5. Strategic Environmental Management

5.1 HEZ Association

The Director Generals Requirements include a requirement to consider the ongoing management of the environmentally significant central creekline corridor and ongoing environmental management and reporting for the use and development of the estate.

The body proposed to be created to facilitate and manage these issues is the HEZ Association.

The HEZ Association is to be created as a Company Limited by Guarantee established under the Corporations Act 2001. The Association is to be established and will require every Registered Proprietor of a lot within the HEZ Estate to be a member of the Association. The requirement for membership of the Association will be reinforced and implemented via a Section 88B restriction upon each development lot created in the estate.

The objects of the Association under the proposed Constitution are to:

- Provide an association in which every Registered Proprietor of a lot must be a member; and
- Provide for the promotion, development, organisation, management, administration presentation and control of the Land and all other matters in connection with or incidental to the land and the industrial or other activities carried on or to be carried on in the Land whether by a member or otherwise.

The HEZ Association will be responsible for the care and management of common assets and land throughout the Estate, such as the central conservation lands zoned 7(b) Environmental Protection (Conservation). The role of the HEZ Association in the management of the environmentally significant lands is already enshrined within Environmental Protection and Conservation Biodiversity (EPBC) Act 1999, approval number 2004/1417. This approval requires that future owners

of development land within the Estate be HEZ Association members. The EPBC approval nominates the HEZ Association as the responsible entity for annual environmental performance monitoring and reporting in regard to the Environmental Protection and Conservation Biodiversity (EPBC) Act 1999 controlled actions. That is for the EPBC approval to be operational the HEZ Association must be place. The EPBC approval is supported by Conservation Management Plans prepared for the Conservation Lands (areas zoned 7(b) Environmental Protection, and the Development Lands (areas zoned 4(b) and 5(a)).

The HEZ Association will be in effect a central contact point for any Statutory Authority involved in or requiring overall monitoring of any environmental performance category, such as noise emission and air quality management. The HEZ association will be responsible for the collection and collation of individual lot owners and users data and reporting on the results and implementation of any management requirements.

The proponent continues to pursue the finalisation of the HEZ Association with Cessnock City Council since 2004 without resolution to date. The proponent will continue to pursue finalisation of the HEZ Association concurrently to the Concept Plan Application and is in a position to immediately constitute the required entity.

The HEZ Association Constitution and required Section 88B instrument setting out the obligations of future landowners to be members of the Association are complete and ready to be implemented.

In addition to the Statutory role of the HEZ Association under the EPBC approval it is envisioned that the HEZ Association functions will include Estate Representation, Data collection management and reporting, Property Management and Services and Development Management and Services

The various functions under these broad topics could include:

Estate Representation

- Promotion of the estate (including activities on the estate)
- Promotion of environmental objectives and achievements
- Fostering links between firms within the estate, as members of the HEZ

Association

- Representation of members in dealing with public authorities on estate wide issues
- Assisting individual members in dealings with public authorities
- Acting as initial point of contact with authorities on behalf of members
- Maintain Minutes of Association meetings, company administration in accordance with its Constitution and ASIC requirements (self regulation)

Data Collection Management

- Maintain records of background environmental data
- Maintain records of individual developments (including environmental data)
- Undertake estate wide environmental monitoring such as air quality monitoring)
- Maintain records relating to environmental monitoring and performance against statutory Conservation Management Plans
- Provision of data to assist in ongoing user application preparation and estate planning
- Provision of six monthly and annual reporting to Public agencies as required by consent conditions

Property Management and Services

- Property marketing
- Maintenance of 7(b) lands in accordance with adopted Conservation Plans of Management
- Maintenance of APZ's outside of private land
- Maintenance of any private estate roads (owned by HEZA), public signage.
- Bulk purchasing on behalf of estate and members, as appropriate
- Provision of non-compulsory services to resident companies (eg site specific landscape maintenance, security, waste removal etc).
- Promotion of waste management and energy efficient practices within the estate

Development Management and Services

- Assist with pre-DA negotiations and authority introductions.
- Act as agent for intending members as required
- Provide access to data to assist user application document preparation

- Access to service providers etc with estate background
- Assistance with DA documentation requirements

The HEZ Association will therefore have a statutory role in complying with the EPBC requirements that are in pace as well as promoting the HEZ Estate as a location for business to establish and fostering potential linkages between members for mutually beneficial relationships and the creation of an industrial business ecosystem.

A successful and well managed estate as an objective to strive for represents the greatest potential for successful enterprises to be accommodated and thus fostering employment and business opportunities on the estate.

6. Statutory Planning Framework

6.1 Hunter Regional Environmental Plan

The objectives of the Hunter Regional Environmental Plan (REP) 1989 are to promote the balanced development of the region, and the optimum use of its land and other resources.

The proposed development is considered to be consistent with the provisions of the Hunter REP.

The Hunter REP at Part 3 provides specific guidelines and consideration for Economic Development, and specifically Industrial Development at Division 1.

Part 3 Division 1 Industrial Development

The provision of development lots in precinct 1 to accommodate the Industrial development of the existing zoned land does not conflict with the objectives of clause 15. The clause seeks to ensure sufficient zoned land is provided while protecting the environment and to promote the distribution of employment compatible with the availability of services and population distribution.

Part 5 Division 1 Roads, Railways and Public Transport

The objectives of this Division are to ensure the use of public transport is facilitated, traffic management ensures optimal use of the existing road system and upgraded roads are constructed to meet identified demands.

The entire 4(h) Hunter Employment zoned lands have been the subject of extensive traffic and transport analysis which has lead to the preparation of a draft Deed of Road Funding Agreement between the Proponent and the RTA. The Agreement is intended to facilitate the implementation of the identified road and network upgrades generated by the development of the subject lands. The finalisation is being pursued separately but concurrently with the Concept Plan application.

Part 7 Division 1 Pollution Control

Clause 47 provides that in assessing development consideration must be given to the means of managing potential air and water pollution, noise, dust and vibration impacts, water quality and protection of watercourses.

Comprehensive strategies for the estate and Precinct 1 have been developed by SKM to address the elements of air pollution, noise, and dust and vibration impacts. The issues of water quality and water course protection have been addressed in the strategy prepared for the precinct by EDAW. These strategies and assessments are provided in the appendices to this assessment.

These strategies and guidelines will be incorporated into the Draft Statement of Committments (Appendix A) proposed for the site to ensure that future individual development of the land do not result in the adverse impacts that clause 47 seeks to manage.

Part 7 Division 2 Waste Disposal

A comprehensive Waste management Strategy was prepared for the Estate and currently comprises one element of the Environmental Management Strategy (EMS) for the estate. The requirements of this plan are adopted and retained for Precinct 1.

Part 7 Division 3 Environmental Hazards

The division seeks to minimise the effects of soil erosion, flooding, coastal erosion and storm damage, bushfires and mine subsidence on development.

The investigations and strategies have been prepared to address the management of soil erosion as an element of the water management strategy. Bushfire prevention measures have been incorporated into the precinct layout including road design as APZ's and inclusion of APZ's within lots where required.

The land which has been zoned for Industrial purposes and is subject to this application is not subject to flood inundation.

The site has been subject to previous investigations into potential mine subsidence impacts and the recommendations of that report have been adopted and identify that in the area of Precinct 1 Mine Subsidence is a readily manageable issue.

6.2 Lower Hunter Regional Strategy

The Primary purpose of the Lower Hunter Regional Strategy is to ensure that adequate land is available to sustainably accommodate the projected housing and employment needs of the Region until 2031. The Strategy applies to five Local Government areas, including Cessnock City Council. As the subject site is within the Cessnock Local Government Area (LGA) the Strategy applies to the development.

The HEZ Estate is recognised in the strategy as employment lands zoned to permit activities such as factories, warehouse, and manufacturing and major storage operations.

The site as existing zoned and serviced land is potentially a significant contributor to accommodating a large portion of the 66,000 jobs identified as being required in the region by 2031.

The Precinct 1 lands provide the opportunity for a diverse range of employment generating uses that will be accessible to transport links and labour supply. The size and scope of the opportunities available will accommodate employment purposes to serve the economic growth of the Hunter region as well as broader State development outcomes.

Development of the land as proposed does not conflict with the outcomes and actions for the matters raised in the Strategy. The Environmental Assessment includes consideration of and responses to the issues of employment, transport, environmental and natural resources, natural hazards, water, and heritage.

Transport

The Regional Strategy identifies the desired outcomes for transport as being the integration of lands use and transport planning to minimise the need to travel and encourage energy and resource efficiency. As detailed in the Transport and Access assessment the HEZ Estate is the subject to a long term traffic and transport management strategy to accommodate the growth and development of Precinct 1 and subsequent precincts.

This includes the establishment of a Deed of Road Funding Agreement for the provision of road network upgrades and network facilities.

