing traffic volumes that the TSF would not significantly contribute to cumulative traffic volumes.

5.5. Heritage

Historic Heritage

The Proponent prepared a Statement of Heritage Impact on items of historic heritage significance. The assessment was prepared in accordance with the guidelines for *Assessing Heritage Significance and Statement of Heritage Impact* (NSW Heritage Office), and the Australia ICOMOS Burra Charter.

The site has a long European history in association with local coal mining and rural industries. The site and has been associated with the coal industry from 1857 following construction of a railway to carry coal from Minmi Mines to the Hunter River at Hexham. Past activities on the site relating to the transport and treatment of coal provides an association with the Australian and State Heritage Themes of Mining, Transport, Industry and Technology, while the association with the historic coal magnate John Brown links it to the heritage theme of "Persons". The area has enjoyed public interest indicating social significance. Although of less historical significance, the site has been used for agricultural and dairying purposes since the 1830s. Agriculture provides an association with the State Heritage Themes of Pastoralism and Agriculture.

Despite the previous removal of most of the railway infrastructure on site, highly significant evidence relating to the early history of the area remains in the form of a rail corridor and the former Control Cabin and Bath House (refer to **Figure 14**). Remnants of a number of other built structures are located on the site, including:

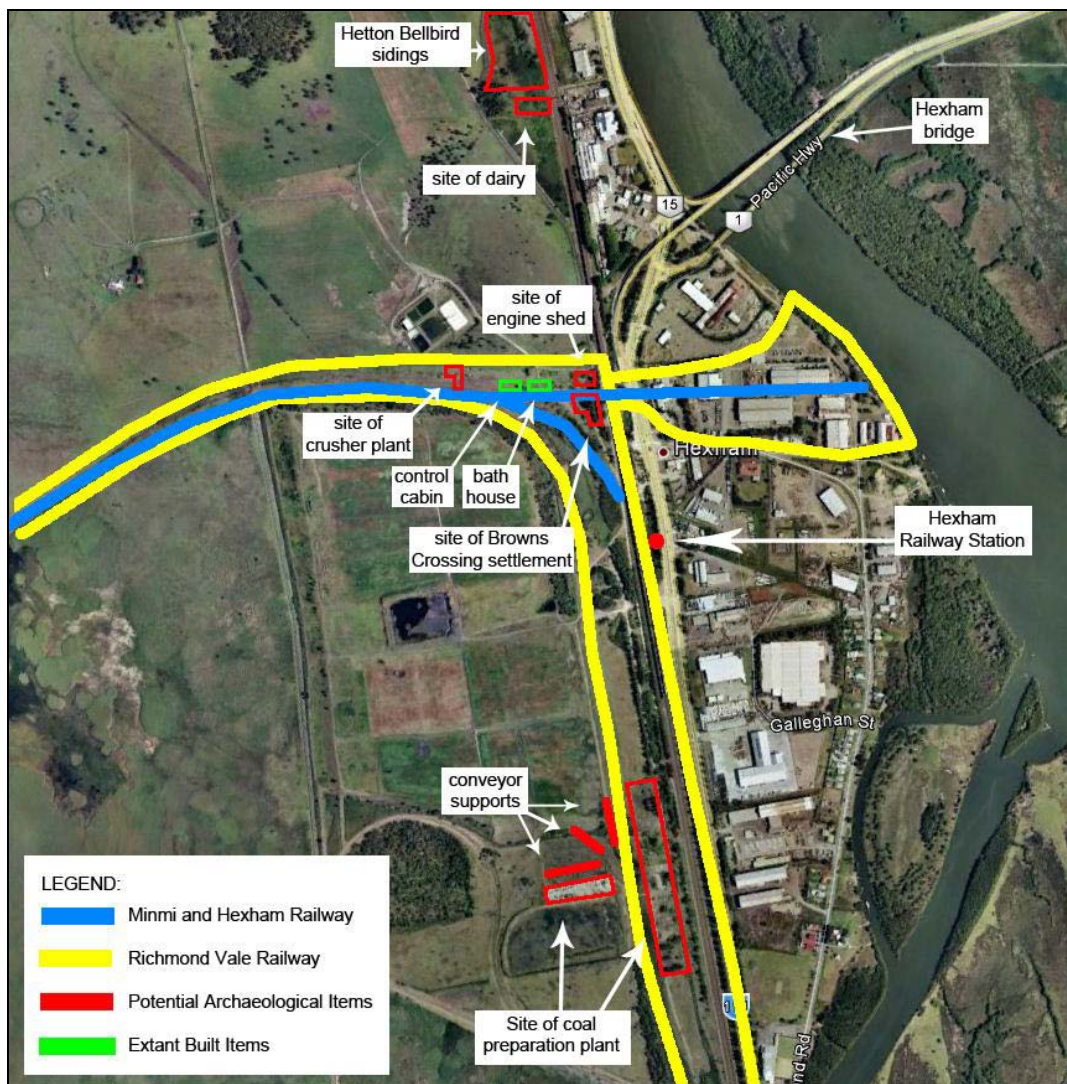
- remains of a coal conveyor belt and stockpile support footings;
- ruins of the Hetton Bellbird weighbridge hut and associated sidings and coal loader;
- former dairy milking shed, feed shed, milking machine hut and concrete feed silos; and
- a narrow portion of the former Richmond Vale Railway, which are remnants of the Minmi and Hexham Railway.

