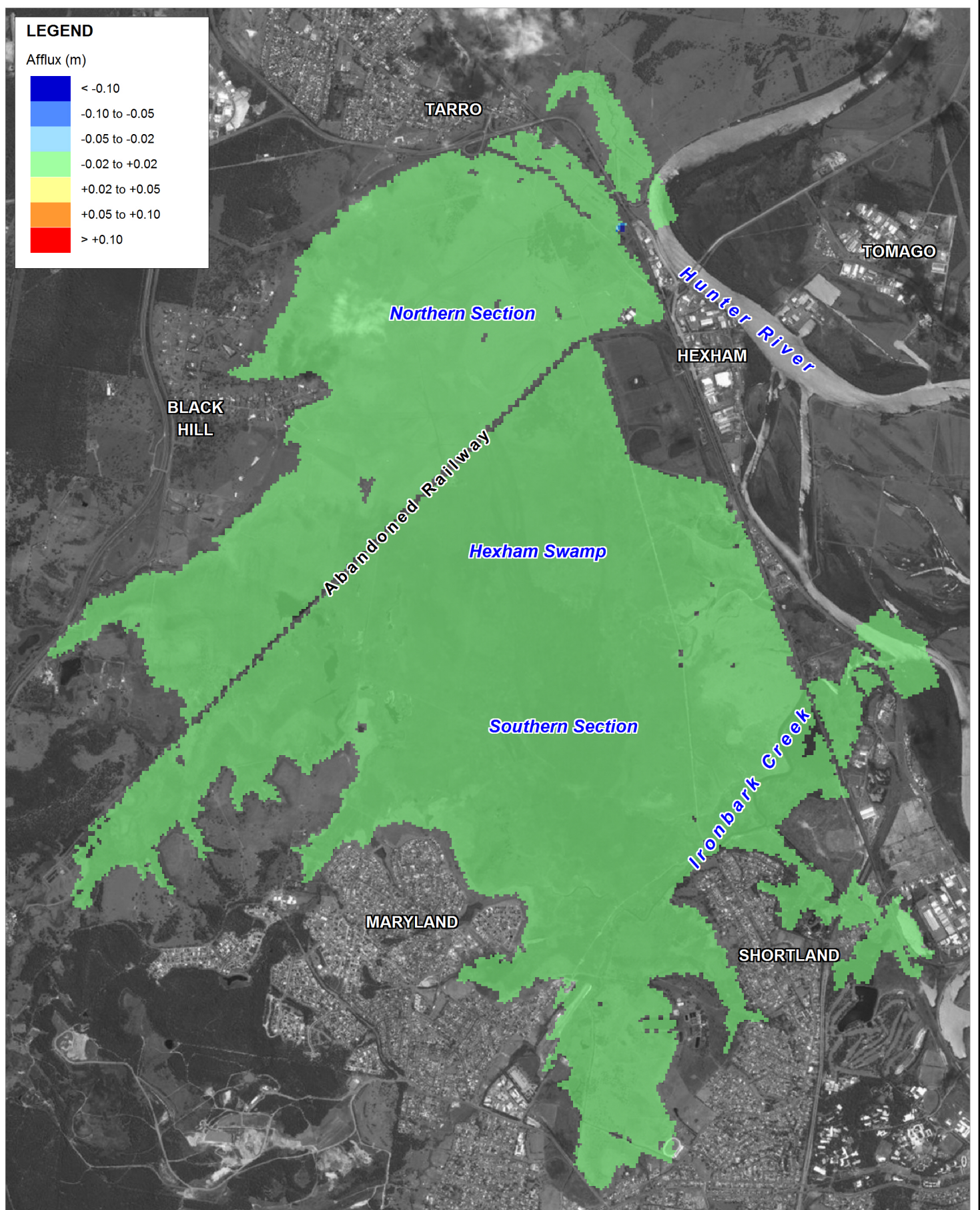




Title:

Impact on Peak 10% AEP Flood Level Local Catchment Flood Conditions

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



0 1 2km
Approx. Scale

Figure:

C-7

Rev:

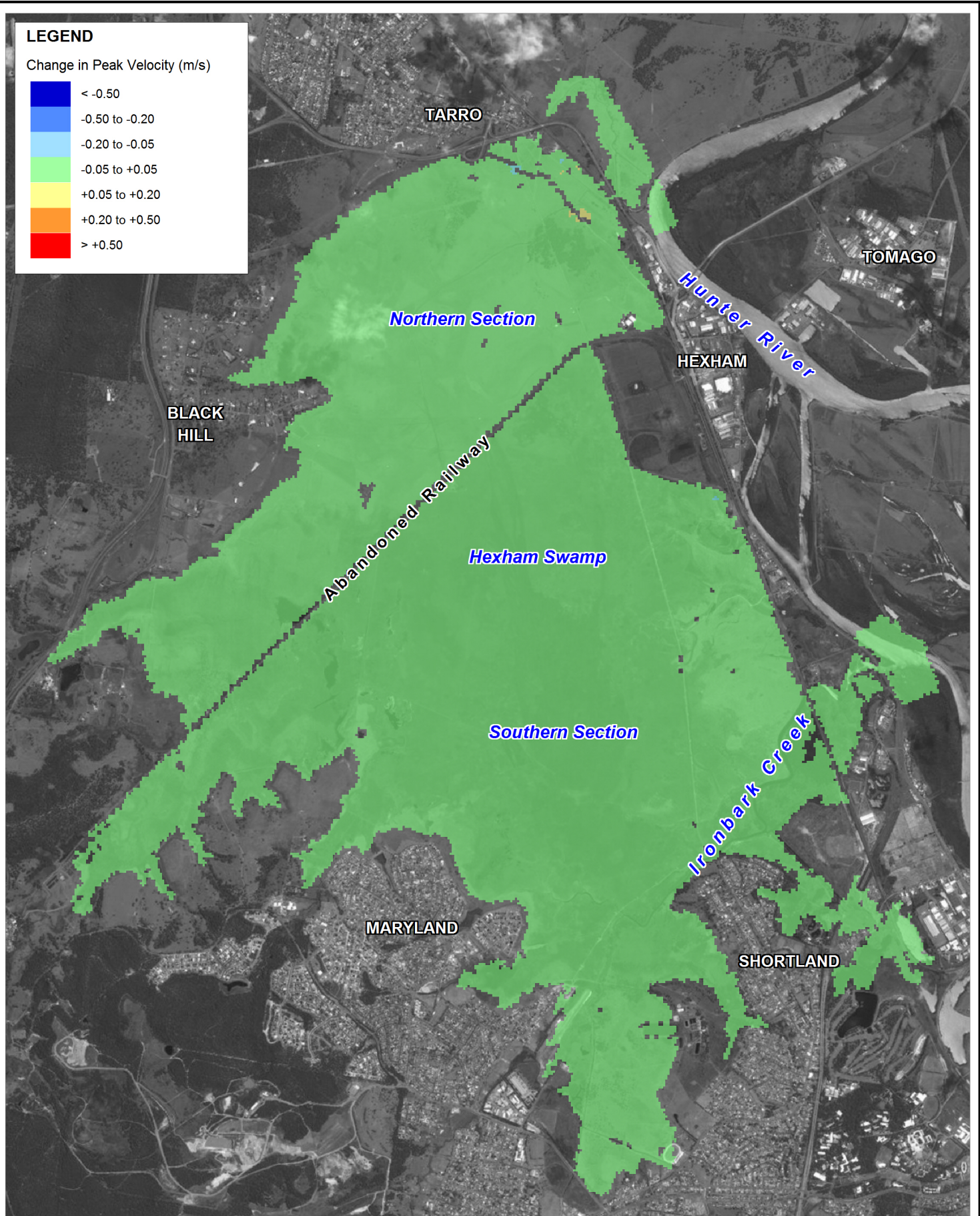
A



BMT WBM

www.bmtwbm.com.au

Filepath : K:\N2335_QR_Hexham_Train_Support_Facility\MapInfo\Workspaces\DRG_036_121003_10%AEP_Local_Impact_h.WOR



Title:

Impact on Peak 10% AEP Flood Velocity Local Catchment Flood Conditions

Figure:

C-8

Rev:

A

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



0 1 2km
Approx. Scale



BMT WBM

www.bmtwbm.com.au

Filepath : K:\N2335_QR_Hexham_Train_Support_Facility\MapInfo\Workspaces\DRG_037_121003_10%AEP_Local_Impact_v.WOR



BMT WBM Brisbane	Level 8, 200 Creek Street Brisbane 4000 PO Box 203 Spring Hill QLD 4004 Tel +61 7 3831 6744 Fax +61 7 3832 3627 Email bmtwbm@bmtwbm.com.au Web www.bmtwbm.com.au
BMT WBM Denver	14 Inverness Drive East, #B132 Englewood Denver Colorado 80112 USA Tel +1 303 792 9814 Fax +1 303 792 9742 Email denver@bmtwbm.com Web www.bmtwbm.com.au
BMT WBM Mackay	Suite 1, 138 Wood Street Mackay 4740 PO Box 4447 Mackay QLD 4740 Tel +61 7 4953 5144 Fax +61 7 4953 5132 Email mackay@bmtwbm.com.au Web www.bmtwbm.com.au
BMT WBM Melbourne	Level 5, 99 King Street Melbourne 3000 PO Box 604 Collins Street West VIC 8007 Tel +61 3 8620 6100 Fax +61 3 8620 6105 Email melbourne@bmtwbm.com.au Web www.bmtwbm.com.au
BMT WBM Newcastle	126 Belford Street Broadmeadow 2292 PO Box 266 Broadmeadow NSW 2292 Tel +61 2 4940 8882 Fax +61 2 4940 8887 Email newcastle@bmtwbm.com.au Web www.bmtwbm.com.au
BMT WBM Perth	Suite 3, 1161 Hay Street West Perth 6005 Tel +61 8 9328 2029 Fax +61 8 9486 7588 Email perth@bmtwbm.com.au Web www.bmtwbm.com.au
BMT WBM Sydney	Level 1, 256-258 Norton Street Leichhardt 2040 PO Box 194 Leichhardt NSW 2040 Tel +61 2 9713 4836 Fax +61 2 9713 4890 Email sydney@bmtwbm.com.au Web www.bmtwbm.com.au
BMT WBM Vancouver	401 611 Alexander Street Vancouver British Columbia V6A 1E1 Canada Tel +1 604 683 5777 Fax +1 604 608 3232 Email vancouver@bmtwbm.com Web www.bmtwbm.com.au

Appendix B

Flood Emergency Management Plan

1. Flood Emergency Management Plan

1.1 Purpose of plan

The purpose of this provisional management plan is to provide information and a clear set of instructions to manage the flood risk at the Hexham Relief Roads project site. The plan considers both the construction and operational phase of the project.