The location and establishment of the HEZ Estate as an employment zone was influenced by the proximity to excellent road transport linkages and the accessibility of the estate to the Port of Newcastle, Williamtown Airport and the Regional rail network. In addition to site is readily accessible to diverse population catchments providing a source of potential employees and accommodation options for employees.

The masterplanning of the estate includes proposals for an extensive cycle network that links the site to the surrounding residential areas and the existing and future cycle networks beyond.

Development of the land as proposed does not conflict with the outcomes and actions for Transport detailed within the Strategy.

Environment and Natural Resources

A key outcome and action for the strategy is the protection of the Regions waterways and Riparian zones and the associated habitats.

The Greater HEZ Study area comprises a total land area of 3223ha. Of this area 923ha is zoned for employment and community purposes. The balance of 2,300ha has been zoned as 7(b) Environmental Protection and 8(a) National Parks and Nature reserve. The former Aberdare State Forest is zoned as 1(f) Rural (forestry) but is now owned by National Parks and has been incorporated into the Werekata

National Park.

This strategic framework of land zonings has provided a strategic base to provide for the protection of the biodiversity of the locality and to integrate the employment generating development into the landscape.

The proposed layout of precinct 1 provides a comprehensive solution to the pertinent issues of Riparian zone protection through the provision of the central protected corridor over Chinamans Hollow Creek and the integration of water sensitive urban design and working with the natural topography of the site such that the new roads integrate with the sites natural drainage patterns. These devices in conjunction with the setbacks proposed provide significant opportunities for vegetation retention and augmentation to further supplement the lands specifically protected in conservation zonings.

Natural Hazards

The land the subject of the Concept Plan has not been identified as being potentially adversely impacted by natural Hazards of flooding or tidal inundation. The major riparian zone located centrally to the HEZ estate is protected within a 200m corridor that has been zoned 7(b) Environment Protection (Scenic) under Cessnock LEP 1989. This zoning protects the natural drainage attributes of this land in conjunction with the retention and management of the flora and fauna habitats in this corridor.
The proposed development does not conflict with the required outcomes of the Regional Strategy.

Water

The regional Strategy requires water sensitive urban design for residential development. Despite this the water management strategy proposed for the industrial estate adopts water sensitive urban design principles and includes significant opportunities for on-site water re-use within the guidelines developed for individual site developments.

The strategies proposed within the Draft Statement of Committments (Appendix A)

is considered to exceed the desired outcomes of the Regional Strategy.

Heritage

The concept plan is supported by assessments of the potential impacts upon the Aboriginal and European heritage of the area. The outcomes of these considerations have been included within the Draft Statement of Committments (Appendix A) for the proposal and have sought to recognise and respond to those elements of the site which have potential heritage significance. The outcomes of the Strategy have been achieved by the assessment

6.3 Cessnock LEP 1989

The land to which the Concept Plan applies is within Zone No 4 (h) (Hunter Employment Zone), 5(b) Special Uses (Railways); 1(a) Rural "A" and Zone No 7 (b) (Environmental Protection (Conservation) Zone).

No development is contemplated within the 7(b) zoned lands other than already approved infrastructure and access routes.

The objectives of the 4(h) zone are:

(a) to encourage sustainable major industrial development or major employment-generating development that is conveniently accessible to urban centres and that has good road and rail access links, and

(b) to encourage ecologically sustainable development by prohibiting development that contributes to the degradation of the Wallis and Fishery Creeks water catchments, and

(c) to permit other development that is complementary, ancillary or related to existing development within the zone, and

(d) to prohibit development that exposes residences and the natural environment to unacceptable levels of pollution or hazard risk, and

(e) to minimise the clearing of native vegetation, and

(f) to facilitate the movement and survival of native fauna and flora by conserving native vegetation corridors.

These objectives are met by the proposed Concept Plan as:

- The development provides an estate design and layout for the development of a range of lots suitable for a diverse range of industrial and employment generating purposes. The lot pattern is based upon lot layouts that are readily able to be amalgamated to accommodate a variety of potential users targeted at potential demand in the 2 to 5 hectare lots size.
- The proposed wall and floor panel manufacturing use and the subdivision design and layout does not include development that would contribute to the degradation of the Wallis and Fishery Creeks water catchments.
- The design and configuration does not preclude or hinder the future provision of development that may be complementary, ancillary or related to existing development in the 4(h) zone.
- No development is proposed that is offensive or hazardous and a strategy framework has been proposed to manage and mitigate potential impacts upon air and water quality, noise, vibration and light impacts.
- The Concept Plan delineates the potential area of clearing to accommodate the development of the sites for industrial purposes while providing a strategy for the provision of vegetation and buffers within the setbacks that exceed the amenity and environmental attributes of the buffers and setbacks contemplated by the current DCP provisions. This is reinforced by the road pattern responding to the site topography and the setbacks therefore providing supplementary corridors to the central Chinamans Hollow Creek corridor.

The objectives of the 7(b) zone are:

a) to maintain the ecological integrity and viability of areas of conservation value, and

(b) to conserve biological diversity, and

(c) to conserve native ecosystems, and

(d) to prohibit development that would adversely impact on the conservation of native ecosystems and biological diversity, and

(e) to minimise the clearing of native vegetation, and

(f) to facilitate the movement and survival of native fauna and flora by

conserving native vegetation corridors, and

(g) to protect the Aboriginal heritage values of land, and

(h) to protect the scenic qualities of land, and

(i) to prohibit the further subdivision of land within the zone.

The Concept Plan does not conflict with the objectives of this zone.

The proposed Station Street extension road through and across the 5(b) Special Uses (Railways); 1(a) Rural "A" are not prohibited by the relevant zones and are consistent with the zone provisions.

In addition to the zone provisions, Cessnock LEP 1989 contains a number of matters for consideration applicable directly to development undertaken within the HEZ Estate. The assessment and consideration of the Project Application for the wall and floor panel manufacturing facility is detailed within the accompanying volume of assessment for the Project element of the application.

The major consideration that arises from an assessment of the Concept Plan application for the precinct 1 layout against the provisions of Cessnock LEP 1989 relates to clause 56 of the LEP. The relevant clause states:

"56 Hunter Employment Zone—Subdivision of land within Zone No 4 (h), 5 (a) or 7 (b)

(1) This clause applies to land that is shown edged heavy black on the map marked "Cessnock Local Environmental Plan 1989 (Amendment No 60)—Hunter Employment Zone" and that is within Zone No 4 (h), 5 (a) or 7 (b).

(2) Consent must not be granted to the subdivision of land within Zone No 4 (h) or 5 (a) to which this clause applies unless the subdivision specifically relates to the use of the land for which consent has previously been or will concurrently be granted.

(3) Despite clause 17A and subclause (2), consent may be granted to the subdivision of land to which this clause applies solely for the purpose of subdividing areas of land within Zone No 4 (h), 5 (a) or 7 (b) along zone boundaries."

The Concept Plan includes a request for the subdivision of Precinct 1 contrary to

this provision. The application seeks a determination to set aside this provision on the basis of the sound planning outcomes presented in the Environmental Assessment. That is, the endorsement of a Precinct layout and design as proposed provides a greater level of certainty to the highly desirable outcomes of vegetation and habitat management, water management and bushfire protection planning.

By setting aside the limitation on subdivision unless associated with a specific use, the piecemeal implementation of the environmental objectives for the development of the estate that has characterised the assessment of the development to date is removed. Instead, the piecemeal approach is replaced with a comprehensive well researched and reasoned response to all of the competing site considerations.

The proposed solution has sought to optimise the balance between the environmental considerations and the economic considerations for the development and the subsequent employment opportunities introduced into the region.

The approval of the subdivision layout contrary to clause 56(2) is considered to be prudent given the significant estate management benefits that result.

6.4 Cessnock DCP

The provisions of Part E6 of Cessnock DCP address a range of issues including the elemental Environmental Management Strategies for the HEZ Estate. The Director Generals Requirements issued for the site have required these issues to be specifically addressed. The consideration of Flora and Fauna, Heritage, Traffic impacts, Soil and Water, and Noise and Vibration impacts are all addressed within the Appendices of this Environmental Assessment and the specific environmental assessment for the wall and floor panel manufacturing facility.

The preparation of the lot layout has addressed the principles of design to reflect the applicable site considerations and provision of a framework to maximise the efficiency and environmental responsiveness of the design. This outcome is reinforced in the specific assessments and considerations included in the Environmental Assessment.

The performance of the proposed wall and floor panel manufacturing facility against the DCP is addressed specifically within the volume addressing the facility component of the application.

The provisions of the DCP in relation to Urban Design at Section 6.3.5 will be addressed in this assessment.

Otherwise the DCP is focused towards the construction of buildings and is irrelevant to the proposed subdivision of precinct 1 as proposed in the Concept Plan.