The above structures are in ruinous or poor condition, some having been burned and vandalised, with the exception of the concrete feed silos which are in good condition. The assessment identified that the proposal would necessitate the disturbance, concealment or removal of a range of built items, including the Hetton Bellbird sidings; the dairy; the Control Cabin; the Bath House; Brown's Crossing; the conveyor supports; and the coal preparation plant. In addition, some remnant items of track work would be removed. None of these are individual Heritage Items, except the Minmi to Hexham Railway, which is an Item of Environmental Heritage listed as having Local significance in the *Newcastle LEP 2012*. Two structures, the Control Cabin and the Bath House, are within the curtilage of the former Richmond Vale Railway. The report noted that both structures, however, have been degraded into ruins due to vandalism, malicious damage and neglect.

The assessment concluded that the proposal would have very minimal inherent impact on the heritage values of the site. While all or part of several items associated with previous uses may be removed, these have a very restricted level of significance, and their loss would not be detrimental due to their current ruinous condition. The heritage assessment also noted that in heritage terms, the site is suitable as it would preserve and enhance the historical connection to the former river port of Hexham and the early Proponents of the railway. As the proposal would re-introduce rail-based activities similar to those that came to an end with the closure of the Richmond Vale Railway in 1987, the proposal has the potential to increase the values of the site in this respect.

The Proponent has committed to the re-use of relics such as clean, undamaged bricks from the Control Cabin and remnant track work, as appropriate, for landscaping and / or signage activities within the site to preserve links between the past and future uses of the place. Due to the history of the site, there is a high probability of the discovery of relics associated with the settlement of Brown's Crossing and with the operation of steam locomotives during construction. As such, the Proponent has committed to implementing practical measures for the protection of any relics or heritage items discovered during construction works. The Proponent has also committed to the preparation of a Construction Non-Indigenous Management Plan and appointment of an Excavation Director to oversee excavation within the vicinity of the Minmi and Hexham Railway who will advise on heritage matters, compliance with proposed unexpected finds protocols and conservation of heritage items.

Figure 14: Sites of redundant structures, and Hexham railway platform and bridge over the Hunter River (Source: EJE Heritage, August 2012)



Whilst the Proponent's heritage assessment and Statement of Heritage Impacts did not include formal assessment of potential cumulative impacts from impacts associated with the ARTC Hexham Relief Roads project, the Department is satisfied that the report has assessed each of the built structures and their remnants remaining on the site, and their connection to the broader Hexham area, as well as noting the potential for unidentified relics on the site.

Following exhibition of the EA, the Heritage Council of NSW suggested four additional commitments should be included, requiring the preparation of an Interpretation Plan as an addendum of the Construction Heritage Management Plan; endorsement of the Excavation Director; the preparation and endorsement of an archaeological research design and methodology should archaeological excavation be required as part of the proposed works; and preparation of a final archaeological report at the end of archaeological works.

Given that the proposal would not necessitate the removal of any listed Heritage Items and that particular aspects of the proposal have the potential to respect or enhance the significance and former use of the site, the Department is satisfied that the proposal would not pose a significant impact to historic heritage during construction or operation of the facility. To ensure heritage items and discovery of unidentified relics on the site are in keeping with the recommendations of the Heritage Council, the Department has recommended the following conditions:

- prior to commencement of pre-construction and construction activities, prepare an Archaeological Assessment in accordance with the Heritage Council's *Archaeological Assessments Guideline*, and should the assessment identify areas of potential archaeological resources prepare a historic archaeological investigation program;
- undertake an Interpretation Plan for the site; and
- prepare and implement a Construction Heritage Management Plan to detail how construction impacts will be minimised and managed.

Aboriginal Heritage

The Proponent undertook an Aboriginal heritage assessment to determine the potential for Aboriginal heritage sites within the study area and to assess the likely impact of the proposal.

The following sequence of assessments and reviews have been undertaken with regards to Aboriginal heritage relevant to the proposal:

- the Proponent undertook an Aboriginal Heritage Impact Assessment in 2011 as part of the EA for the proposal;
- ARTC undertook an Aboriginal Heritage Impact Assessment, including archaeological test excavations, in 2012 as part of the EA for the Hexham Relief Roads project;
- the Proponent revised its assessment in August 2012 to take into account the findings of the ARTC Hexham Relief Roads project assessment, and incorporated this into the EA for exhibition from November to December 2012;
- a peer review of the Proponent's assessment and the ARTC Hexham Relief Roads project's assessment was undertaken in December 2012, on behalf of the Proponent; and
- the Proponent's Preferred Infrastructure Report prepared in April 2013, included an addendum to the assessment provided in the EA and the peer review.

Proponent's initial assessment

A search of the OEH AHIMS register revealed that 93 known Aboriginal sites are currently recorded within a 10 km radius of the study area. Within the local area, previous assessments within a similar environmental context indicate that, within a well-watered context, there is high potential for archaeological material to be present on level, typically well-elevated natural landforms that provide ready access to low-lying waterlogged areas and the associated resources located there. The majority of sites within the area appear to contain low-moderate artefact densities situated on elevated landforms. No sites have been identified within Hexham Swamp itself. The assessment identified that given the Hexham Swamp area is a floodplain prone to regular flooding, the locality would have been unsuitable for past occupation. However, whilst very limited occupation would have occurred in the northern floodplain portion of the site, this area

would have provided resources for hunting and gathering via the elevated natural landforms surrounding the site that would also have been more suitable to habitation.