It is noted that this plan is provisional only and should be enhanced with ARTC and HRR site specific information. This provisional plan therefore provides a basis for developing a more detailed site specific plan that will ensure the safety of staff and minimise disruption to the HRR operation.

1.2 Context of plan

The HRR flood emergency management plan is site specific and should be read in conjunction with the Newcastle Local Flood Plan March 1996 Edition and the New South Wales State Disaster Plan (DISPLAN 2010). This plan has been developed to complement these regional plans.

This next version of this plan should consider Emergency Management plans on adjacent developments such that this plan does not negatively impact the flood emergency management plan for adjacent developments and collaborative arrangements should be considered.

1.3 Authority

The New South Wales State Disaster Plan (DISPLAN 2010) has been prepared by the State Emergency Management Committee in compliance with the *State Emergency and Rescue Management (SERM) Act, 1989* (as amended) [Sections 10 (1) (c) and 15 (2) (r)]. The *SERM Act 1989* sets out State arrangements for emergency and rescue management with provisions for bushfire fighting as an integral part of the emergency management system in NSW.

At the local level, the Newcastle Local Flood Plan (SES 1996) is issued under the authority of the *State Emergency and Rescue Management Act 1989* and the *State Emergency Service Act 1989*. It has been endorsed by the Newcastle State Emergency Services (SES) Region Controller and the Newcastle City Council Local Emergency Management Committee. The Plan covers preparedness measures, the conduct of response operations and the coordination of immediate recovery measures from flooding within the Lower Hunter River area.

Newcastle City Council (NCC) is responsible for the management of flood prone land within the Newcastle Local Government Area in which the Hexham Relief Roads project is located. In compliance with the NSW Flood Prone Land Policy (NSW Government, May 2005), NCC have a flood policy (NCC 2003) and have been undertaking investigations to understand the magnitude of the flooding problem for the Hunter River. Several reports have prepared including the "City-wide Floodplain Risk Management Plan (FMP)" (BMT WBM 2009) prepared to provide "scale and context to floodplain management across the whole of Newcastle in order to reduce exposure of flood risks to

the wider community." (BMT WBM 2009). In June 2012, stage 2 of the FMP was released and outlined "a strategy of short term and long term actions and initiatives that are to be pursued by agencies and the community in order to adequately address the risks posed by flooding" (BMT WBM 2012). These documents provide valuable background information to understanding the flood problem for both the Hexham area and the wider Hunter River floodplain residents.

1.4 Review and update of plan

This plan should be reviewed following at the following points in time:

- Following finalisation of the construction plan for the proposed development, before construction has commenced
- Following completion of the proposed development and incorporate site specific "work as executed" information
- Every 5 years and/or following a flood event at the site.

1.5 Contacts

Relevant contacts for this plan include:

Table B1-1 Contact Organisations and Phone Numbers

Organisation	Contact Number	Webpage
State Emergency Service (SES)	132 500	www.ses.nsw.gov.au
Bureau of Meteorology (BOM) River height data		http://www.bom.gov.au/nsw/warnings/ http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDN60141.html#Lower_Hunter_River
Newcastle City Council	4974 2000	http://www.newcastle.nsw.gov.au/
NSW Police Beresfield (not open 24hrs) Newcastle City (open 24hrs)	4966 3344 4929 0999	http://www.police.nsw.gov.au
NSW Fire and Rescue	4964 1271	http://www.fire.nsw.gov.au/station_details.php?id=278
HRR Construction Site Supervisor	TBC	
HRR Operational Site Manager	TBC	
ARTC Hunter Valley Regional Manager	TBC	
Regional ARTC Emergency contact	TBC	

Other contacts relevant for this plan may include the proposed adjacent Train Support

Facility for QRN, Brancourt (Oak) Sewerage Treatment Plant, and neighbouring industrial developments.

1.6 Assumptions

This flood emergency management plan is based on information that was available at the time the plan was produced (March 2013). This information includes information that was provided by the Upper Hunter Valley Alliance which is preparing the design for the project and information that was included in the HRR EIS August 2012.

This plan assumes that there will not be any permanent staff on site during normal operation of the relief roads. Management of the site will be coordinated from a regional office located away from the HRR site. This document will therefore be located at this off-site office and an ARTC representative will be responsible for implementation of the plan should the need arise.

It is assumed that ARTC have emergency management manuals which this plan will form part of these manuals.

For the construction phase, it is assumed that there will be an on-site supervisor who will be on site during hours of operation 7am to 6pm. This supervisor will have basic emergency management training such that they are aware of this document and will know where to find this document should a flood warning be issued. But the main control for the site will rest with the regional office.

1.7 Disclaimer

This emergency flood management plan is the sole responsibility of the owners/operations of the Hexham Relief Roads site. Parsons Brinckerhoff Australia does not accept any responsibility for any omission or error in this plan, or for any loss, damage or inconvenience, which may result from the plan's implementation. Should assumptions or circumstances change then it is the responsibility of the owner to update the plan as necessary. Any other changes that may result in the plan not being completely relevant include:

- change in ownership of the site
- change in management of development
- change in staff managing the development
- change in Newcastle Local Flood Plan.

1.8 Map

The map presents the PMF flood extent with an outline of the Hexham Relief Roads construction compounds and permanent works.

(It is noted that these maps should be updated and finalised before construction starts.)

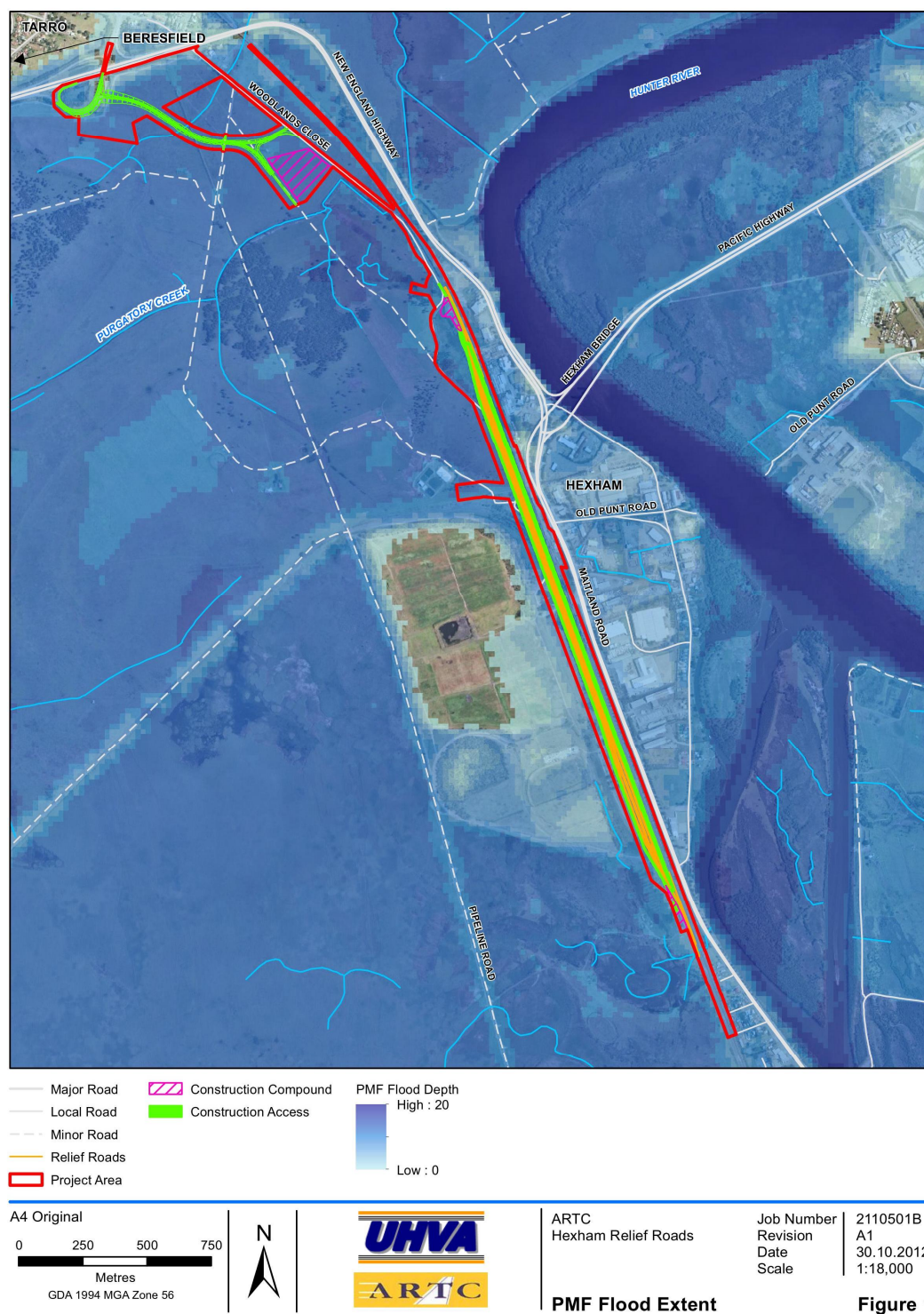


Figure B1-1 Map: HRR site and PMF flood extent

1.9 Flood information

1.9.1 Site development

It is important to understand the site development so the key items at risk can be identified. The items at risk include people and equipment and the response plan will focus on management of these aspects. A brief description of each phase of development is included below. Further information on the site should be sourced from design documentation.

1.9.1.1 Operational phase

The site will consist of 5 relief roads (train lines) to the west of the existing up main, down main and up coal of approximately 1650 in length, amendments to the existing up and down coal train lines and access tracks to and adjacent to the train lines and associated signalling and ancillary infrastructure.

It is assumed that the HRR project site will not have any permanent staff located on site. Maintenance staff and equipment will be moved to the site as required. Although there is adequate warning of a flood event for the Hexham area, there is still the potential for people and equipment to be located on site during a flood event. These occasions include:

- train drivers and train staff in trains parked in relief roads awaiting clearance to return to up or down coal lines
- maintenance staff undertaking emergency or routine maintenance.

The response plan outlined in table 4 below relates to these occasions.

1.9.1.2 Construction phase

The construction phase will take approximately 18 months and will involve the establishment of up to 3 construction compounds with temporary access tracks.