The Environmental Assessment and precinct 1 framework proposes alternate solutions to the future development of the individual sites created within the estate which are reflected within the Draft Statement of Committments (Appendix A). The conflicts and alternate solutions to the DCP provisions are addressed in the following paragraphs.

Lot Sizes and Boundaries

The DCP reinforces the LEP provision precluding pre-emptive subdivision. As addressed the prohibition of pre-emptive subdivision is a significant hindrance to the implementation of appropriate environmental protection and retention measures. The proposed Precinct design accommodates lot modules of generally 2 hectares or greater. This configuration has been pursued to permit easy amalgamation of lots to provide industrial lots in the range of 2 to 5 hectares.

The benefits of providing a Precinct configuration out weigh any consideration that may have been contemplated in the preclusion of pre-emptive subdivision.

Despite this the objective of the control is considered to be met through the provision of large parcels of land for employment generating industries as intended by the zone provisions.

External Appearance and Use of Materials

The assessment and consideration criteria of this provision from the current

Cessnock DCP can be adopted for future applications to develop the lots created by the proposed subdivision.

Building Height and Scale

The assessment and consideration criteria of this provision from the current Cessnock DCP can be adopted for future applications to develop the lots created by the subdivision pursuing a general 14m height limit.

Boundary Setbacks

The DCP imposes a 10m front setback requirement in conjunction with 5m setbacks to the side and rear boundaries. It is proposed that future lot developers be provided with the opportunity to implement this control or the alternative as prepared by EDAW in support of the Concept Application submission. This flexibility is proposed to accommodate existing applications that have been prepared and lodged with Cessnock Council and those which have commenced preparation in accordance with contracts for sale already negotiated.

The alternative setback regime provides for a 20m retained setback to the proposed road networks, supplemented by a 10m transitional setback including opportunities for incorporating site water treatment measures and similar facilities. No setbacks are required to the side and rear boundaries in this configuration. Any setbacks that would be provided in addition to the required front setback would be landscaped in accordance with the landscape strategy prepared by EDAW for the Precinct.

The current DCP setbacks provide for the retention of 13.26% of mature trees compared with 17.68% in the 20m retention option proposed as the alternate solution with this application.

The 20m front setback with no side and rear setback option also removes the conflict with APZ provision requirements for bushfire planning and the retained 7(b) corridors throughout the perimeters of the Precinct that exist under the current DCP provisions.

Further benefits are derived as regardless of the internal subdivision pattern and lot layouts, strong landscape corridors are created along the road alignments that reinforce and comprise meaningful habitat protection potential.

Transport Considerations

The Precinct 1 design incorporates capacity for cycleways and pedestrian facilities as part of a comprehensive network to service the precinct and link to future development of the estate.

The Precinct 1 design does not preclude future lot developments complying with the relevant provisions for internal access and design from the Cessnock DCP.

Due to the scale and nature of development on the HEZ Estate a variation to the DCP for on-site car parking provision should be implemented. Lot developers should have the option of providing car parking in accordance with the DCP or to determine the minimum number of vehicle parking requirements using appropriate guidelines for parking generation and servicing facilities based on development type comparison based on the RTA Guide to Traffic Generating Development or analysis drawn from surveyed data for similar development uses.

This flexibility would preclude low parking generating uses from being required to provide redundant car parking and therefore excessive hard surfaced areas on a development site.

7. Flora and Fauna

7.1 Background and Methodology

The most important ecological study of the HEZ was the Ecological Constraints Master Plan (ECMP). The ECMP (RPS HSO 2004) is a comprehensive ecological database and a primary guiding document for the development of the HEZ industrial estate. Important information sources utilised by the ECMP include Bell (2001, 2004), Ecotone (1999; 2000, 2002a; 2002b), Harper Somers O'Sullivan (2002), and University of Newcastle (2001).

Detailed ecological investigations, using high accuracy DGPS (Differential Global Positioning System), were undertaken within the 4(h) development zone and the central 7(b) conservation zone corridor along Chinamans Hollow Creek. In addition to those threatened species surveys previously conducted within the HEZ study area, further targeted surveys for a select number of species were conducted so that a more comprehensive overview of the occurrence of these species within the HEZ could be attained. The key features detailed as part of the development zone habitat surveys included Keystone Mature Tree Species, Hollow-bearing Trees, 'Grid Pattern' Habitat Investigations and Threatened Species Surveys. A detailed vegetation survey and mapping report was also undertaken by Stephen Bell (Eastcoast Flora Survey) on behalf of RPS HSO.

The conservation zones of the HEZ study area were also systematically "reconnaissanced" in east-west diurnal walking transects separated by 300 metres - totalling 66 km of survey. This was undertaken by GPS navigation and data collection along each particular transect. The main target of these surveys was to find additional occurrences of threatened flora species including *Acacia bynoeana*, *Callistemon linearifolius*, *Eucalyptus glaucina*, *Grevillea parviflora ssp. parviflora*, and *Rutidosis heterogama*. In locations where threatened flora species were found along transects, then more detailed surveys were also undertaken in the vicinity to obtain further records / population counts.

7.2 Results

The vegetation mapping, grid habitat investigations and targeted threatened species surveys resulted in a comprehensive data set being available for development design and impact assessment.

Focal issues were identified as the occurrence of three endangered ecological communities (EEC's) and the corresponding habitats that these communities provided for a range of threatened flora and fauna. These EEC's included Lower Hunter Spotted Gum - Ironbark Forest (LHSGIF), Kurri Sand Swamp Woodland (KSSW) and Hunter Lowland Redgum Forest (HLRF).

Focal threatened flora included *Acacia bynoeana, Callistemon linearifolius, Eucalyptus glaucina, Eucalyptus parramattensis ssp. decadens, Grevillea parviflora ssp. parviflora* and *Rutidosis heterogama.* Focal threatened fauna included Green-thighed Frog, Glossy Black-Cockatoo, woodland birds (Brown Treecreeper, Grey-crowned Babbler, Speckled Warbler and Black-chinned Honeyeater) and the migratory Swift Parrot and Regent Honeyeater. Species such as Powerful Owl, Yellow-bellied Glider, Squirrel Glider and a range of threatened bats were also considered to be important. Diamond Firetail and Square-tailed Kite have also been recently recorded.

In relation to the specific components of the application, relevant threatened species issues were as follows.

Precinct 1 was found to contain the EEC's LHSGIF and HLRF. These communities provide habitat for the threatened flora species *Grevillea parviflora, Callistemon linearifolius* and *Rutidosis heterogama.* They also provide habitat for the threatened fauna species Green-thighed Frog, Glossy Black-Cockatoo, Brown Treecreeper, Grey-crowned Babbler, Black-chinned Honeyeater, Swift Parrot, Powerful Owl and Yellow-bellied Glider.

Station Street was found to contain the EEC's LHSGIF and KSSW. Three threatened flora species occur on the site including *Callistemon linearifolius*, *Eucalyptus glaucina*, and *Eucalyptus parramattensis subsp decadens*. Black-chinned Honeyeater, Powerful Owl and Yellow-bellied Glider have been recorded in

the immediate vicinity of the project.

WIPS Management site was found to contain the EEC LHSGIF. One threatened flora species occurs on the site, *Grevillea parviflora*. Grey-crowned Babbler, Black-chinned Honeyeater, Brown Treecreeper, Yellow-bellied Glider, Squirrel Glider and Powerful Owl have been recorded within the vicinity of the project.

In relation to the Pelaw Main Bypass, the EEC's KSSW, LHSGIF and Freshwater Wetland Complex (FWC) were recorded, as well as Grey Gum / Scribbly Gum Open Forest (GGSGF). The threatened flora *Acacia bynoeana, Grevillea parviflora, Callistemon linearifolius, Eucalyptus parramattensis ssp. decadens, Eucalyptus glaucina* and *Rutidosis heterogama* were all recorded in the study area. Speckled Warbler and Squirrel Glider are the threatened fauna recorded within the project study area.

7.3 Rezoning Process and Offsets

At a broad scale, the zoning process for HEZ led to significant conservation outcomes for the LEP area, Cessnock Local Government Area and the region. This process involved studies and negotiations being undertaken over a number of years to identify ecological constraints and respond to these constraints via the dedication of significant conservation lands within the HEZ LEP area. These conservation lands were dedicated by the major stakeholders with the LEP area, including HEZ Pty Ltd, the State Government and Mindaribba Local Aboriginal Land Council.

It was a specific requirement of the NSW National Parks and Wildlife Service that assessments undertaken for the HEZ rezoning included the existing State Forest areas. The reason for this was to ensure that an adequate landform / vegetation association representation was conserved in the wider area as part of the HEZ LEP formulation, regardless of land tenure or zoning at that point. Although the impetus for the rezoning of the State Forest may not have been directly attributed to the HEZ rezoning process, the inclusion of that land within the LEP and assessments undertaken by HEZ provided the vehicle for formal conservation of that area.