As part of the assessment, a survey of the site was undertaken with representatives from 2 of the 3 registered Aboriginal parties in the area (Awabakal Traditional Owners Aboriginal Corporation and Awabakal Descendants Traditional Owners Aboriginal Corporation). No sites were identified during the field survey. The assessment noted that the potential for identifying archaeological evidence may have been hindered due to a number of reasons including the geomorphic history and flood prone land rendering the area unsuitable for previous occupation, poor visibility due to vegetation cover of extensive pasture grass and / or disturbances from past site uses.

For the purposes of the assessment, the site was divided into two portions: northern and southern, both of which have been highly disturbed by past land uses. The assessment found that significant alterations to the landscape following European settlement was likely to have disturbed and / or destroyed any evidence of past occupation on the site. In relation to modern alterations to the landscape, it was noted that the installation of the Hexham Swamp flood gates has significantly altered the area. The use of the northern portion of the site for agricultural land uses were expected to have had low to moderate impacts upon the archaeological record and to have displaced any cultural materials that may have been present. As such, it was expected that only isolated finds and / or very low density artefacts scatters may be found.

Although no heritage sites were identified on the site as part of the assessment, the Hexham Swamp area was found to be of very high cultural significance to the Awabakal people as it was well resourced by both the wetlands and the Hunter River and, based on cultural knowledge, was well suited to a high degree of recent Aboriginal hunting and gathering activity. Due to the high significance to the Awabakal people, the northern portion of the site was identified as a Cultural Potential Archaeological Deposit (PAD) (refer to **Figure 15**).

The Proponent's assessment noted that due to geomorphic processes across the floodplain, as well as previous human and natural disturbances, any cultural materials that may be present on the site were expected to be highly disturbed and those that may have been present no longer exist. It was considered that the Cultural PAD identified by the Proponent would be impacted through the construction of the access road and a section of the TSF.

ARTC's assessment of adjacent site

A separate assessment undertaken for the ARTC Hexham Relief Roads project included test excavations on an alluvial plain near the margins of Hexham Swamp and confirmed the disturbed nature of the proposed access road and swamp. This survey identified an artefact scatter site (HS1, AHIMS site # 38-4-1478; Refer to **Figure 15**) along a constructed track and spread across surrounding areas within the ARTC Hexham Relief Road site. On the basis of the materials observed along the access track, the heritage assessment purported the potential for Aboriginal heritage material below the surface in the vicinity of HS1 and designated the area as a PAD. However it was later confirmed by Hunter Water that the shell fragments found in the southern part of the site were brought in as fill material. Shells found at HS1 were confirmed as having also been brought into the area from elsewhere, rather than being associated with artefactual stone material of HS1, and were not considered indicative of the local Aboriginal archaeology.

Test excavation identified two artefacts near Purgatory Creek (HS2) (Refer to **Figure 16**), which were recovered from disturbed contexts and considered to be a background scatter of stone artefacts. It was considered that the two artefacts did not represent long-term cultural activities that would result in extensive in situ archaeological sites. It is noted that an additional cultural site was identified by the Aboriginal stakeholders during the assessment to the south of the proposal.