Within the construction compounds will be site offices and equipment. Based on the number of expected traffic movements (HRR EIS, Chapter 10, August 2012) it is estimated that there will be up to 70 construction staff and 11 heavy vehicles per hour on site between the hours of 7am to 6pm. This means the potential number of people on site at any particular time is a minimum of 121 people.

In addition to people there will also be construction equipment including temporary site offices, machinery and earthworks materials.

The response plan outlined in table 3 below relates to the construction phase.

1.9.2 Extent of flooding

As can be seen from the Map flooding of the site is extensive and will impact both the construction and operational phases of the project. The main hazard for the development is the depth of inundation that is predicted for the extreme flood events, with 2-3m of water during the 1%AEP flood event and up to 6m in the probable maximum flood.

1.9.3 Duration of flooding

The duration of flooding in the Hexham area is dependent on the flood depth and the downstream river condition, which dictates how long floodwaters will take to drain away. If the peak flood levels coincide with high tide levels, then the area will take longer to drain. However, the modelling shows that the duration of flooding for the area is in the order of several days for extreme events. The site will be isolated during flood events greater than the 5%AEP flood event where overbank flows from the Hunter River flood the Hexham area and the main roads into and out of the area, namely the New England Highway and the Pacific Highway.

The main site access road, Woodlands Close will be inundated during all events above the 10% AEP flood event so it will be important to follow flood warning and evacuation orders as early as they are issued.

1.9.4 Flood gauge information

Flood gauges provide information to the Commonwealth Bureau of Meteorology (BOM) about the water levels in the river. They use this information to predict the proceeding flood conditions.

The BOM monitor many gauges on the Hunter River and its main tributaries. The most relevant gauges for the site are presented in table 2 below; with information the BOM monitor included. The table presents a sample of the information that is available from the BOM. Refer to the following webpage for real time data http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDN60141.html

Table B1-2 Sample River Height Data for Hunter River near Hexham

Station Name	Time/Day	Height	Tendency	Flood Class
Hunter River at Raymond Terrace	3.45pm Mon	-0.25	Falling	See notes below
Hunter River at Hexham Bridge	3.45pm Mon	-0.51	falling	See notes below

About this table

The river *height* data is real-time operational data from automated telemetry systems and has not been quality controlled. All river *height* reports are in metres and are shown in local time.

The *tendency* indicates the predicted trend in the water level. Care should be taken in using the tendency field in this table, which tells whether the river is rising, falling or remaining steady. It is understood that this prediction is based on just the last few readings, and may not be completely representative of the true trend of the river.

The *Flood Class* is a classification of impacts from possible flooding. It is issued by the BOM based on the BOMs best available information at the time of issue.

- Minor flooding: Causes inconvenience. Low-lying areas next to watercourses are inundated which may require the removal of stock and equipment. Minor roads may be closed and low-level bridges submerged.
- Moderate flooding: In addition to the above, the evacuation of some houses may be required. Main traffic routes may be covered. The area of inundation is substantial in rural areas requiring the removal of stock.
- Major flooding: In addition to the above, extensive rural areas and/or urban areas are inundated. Properties and towns are likely to be isolated and major traffic routes likely to be closed. Evacuation of people from flood affected areas may be required.

Manly Hydraulics Laboratory and the NSW Office of Water also monitor several gauges on the Hunter River. These are presented in the table below.

Table B1-3 Other Hunter River Water level data

Date Source	Gauge Details	Data Available	Website details
Manly Hydraulics Laboratory	Site Number 210448 Hunter River at Hexham Bridge	Rainfall Water Level (m AHD)	http://new.mhl.nsw.gov.au/Site-210448
NSW Office of Water			http://www.waterinfo.nsw.gov.au/drr/hunter.shtml

These gauges provide real time data that the BOM and NCC can use to predict peak flood levels. They can also be used by the public to understand the speed at which flood waters are rising and therefore indicate the level of urgency for the flood emergency. However, directions from Emergency Services should be followed despite the information at these gauges as there is the potential for these gauges to fail but continue to send information which will subsequently be incorrect.

1.10 Preparation

Being prepared for a flood emergency will help manage the risk and reduce potential loss of life and damage to property. A key outcome of being prepared for a flood emergency is to prevent panic during the emergency and to ensure enough information is available to allow well informed decisions to be made and executed during the emergency.

Evacuation of the site is likely to be ordered so it is essential to prepare the staff and site for evacuation.

Each phase of the project will require separate preparation considerations and these are outlined below.

1.10.1 Preparing the site during the Construction phase

The accompanying map to this FEMP indicates that the project site is likely to be completely surrounded by floodwater during an extreme event. Depending on the

magnitude of the event, many of the construction buildings are likely to be inundated. Although the velocities will be slow there is still potential for significant loss of construction materials. To prepare the facility for a flood emergency as a minimum the following should be considered:

- Provide flood depth indicators (with 0.3m and above marked as red) on the access track and at the entrance/exit to the construction compounds as this will help drivers determine if floodwaters are too deep to safely drive the vehicle.
- Back-up all computer files and network information off-site, out of the floodplain.
- Store sandbags on site to place at site office doors and equipment shed doors to impede the ingress of floodwaters into the buildings.
- Store geofabric (or similar) to place around material stockpiles to prevent erosion and loss of material.
- Store additional food, medicine, toiletry supplies and warm clothes/blankets for use during a flood emergency as the construction compound will become isolated during a flood event. (These supplies are unlikely to be required if the site is evacuated but it is best to be prepared.).
- Install an alarm system that will notify all staff on site of the flood emergency and further instructions will follow.

1.10.2 Staff preparedness

During the construction phase of the project, it is anticipated that there will be a few permanent staff and significant numbers of transient staff/workers and visitors to the site. Therefore it will be important to provide emergency management training for all permanent staff to ensure they are prepared for a flood emergency. A chain of command should also be developed with specific roles identified so that during the flood emergency the response plan can be implemented in the most efficient manner. The on-site manager and permanent staff will be responsible for disseminating the flood information to non-permanent staff during a flood emergency.

An ARTC regional manager should also be trained and prepared for a flood emergency at the HRR site during the construction phase of the project.

For transient staff/workers and visitors the site safety induction should include information on the flood affectation of the site and outline what will happen if a flood warning is issued.

1.10.3 Preparing the site during the Operational Phase

Operation of the HRR site will consist of train lines, access tracks and signalling boxes. Preparing these features for the flood emergency mainly includes ensuring their structural integrity to withstand large depths of flood waters and minimise soil loss and erosion from the site.

In addition to preparing the site for the flood emergency will be preparing equipment, materials and staff for recovery of the site for a fast return to operation. The response

plan is covered below in Section 1.11 but it will be important to prepare for implementation of the response plan.

1.10.4 Operational phase staff preparedness

Even though there will be no permanent staff on the site during normal operation there is still the need to prepare those managing the site for a flood emergency. The manager of the site will need to have emergency management training and they will need to understand what happens at the site during a flood emergency.

The site manager will be responsible for disseminating the flood warning and evacuation information to maintenance staff who are on site and to the drivers and staff on board the trains that will be parked on the relief roads or those that are scheduled to arrive at the relief roads during the flood event. For events greater than the 5% AEP flood event, the relief roads will be isolated so there will be no train operations during a flood event. This may mean train drivers and staff are isolated at the relief roads or wherever their train has stopped. So the site manager and regional coordinator for the HRR will need to have in place a plan to ensure the safety of these drivers and staff.

1.11 Response plan

This response plan includes a clear set of instructions that must be followed, as soon as the BOM has issued a flood warning for the Lower Hunter River. The two response plans outlined below (construction and operation) should be finalised with site specific and ARTC specific operational instructions before work is started on site.

1.11.1 Construction Phase response plan

The construction phase response plan will be administered from the site office with support from the regional ARTC office. Therefore all actions below need to be assigned to the appropriate people at the site and in the regional office.

Table B1-4 Construction Phase response plan

Item	Action	Details
The plan is activated by the issue of a flood warning by the BOM for the Lower Hunter River, or A 'white alert' level has been reached in the Glennies Creek Dam	Monitor	BOM warnings website http://www.bom.gov.au/nsw/warnings/index.shtml
	Listen	ABC local radio (2NC) AM frequency 1233
	Notify	On-site manager to notify all on-site supervisors of flood warning. Identify what major works are occurring and develop strategy for closing the site should the situation escalate.

Item	Action	Details
If the BOM predicts the event is escalating for the Hunter River then height predictions are key gauges will be issued.	Monitor (continue)	BOM river height website http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDN60143.html
	Listen (continue)	ABC local radio (2NC) AM frequency 1233
	Monitor (road closures)	Roads and Maritime http://livetraffic.rta.nsw.gov.au/desktop.html
	Notify	Notify all staff on site and close site to further work. Notify any deliveries/truck movements that site is closed due to flood event.
	prepare	Prepare site offices for flood event. Prepare material stockpiles for flood event
If the BOM predicts the major flooding for the Lower Hunter River	Listen (continue)	ABC local radio (2NC) AM frequency 1233
	Monitor (road closures)	Roads and Maritime http://livetraffic.rta.nsw.gov.au/desktop.html
	Notify	Activate internal alarm and move all people on site to a common area for dissemination of information.
	Notify	Notify regional ARTC office of decision to evacuate.
	Prepare	Turn off power to construction compound to prevent damage to equipment during and after flood event.
	Evacuate	Instruct a self evacuation for all staff on site. Note: some roads may be closed so notify staff of these road closures before they leave. Register all people leaving the site and where they are going and how. (e.g. going home by car, or going to relatives as passenger in car) Notify all staff of nearest evacuation centre so that they can go there is necessary. (Visitors to site may require the evacuation centre)
	Record	Register all people leaving the site and where they are going and how. (e.g. going home by car, or going to relatives as passenger in car)
During the flood event	Monitor (continue)	BOM river height website http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDN60143.html
	Listen (continue)	ABC local radio (2NC) AM frequency 1233

1.11.2 Operational phase response plan

The operational phase response plan will be administered from the regional ARTC office and site manager. Therefore all actions below need to be assigned to the appropriate person in the regional office.