The rezoning of the area provided conservation zoning protection to over 63%

(approx) of the HEZ LEP area (as defined and specified by the NSW NPWS and Department of Planning), incorporating a representation of all landform units and vegetation associations within an area of 2,076ha. This was a primary focus of Department of Environment and Conservation throughout the rezoning process. This was considered to result in adequate conservation of habitat for all EEC's and threatened species, apart from a select few threatened species with substantial populations being located within 4(h) lands. These species included *Acacia bynoeana, Callistemon linearifolius, Eucalyptus glaucina, Rutidosis heterogama,* Green-thighed Frog, Swift Parrot and Brown Treecreeper. In other words DECC **considered that conservation outcomes were adequate** for all threatened species and EEC's apart from these few particular species. To address the adequacy of conservation for these species DECC (in association with RPS HSO) determined Deferred Areas. These deferred areas conserved particular portions of land within the 4(h) industrial zoning that contained known records and habitat of these species, until such time as the conservation status of the key species was revised such that the areas were not deemed significant for these species. In addition, incorporation of mature tree retention for Swift Parrot was required. Of these Deferred Areas, Deferred Area 1 is located within Precinct 1.

The results of the ECMP data have been used to achieve adequate conservation outcomes for all of the threatened species and EEC's within the HEZ Study Area, which culminated in the DECC issuing an assumed concurrence for the development of the HEZ, in March 2005. Subsequently, the Commonwealth Department of the Environment, Water Heritage and the Arts also issued an approval in May 2007.

In summary, the conservation outcomes resulting from the original rezoning:

- Conserve in perpetuity key strategic parcels of land that complete regional biodiversity conservation corridors and buffer areas;
- Provide large intact areas of conserved habitat that will function as regional biodiversity gene pools;
- Protect an important array of vegetation communities, flora and fauna species, and natural landscape assets, including threatened species and EEC's; and
- Achieve additional conservation benefits within the development zones via appropriate design and management practices.

DECC's Threatened Species Assessment Guidelines have been considered as part of the process for development design. In effect, the avoidance, mitigation and offsetting impact consideration process has been ongoing over a number of years. This has included the process that lead to the issuing of the Assumed Concurrence by DECC. The issuing of the Assumed Concurrence demonstrated that DECC was of the opinion that impacts had been appropriately avoided, mitigated and offset. This has resulted in substantial areas of high biodiversity within the HEZ LEP area being identified and zoned for conservation purposes. Deferred Areas also supported the conservation zoned areas and it is considered that the original intent and purpose of the identification of the Deferred Areas has been maintained in the design process that has lead to the precinct 1 layout for which Concept approval is sought.

7.4 Precinct Design Process

Precinct 1 and the accompanying components have undergone detailed ecological investigations. The design process focussed on avoiding, mitigating and offsetting impacts of the proposals upon the ecological values of the HEZ. This is in addition to the broader scale ecological constraint considerations provided to the HEZ LEP area as part of the rezoning process, which as previously mentioned resulted in over 63% of the LEP area being zoned for conservation. Any avoidance, mitigative and offset measures outlined hereunder are in addition to those already granted as part of this rezoning process. In addition it should be recognised that Precinct 1 and the WIPS Management project occurs within land zoned as 4(h) Hunter Employment Zone for industrial development.

The current design for Precinct 1 was developed with the following primary ecological objectives in mind. Namely, to avoid impacts upon:

- Substantial drainage areas and / or Green-thighed Frog habitat;
- HLRF EEC;
- *Rutidosis heterogama* and *Callistemon linearifolius;* and
- Mature and hollow-bearing trees.

This is in accordance with the principles of the HEZ Habitat Management Strategy (HMS), DECC Assumed Concurrence and Commonwealth approval conditions.

The approach resulted in protection of the two main riparian areas, including those mapped as providing Low – Medium quality habitat for the Green-thighed Frog (and an overall majority of its habitat within Precinct 1).

In terms of impacts upon HLRF, Precinct 1 will result in the modification of approximately 6.8 hectares. Most of this is likely to require clearing, although in some areas retention will occur in pockets. Approximately 6.6 hectares (or 49%) will be retained within the designated conservation and riparian protection areas in addition to that conserved within existing designated conservation zones. These outcomes are shown in the accompanying EDAW Concept Plan. The DECC Assumed Concurrence indicates that an adequate conservation outcome for this EEC has been achieved within the HEZ LEP area overall. This is particularly the case in relation to retention of a majority of this community on the site overall within the central 7(b) conservation corridor. It should be noted that this level of impact within Precinct 1 has also resulted from the prioritisation of the more significant HLRF EEC during the concept planning workshops. In addition, the overall results from the rezoning within the HEZ Nominees owned portion of HEZ actually resulted in conservation of 52ha. This is 40% of the total HLRF within the Cessnock LGA.

Of the 458 *Rutidosis heterogama* plants recorded within the Precinct 1 area, 54 (12%) are likely to be retained. This is considered to be more than adequate – particularly given the level of conservation of the other major populations within 7(b) conservation zoned areas and also other Deferred Areas. Such conservation includes the protection of approximately 2000 plants within 7(b) conservation zones and Werakata National Park, and likely protection of a further approximately 900 plants in Deferred Areas 2 and 4. In addition, reuse of topsoil for landscaping / rehabilitation from where this species is affected by clearing is hoped to assist in providing opportunities for this species to naturally regenerate post-development. The DECC Assumed Concurrence indicates that an adequate conservation outcome for this species has been achieved within the HEZ LEP area (including Deferred Areas).

Of the 314 *Callistemon linearifolius* plants recorded within the Precinct 1 area 112 (36%) are likely to be retained. This is considered to be more than adequate – particularly given the level of conservation of the other major populations within 7(b)

conservation zoned areas and also other Deferred Areas. Such conservation includes the protection of approximately 1400 plants within 7(b) conservation zones and Werakata National Park, and likely protection of a further approximately 1300 plants in Deferred Areas 5 and 6.The DECC Assumed Concurrence indicates that an adequate conservation outcome for this species has been achieved within the HEZ LEP area (including Deferred Areas).

Protection of a total of 49 out of 159 winter flowering mature *Corymbia maculata* (Spotted Gum) and *Eucalyptus tereticornis* (Forest Red Gum) will occur. This is approximately 30% retention of the Swift Parrot and Regent Honeyeaters primary foraging habitat. This is in addition to the retention of approximately 500 mature *Corymbia maculata* and *Eucalyptus tereticornis* within 7(b) conservation zones. 13% of hollow bearing trees are also to be retained within Precinct 1 along with 589 hollow bearing trees (containing a total of 1505 hollows) in the 7(b) conservation zones.

Numerous other ecological / environmental factors were also considered as part of the design process. These contributed to an overall ecologically sustainable design.

These factors included:

- A twenty metre wide conservation corridor of existing bushland will adjoin all roads, providing links between primary conservation areas;
- A ten metre reinstatement buffer will adjoin the 20m conservation corridors to provide additional buffering capacity and a gradual transition zone from the industrial areas;
- Road layouts being designed to incorporate retention of existing threatened species locations;
- Stripping of weed-free topsoil from approved development areas for re-use in landscaping and bushland rehabilitation. This will occur in association with soil profiles, so that when re-used the stripped soil will contain its original profile;
- All road verges and / or individual allotments being reinstated with modified plant communities consistent with the location of the road verges in relation to the original natural vegetation. That is, where a road runs through three different vegetation communities, rehabilitation of road verges will utilise species consistent with those communities in those three areas;

- All plant material used in landscaping / restoration will be of local provenance and grown on-site by a specialist nursery;
- Direct seeding will involve the use of locally collected seed (either within HEZ or in close proximity where sufficient volumes are not available);
- Monitoring of the success of topsoil re-sue will occur by Mark Tozer of DECC to assess project outcomes;
- The HEZ Association (HEZA) will be an association directly managing conservation areas within the estate in addition to monitoring and providing advice to individual landholders, This will ensure a coordinated conservation approach to the development of the estate;
- Development will occur on higher lands, ensuring that perimeter roads, swales and detention structures will provide for integrated treatment of all runoff prior to it entering natural aquatic systems;
- Water Sensitive Urban Design measures will include:
  - Stormwater harvesting in tanks and re-use on-site;
  - Industrial site design to minimise the generation of stormwater pollutants;
  - Having a general target to reduce potable water demand by 40%;
  - On-site detention for each development to capture and treat individual site runoff;
  - A system of swales and rain gardens associated with the roadsides to capture and treat runoff from the road system;
  - Instream riparian works to improve the stability of existing nick point erosion heads via use of measures such as rock shutes.
- All of these measures are in addition to the recommendations within the Ecological Assessment Report (Appendix C) and Statement of Commitments that are generally consistent with the original HEZ HMS and which include:
  - Development Application requirements such as site-specific ecological surveys to ground-truth ECMP data and numerous reporting requirements;
  - Management and protection of conservation zones (including by HEZA);
  - Habitat removal and animal welfare considerations such as clearing protocols, use of compensatory mechanisms such as nest boxes;

- Control of pest and domestic animals;
- Weed eradication and control in association with bushland restoration / regeneration requirements;
- Landscaping requirements; and
- Monitoring requirements.