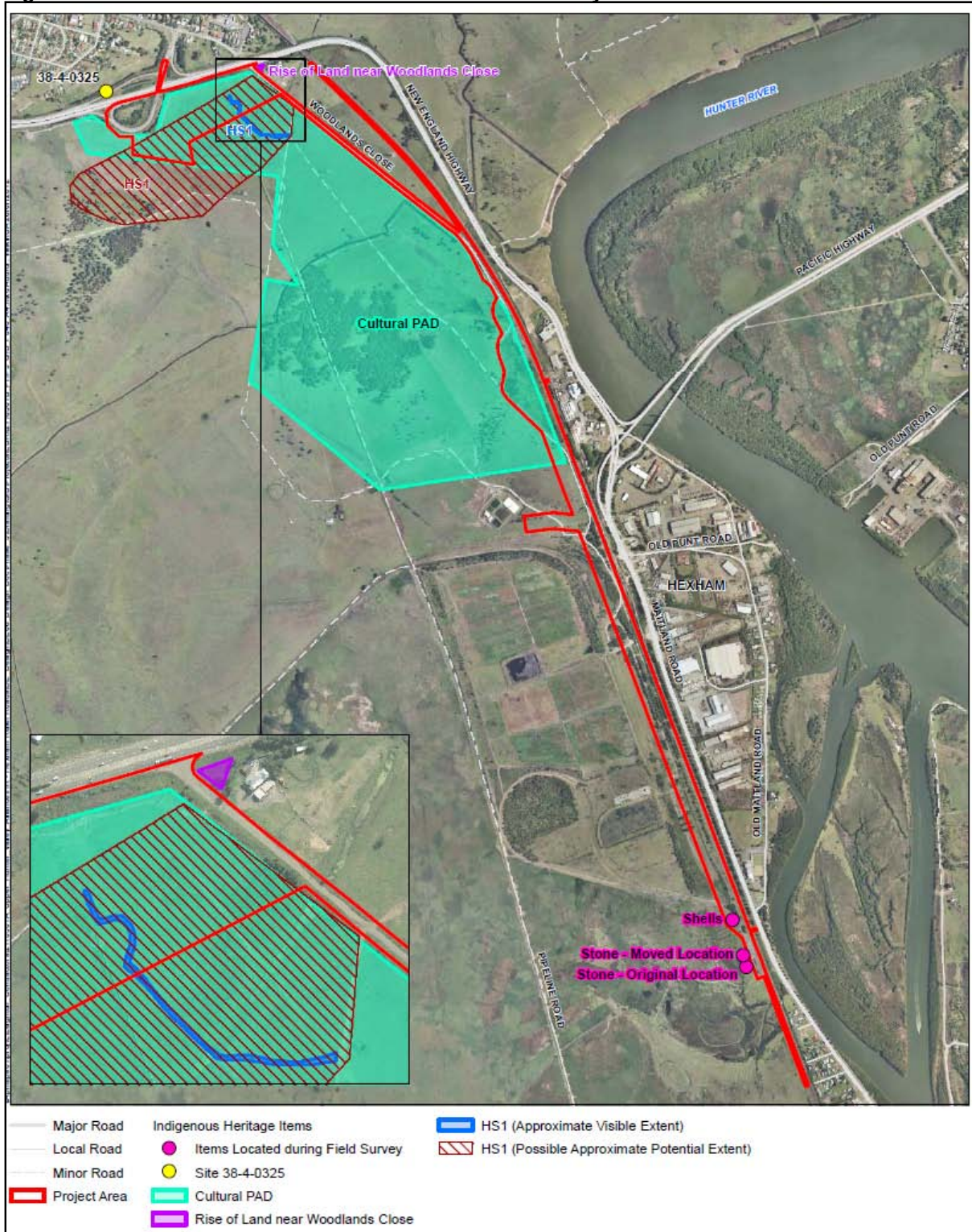
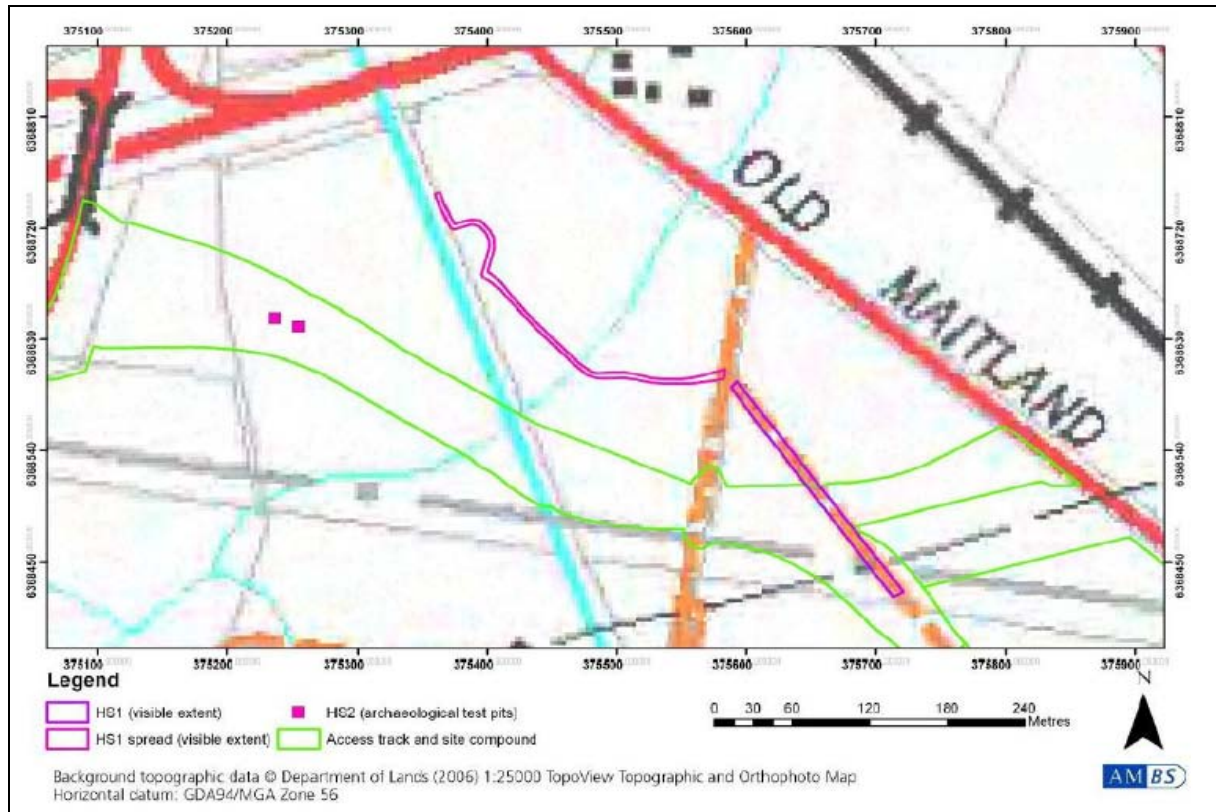
Figure 15: Cultural PAD and Cultural Sites within the Study area

Figure 16: Location of sites HS1 and HS2

Peer review

The peer review of the assessments was commissioned by the Proponent in December 2012. The review concluded that the Proponent's assessment was a detailed report which satisfied the requirements of archaeological assessment in NSW. The review found the field survey undertaken by the Proponent to be adequate for the assessment and in compliance with relevant guidelines and archaeological best practice. The review concluded that no significant archaeological objects exist on the site and that all impacts to archaeological objects (such as HS1 or the disturbed fluvial deposit) as a result of the proposal would be low. The review questioned the identification of the Cultural PAD, noting that there was no scientific data to support the classification. The review found that in archaeological terms, the area has no integrity, no research potential, no significance and is not rare.