Table B1-5 Operational Phase Response Plan

Item	Action	Details
The plan is activated by the issue of a flood warning by the BOM for the Lower Hunter River, or A 'white alert' level has been reached in the Glennies Creek Dam	Monitor	BOM warnings website http://www.bom.gov.au/nsw/warnings/index.shtml
	Listen	ABC local radio (2NC) AM frequency 1233
	Notify	Regional Manager to check the schedule for trains to be located at the relief roads and for maintenance. Notify scheduled train drivers and staff of flood warning and advise actions.
If the BOM predicts the event is escalating for the Hunter River then height predictions are key gauges will be issued.	Monitor (continue)	BOM river height website http://www.bom.gov.au/cgi-bin/wrap_fwv.pl?IDN60143.html
	Listen (continue)	ABC local radio (2NC) AM frequency 1233
	Check	Check these predicted gauge heights against HRR rail levels. Check train locations with respect to potentially inundated rail lines.
	Notify	Notify train line operators of potentially inundated train lines. Notify train drivers and staff of train line closures and advise actions. (Some train drivers and staff may need to be evacuated from the train if a safe parking location cannot be identified. ARTC regional manager will need to therefore organise for evacuation of these affected train staff.)
If the BOM predicts the major flooding for the Lower Hunter River	Listen (continue)	ABC local radio (2NC) AM frequency 1233
	Monitor (road closures)	Roads and Maritime http://livetraffic.rta.nsw.gov.au/desktop.html

Item	Action	Details
	Contact	All train staff on the HRR site and evacuate to higher ground. If possible send the staff home or to the ARTC regional office or to nearest evacuation centre Beresfield Public School, Boomerang St Beresfield.
	Record	record details of when and how staff on site were evacuated and keep a record of where they are and their contact details.
During the flood event	Monitor (continue)	BOM river height website http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDN60143.html
	Listen (continue)	ABC local radio (2NC) AM frequency 1233

1.12 Recovery plan

Preparing a recovery plan for the site for both the construction and operational phases will allow the site to become operational as soon as the all clear has been issued by the emergency management authorities.

Recovery plans focus on ensuring the site is safe and all safety procedures for equipment should be followed when returning to the flood affected site.

1.12.1 Construction Phase recovery plan

A flood event at the site during the construction phase of the project could cause considerable damage. If the site is properly prepared for the flood emergency then damage can be minimised. The following list of actions assumes the site has been prepared for the flood emergency and is not exhaustive but provides an idea of what should be considered when returning to site.

- Access roads to site may have been damaged during the flood event so drive carefully in a suitable vehicle.
- Check power boxes and electrical equipment on site. These may have been inundated so have a qualified electrician check for damage. (Do not turn power back on until all electrical equipment on site has been checked for damage.).
- Check structural integrity of all buildings on site. Buildings on site will be of a temporary nature so may not be designed to withstand extreme flood flows and depths. Even if floodwaters have not entered the buildings check foundations for erosion.
- Check to see if any equipment has been moved by flood waters and move equipment back to a safe position/location.
- Check material stockpiles for erosion and losses.

- Check water and waste water systems on site. Water systems may need to be flushed or repaired following the flood event. Clean up any ponded water around site to prevent the spread of waterborne disease.
- Prepare a report on the flood event. Include information on how the site was evacuated and document the resulting flood depths and damage to the site. (This will provide valuable information for the next flood event for this site and others).

Re-open site when it is deemed safe to continue work.

1.12.2 Operational Phase recovery plan

Following a flood event during operation of the HRR, the main focus will be on checking for damage at the site, making repairs and re-opening the site. It is likely that other sections of the train line will also be affected during a flood event so a coordinated approach to opening the train lines again should occur.

Specifically for the HRR site the following actions should occur following a flood event:

- Check access and maintenance tracks for damage. Floodwaters may have eroded sections of the road so these will need to be repaired.
- Check train embankments for damage and erosion particularly near culverts and stormwater channels.
- Check signalling boxes for damage and have an qualified electrician provide the all clear
- Prepare a report on the flood event including the flood depth and the damage caused on site. Include recommendations for better preparing the site for the next flood event.

1.13 Additional information

1.13.1 Definitions

The following definitions are provided for information, they have been sourced from the Floodplain Development Manual (NSW Government, May 2005) and BOM (www.bom.gov.au, December 2011).

Table B1-6 Definitions

Term	Definition
Annual exceedance probability (AEP)	The chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. E.g., if a peak flood discharge of 500 m ³ /s has an AEP of 5%, it means that there is a 5% chance (that is one-in-20 chance) of a 500 m ³ /s or larger events occurring in any one year (see ARI).

Term	Definition
Average recurrence interval (ARI)	The long-term average number of years between the occurrence of a flood as big as or larger than the selected event. For example, floods with a discharge as great as or greater than the 20 year ARI flood event will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event.
Flood Class	Is a classification of impacts from possible flooding. Minor flooding: Causes inconvenience. Low-lying areas next to watercourses are inundated which may require the removal of stock and equipment. Minor roads may be closed and low-level bridges submerged. Moderate flooding: In addition to the above, the evacuation of some houses may be required. Main traffic routes may be covered. The area of inundation is substantial in rural areas requiring the removal of stock. Major flooding: In addition to the above, extensive rural areas and/or urban areas are inundated. Properties and towns are likely to be isolated and major traffic routes likely to be closed. Evacuation of people from flood affected areas may be required.
Flash flooding	Flooding which is sudden and unexpected. It is often caused by sudden local or nearby heavy rainfall. Often defined as flooding which peaks within six hours of the causative rain.
Flood planning levels (FPLs)	Are the combinations of flood levels (derived from significant historical flood events or floods of specific AEPs) and freeboards selected for floodplain risk management purposes, as determined in management studies and incorporated in management plans. FPLs supersede the "standard flood event" in the 1986 manual.
Flood prone land	Land susceptible to flooding by the PMF event. Flood prone land is synonymous with flood liable land.
Flood warning	Advance notice that a flood may occur in the near future at a certain location or in a certain river basin. Flood Warnings are firm predictions of flooding based on actual rainfall measurements and streamflow based models of catchment behaviour that take account of likely future rainfall.
Flood watch	Notice of the potential flood threat from a developing weather situation.

Project Risk Assessment – Flooding

Hexham Relief Roads

Risk Assessment- Flooding

January 2013

Revision 4

Contents

1.	Introduction	4
2.	Risk Assessment	5
2.1	Purpose	5
2.2	Context	5
2.3	Risk Identification	5
2.4	Risk Analysis	6
2.5	Risk Evaluation	6
2.6	Risk Assessment	6

Tables

Table 1.	Upper Hunter Valley Alliance risk consequence and likelihood	7
Table 2.	Upper Hunter Valley Alliance risk rating and legend	7
Table 3.	Acronyms	7
Table 4.	Assessed Activities	7
Table 5.	Preliminary Risk Assessment	7

Document Control

Client: Australian Rail Track Corporation

Project: Hexham Relief Roads

Document Title: Risk Assessment- Flooding

Date Issued: January 2013

Revision: Revision 4

Prepared by: Karen Brakell, Darren Green, Andrew Tipene

Purpose: Risk Assessment – Flood Risks

Endorsed by: Rob Leslie

Approved by:

Date Approved:

Doc No :

Revision History

Revision	Date Issued	To	From	Description
1	18/12/12	S.Tarbox D. Green	K. Brakell	Working draft for comment
2	09/01/13	D Green	R Leslie	Working draft for comment
3	15/01/13	D Green W. Owers	K. Brackell	Draft for comment
4	31/01/13	D Green W. Owers	A. Tipene	Draft for comment

1. Introduction

The HRR project site is subject to inundation from flood events of a magnitude of 5% AEP and larger. Flooding at the HRR site originates from the Hunter River to the north and east of the project area and can inundate the site for extended periods of time for large events such as the Probable Maximum Flood. The site can be isolated with no access to higher ground once floodwaters have overtopped the nearby New England Highway and Pacific Highway. People, property and the local environment are therefore at risk during a flood event.

The site will operate in two phases, construction and operation. These two phases will have similar and different risks that must be managed during any flood event.

This preliminary risk management assessment is a high level assessment and has been completed to enable an understanding of the flood risks for the construction and operational phases of the project. It is intended to identify, assess and mitigate the potential flood risks so that losses and damage is minimised.

This document is prepared in accordance with AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines (Standards Australia 2009). Where applicable, the NSW Flood Prone Land Policy and advice and guidelines outlined in the NSW Floodplain Development Manual (NSW Government, 2005) are also considered. It is reliant on all information pertaining to the project and flood behaviour that is available at the time of writing, January 2013.

2. Risk Assessment

2.1 Purpose

Purpose of this document is to identify, analyse, evaluate and prepare management measures for addressing the risks associated with flooding at the Hexham Relief Roads site.

2.2 Context

This risk assessment is focused on the risks associated with flood events across the proposed Hexham Relief Roads project site from the regular (daily) up to the probable maximum flood (PMF).

The risk assessment covers both the construction and operational phases of the project as designed at January 2013. It is noted that this assessment will need to be reviewed during the 18 month construction program if there are changes to the construction program and prior to commissioning of the project to re-evaluate the risks and proposed management measures.

This risk assessment is intended to address the risks to people, property and the environment in the Hexham area affected by the project as well as the Hexham Relief Road project site.

The outcomes from this risk assessment will be incorporated by UHVA (the owners of the facility) into the operational maintenance procedures for the facility. The construction phase related risk management measures will be the responsibility of the Constructor.

In accordance with the requirements of the Rail Safety Act and also the ARTC risk management procedure RM01 and Risk Management Work Instruction 3, the Project risk management process must be able to demonstrate that safety and rail safety risks have been assessed and control measures identified and implemented so far as is reasonably practicable.

2.3 Risk Identification

Risk Identification is the structured process of identifying all risks relevant to the project or operation and documenting these in a comprehensive register. The risk identification process is applicable to all project and operational stages and functional areas. Risk identification is fundamental to establishing the full range of potential issues to be faced in undertaking operations.

The objective of this process is to generate a comprehensive list of risks based on the full range of potential flood events. Flood events are likely to range from flooding due to daily rainfall events up to and including the probable maximum flood (PMF). Such events might prevent, degrade or delay the construction and or the operation of the HRR project, or negatively impact the nearby areas of Hexham, Hexham Swamp or the Hunter River floodplain.

It is noted that the area is already subject to flood related risks for flood events of 5%AEP and greater. The flood assessment investigation completed for the.

Hexham Relief Roads Environmental Impact Assessment documents the flood behaviour for the project site and immediate surrounds. Management of the flood risk for the area of Hexham is the responsibility of the City of Newcastle Council. The additional flood risk to property and the environment as a result of the proposed HRR project has however been considered below.