Combined, all of these measures will ensure that the best possible, ecologically sensitive development outcomes are achieved within Precinct 1.

7.5 Deferred Area 1

DECC Deferred Area 1 has been reconfigured as a result of the masterplanning process for Precinct 1. The main reasons behind this area being deferred was to provide further protection to HLRF, *Callistemon linearifolius, Eucalyptus glaucina,* Green-thighed Frog and species reliant on mature trees such as Yellow-bellied Glider and Swift Parrot. It was also deferred for general reasons such as widening the central 7(b) corridor and providing additional buffer capacity to this corridor.

As previously discussed, the protection of HLRF has been a major focus of the masterplanning process and it is considered that the retention of 49% of this EEC as part of Precinct 1 (in addition to the significant conservation outcome for this EEC within the Cessnock LGA and region in general) provides an ecologically suitable outcome for this community.

The major occurrences of *Callistemon linearifolius* in HEZ do not occur within Precinct 1, nevertheless the masterplanning process also focussed on retention of this species within the Precinct. A retention figure of 36% is achieved.

In relation to *Eucalyptus glaucina*, the exact locations of this species are largely not known (apart from three known locations). This species is significantly associated with HLRF and the retention of the vast majority of this EEC within HEZ overall, plus a significant retention of this community in Precinct 1, is expected to adequately conserve this species.

A major focus was also the preservation and integration of Green-thighed Frog habitat within Precinct 1. This species habitat was specifically mapped as part of

the ECMP process and was considered during the design process.

Mature trees were also integrated into the proposal, with a total of 30% retention of winter flowering mature trees, thereby providing significant retention of habitat for species such as Yellow-bellied Glider, Swift Parrot and Regent Honeyeater.

Given the outcomes of the Precinct 1 planning process have resulted in significant retention and incorporation of the factors that Deferred Area 1 was originally deferred for, it is considered that the guaranteed connected outcomes achieved by the Precinct 1 plan provide for a superior holistic land use outcome than the complete retention of Deferred Area 1 alone.

7.6 Recent Regent Honeyeater Records

Additional records of the Regent Honeyeater have recently been recorded within the HEZ Estate area. Detailed investigations were undertaken by Biosis Research in December 2007 to ascertain the locations and type of activity of individual birds in relation to future development (including that of Precinct 1). These investigations were undertaken in association and cooperation with DECC staff. The results indicated that a total of 20 locations contained evidence of foraging / calling birds, successful nest-building and breeding, or non-successful / abandoned nests. These points were all located outside of Precinct 1 and component areas. The recording of breeding birds is significant as previously it was considered that the habitats contained within the HEZ Estate were primarily likely to be used by the Regent Honeyeater for foraging purposes in winter, following seasonal migration from breeding strongholds such as the Capertee Valley and Bundarra-Barraba region.

Precinct 1 and components comprise a relatively small proportion of the overall habitat present within the HEZ LEP area for the Regent Honeyeater. All records (refer to accompanying map) were located outside of the Precinct 1 area. This is despite habitat type and quality in general being similar within those areas in which the Regent Honeyeater was recorded and those areas where it was not recorded. It is considered that the modification of habitat by Precinct 1 and components is unlikely to significantly affect future potential breeding / foraging activities of this species overall within the HEZ LEP area. This is particularly the case given that:

- Precinct 1 is located more than 500 metres from all but one of the nesting records;
- The one nesting record within close proximity to Precinct 1 is located to the south of a wide existing cleared electricity easement, of which land tenure is either HEZ Nominees-owned 7(b) conservation or National Parks;
- Due to these substantial buffer distances and barriers, fragmentation is likely to be of low concern;
- Precinct 1 design has prioritised consideration of integration and retention of foraging and breeding habitat via retention of HLRF and retention of 30% of winter-flowering mature trees. These habitats are of major importance for the Regent Honeyeater.

7.7 Flora and Fauna Conclusions

The Concept Plan, includes the subdivision of the land, demonstrate how masterplanning can result in an improved environmental, ecological and development outcomes at HEZ. Areas shown as being retained / conserved and / or restored will be guaranteed as a result of this masterplanning process. This is in contrast to the current piecemeal approach taken to individual development ecological conservation under the existing Habitat Management Strategy (HMS) which, while worthy, has potential to result in a disconnected and fragmented landscape of small conservation “islands”.

In contrast, the Precinct 1 Concept Plan provides for a focus towards protection of the most important threatened species, endangered ecological communities and environmental features, including focus on:

- Integration and protection of the Endangered Ecological Community (EEC) Hunter Lowland Redgum Forest;
- Integration and protection of Green-thighed Frog riparian and aquatic habitat;
- Integration and protection of *Rutidosis heterogama* and *Callistemon linearifolius*;
- Integration and protection of approximately 16% of mature trees, 30% of

winter flowering mature trees and 13% of hollow bearing trees. Of particular importance is the retention of 30% of winter flowering mature trees as they are of high significance for the nationally and state-listed threatened Swift Parrot and Regent Honeyeater and exceed the minimum 10% retention required under the EPBC approval.

- Retention of substantial connectivity (terrestrial and aquatic) through proposing 20 m Conservation Setbacks from the road system in which existing natural vegetation will be retained. In addition, integration of substantive drainage areas into the proposed development.
- An ecologically sustainable stormwater capture, release and reuse system that will maximise water reuse efficiency and ensure that stormwater is captured and released at environmentally sensitive levels. This will incorporated capture and reuse of stormwater in tanks, the use of swales along roadsides and the use of on-site detention for each individual development.

Together, these measures will ensure that development of the first Precinct of the HEZ will set the standard in relation to the incorporation of significant ecological and environmental values into an industrial development design. This will ensure that the HEZ Estate will in fact become a “bushland” industrial estate, which is consistent with the original aims of the HEZ.

8. Heritage

The investigations and considerations have addressed potential impacts upon the potential Aboriginal and European Heritage significance of the areas within development is proposed. These have been addressed in separate considerations.

8.1 Aboriginal Heritage

The following sections have been summarised from ENSR Australia's Pty Limited (HLA ENSR) (2007) *Aboriginal Heritage Assessment – Precinct 1, Pelaw Main Bypass and Station Road Extension, Hunter Economic Zone.* (Appendix F)

HLA ENSR undertook an assessment of Precinct 1, Pelaw Main Bypass and the proposed Station Road Extension within the Hunter Economic Zone (HEZ) in accordance with the Department of Environment and Climate Change's (2005) *Guidelines For Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (with reference to Part 3A of the *Environmental Planning and Assessment Act, 1979*), and (2004) *Interim Community Consultation Requirements,* and in conjunction with the Mindaribba Local Aboriginal Land Council and Barkuma Neighbourhood Inc.

The assessment undertook an extensive archaeological review of the HEZ and identified several documented Aboriginal sites and previous archaeological studies within the region. An AHIMS search identified 31 previously documented Aboriginal sites within a 50 x 50 km search around the Study Area, which was dominated by undefined sites and isolated finds. Four of these sites are located in the immediate vicinity of the Study Area, specifically HEZ 2, HEZ 6, UTCA1, and UTCA2 – all isolated finds or low concentration artefact scatters.

A physical inspection of the Study Area identified the area as marginally disturbed (through mining and infrastructure activities) with a dense coverage of Eucalypt woodland and patches of Kurri Sand Swamp woodland. Effective coverage was poor due to the thick coverall of grasses and Acacia shrubs. However, the investigation revealed an absence of defined creek lines or sand sheets, both likely factors in Aboriginal site location. One Aboriginal site was found within the Study

Area as part of this investigation. *Spine Road 1* is an isolated find (a silcrete core), that was located on immediately to the west of the Spine Road in the northwest of Precinct 1

Spine Road 1, which was identified as of low archaeological significance, is located within the centre of Precinct 1, and is likely to be impacted by future development. The remaining sites, HEZ 2, HEZ 6, UTCA1, and UTCA2, could not be positively identified, but their general locations appear to be outside of the Study Areas investigated.