The peer review concurred with the Proponent's findings which stated that no in situ archaeological deposit was likely to exist on the site, and went on further to state that the identification of the PAD associated with site HS1 was incorrect as there was no scientific data to support the identification of a PAD on the site.

Based on the findings, the peer review concluded that in an archaeological context, it was not possible to conclude that an intact deposit would exist within the floodplain of the site. The review stated that, therefore, no mitigation or further assessment (including test excavations) was necessary or warranted.

Preferred Infrastructure Report

In response to the exhibition of the EA, OEH recommended that the results of additional sub-surface archaeological investigations for the PAD along the shared access route should be undertaken and provided as part of the assessment process. OEH raised concern regarding the lack of evidence of ongoing consultation, suggesting that the consultation process for the assessment was incomplete.

Following changes in the design of the proposal, test excavations were undertaken in early 2013 in the vicinity of the proposed temporary construction access road linking the Tarro Interchange to Woodlands Close and the primary construction compound. The assessment and excavations were undertaken in consultation with registered Aboriginal stakeholders, and the consultation process included site surveys / inspections and provision of reports for comment. The Proponent's revised report concluded that as a result of the proposal:

- the surface expression of site HS1 would not be impacted on;
- the majority of the HS1 / PAD would not be impacted on. The only portion to be impacted on would be the eastern section where the access road would be placed;
- the majority of the Cultural PAD would not be impacted on. The only portion that would be impacted on would be where the access road would be placed; and
- the cultural site identified by Aboriginal stakeholders is not a registered archaeological site, however the Aboriginal stakeholders would be given the opportunity to collect the objects prior to works.

The Proponent's revised report therefore updated the recommendations to mitigate potential impacts to cultural heritage from the proposal. These measures included:

- preparation of an Aboriginal Cultural Heritage Management Plan, to cover all activities during the construction and post construction phase of the proposal;
- education of all staff, contractors and others involved in construction and maintenance related activities in the legislative requirements for protecting sites and places of significance, including induction into cultural awareness;
- the involvement of the registered Aboriginal parties in an Aboriginal Cultural Heritage Management Plan and the ongoing management of the Aboriginal cultural materials of the site;
- a cultural awareness program included as part of the site induction program and developed with the registered Aboriginal stakeholders; and
- if the surface expression of HS1 will be impacted upon by any future development, an AHIP would be required.

The Proponent's assessment further concluded that the cumulative impact to Aboriginal heritage as a result of proposed development in the area would be limited, as:

- the net development footprint (i.e. the area of direct impact) would be small and would not affect a high proportion of any particular landform present within the region;
- a comparable suite of landforms (swamps and swamp margins) that are expected to contain a similar archaeological resource occur in multiple contexts within the local area;
- all high density deposits identified to date occur outside the proposal footprint;
- the site HS1 has been subject to long term past land use impacts that have resulted in a disturbed landscape and consequently lessened the representative value of the archaeological resource;
- the placement of the proposal within a low-lying swamp and disturbed context, centres cumulative impacts to areas of lower archaeological potential;
- no part of the surface expression of site HS1 would be impacted upon;
- only a small portion of the potential sub-surface expression of site HS1 may be impacted upon; and
- the majority of the Cultural PAD will remain undisturbed, and the Cultural PAD has been subject to long term past land use impacts that have resulted in a disturbed landscape and consequently lessened the representative value of the cultural resource.

The Department has assessed the potential impacts to Aboriginal cultural heritage from the proposal, and considers that the assessment was undertaken in an appropriate manner and satisfies the requirements of archaeological assessment in NSW. The assessment appropriately employed a regional approach, taking into consideration both the landscape of the study area

(geomorphology, landforms, water resources, soils, geology etc), the regional archaeological patterning identified by past studies, as well as incorporating cultural knowledge.

In light of the reduced potential for sensitive archaeological objects being located on the site, due to patterns of likely previous occupation within an active fluvial environmental context of the Hexham swamp / floodplain landform, and significantly disturbed landscape of the former coal preparation and stockpiling activities, the Department is satisfied that the potential impacts to aboriginal cultural heritage of the proposal and the cumulative impacts with that of the neighbouring ARTC HRR project has been conservatively assessed.

The Department notes that the potential archaeological record of the site is limited by the low-lying environment in the north and the highly disturbed context in the south of the site. Although there is conflicting scientific views relating to the identification and relative significance of cultural heritage items and areas within the site, and the basis upon which identification of the HS1 site and PAD was formed is incongruous with the scientific findings of the Proponent's report, the Department nevertheless notes that the surface expression of site HS1 would not be impacted and that the majority of the HS1 / PAD and Cultural PAD would not be impacted by the proposal. Given this, and as the proposal would not necessitate the disturbance of any previously identified or significant Aboriginal cultural heritage sites, the Department is satisfied that through implementation of the proposed mitigation measures the proposal would not pose a significant impact to Aboriginal cultural heritage during construction or operation.

In addition to the management measures recommended by the Proponent, the Department has recommended that the Proponent prepare a Construction Heritage Management Plan which addresses the measures to be implemented to minimise and manage construction impacts on Aboriginal heritage and includes procedures for:

- dealing with previously unidentified Aboriginal objects, including cessation of works;
- managing the discovery of confirmed or potential human remains;
- details of management measures to be carried out in relation to Aboriginal heritage;
- ongoing Aboriginal consultation and involvement for the duration of the construction of the proposal; and
- heritage training and induction.