2.4 Risk Analysis

Analysis of the risks involves considering the likelihood and consequence of the identified risks, to determine the overall level of risk. For flooding, the likelihood is dependent on the particular flood event that is being considered. A full range of flood events has been considered so there is a range of likelihoods associated with each of the risks. The consequences are also linked to the magnitude of the flood event, as a PMF event will have more severe consequences than a 10%AEP flood event. The likelihood and consequences for each risk have been identified qualitatively and an overall risk rating (low, medium or high) or a range has been assigned to each risk.

2.5 Risk Evaluation

Each identified risk has been evaluated qualitatively by the owners and operators of the HRR project. These ratings as presented in the table below are low, moderate, high, very high and extreme. They are based on a combination of the rating of the likelihood and the consequence. Mitigation measures are then proposed and the risk evaluation re-assessed to determine the change in rating as a result of the proposed mitigation measures.

2.6 Risk Assessment

The risk assessment involves all the preceding steps and is summarised in the following table. The risk assessment is preliminary and has only been completed with respect to flooding. This is a qualitative assessment and should be assessed further by the project delivery team and managed throughout the lifecycle of the project construction.

Table 1. Upper Hunter Valley Alliance risk consequence and likelihood

CONSEQUENCE				LIKELIHOOD	
Category	Health & Safety	Environment	Predicted Environmental Impact	Category	Description
Substantial (5)	Class 1 (Fatal Incident)	Permanent widespread ecological damage	Fatality / Major injuries or significant infrastructure damage or pollution	Almost certain (5)	This threat can be expected to occur
Major (4)	Class 1 (Permanent Injury)	Heavy ecological damage, costly restoration	Major Injuries leading to hospitalisation & major infrastructure damage or pollution	Likely (4)	This threat will quite commonly occur
Medium (3)	Class 2 (Lost Injury Time)	Major but recoverable ecological damage	Minor injuries requiring treatment or minor infrastructure damage or pollution	Possible (3)	This threat may occur occasionally
Minor (2)	Class 3 (Minor injury, medical treatment required)	Limited but medium term damage	First Aid injuries or some infrastructure damage	Unlikely (2)	This threat could infrequently occur
Negligible (1)	Class 3 (Slight injury, First Aid)	Short term damage	Short-term damage or losses	Rare (1)	This threat may occur in exceptional circumstances

Table 2. Upper Hunter Valley Alliance risk rating and legend

		CONSEQUENCE					LEGEND	
		Negligible (1)	Minor (2)	Medium (3)	Major (4)	Substantial (5)	Risk Rating	Risk Treatment Options
LIKELIHOOD	Almost certain (5)	5	10	18	23	25	Extreme	1. Eliminate the risk
	Likely (4)	4	9	17	20	24	Very High	2. Reduce / substitute the risk
	Possible (3)	3	8	13	19	22	High	3. Transfer / separate
	Unlikely (2)	2	7	12	15	21	Moderate	4. Accept the risk and manage / reduce the consequence / probability
	Rare (1)	1	6	11	14	16	Low	5. Accept the risk and manage

Table 3. Acronyms

DOCUMENTS	
EIS	Hexham Relief Roads Environmental Impact Statement (August 2012)
PCEMP	Project Construction Environmental Management Plan

Table 4. Assessed Activities

Typical Construction Activities	
- Fencing - Installation of Environmental Controls - Establishment of site compound - Clearing and Grubbing - Earthworks	- Connection and relocation of Services - Access Tracks / Roads Development - Laying of Track - Modification of culverts - Demobilisation

Table 5. Preliminary Risk Assessment

ID	Aspect (Risk Issue)	Key Impact (Risk Effect)	Consequence	Likelihood	Risk Rating (before mitigation)	Mitigation measures and safeguards (including design considerations, training etc)	Responsibility Specifically detailed in referenced EMS documentation	Risk Rating (after mitigation)	Residual Risk
People									
1	Construction staff isolated due to flood event	There is a possibility that construction personnel may become exposed to risk from rising water levels during the Works	Medium	Unlikely	12 High Threat	- Make arrangements with SES to provide updates and advise when storm events are anticipated - It is expected that flood levels will rise to the east of the project between the NEH & the Rail Corridor providing a sound indicator to put in place the Evacuation Procedure - Develop a Site Procedure forming part of the Emergency Response Plan This could include use of sirens and or two way radio emergency channels - Effectively Communicate through Site Inductions and Toolbox talks the site procedures - Make arrangements for designated assembly points on areas of high ground	PM, CM & OHSM	7 Low threat	The project including the access to and from the worksite is designed to withstand the PMF flood event On this basis, any sudden or unexpected floods should be foreseeable and the necessary steps take to avoid the risk
2	Operational Staff (ARTC Maintenance or Train Drivers)	The risk is to ARTC maintenance crews and / or Train or Crew Staff	Medium	Unlikely	12 High Threat	- Undertake a rail safety assessment carried out by a qualified expert to determine the point at which the rail becomes unsafe to operate due to flooding and the protocols for ceasing operations - Install flood depth markers at key waterway crossings - Operations office to restrict and/or cease train movements following issue of a flood warning for the Lower Hunter River - Train to be parked and all staff evacuated to high	PM, CM & OHSM	7 Low threat	The proposed design of the new access roads located alongside the new HRR Project have been designed to withstand the PMF The residual risk is therefore low

Table 5. Preliminary Risk Assessment

ID	Aspect (Risk Issue)	Key Impact (Risk Effect)	Consequence	Likelihood	Risk Rating (before mitigation)	Mitigation measures and safeguards (including design considerations, training etc)	Responsibility Specifically detailed in referenced EMS documentation	Risk Rating (after mitigation)	Residual Risk
						ground as soon as possible			
3	Private Land Owners	The risk is that private land owners become stranded by access through the project worksite during a time of severe flooding	Medium	Unlikely	12 High Threat	- Install flood depth markers at key waterway crossings - Construct access routes for private land owners to withstand PMF flood levels - Provide access road boundary indicators (poles) to assist with driving along access roads	Design Manager, PM, CM	7 Low threat	The local private landowners are fully aware of the risk associated with living in flood prone area and have substantial experience There is a chance that access roads may deteriorate in time and as such risks are more prone
Property & Infrastructure									
4	Damage/loss of hazardous and chemical materials	Degradation of water quality through contamination, sedimentation and erosion	Medium	Likely	13 High Threat	- Store in a building - Raise storage areas / containers above flood level if possible - Bund around large internal / external storage containers and capture and treat runoff from external bunded areas - Plan to remove exposed contaminated material off site early in the project	PE, FM, SEO	11 Moderate threat	There is a chance that some contaminated material may escape bunded or protected enclosures
5	Damage/Loss of stockpile material	The project is predominantly consisting of significant earthworks and movements increasing the risk of flood impacts	Medium	Unlikely	13 High Threat	- Sedimentation controls and also physical barriers the base of all stockpiles to prevent erosion - Improved early planning to understand the locations of stockpiles - Where possible, locate stockpiles on higher ground	FM, EO	7 Low Threat	There is a chance that some stockpiled material may escape bunded or protected enclosures
6	Damage to construction buildings	Site offices and facilities are flooded above floor level and electrical services are affected	Possible	Minor	8 Moderate Threat	- Construct building to withstand up to 5% AEP flood event - Raise electrical equipment above flood level if possible	FM	7 Low Threat	None – Site offices are removed upon completion of the Project

Preliminary Risk Management Assessment

Rev	Date	Prepared by	Approval	Page 3 of 6

Table 5. Preliminary Risk Assessment

ID	Aspect (Risk Issue)	Key Impact (Risk Effect)	Consequence	Likelihood	Risk Rating (before mitigation)	Mitigation measures and safeguards (including design considerations, training etc)	Responsibility Specifically detailed in referenced EMS documentation	Risk Rating (after mitigation)	Residual Risk
						- Leave open space below buildings and between buildings to allow passage of floodwaters - Back-up electronic files off-site			
7	Damage to access tracks	Both haul roads and new access tracks are damaged by excessive flows	Possible	Minor	8 Moderate Threat	- Design access roads using appropriate flood resilience criteria as per design standards - Maintain integrity of access tracks with regular maintenance - Provide design able to shed water to adjacent drains - Install flood depth markers at key waterway crossings	DM, FM	7 Low Threat	The remaining access roads are in the most positioned above the PMF level The access roads to the country end of the project are the most at risk The make up of the access road may need to be reinstated
8	Damage to rail embankment	The proposed rail embankment is degraded and fails causing slumping and failure of the track formation	Possible	Major	19 Very High Threat	- Design track embankments using appropriate flood resilience criteria as per design standards - Maintain integrity of embankment with regular maintenance especially following a rainfall event - The proposed cess drain is maintained to ensure regular flows remain unhindered - Develop and implement inspection procedures for embankments following a flood event and protocols for recommencing safe operation following inspection	ARTC Maintenance	8 Moderate Threat	There remains the risk that the embankment placed over soft soils will deteriorate due to flooding leading to the possibility of slumping
Flora & Fauna									
9	Pollution of downstream waterways	Downstream waterways are polluted during the project construction	Possible	Medium	13 High Threat	- Apply soil and erosion management principles to material stockpiles during construction - Store hazardous materials and chemicals in covered and sealed areas Bund these storage areas and capture and treat all runoff from these	FM, SEO	7 Minor Threat	There remains the risk that in severe storm events that soil and erosion controls become ineffective

Table 5. Preliminary Risk Assessment

ID	Aspect (Risk Issue)	Key Impact (Risk Effect)	Consequence	Likelihood	Risk Rating (before mitigation)	Mitigation measures and safeguards (including design considerations, training etc)	Responsibility Specifically detailed in referenced EMS documentation	Risk Rating (after mitigation)	Residual Risk
						bunded areas - Look to reduce the volume of double handling on site - Provide emergency spill equipment adjacent to pollutant sources - Provide a truck washing facility at exit from site - Conduct regular maintenance of all on-site vehicles to prevent fluid leaks - Capture all runoff from hard-stand areas and treat or dispose appropriately - Install environmental information signs at all waterways to alert construction staff to sensitive environment - Include sensitive environment information in site induction - Follow “property” flood mitigation measures outlined above before a flood event			
10	Change to flow distribution into Hexham Swamp		Possible	Medium	13 High Threat	- Maintain overland flow paths around construction compound as far as practicable - Re-instate flow paths following construction phase as far as practical to match pre-construction conditions - Align construction buildings and equipment in dominant direction of flood flows		7 Minor Threat	
11	Change to flow distribution through adjacent Hexham area				13 High Threat	- Reinstate existing rail corridor stormwater channels and maintain existing flow regimes. - Maintain integrity of stormwater channels with regular maintenance especially following a	ARTC Maintenance	7 Minor Threat	