Recommendations from the report developed a series of management options for inclusion into the Statement of Commitment of the project, they are as follows:

- *Spine Road 1,* located within the northwest section of Precinct 1, should be collected by a heritage professional in consultation with the registered Aboriginal communities prior to any development activities. Identification of the "keeping place" of this site, should be identified in conjunction with the Aboriginal communities prior to the site's collection;
- with the exception of *Spine Road* 1 there are no apparent constraints to development in Precinct 1, Pelaw Main Bypass and Station Road extension in relation to Aboriginal heritage; and
- in the event that previously undiscovered Aboriginal objects (or potential Aboriginal objects) are discovered during construction, all works in the vicinity of the find would cease and the relevant Environmental Representative would be informed to determine the subsequent course of action. The Environmental Representative would, if required, notify a heritage professional to obtain advice on how to proceed. Works would not recommence until any heritage requirements identified through this process have been met; and
- should suspected skeletal material be uncovered during the course of any site works or through subsidence landscape modification, all works must cease and the DECC the NSW Police and the NSW Coroners office contacted immediately, regardless of any existing environmental approvals.
- contractors who work within the confines of the Study Area should

be made aware of these recommendations, and advised of the importance and protection of Aboriginal Objects/Sites by State legislation. All contractors should be advised of the need to stop work and contact the relevant Environmental Representative should Aboriginal Objects/Sites be identified during construction.

8.2 European Heritage

8.2.1 Pelaw Main by-pass

A Statement of Heritage Impact and Statement of Heritage Significance (Appendix G) has been prepared to consider the impact of the proposed Pelaw Main Bypass road on a section of the rail bed known as the Pelaw Main Branch of the heritage listed Richmond Vale Railway. The Richmond Vale Railway is listed on the Cessnock City Council Heritage Register as being of local importance.

The report for the Pelaw Main Bypass is divided into two components:

- The *Statement of Heritage Impact* that details the proposal and the consequence for the heritage item impacted by the proposal and;
- The *Statement of Heritage Significance* that provides background information on the heritage item; pre contact and post contact history; the development proposal; report on the current state of the site; legislative requirements; a heritage significance assessment; a statement of heritage significance; an assessment of the impact on the heritage significance and recommendations.

The proposal is for the construction of a road to bypass Pelaw Main to provide an alternate traffic route to minimise disruption to the amenity of that village.

The proposed by-pass road will intersect the rail bed of the now defunct Richmond Vale railway line which is listed on the Cessnock City Council Heritage Inventory. The Richmond Vale railway is not listed on the NSW State Heritage Register or the Australian Heritage Commission Register.

In the area directly affected by the proposed Pelaw Main Bypass there are two remnants of the railway that would be impacted. They are:

- The rail bed - this has been highly degraded most likely through use by 4WD vehicles and motor bikes.

- Remnant fence posts – these show signs of deterioration through age and damage by bushfires.

The section of the rail bed where the road will intersect is higher than the surrounding land, approximately 1 metre higher on the northern side and 2.6 metres higher on the southern side. Like the majority of the rail bed of the Pelaw Main Branch Line the surface is highly disturbed.

It is proposed that the Pelaw Main Bypass, a fifty metre wide two-lane rural road, traverse the now-abandoned Pelaw Main Branch of the Richmond Vale Railway. The proposed Pelaw Main Bypass would cut through the rail bed and require the removal of approximately 8 fence posts from the original railway fencing.

The development proposal will require excavation through the rail bed with earthworks by mechanical excavators. The width of the cut will be approximately fifty metres wide with the point of intersection of the road and rail bed at an angle of 60°/120°.

The proposed road will surfaced with construction methods following current industry standard.

The Pelaw Main Bypass has been designed to avoid unnecessary impact on associated railway line structures such as cuttings, culverts and abutments.

The proposed construction of the Pelaw Main Bypass will adversely impact on the Pelaw Main Branch Line and by traversing the defunct rail corridor break the continuity of the rail bed.

In considering this impact it is noted that:

- the earlier removal of the rail line and associated transportable items has led to a degradation of the rail bed; and
- the Pelaw Main Branch Line is part of the Richmond Vale Railway network a portion of which has been retained and is currently maintained by the Richmond Vale Railway Museum.

It is considered that while the construction of the Pelaw Main Bypass will have an affect on the Pelaw Main Branch of the Richmond Vale Railway the line is already significantly degraded and that important features of the railway have been retained as part of the Richmond Vale Railway Museum site.

The following recommendations are made at the conclusion of a desk top study and field survey of the subject area.

The recommendations are that:

- Impact on rail bed be minimised by restricting construction activity in the vicinity of the rail bed to the immediate area required for the Bypass road.

- Appropriate measures be taken to ensure that during construction of the Bypass road the culvert and abutment lying to the east of the construction area be cordoned off and protected. Construction workers should also be advised of the sensitivity of the cordoned area.

- Consideration is given to the reuse of old fence posts removed during construction to rehabilitate other sections of the Richmond Vale Railway.

- Consideration is given to the possibility of the conversion of the disused rail bed of the Richmond Vale Railway to a cycleway by community or council in the future. To facilitate this, if the Bypass road proposal is progressed, discussions with Cessnock City Council regarding the interaction between the road and cycleway could be undertaken.

These recommendations have been incorporated into the statement of Commitments for application.

8.2.2 Station Street Extension

The proposed Station Street extension will traverse the rail line east of the former Weston Station platform structure. There is at present a level crossing on Station Street rail line and an unformed track leading off to the south west to the end of Webb Street. South of the railway on the proposed road alignment there is an area of modified bushland disturbed by clearings and bush tracks. The locality contains a number of elements that are strongly associated with the railway namely the

water tank; two stand pipes; a pedestrian overbridge; the station platform structure; the main railway line and a siding.

Further south is the 1930s Hebburn No.1 Mine Office building. This is a brick and tile single storey structure with outbuildings currently tenanted. The proposed road works would be well to the east of this item. No impacts are envisaged and therefore there is no further discussion or investigation.

The structures associated with Western station are of State and local historic significance as evidence of the South Maitland Railway, one of the largest and most heavily used private railways in Australia between 1892 and the 1960's conveying coal from the Greta coal seam to the junction with the Great Northern Railway and to the Port of Newcastle. The section of the network that runs through Weston was built to serve the Hebburn and Aberdare collieries and was later extended to Cessnock.

The station precinct is of significance to the local community as a tangible symbol of the establishment of the collieries that generated the township - for its role in providing transport for the miners to their workplaces and for the product of their labour. The Water Tank has a landmark presence and serves as a highly visible reminder of the role of the railway and of the AA company in particular, which played an important part in the development of the coal industry in this locality.

The proposed road crossing coincides with the location of the water tank and western stand pipe. The design of the roadway extends directly from the current Station Street terminus at the site boundary. The road will extend to the south to connect with the terminus of the currently under construction stage 2 road, some 900m to the south.

Taking into account the fixed points of the existing Station Street road reservation, Scott Street and the railway line there is no scope to make a deviation where the new roadway joins the existing roadway that would avoid the water tank and provide a safely designed level crossing.

The proposed roadway construction would also take up approximately two thirds of the length of the ramp from the pedestrian overbridge but would be about fifteen

metres away from the bridge at the end of the former railway platform.

8.2.3 Water Tank And Western Stand Pipe

The proposed roadway construction would be in conflict with retention of the water tank in its existing location. The alignment of the existing southern end of Station Street would determine the crossing point of the South Maitland Rail line and not allow any significant deviation to avoid the water tank and the nearby standpipe.

The water tank's level and degree of significance is such that it must be retained. Relocation of the water tank approximately 8 metres to the east would take it out of the roadway reserve, at the same time keeping its visual connection with the station and its ability to be an historic landmark in the vista from the township along Station Street, from Scott Street and from the rail line also. The stand pipe could also be relocated adjacent to the water tank.

This arrangement would require detailed engineering resolution of the method of relocation to ensure minimal physical change to the fabric of the water tank and construction of new pad footings.

In these circumstances the water tank's high significance at State level and interpretive value would not be diminished.

8.2.4 Station Platform And Eastern Stand Pipe

The station platform and stand pipe will not be affected physically or visually by the proposed road works.

8.2.5 Pedestrian Overbridge

The northern section of the pedestrian overbridge will need to be demolished to enable the proposed road works to be undertaken.

The 1909 section of the bridge associated with the platform and the later southern

section spanning the former siding and its associated earth formed ramp would not be affected physically or visually by the proposed works.

Loss of the northern ramp would result in a minor impact on the significance of the bridge as a whole because it is of later construction at a low level of local significance. When it was built its construction involved renewal of the stair that would have been part of the 1909 bridge.

The issue of retention or otherwise of the remaining elements of the bridge is not one that arises from construction of the Station Street extension and is more related to whether, given the future development in the area generally and future frequency of the use of the South Maitland rail line, there is a need to provide this form of pedestrian access between the township of Weston, the Station and living and working places to the south.

Should it be found that there is a need to reinstate the bridge for future use, substantial repairs and reconstruction will need to be undertaken which would most likely involve complete replacement of the spalling concrete deck and construction of a new northern ramp running east or running east and returning in itself to the west.

Whether the bridge is ultimately retained or removed entirely, or in part, loss of just the northern ramp would not greatly affect the significance of the station precinct.