This recommendation is consistent with the recommendations of the OEH and includes the requirement for ongoing consultation with Aboriginal stakeholders, and stop work procedures in the event of unidentified Aboriginal objects or discovery of human remains.

Additionally, the Department has recommended a suite of requirements to ensure consideration of all Aboriginal heritage issues during design, construction and operation of the proposal, including:

- liaising with registered Aboriginal stakeholders, in particular in relation to sites HS1 and HS2;
- impacts to Aboriginal objects shall, where feasible and reasonable, be avoided and minimised;
- provision for registered Aboriginal stakeholders to collect surface artefacts at sites HS1 and HS2 and shell material at the southern end of the site; and
- erect a protection zone around the rise of land around Woodlands Close during pre-construction to prevent incursion into the area as it is not a designated construction zone.

Overall, the Department considers that the construction of the proposal would not have a significant impact on known Aboriginal sites and areas of archaeological potential. In addition, the Department considers that the Proponent's mitigation measures, strengthened by the Departments requirements provide an appropriate framework to manage potential impacts during construction.

5.6. Other Issues

The Department's consideration of other issues associated with the proposal is presented in the following **Table 11**.

Table 11: Other Issues associated with the Proposal

Issue	Department's Consideration
Soils	The EA for the proposal included a Geotechnical Investigation, a Preliminary Contamination Assessment, a Remediation Action Plan, an Acid Sulfate Soil Management Plan, and a Stormwater Management Plan. Collectively, these documents assess the impact of the proposal on soils at the site. The construction of the proposal has the potential to cause erosion of soils within the site, particularly during excavation activities, which may cause adverse impacts for receiving environments through increased levels of turbidity and sedimentation. As previously discussed, the Department has included conditions of approval that require a management and treatment framework for Acid Sulfate Soils to be included within relevant monitoring and management plans. In addition, the Department has provided conditions for the stockpiles to be located above the 1% flood event, to further minimise the potential for interaction with flood water, unless otherwise agreed by the Director-General. The Department supports the recommendations of the Geotechnical Investigation that excavation into the surface crust will be avoided where possible to avoid exposing underlying softer soils. The EA included an Effluent Disposal Assessment, which outlined the mitigation measures required to address effluent disposal impacts. The mitigation measures involve alterations to the soil of the irrigation area including addition of lime to maintain plant growth, addition of gypsum to improve the soil structure and reduce dispersion and erosion. Wastewater utilisation must ensure that the soil is able to absorb the nutrients, salts, hydraulic load and organic materials in the solids or liquids. The Department requires the Proponent to monitor the irrigation rates, nutrient balance and soil capacity to quantify impacts from the use of treated wastewater for irrigation can be sufficiently mitigated so as not to adversely affect the chemistry of soils and groundwater at the site, and to further investigate the opportunities to dispose of wastewater from the site to sewer through reticulated means. The Proponent has committed to implementing standard erosion and sediment controls consistent with the principles set out in Landcom's <i>Managing Urban Stormwater: Soils and Construction</i> to manage and mitigate this impact. The Department considers this an appropriate measure which has been reinforced in the recommended conditions of approval. In addition, the Department has recommended that the Proponent prepare and implement a Construction Soil and Water Quality Management Plan which details how construction activities would be managed to mitigate and minimise erosion and sedimentation.
Soil Contamination	A Preliminary Contamination Assessment (PCA) was undertaken to assess past and present contaminating activities, report on site conditions, and provide a preliminary assessment of site contamination. The PCA identified soil, surface water, and groundwater impacts that would require management as part of the proposal. The PCA made a number of recommendations to identify and manage potential contamination at the site, including the requirement to undertake further investigations and the preparation of a Remediation Action Plan (RAP). A RAP was subsequently prepared that outlines remediation and management measures for contaminated soils during the construction of the proposal. The RAP identified potential sources of contamination including hydrocarbon contamination

Issue	Department's Consideration
	soils, asbestos containing materials in soil, and contaminated fill materials. The RAP has recommended additional investigations around the TSF footprint where the tracks would be lowered, and around drainage basins one and three. An updated RAP was prepared that includes findings of additional investigations and a revised remediation strategy. The RAP outlines each area of contamination identified at the site that requires management, including the following: • former underground storage tank area (total petroleum hydrocarbons (TPH)); • a hot spot at TP532 (TPH and polycyclic aromatic hydrocarbons (PAH)); • fill materials (TPH); • Woodlands Close fill (TPH and PAH); • hazardous building materials (asbestos); and • miscellaneous stockpiles of waste. The Department accepts the level of assessment undertaken to date and recommendations made in the RAP and revised RAP. The Department supports the recommendations to undertake additional investigation to further delineate contamination in these areas. Due to the extensive volume of soil to be excavated and proximity to land of environmental value, the Department recommends that the further investigations outlined in the RAP are undertaken prior to the commencement of construction to confirm the presence of contaminants on site. An updated RAP should be prepared to document the proposed remediation and management of these areas. The Department has further recommended that a Validation Report be prepared by a suitably qualified contaminated land consultant at the completion of the remediation to verify that the site has been remediated in accordance with the RAP. Any unexpected contaminated material that is encountered during the construction works would be managed in accordance with the RAP and the Validation Report updated as necessary. The Proponent has indicated that ballast, chitter and tailings within the existing rail corridor may be reused in the construction of the proposal. There is the potential for such materials to be contaminated and consequently the Department's recommended conditions of approval require the testing and classification of such materials prior to reuse. The Department has also recommended that the Proponent prepare a Construction Contamination Management Plan which sets out the procedures for sampling and testing of the materials that will be excavated at greater depths (due to the amended project design) as well as for ballast, chitter and tailings. The Department has also recommended that the Plan include contingency measures in the event of the discovery of contaminated soils and a procedure for updating the RAP to address the remediation of such soils.
Visual Amenity	The Proponent has undertaken a visual assessment that considered the visual context of the site and surrounding land uses. Apart from the Hunter Wetlands National Park, the site is considered to have low scenic value due to its history of industrial activities including coal preparation and storage. The proposal would comprise buildings that would be a maximum of 2 storeys in height. The Proponent has proposed to mitigate visual impact by using low reflective materials on the external cladding of the buildings and through various landscaping treatments. Public views to the proposal would be predominantly screened by existing vegetation along the New England Hwy and the industrial land to the east. Views from the north would be limited to motorists using the New England Hwy. The Department accepts the conclusion that the site has low scenic value given the existing land use and surrounding land uses, and considers the proposed mitigation measures to be appropriate. The Department has further recommended