Table 5. Preliminary Risk Assessment

ID	Aspect (Risk Issue)	Key Impact (Risk Effect)	Consequence	Likelihood	Risk Rating (before mitigation)	Mitigation measures and safeguards (including design considerations, training etc)	Responsibility Specifically detailed in referenced EMS documentation	Risk Rating (after mitigation)	Residual Risk
						rainfall event Develop and implement inspection procedures for stormwater channels following a flood event and protocols for recommencing safe operation following inspection			
Operational									
12	Delays to completion of construction	Significant rain delays place considerable risk to the programme of works This combined with the reliance on track possessions could see the project delayed circa 3 months	Likely	Medium	17 High Threat	- Implement construction phase mitigation / management measures outlined above to minimise risk of delays to construction program - Monitor weather forecasts / predictions and take necessary steps to protect / open work faces - Design of the formation is made up of rock which is less sensitive to rain events leading to less delays - Planned methodology will assist in reducing the impact of heavy wet weather events - Allow sufficient allowance in the programme		8 Moderate Threat	During extensive periods of rain events works are likely to be suspended
13	Disruption of operation of train line	The main risk is at both the entry and exit to the relief roads which form the lowest sections of the project denying access to the relief roads during a significant storm event	Possible	Medium	13 High Threat	Monitor flood warnings and prevailing weather conditions and plan train movements around predicted flood events where possible		8 Moderate Threat	Given that floods are natural disasters it is inevitable that there will be disruptions to train services so mitigation measures should focus on reducing the recovery period for the train line since the flood event itself cannot be prevented

Water management work – flood work (WMA 2000) application

Attach additional pages to back of form, if required.

Application for approval for water supply works, and/or water use

Application for Minister's consent under section 92 of the *Water Management Act 2000*

Applicants are advised to read the instructions carefully before filling in this form. Step-by-step instructions on each section are included in the Guide to the application for approval for water supply works and/or new water.

Please complete the form with a black/blue ink pen and use BLOCK letters.

Part 1 Applicant Details

Section A

Applicant details

(attach/ photocopy extra page if more than 2 holders)

First applicant (or company applicant)

(correspondence in relation to this application will be directed to the person given below)

A1 Title _____ A2 Surname _____
(Mr, Mrs, Ms)

A3 Given name(s) _____

A4 Company name _____ A5 ACN _____
(if applicable)

A6 Position held _____
(if applicable)

Name of company representative _____
(if applicable)

A7 Address _____ A8 Town _____

A9 State _____ A10 Postcode _____ A11 Country _____

A12 Phone no. _____ A13 Alternative phone no. _____

A14 Fax no. _____

A15 E-mail _____

Second Applicant

(if applicable)

A16 Title _____ A17 Surname _____
(Mr, Mrs, Ms)

A18 Given name(s) _____

A19 Address _____ A20 Town _____

A21 State _____ A22 Postcode _____ A23 Country _____

A24 If more than 2 applicants, specify total number of applicants _____
(attach extra page to list additional applicants)

Office use only	Fee paid: \$	Customer receipt number:	Office Stamp
	Officer signature:	Date:	
	Application number:	Acceptance date:	

Section B

Applicant's or agent's contact details

(Only fill in this section if a different person from the first applicant in section A will be dealing with the application)

B1 Title _____ B2 Position _____
(Mr, Mrs, Ms)
B3 Surname) _____ B4 Given name _____
B5 Postal address _____
B6 State _____ B7 Postcode _____ B8 Country _____
B9 Preferred phone no. _____ B10 Alternative phone no. _____
B11 E-mail _____

Section C

Land ownership of the works site

(Tick appropriate boxes) - relates to applicants listed in Section A)

Is your application made as the:

C1 Owner of the land ☐ C2 Lawful occupier of the land ☐
(attach documentary evidence of lawful occupation such as a lease or court order)
C3 Other (please specify) _____

Section D

Other approvals

(Please tick appropriate boxes)

D1 Does your proposal (including water use and water supply works) require development consent from your local council? Yes ☐ No ☐
D2 If yes, has development consent been granted? Yes ☐ No ☐
D3 If yes, provide consent number _____
D4 If your proposal involves water use, does it also require consent to clear native vegetation (incl. grassland)? Yes ☐ No ☐
D5 If yes, has consent been granted? Yes ☐ No ☐
D6 If yes, provide consent number _____

Section E

Maps

Attach a topographic map, aerial photo and/or a farm plan of A3 or A4 size outlining the following information:

- location of property (identifiable from a landmark and with North arrow included);
- property boundary;
- location(s) of all **existing works** as well as **works proposed in this application**. Include pumps, diversion works, bores, storages, channels etc.; and
- watercourses and wetlands (including dry river beds and temporary wetlands).

Section F

Pre-application discussion

(Please tick appropriate boxes)

Has a pre-application discussion taken place in respect of this application?

F1 ☐ No F2 ☐ Yes, it took place on _____ with the assistance of
F3 _____ from the _____ NOW

Part 2 Water use approval

(You may be requested to provide further information to support your application)

NB. In order to begin irrigation, you must ensure that you have a valid **water access licence** and a valid **water use approval**. Contact your local NOW office for further details.

You do not require a water use approval for a development that has been granted development consent under Part 4 of the *Environmental Planning and Assessment Act 1979*.

Section G

Water Use only

(Please tick appropriate boxes)

I wish to apply for: G1 ☐ a new water use approval

G2 ☐ an amended water use approval specifying changed water use (ie to amend or change the details of an existing water use approval)

If you ticked the second box (G2) please complete the following questions G3 and G4:

G3 Existing approval number to be amended _____

G4 Briefly describe the changes you wish to make (e.g. increase the size of irrigated area etc.) _____

Section H

Purpose

Please nominate the purpose you are seeking approval for:

(Please tick appropriate boxes)

H1 ☐ Irrigation ☐ Town water ☐ Other

H2 If 'other', please specify _____

H3 Do you have a current and relevant water access licence? Yes ☐ No ☐

H4 If yes, what is the number of the licence/s to be associated with this application? _____

H5 If no, when do you intend to secure a water access licence? _____

Section I

Location of land where water will be used

I1 Property name _____

I2 Property address _____

I3 Town _____ I4 Postcode _____

I5 Area of property _____(ha) I6 Area of property proposed for the use _____(ha)

Lot	DP	Parish/Portion	County

I8 Local council _____

I9 Name of nearest river/s adjacent to or within the property boundaries _____

Section J

Water use proposal

For irrigation please specify:

Crop Type (please specify)	Area to be irrigated (ha)	Irrigation System / Method

For other purposes, please provide details of proposal. _____

(attach photocopy extra page if more space is required) _____

Section K

Information maps

On the map described in Section E mark the following information relating to your proposed use of water:

- area(s) to be affected
- location(s) of all works supplying water to your proposed use area including any flood protection works
- drainage and/or recycling system proposals
- soil types such as sandy/light soils, clay, clay loam, loam areas within the proposed use area
- any native vegetation on the property (including native grasses)
- any known high watertable areas on the property
- any known Aboriginal or European cultural heritage features on the property
- any areas covered by an Irrigation Drainage Management Plan
- areas of wetlands

Section L

Soils

(Please tick appropriate boxes)

Identify the soil texture in the proposed use area (tick one or more boxes)

L1 Sandy ☐ Loamy ☐ Clay Loam ☐ Clay ☐ Other (please specify) _____

Identify the soil colour in the proposed irrigation area (tick box)

L2 Red/red brown ☐ Yellowish brown ☐ Grey ☐ Black ☐ Other (please specify) _____

L3 Describe the soil category in the proposed use area (tick one or more)

Type	Description	Tick
Alluvial soils	extremely variable, layered profile with sand, clay etc	☐
Cracking clays	deep uniform clays with seasonal cracking when dry	☐
Sandy soils	deep, uniform, coarse or fine textured sandy soil	☐
Earthy soils	gradual texture change – increase in clay content	☐
Duplex soils	texture contrast between surface soil and sub soil – loam (over clay)	☐

Other

(please specify) _____

In the case of irrigation, what is the slope of the area to be irrigated? (tick box)

L4 ☐ Flat (less than 2%) ☐ Gentle slope (2–5%) ☐ Undulating ☐ Steep slope (more than 5%)

Section M

Environmental issues

(Please tick appropriate boxes)

M1 Does your property have any of the following features/characteristics?

☐

Salinity

☐

Acid Sulphate Soils

☐

Sodic Soils

☐

Waterlogging

☐

Erosion

☐

High Watertables

☐

Land Subsidence

☐

Contaminated Land

Other _____

Any other comments (include the occurrence any of the above features/characteristics on neighbouring properties, if known) _____

Section N

Drainage management

(For irrigation only – please tick appropriate boxes)

N1 Have you prepared an Irrigation and Drainage Management Plan?

Yes ☐

No ☐

If yes, supply a copy with this application.

N2 If you intend to recycle your irrigation drainage on-farm, provide details of your proposed recycling setup including collection, storage and re-use proposals.

N3 If you are not recycling your drainage, how do you propose to dispose of any irrigation tailwater?

N4 Does your proposal also require consent from the Department of Environment, Climate Change and Water

Yes ☐

No ☐

N5 If yes, have you got this consent?

Yes ☐

No ☐

N6 If yes, please provide consent number. _____

Part 3 Water supply works approval

Section O

Pump(s) – surface water only

(If you are seeking approval for more than one of these works, please photocopy this page, complete it and attach it to this application. Mark each work on a copy of the topographical map, aerial photo and/or farm plan. Please tick appropriate boxes)

I wish to apply for

O1 ☐ A new water supply work approval

O2 ☐ An amended water supply works approval specifying a changed or new water supply work (ie to amend or change the details of an existing water supply works approval)

If you ticked the second box (O2) please complete the following questions O3 and O4.

O3 Existing approval number to be amended. _____

O4 Briefly describe the changes you wish to make (eg. change in the size of pump, location, etc).