8.2.6 Measures Taken to Mitigate Impact

Water Tank And Western Stand Pipe

- The water tank and stand pipe should be accurately recorded in their present state for archival purposes before any works are undertaken in their vicinity. The recording should involve measured drawings and photographs in accordance with the guidelines established by the NSW Heritage Office.

- Repositioning of the water tank will be preceded by a thorough engineering assessment of the structure, identification of a suitably experienced and

qualified contractor and approval of a detailed method statement that will show how the structure can be repositioned with the minimum extent of dismantling.

- Retention of the stand pipe in its present location would be in conflict with the road construction and would be a safety issue. Its proximity to the water tank can be retained by relocating it close by. The present distance between the two items was not a functional requirement as demonstrated by the greater separation of the stand pipe at the end of the station platform.

- Its new position would be east of the new position of the water tank to enable the water tank's eastern movement to be the minimum distance to clear the road works zone.

Station Platform And Stand Pipe

- No measures are considered necessary as a consequence of the proposed road works as there is no impact on thee significance of these items to be addressed. The future treatment of these elements is more related to other development within the Hunter Economic Zone outside the scope of this statement.

Pedestrian Overbridge

- Removal of the late phase structure of the northern ramp, being a low level impact does not necessitate any mitigating measures. Decisions about the future of the pedestrian overbridge are otherwise unrelated to the proposed road works project and outside the scope of this statement.

- This statement has given consideration to the impacts arising from the proposed road extension of Station Street on the significance of the structures associated with the Weston Station precinct, as part of the south Maitland Railway and showing a history with the Hebburn Colliery.

- These structures are significant to varying degrees for their contributions to the wider significance of the development of the local coal industry and

associated rail network on the South Maitland coal fields. The most significant elements, rated high at a State level, are the Water Tank and stand pipes. The main issue this assessment addresses arises from the Water Tank and western stand pipe standing squarely within the proposed road reserve. While the proposed construction of the road will require removal of the northern ramp of the pedestrian overbridge, this impact is considered to be at a very low level given the low significance of this later phase portion of the bridge construction.

- No recommendations are made to relation to the station platform, the remaining sections of the overbridge, the eastern standpipe and the rails as the impacts of the road works would be of no consequence, or in the case of removal of the southern rail track, where within the road works zone, minimal - provided the ability to interpret the route and the sidings to the east is maintained,

The Precinct Planning affects two areas of potential European Heritage significance. These areas are both related to the coal mining activity previously undertaken on the site. Assessments on the potential impact of the development upon the Heritage significance has been undertaken for the Station Street extension south of the township of Weston and the alignment of the proposed Pelaw main by-pass which crosses the alignment of the former Richmond Vale Railway.

Separate assessments have been undertaken for each of these elements. The recommendations of the assessment have been incorporated into the Draft Statement of Committments (Appendix A) prepared for this assessment.

The assessment of the impact of the Pelaw main by-pass alignment has been undertaken by RPS-Harper Somers O'Sullivan (Appendix H).

The consideration concluded that

- Impact on rail bed be minimised by restricting construction activity to the immediate area required for the Bypass road.
- Appropriate measures be taken to ensure that during construction of the

roadway the culvert and abutment lying to the east of the construction area be cordoned off and protected. Construction workers should also be advised of the sensitivity of the cordoned area.

- Consideration be given to the reuse of old fence posts removed during construction to rehabilitate other sections of the Richmond Vale Railway.
- Consideration be given the possibility of the conversion of the disused rail bed of the Richmond Vale Railway to a cycleway in the future. To facilitate this, if the road proposal is progressed, consideration should be given to ensuring that the descent from the rail bed to the road surface is of a suitable gradient for cyclists.

The assessment is included within the Appendices of the assessment.

The assessment of the impact of the Station Street extension has been undertaken by HBO+EMTB Heritage Pty Ltd (Appendix G). The assessment has identified three elements of potential significance comprising the Water Tank and Stand Pipe, the Station Platform and Stand Pipe and the Pedestrian Overbridge.

The assessment has concluded that there are no measures required to the Station Platform and Stand pipe as these items are unaffected by the proposed works.

The proposed road works will require the removal of the late phase structure of the northern ramp. This has been assessed as being a low level impact and does not require any mitigating measures.

The Water Tank and Stand Pipe have been determined as having Local and State Significance. The measures for mitigating the impact of the proposed works on the Water tank and Stand Pipe include:

- The water tank and stand pipe should be accurately recorded in their present state for archival purposes before any works are undertaken in their vicinity. The recording should involve measured drawings and photographs in accordance with the guidelines established by the NSW Heritage Office.

- Repositioning of the water tank will be preceded by a thorough engineering assessment of the structure, identification of a suitably experienced and

qualified contractor and approval of a detailed method statement that will show how the structure can be repositioned with the minimum extent of dismantling.

- Retention of the stand pipe in its present location would be in conflict with the road construction and would be a safety issue. Its proximity to the water tank can be retained by relocating it close by. The present distance between the two items was not a functional requirement as demonstrated by the greater separation of the stand pipe at the end of the station platform.

- Its new position would be east of the new position of the water tank to enable the water tank's eastern movement to be the minimum distance to clear the road works zone."

The implementation of these recommendations is included within the Draft Statement of Committments (Appendix A) and the full report is included within the Appendices of the assessment.

9. Road and Traffic Impacts

9.1 Overview

Detailed traffic investigations were undertaken by Parsons Brinckerhoff (PB) to identify existing traffic conditions and impacts of proposed development at Precinct 1 of HEZ.

PB developed a comprehensive road network traffic model. This estimated the traffic generation from HEZ and future background growth to devise a network improvement plan. This investigation reviewed existing infrastructure and identified capacity constraints in the road network. The results of these investigations show that the following intersections will require upgrading due to development of Precinct 1 at HEZ:

- HEZ eastern access intersection with the Leggetts Drive and HEZ Spine Road. Initially this intersection should be constructed as C type with appropriate turning lane. This intersection will be converted to signals after the completion of around 67 Ha of development at Precinct 1 HEZ;
- Construction of Cessnock Road/ Station Street (HEZ northern access) between 20.6Ha and 43.6Ha of Precinct 1 development. This will occur around 2009;
- Construction of the Pelaw Main Bypass when approximately 67Ha of development in Precinct 1 is reached in 2009/2010. It is recommended that Pelaw Main Bypass be constructed as a two-lane, limited access road (one lane each way) when the existing capacity in the road network approaches saturation.

The following intersections will also require upgrading in conjunction with the development of Pelaw Main Bypass:

- Traffic signals at Leggetts Drive/ HEZ Spine Road (HEZ eastern access);
- A new roundabout at John Renshaw Drive/ Pelaw Main Bypass.

In addition, a partial road closure is recommended at the Mitchell Street /

Government Road intersection.

9.2 Study Area

The study area includes the HEZ estate and extends beyond the immediate site to include:

- John Renshaw Drive (MR588), which provides access to New England Highway (Newcastle);
- Main St/Lang St (MR 195), which provides access to Maitland;
- Leggetts Drive (MR195), which provides access to the Freemans Waterhole interchange with F3 (Sydney); and
- Cessnock St/Northcote St (MR588), which provides access to Cessnock.

The modelled links in the study area contain all state and regional roads in Weston, Kurri Kurri, Pelaw Main, Stanford Merthyr, Loxford and Buchanan. In addition, key local roads in Kurri Kurri and Weston are also included. The study area road network includes all key intersections which formed the basis of detailed investigations.

9.3 Journey to Work (JTW) Analysis

An analysis of 2001 Census data shows that around 91% of work trips for those working and living in Cessnock area are undertaken by private vehicle, with 9% of those as a passenger. Bus travel to Cessnock workplaces represents a low 0.8%, cycling 0.7% and walking 4.6%. From these figures, it can be seen that the private vehicle is by far the dominant mode of transport to work. Walking is the only other significant mode. Typically, cyclist facilities in the area are primarily used for school and recreational trips.

Due to the dispersed pattern of residential settlement and dispersed employment patterns in the area, it is not anticipated that walking or cycling will become a major form of transport for journey to work trips although it will be encouraged and facilitated by the development of HEZ.

9.4 Public Transport/Pedestrian/Cyclist Network

The ability to provide viable, attractive and frequent alternatives to private cars within the HEZ are limited due to the low existing service base and the actual population (living and working) within the area. The challenge is to reduce the number and distance of private vehicle trips in an area which is dominated by car travel and has a very limited public transport network. Residents in Cessnock and the areas around the HEZ have existing accessibility challenges such as:

- low density housing development;
- low public transport use and high car dependence;
- social isolation of the young, the aged and people with disabilities;
- expensive taxi option, given dispersed location;
- low frequency, indirect bus services;
- no passenger rail system;
- high youth unemployment and a need to travel to find work;
- little integration in the public transport system; and
- isolated pockets of residential development with patterns of development that are difficult to serve using conventional bus service patterns.