Issue	Department's Consideration
	conditions including the retention of existing vegetation and providing landscaping and screen vegetation to minimise visual impacts, and consideration of external lighting as a potential nuisance.
Waste	The EA included a Waste Management assessment that considered the waste reduction principles under the NSW <i>Waste and Resource Recovery Strategy 2007</i>. The assessment identified the waste generating activities and waste types that would be generated during both the construction and operational phases of the proposal. During construction, wastes would be generated from the excavation, construction of buildings, road and rail infrastructure works, drainage works and equipment operation and maintenance. The majority of waste would be classified as General Solid Waste (in accordance with DECCWs <i>Waste Classification Guidelines</i>). Small amounts of Hazardous Waste, including solvents, oils, and batteries, would also be generated from the operation and maintenance of construction equipment. Once the facility is operational, wastes would include machinery parts, used rags, oils, scrap metal, empty paint cans, chemical containers, used lubricating oil, batteries, lighting equipment and engine oil. Wastes such as paper, cardboard, glass and used cartridges would also be generated from office activities. The Proponent has proposed to manage waste generated during construction with the preparation and implementation of a Construction Waste Management Plan. The Plan would be developed in accordance with OEH Guidelines and would include specific procedures to minimise exposure to contaminated soils and hazardous waste storage. A Waste Handling Strategy has also been proposed that outlines storage locations and disposal methods for each waste type. The Department accepts these measures and is satisfied that the expected construction and operational wastes have been identified and that appropriate procedures have been proposed to manage the wastes. The Department has recommended conditions requiring the Proponent to maximise the reuse and / or recycling of waste materials generated on site. Any material being disposed off site must first be assessed and classified according to the <i>Waste Classification Guidelines</i> (DECCW, 2009) and appropriately tracked to a waste management facility. In addition, the site must not receive any waste generated outside the site, unless a licence has been obtained under the <i>Protection of the Environment Operations Act 1997</i>. The Department has also recommended that the measures for managing waste generated during construction and maintenance be addressed in the Construction Environmental Management Plan and the Proponent's existing operational environmental management system.
Air quality	The Proponent has provided a qualitative Air Quality Impact Assessment which assessed the potential air quality emissions associated with the construction and operational phases of the proposal. An updated Air Quality Impact Assessment was prepared as part of the Response to Submissions report to address design amendments to the proposal including the following: • excavation of approximately 125,000-150,000m³ of soil; • crushing and screening of excavated soil for reuse on site; and • on site concrete batching plant. The updated assessment indicated that the activities associated with the proposal would be irregular and of a short duration and were not expected to have long-term health or ecological impacts beyond the site boundaries, hence a quantitative assessment was not undertaken. The updated assessment indicated that there would be an increase in the predicted emissions of particulates associated with excavation, operation of a