- O5 Do you have a current and relevant water access licence? Yes ☐ No ☐
- O6 If yes, what is the number of the water access licence/s to be associated with this application? _____
- O7 If no when do you intend to secure a water access licence? _____

Location of works

- O8 Lot number _____ DP number _____ County _____ Parish _____
- O9 River _____
- O10 Type _____ Size _____ (mm) Capacity _____ (litres/sec)
- Description _____
(e.g. centrifugal)
- O11 Do you intend to excavate to install your pump? Yes ☐ No ☐
- O12 Do you intend to clear any native vegetation to construct the works? Yes ☐ No ☐
- O13 If yes, area of ground to be cleared _____ (m²)

Section P

Channel(s) for diverting or conveying water, regulator(s) or pipes

(If you are seeking approval for more than one of these works, photocopy this page and attach the completed extra page(s). Mark each work on a copy of the topographical map, aerial photo and/or farm plan of A3 or A4 size. Please tick appropriate boxes)

I wish to apply for

- P1 ☐ A new water supply work approval
- P2 ☐ An amended water supply works approval specifying a changed or new water supply work (ie to amend or change the details of an existing water supply works approval)

If you ticked the second box (P2), please complete the following questions P3 and P4.

- P3 Existing approval number to be amended. _____
- P4 Briefly describe the change(s) you wish to make. _____

- P5 Do you have a current and relevant water access licence? Yes ☐ No ☐
- P6 If yes, what is the number of the licence/s that is/are to be associated with this application? _____
- P7 If no, when do you intend to secure a water access licence? _____
- P8 Type of Work ☐ Channel ☐ Regulator ☐ Pipe ☐ Other _____

Location of the work

- P9 Lot number _____ DP number _____ County _____ Parish _____
- P10 Name of nearest river _____ Distance from nearest river _____ (m or km)
- P11 **Size and dimensions of the work**
- | | |
|---------------------------------------|-----------------|
| Length | _____ (m or km) |
| Depth (average) | _____ (m) |
| Width (average) | _____ (m) |
| Height above surrounding ground level | _____ (m) |
| If a pipe, diameter of pipe | _____ (m) |

- P12 Do you intend to clear any native vegetation to construct the works? Yes ☐ No ☐
- P13 If yes, area of ground to be cleared _____ (m²)

Groundwater works

(If you are seeking approval for more than one of these works, please photocopy this page and attach the completed extra page(s). Mark each work on a copy of the topographical map, aerial photo and/or farm plan of A3 or A4 size. Please tick appropriate boxes)

I wish to apply for

- Q1 ☐ A new water supply work approval Q2 ☐ A amended water supply works approval specifying a changed or new water supply work (ie to amend or change the details of an existing water supply works approval)

If you ticked the second box (Q2), please complete the following questions Q3 and Q4.

- Q3 Existing approval number to be amended. _____
- Q4 Briefly describe the change(s) you wish to make. _____

Q5 Is the work existing or proposed? _____

Q6 Do you have a current and relevant water access licence? Yes ☐ No ☐

Q7 What is the number of the licence/s to be associated with this application? _____

Q8 Type of Work

☐ Bore ☐ Well ☐ Excavation ☐ Spearpoint ☐ Test Bore ☐ Artesian Well

Q9 Purpose of Work _____

Q10 Lot number _____ DP number _____ County _____ Parish _____

Q11 Will the proposed works be within 40m of a creek, stream, river, lake, wetland, swamp, marsh or the coast line? Yes ☐ No ☐

Q12 If Yes, what is the name of this water body _____

Q13 Distance of proposed work from this water body _____ (m)

Q14 Distance from property boundary _____ (m or Km)

Q15 Proposed depth of bore _____ (m)

Q16 Are the proposed works within 100m of any septic, sewerage, stormwater or other waste water storage or conveyancing works, or any other waste repository (such as a landfill, dump, burial area), or known site of contamination (such as a sheep or cattle dip site, or petrol station) that has or may have the potential to contaminate the groundwater into which the bore will be constructed? (If yes, indicate type and distance in each case.)

Q17 Do you intend to clear and native vegetation to construct the works? Yes ☐ No ☐

Q18 If yes, area of ground to be cleared _____ (m²)

Q19 Will your proposed work impact on an area of known Aboriginal cultural significance? Yes ☐ No ☐

Q20 Are you in an underground mining area? Yes ☐ No ☐

Q21 Please supply details of proposed bore driller.

Section R

Storage works – off-river and runoff harvesting storages only (eg. on-farm dams, turkey's nest dams)

(If you are seeking approval for more than one of these works, photocopy this page and attach the completed extra page(s). Mark each work on a copy of the topographical map, aerial photo and/or farm plan of A3 or A4 size. Please tick appropriate boxes)

I wish to apply for

R1 ☐ A new water supply work approval

R2 ☐ A replacement water supply works approval specifying a changed or new water supply work (ie to amend or change the details of an existing water supply works approval)

If you ticked the second box (R2) please complete the following questions R3 and R4.

R3 Existing approval number to be replaced. _____

R4 Briefly describe the change/s you wish to make.

R5 Is the work existing or proposed? _____

R6 Do you have a current and relevant water access licence? Yes ☐ No ☐

R7 If yes, what is the number of the licence/s to be associated with this application? _____

R8 If no, when do you intend to secure a water access licence? _____

R9 Type of work _____ R10 Purpose _____

Location of the work

R11 Lot number _____ DP number _____ County _____ Parish _____

R12 Is the work proposed to be on a floodplain? Yes ☐ No ☐

If Yes, you may be required to lodge a separate application under the *Water Act 1912*.

R13 Size and dimensions of the work

Length _____ (m or km)

Depth (average) _____ (m)

Width (average) _____ (m)

Height above surrounding ground level _____ (m)

Proposed capacity _____ (ml)

R14 Do you intend to clear and native vegetation to construct the works? Yes ☐ No ☐

R15 If yes, area of ground to be cleared _____ (m²)

Storage works – in-river storage only (eg. weirs)

Note that most water sharing plans prohibit in-river dams. Check the guide for your area.

(If you are seeking approval for more than one of these works, please photocopy this page and attach the completed extra page(s). Mark each work on a copy of the topographical map, aerial photo and/or farm plan of A3 or A4 size. Please tick appropriate boxes)

I wish to apply for

- S1 ☐ A new water supply work approval S2 ☐ A replacement water supply works approval specifying a changed or new water supply work (ie to amend or change the details of an existing water supply works approval)

If you ticked the second box (S2), please complete the following questions S3 and S4.

S3 Existing approval number to be replaced. _____

S4 Briefly describe the changes you wish to make.

S5 Is the work existing or proposed? _____

S6 Do you have a current and relevant water access licence? Yes ☐ No ☐

S7 If yes, what is the number of the licence/s to be associated with this application? _____

S8 If no when do you intend to secure a water access licence? _____

S9 Type of work _____ S10 Purpose _____
(see list of works at the end of the Guide)

Location of the work

S11 Lot number _____ DP number _____ County _____ Parish _____

S12 Is the work proposed to be on a floodplain? Yes ☐ No ☐

If Yes, you may be required to lodge a separate application under the *Water Act 1912*.

S13 Size and dimensions of the work

Length _____ (m or km)

Depth (average) _____ (m)

Width (average) _____ (m)

Height above surrounding ground level _____ (m)

Proposed capacity _____ (ML)

S14 Do you intend to clear and native vegetation to construct the works? Yes ☐ No ☐

S15 If yes, area of ground to be cleared _____ (m²)

Part 4 Declaration of approval holder(s)

(attach/ photocopy extra page if more than 2 holders)

Section T

I/We, the undersigned, apply for an approval described above for the nature and purpose specified in the application.

I/We state that the information provided for the purpose of this application is accurate and true.

For applications made by individuals:

T1 Name _____ Signature _____ Date _____

Name _____ Signature _____ Date _____

For approvals held by companies:

T2 Name of company _____ Position held _____

T3 Name _____ Signature _____ Date _____

of company representative

Witnessed by

T4 Name _____ Signature _____ Date _____

Please note that it is an offence to provide misleading or incorrect information. This approval (should it be granted) may be cancelled or suspended if you are convicted of an offence under the *Water Management Act 2000*.

Submit your completed form to your local NOW office. Enclose a cheque or money order for the application fee.

Privacy Note: The personal information you provide in this form will be treated in accordance with the *Privacy and Personal Information Protection Act 1998*, under which you have rights of access and correction. Your personal information will be used for assessing and processing your application and may be disclosed to public authorities and other parties as required.

NB The *Water Management Act 2000* requires that some details of your application appear in a public application register. Should your application be approved, details of the approval will also appear in a public approval register.

Guide to the application for water supply works approval, and/or water use approval

Application for Minister's consent under section 92 of the *Water Management Act 2000*

Introduction

This guide is provided to assist you in completing the *Application for approval for water supply works, and/or water use*. This form must be completed in order to obtain a water use or water supply works approval under section 92 of the *Water Management Act 2000* (WMA) or to apply to change or remove a condition of an existing water use or water supply works approval.

A water supply works approval allows you to install and operate a particular pump, bore or other water management work at a particular location. A water use approval allows you to use water for a particular purpose at a particular location (fill out this form only if you want approval to use water for irrigation or town water supply). It is important to note that water use or water supply works approvals do not allow you to take water without a water access licence (WAL).

If you want to apply for approval for water supply works and water use on different properties, you will need to make separate applications.

You should also refer to information on *Dealings in water and Applying for a new water access licence* on the NOW website which provides more information on water dealings.

About these guidelines

The Application for approval for water supply works, and/or water use has several parts (relating to the type of approval sought) and sections, which are divided into a series of questions. The questions are identified by a number on the left hand side of the page, for example, B4, which is question 4 in section B. This guide provides detailed explanations of each section and question to help you fill in the application form. We recommend you read this carefully before completing the application form. However, if you require further assistance, please contact your local NOW office.

General Instructions

To make sure that your application is processed efficiently, please note these general instructions:

- use BLOCK letters as they are easier to read;
- if there is not enough space on the form for all your information complete the answer on a separate sheet of paper and attach it to application form (remember to include this page when numbering your pages);
- ensure that you fully complete the form as all the information is necessary to verify and process your application – it may be rejected if all the information is not available for the assessment; and
- include the appropriate fee with your application – your local NOW office will be able to advise you on the current fee.

Section A: Applicant details

These are the details of either the applicant(s) that will appear on your approval.

- A1-4. The name can be a person's name or the name of a legal entity, such as a corporation, that is either the owner or legal occupier of the land to which the application relates. The application for an approval must be by an individual (or individuals), a company, body corporate or public authority, but not a partnership or joint venture. If the approval is to be registered under the names of more than one person, provide the names in the spaces provided, or if more than two owners, provide the additional names on a separate sheet of paper and attach it to application form.
- A5: Insert your Australian Company Number (ACN) if it is a company application. Note that an ABN (Australian Business Number) is not permitted.
- A6: Insert the position of the person who will represent the company as the holder the approval, should it be granted.
- A7-11: Insert the usual address of the applicant. If a corporation is applying, you should fill

in the details of the contact person to whom all correspondence will be sent.