Issue	Department's Consideration
	crusher, and concrete batching plant, but there would also be a reduction in the emissions from truck movements associated with delivery of concrete to the site. The Proponent has proposed mitigation measures to manage fugitive dust emissions during construction. The Proponent has also proposed specific mitigation measures for the concrete batching plant and crushing and screening plant which include locating the plant at least 50 m from an environmentally sensitive location and 100 m from any residential dwellings, dampening sand and aggregate before it is transported to the site, and incorporating various covers, filters and cleaners to contain fugitive dust in the design of the plant. The Department considers that standard on-site measures to minimise the potential for fugitive dust emissions during construction are sufficient. Notwithstanding, given the close proximity of residences to the south of the proposal and commercial and industrial premises to the east, the Department has recommended conditions of approval requiring the Proponent to: • undertake all works with the objective of minimising visible dust emissions; • implement control measures, including the cessation of works, in the event of visible dust emissions; • detail the measures to manage dust in a Construction Environmental Management Plan; and • implement a Construction Complaints Management System to respond to complaints, including those relating to dust.
Greenhouse gases	A greenhouse gas (GHG) assessment was undertaken, which quantified carbon dioxide (CO₂) and other non-CO₂ emissions associated with the proposal. The GHG emissions were assessed in terms of potential direct emissions (Scope 1), potential indirect emissions (Scope 2) and significant upstream / downstream emissions (Scope 3). The assessment indicated that GHG's would be generated for a short period during the construction phase but would be insignificant. The Proponent has proposed to adopt a variety of practices to assist in the reduction of GHG emissions during construction. These practices include regular maintenance of vehicles and scheduling work to minimise vehicle idling time on site. The Department accepts the assessment as sufficient and supports the practices that would be adopted to reduce GHG emissions during construction. The operation of the facility would result in a minor increase in the generation of GHG's, primarily from the on site use of diesel. Overall the estimated emissions are less than 0.001% of the NSW emission total and are considered to be negligible.
Socio-economic impacts	An Economic and Social Impact Assessment has been undertaken for the EA. The demographic data produced for the assessment was based on the 2006 Australian Bureau of Statistics Australian Census. The data revealed an overall increase in population across all age profiles for Hexham and surrounding suburbs, which indicates growth in the area in recent periods. The growth supports the justification for increased infrastructure and employment opportunities. The data revealed a higher unemployment rate compared with the NSW rate which further supports the need for increased employment opportunities that could be created through developments such as the proposed TSF at Hexham. The <i>Hunter Valley Coal 2007-2012 Capacity Strategy</i> (ARTC, 2007) identified problems that needed to be resolved in the NSW and interstate rail network including the need for greater efficiency, capacity and reliability. By proposing to service and maintain locomotives away from the Port, the proposal would be consistent with the strategy and would assist with alleviating congestion at the Port of Newcastle and enhance capacity of the Hunter Valley rail network.

Issue	Department's Consideration
	The proposal would reduce costs, minimise track time and improve reliability for the Proponent. These benefits would in turn drive down coal haulage prices and increase the competitiveness of the market. The opening up of the coal haulage market to competition would be the principle economic benefit of the proposal. Indirectly the proposal would improve the capacity and efficiency of the existing port facilities through freeing up land that is currently used for train servicing. The assessment identified that the proposal would create ongoing full time equivalent employment for 30 persons and construction employment of up to 75 jobs. The construction phase would also result in induced consumption and production impacts in the economy through the payment of wages, and purchase of construction materials and products. The assessment outlines two levels of impact; firstly, impacts on the neighbouring and adjoining communities and environment, and secondly, impact on the much wider community and economy. The assessment found that the proposal would have a net positive economic benefit for the local, regional and national communities. The Proponent would mitigate any negative impacts by adopting a strategy of proactive engagement and communication with surrounding and adjoining residents. The Department acknowledges the positive economic impact associated with the proposal and that the majority of the negative socio-economic impacts on the surrounding local community would be temporary during the construction phase. The Department accepts the measures of community and local resident engagement that are proposed during the construction phase to mitigate these impacts. Permanent environmental impacts, including the loss of wetland and EECs, would be mitigated through the implementation of offsets that would be managed and conserved in perpetuity. The Department has recommended conditions with regard to noise, air quality, visual amenity, property damage, access, external lighting, and landscaping to minimise negative impacts on surrounding properties.

6. RECOMMENDATION

There is an increasing need for additional train servicing and maintenance facilities, to service the Proponent's growing coal freight business in the Hunter Valley, and to also minimise rail congestion and improve efficiency in the transport of coal to market. The objective of the Hexham Train Support Facility is for the Proponent to relocate and re-establish its current train provisioning facilities outside of the Port to free up port land for port related activities, and to expand its own rail servicing capacity.

The Department has undertaken a detailed assessment of the proposed Hexham Train Support Facility, having regard to the Proponent's EA and Preferred Infrastructure Report. In assessing the proposal, the Department has also considered the views of State and local government authorities and the public, as raised in their submissions during and post exhibition of the EA.

The Department is satisfied that the Proponent has undertaken a robust and conservative assessment of the impacts of the proposal and that the impacts can be managed and / or mitigated through design or other management measures to an acceptable level. Based on its assessment, the Department considers the key environmental issues associated with the proposal to be flooding, surface and groundwater hydrology, ecology, noise (particularly construction noise), construction traffic and access, and heritage. In order to manage potential impacts that may arise to an acceptable level, the Department has recommended stringent conditions of approval which require not only that mitigation measures be implemented, but that monitoring also be undertaken to confirm compliance and impact predictions as well as provide a trigger for the implementation of contingency measures, as required.

The Department has also recommended conditions of approval for environmental management, including requirements to prepare a Construction Environmental Management Plan and incorporate environmental performance and management measures for the operation of the facility into the Proponent's existing environmental management system. The Department believes that these requirements would provide for the implementation of best management practices during both the construction and operation of the train support facility.

The Department considers that on balance the proposal is justified on the basis that it is an integral component in the upgrade of the coal freight network and is in the public's interest.

Based on the above assessment, the Department recommends that the Project be approved subject to the recommended conditions of approval.



Karen Jones 1/10/13
A/Director
Infrastructure Projects

Chris Wilson
Executive Director
Development Assessment Systems and Approvals

APPENDIX A ENVIRONMENTAL ASSESSMENT

See the Department's website at <http://majorprojects.planning.nsw.gov.au>.

APPENDIX B SUBMISSIONS

See the Department's website at <http://majorprojects.planning.nsw.gov.au>.

APPENDIX C PROPONENT'S RESPONSE TO SUBMISSIONS

See the Department's website at <http://majorprojects.planning.nsw.gov.au>.

APPENDIX D RECOMMENDED CONDITIONS OF APPROVAL