A16-23: More than one person can hold one approval. This form makes provision for 2 applicants. If there are more than 2 applicants, please attach additional pages.

A24: This is the total number of applicants to be listed on the approval and includes applicants listed on any additional pages.

Section B: Applicant's (or agent's) contact details

These are the contact details of the applicant's representative. If a corporation is applying for an approval you should fill in the details of the contact person to whom all correspondence will be sent.

Section C: Land ownership

If you are applying for a water use or a water supply works approval where you are the owner of part of the land and the lawful occupier of the remainder then you will need to tick more than one of these boxes.

C1 An **owner of land** is any person with freehold title to land.

C2: To permit you to carry out the activities to be authorised by the approval, the term **lawful occupation** includes:

- a) an easement;
- b) a power arising under legislation; or,
- c) an agreement or other legally binding permission with the owner (eg. a lease, a permissive occupancy or enclosure permit)

The agreement may be a specific authorisation or an appropriate clause in a general authority such as a lease. You must attach a copy of the relevant documentation, which includes:

- a) a letter from the owner authorising your occupation of the land to which the approval would apply;
- b) evidence of an easement, a power arising under legislation or an agreement or other legally binding permission with the owner (eg. lease, a permissive occupancy or enclosure permit).

C3 Other – This could be if you are applying as a major utility, irrigation corporation, private irrigation board, private drainage board or private water trust, or as permissive occupancy. All owners of the land or lawful occupiers, or their legal representative, must sign this application form.

Section D: Other approvals

D1-D3: If your proposal has been granted consent from your local council, please provide the consent number in D3.

D4-D6: You may require a separate approval or a property vegetation plan under the *Native Vegetation Act 2003* if your proposal is for water use and involves clearing. If native vegetation clearing consent has also been granted, please provide the consent number. You do not need to fill in D4–D6 if your proposal only involves works.

Section E: Maps

A photocopy of a topographic map with hand-drawn property boundaries and features is acceptable.

Section F: Pre-application discussion

For complex proposals, we recommend that you have a pre-application discussion with a NOW officer where you discuss the proposed activity, any likely impacts of the proposed activity, the application process, and what information you will be required to provide to NOW. A pre-application discussion could be carried out over the telephone.

Pre-application discussions can save you time by preventing delays in information gathering. To arrange for a pre-application discussion, ring your local NOW office.

Section H: Purpose

H1: You should only fill out Part 2 if you want approval to use water for irrigation or town water supply. If you have any other purpose, contact your local office for advice.

H3-H5: It is not necessary to hold a water access licence in order to apply for a water use approval. However, it is recommended that you check with NOW about water availability before making an application if you are in doubt.

Part 2: Water Use Approval

If you are applying for a **Water Use Approval only**, fill in Part 2, leave Part 3 blank and go on to Part 4.

Section I: Location of water use

I1-I7: Provide the location of the water use approval and the river location to allow references to relevant planning policies that apply to the area. If the proposal will be located on more than one property, please mark them all clearly on a map and provide property details such as lot number etc. for each.

Section K: Information maps

Attach maps to the application.

Section L: Soils

L1-L4: For complex or potentially high impact proposals, you may be required to provide a soil survey to NOW. If you are in doubt, contact your local office.
www.water.nsw.gov.au

Section N: Drainage management

N4-N6: Some activities such as applying pesticides also require consent from the Department of Environment and Conservation.

Part 3: Water Supply Works

Sections O to S: Water supply works approval

If you are applying for a **Water Supply Works Approval only**, fill in the relevant sections O to S then go to the end of the form (Part 4) and sign the declaration.

If you are applying for approval for multiple works, you only need to fill in the relevant section for each individual work.

If you are applying for more than one work of the same category (eg. Groundwater works), you will need additional copies of the relevant section of the application. These copies should be attached to the application before it is submitted to NOW.

An Aboriginal Heritage Information Management System report and a Threatened Species Assessment report will be completed internally by NOW and the Department of Environment, Climate Change and Water as a part of your application.

Depending on the size of your proposal and its potential impacts, you may also be required to provide:

- a Species Impact Statement (if your proposal has potential impacts on threatened species under the *Threatened Species Conservation Act 1995*);
- a surveyed plan showing the proposed layout, dimensions and construction details of the work/s; or
- any other additional information about your proposal as required by NOW.

If your proposed activity is a **water supply work** and it involves clearing of native vegetation, you do not have to get separate approval under the *Native Vegetation Act 2003*. You may, however, require a separate approval or a property vegetation plan under the *Native Vegetation Act 2003* if your proposed activity is water use and it involves clearing at the proposed site of the water use.

In some of the sections below, there are questions relating to rivers. 'River' is defined in the *Water Management Act 2000* to include:

- a) any water source, whether perennial or intermittent and whether comprising a natural channel or a natural channel artificially improved, and
- b) any tributary, branch or other water course into or from which a water course referred to in paragraph (a) flows, and
- c) anything declared by the regulations to be a river.

For the practical purposes of this application, NOW defines 'river' as any blue line on the largest topographical map of that area (ie. at least 1:25,000).

Section O: Pumps(s) – surface water only

- O5-O7: It is not necessary to hold a water access licence in order to apply for a works approval. However, it is recommended that you check with NOW about water availability before making an application if you are in doubt.
- O8: If the proposal will be located on more than one property, or there is more than one work, please mark them all clearly on a map and provide property details such as lot number etc. for each.
- O12 For type of work, see list of works at the end of this guide.

Section P: Channel(s)

- P5-P7: It is not necessary to hold a water access licence in order to apply for a works approval. However, it is recommended that you check with NOW about water availability before making an application if you are in doubt.
- P8: See list of works at the end of this guide.
- P9: If the proposal will be located on more than one property, or there is more than one work, please mark them all clearly on a map and provide property details such as lot number etc. for each.

Section Q: Extraction works – groundwater only

- Q8: See list of works at the end of this guide.
- Q10: If the proposal involves more than one work and/or more than one property, please mark them all clearly on a map and provide property details such as lot number etc. for each.
- Q11-13: NOW needs to check that your proposed work will not extract from a river, damage a wetland, interfere with a neighbour's bore or extract contaminated groundwater.
- Q21: The proposed work must be carried out by a licensed bore driller. Contact NOW to check whether a driller is licensed if you are in doubt.

Section R: Storage works – off river

- R6-R8: It is not necessary to hold a water access licence in order to apply for a works approval. However, it is recommended that you check with NOW about water availability before making an application if you are in doubt.
- R7: See list of works at the end of this guide.
- R11: If the proposal will be located on more than one property, or there are more than one work, please mark them all clearly on a map and

provide property details such as lot number etc. for each.

- R12: If the proposed work is to be on a floodplain, it may cause the redistribution of flood flows, which may have adverse environmental impacts and adversely affect surrounding landholders. NOW is required to assess these aspects and may require you to redesign your proposal to mitigate any potential impacts and a separate application may be required under the *Water Act 1912*.
- R13: Refer to information on farm dams for a method of calculating storage capacity at www.water.nsw.gov.au/Water-licensing/Basic-water-rights/Harvesting-runoff/Harvesting-runoff/default.aspx

Section S: Storage works – in river

- S6-S8: It is not necessary to hold a water access licence in order to apply for a works approval. However, it is recommended that you check with NOW about water availability before making an application if you are in doubt.
- S7: See list of works at the end of this guide.
- S12: If the proposed work is to be on a floodplain, it may cause the redistribution of flood flows, which may have adverse environmental impacts and adversely affect surrounding landholders. NOW is required to assess these aspects and may require you to redesign your proposal to mitigate any potential impacts and a separate application may be required under the *Water Act 1912*.
- S13: Refer to information on farm dams for a method of calculating storage capacity at www.water.nsw.gov.au/Water-licensing/Basic-water-rights/Harvesting-runoff/Harvesting-runoff/default.aspx
NOW may refer the application to NSW Fisheries, who may require a separate approval.

Section T: Declaration

Please ensure you understand your legal obligations before signing this document. If you require assistance, please ring your local NOW office.

- T1: Each of the approval applicants must fill in their name, followed by a signature and the date of signing.
- T2: If the applicant is a company, insert the name of the company and the title or position of the company's signatory/representative.
- T3: Insert the name of the company signatory/representative.
- T4: An independent witness is required to sign this section in order to verify that the position stated in T2, above, is the position held by the signatory in T3.

Submitting your application

Submit your completed form to your local office of the Department Natural Resources enclosing your cheque or postal order.

If the application is complete and correct it will be registered on NOW's database and the fee processed. You will receive an acknowledgment letter providing an application reference number and a receipt for the fee. The application will be delayed if it is incomplete or incorrect. NOW will notify you of this. NOW may also notify you if further information is required. If this information is not received within the specified time, NOW will reject the application and return it with an explanation and the fee will be refunded.

For more information

Contact the water licensing officer at your local NSW Office of Water (contact details are available on the website) or

free call: 1800 353 104

email: information@water.nsw.gov.au

web: www.water.nsw.gov.au

List of works

In each of sections E to L, the application requires the 'Type of work' to be entered. Select from the 'type of work' listed under each of the work categories.

Type of work	Specific type	
Diversion work – pump	Axial flow	Centrifugal
	Mixed Flow	Force
	Piston	Mono
	Submersible	Pumping Plant
	Pumping Station	Stand by pump
	Helical rotor	Windmill
	Hydraulic ram	Spearpoints
Diversion work – other	Cutting	Channel
	Regulator	Water race
Extraction works – groundwater	Bore	Spearpoints
	Well	Excavation
	Artesian bore	Collector system
Conveying works	Channel – above ground	Channel – below ground
	Pipeline	
Storage Works – off river	Bywash dam	Bywash dam and cutting
	Earthen dam and pipe spillway	Recirculation storages
	Groundwater storages (eg. tank, dam)	
Storage works – in river	Block dam	Block dam and diversion pipe
	Block dam and regulator	Block dam with training walls
	Earth fill dam/ spillway/ radial gate and emergency spillway	Earthen dam and pipe spillway
	Overshot dam	Overshot dam and diversion pipe barrage
	Bywash dam	Bywash dam and cutting
	Block dam with bywash	Weir
Storage – runoff harvesting	Bywash dam	Block dam with training walls
	Excavated tank	