HEZ is currently constructing either on-road cycle paths, off-road cycle paths and shared use paths (paths for cyclists and pedestrians) in the estate to encourage cycling as the preferred transport mode for work or other purposes such as school or recreation.

Besides regional bus services, cycling is the only other mode that is likely to reduce private vehicle trips in HEZ. Extensive pedestrian/cycleways are being provided by HEZ as an integral component of the development and this will be included in the statement of commitments for the concept plan approval.

9.5 Industrial Land Traffic Generation Factors

PB undertook surveys in Hunter Valley business parks/industrial areas to estimate the likely trip generation for the proposed HEZ in comparison to the trip generation figures generally applied from the RTA guidelines. The differences were quite

marked. The differences in employment levels directly influenced travel behaviour.

RTA trip generation guidelines provide a broad peak hour trip generation rate for known industry types including business parks where developments may occur across a range of industrial land use types in an integrated complex. While these are the recognised standards under infrastructure SEPP, there are cautions about using RTA's trip generation rates which include:

- the base industry surveys were undertaken during over 10 years ago and production methods, employment rates and logistics have changed;
- business parks in the survey ranged in size from some 7,300 m^2 to 38,200m^2 of gross floor area (GFA), and the implications of size were not accounted for in the single ratios for generation;
- in the RTA surveys, higher employee density were present in the large industrial estates (28 employees per developable hectare) but this far exceeds the employee yields discovered in the Hunter of 18-19 employees per hectare.

PB forecasted trip generation rates for HEZ industrial development for the following two cases:

- using RTA trip generation rates for three scenarios of industrial land uses; and
- using trip generation rates from survey data.

The trip generation rate was further investigated using survey results from Thornton and Rutherford Industrial Estates. Maitland Council provided detailed industrial land survey data for both sites. PB conducted traffic tube counts on all access roads to the industrial estates which potentially captured 100 percent industrial site related traffic. Any through traffic that may influence survey results is accepted within the forecast. This generation rate reflects actual industrial mix and key conclusions include:

- even with selecting the highest hourly volumes over the week from AM and PM peak hours, trip generation rates from Thornton North were a third of RTA's general rate, and at Rutherford, it was about an eighth;

- applying the recent survey data, once fully developed, HEZ could be expected to generate/attract between 6,000 and 10,000 peak hours trips compared to the 24,000 or so from applying RTA generation rates;
- looking at all the factors, a reasonable estimate for peak hour trip generation/attraction from a fully developed HEZ would be in the range of 10,000 total trips to be distributed across the two external connections with the road network based on the split with external attractors/generators from the strategic model;
- risks from applying an excessive rate would include designs in excess of demand that discourage all but car access to the site and unnecessary concern in the community from overstating likely traffic levels when looking at environmental impacts.

The RTA has agreed with the traffic generation rates adopted by PBs for the HEZ traffic model.

9.6 Traffic Forecasting Methodology

The Lower Hunter Regional Traffic Model was used to assess the likely changes in traffic patterns and demands arising from the development of the HEZ and to identify potential constraints in road capacity. This traffic model (TransCAD) was developed as part of the National Highway F3 to Branxton (F3/2B) Link traffic study for the State Government. The model represents the weekday daily and AM peak period (between 7:00 and 9:00) traffic conditions associated with the assumed future road network and land use developments.

The model covers the entire Lower Hunter region, comprising the six Statistical Local Areas (SLAs) of Newcastle – inner, Newcastle – Remainder, Lake Macquarie, Cessnock, Maitland and Port Stephens. The model network includes all National, State and Regional roads, and local roads generally down to the level of collector road.

PB updated this base model (with the growth of background traffic) to include the HEZ development and proposed access to the site. A comparison of the estimated traffic conditions for the updated network conditions with those for the base model

(or background traffic conditions) provided a good indication of the incremental impacts of the HEZ development on the performance of the road network and of further capacity constraints that might arise.

The network model was run for years 2002 for AM peak two hour period future traffic conditions. A medium land use projection was used to determine background traffic conditions, consistent with the regional traffic model. The network modelling was supplemented by more detailed assessments of selected key intersections using the SIDRA intersection model for AM and PM peak hours. The PM peak hour travel pattern was a mirror of the AM peak, using PM peak hour factors derived from traffic counts. This model provides more detailed analysis of intersection performance indicators including delays, queue lengths and levels of service than is provided by TransCAD.

In formulating a strategy for the future development of the regional and local road network, consideration was given to the performance of the network as measured by level of service. Level of service (LoS) is a term used to describe the potential for delay during traffic operation, usually in peak demand situations. It is a simple performance indicator which describes the interaction of vehicles in the traffic stream. As traffic volumes increase on a given section of road, motorists will experience possible reductions in speed, increased difficulty in manoeuvring within the traffic stream and reduced gaps between vehicles. Accordingly there is a reduction in the “level of service” as the traffic volume increases. A reduction in level of service occurs incrementally with increased traffic and would eventually reach a point when additional road capacity may be required to maintain acceptable performance.

Level of service is difficult to measure in the field, and surrogate measures are often used. The letters A to F are often assigned to different ranges of operating conditions with LOS, A representing the best and F the worst. Level of service ratings of F are commonly considered unacceptable. Technical Publications (including Guide to Traffic Engineering Practice Part 2 Roadway Capacity-Austroads, The Highway Capacity Manual –TRB and RTA’s Guide to Traffic Generating Developments) provide an indication of the thresholds for each level of service range. These thresholds are sometimes referred to as maximum service flows which are derived from volume to capacity ratios. For the purpose of

determining maximum acceptable service flows for roads in the wider road network surrounding HEZ, a LoS threshold of E was selected.

On the basis of above principles, the timing for the implementation of the individual road capacity improvements was estimated as follows:

The first step involved using the traffic model to predict traffic volumes on road links corresponding to Stages 1 and 2 of the HEZ development. Assumptions were initially made on which road improvements may be required for each stage of development when volumes exceeded the LoS threshold.

In the second step, timing estimates for the road improvements were refined. A spreadsheet was used to interpolate between estimates of traffic volumes between each of the stages to determine the year when the traffic volume on specific road links would reach the maximum LoS E threshold.

In the third step, a reconnaissance survey was undertaken on the state/regional road which would be significantly affected due to HEZ traffic but without relief from an F3/2B. Key routes included, MR220 Branxton-Toronto Road/ Lake Road, MR195 Leggetts Drive, MR588 John Renshaw Drive, MR527 George Booth Drive, Main

9.7 Road Network Capacity

The operation of key intersections within the study area was assessed using the aaSIDRA (SIDRA) intersection modelling software. SIDRA calculates intersection performance measures such as: level of service; degree of saturation; average delay and maximum queue length.

The intersection modelling was undertaken for several key intersections for both morning and evening peak hour. The results indicate intersection performance as set out below:

- The Cessnock Road/Station Street intersection is operating at an acceptable Level of Service (LoS “B”) during both peaks. However, the PM peak Degree of Saturation is high, as some approach traffic may reach to capacity level.

- All other analysed intersections are operating satisfactorily under current traffic conditions, with a LoS “A” to “B”.

Results of the SIDRA modelling show that the existing network within HEZ study area does not show any significant capacity issues. However, the Leggetts Drive/HEZ Spine Road intersection is currently approved as a temporary access only for Hunter Enviro Mining and will require upgrading to a type C intersection for the development of HEZ Precinct 1.

A type C intersection was analysed for capacity to confirm how much of Precinct 1 could be developed before a second access was required. Modelling determined that between 20.6Ha and 43.6Ha of Precinct 1 development is the trigger to require the second access which is at Station Street (at the northern boundary of HEZ). PB recommends that the correct timing of the second access should be determined by ongoing modelling of the actual traffic impact from the developments at HEZ.

9.8 Investigation of Options for Road Alignments (Station Street and Pelaw Main Bypass)

Station Street

The HEZ northern access at Station Street has been an integral part of the planning of the HEZ Estate for many years. It was part of the early planning that resulted in rezoning the land to ‘4(h) - Hunter Employment Zone’ for industrial uses, and is consistent with Cessnock City Council’s planning instruments. Council’s Development Control Plan No. 47 – Hunter Economic Zone shows this northern access in the ‘Masterplan – Development Area’.

The location of this access is consistent with the current Part 3A application.

The subject land fronts Station Street, an existing legal access to the site. Utilising this access is a sound planning approach. HEZ has undertaken a full environmental assessment of the proposed route of this road, which is included in this application.

The alignment of the Station Street road corridor has been located to minimise

impacts upon the ecology at HEZ. It has been designed to incorporate existing partially cleared and degraded areas where possible, in combination with achieving a direct route that minimises vegetation removal.

Pelaw Main Bypass (PMB)

Similar to Station Street, the Pelaw Main Bypass has been an integral component of the estate planning for many years. Originally, the location of this road was shown further to the north of its current location but was moved after comprehensive investigations, primarily to minimise traffic noise related impacts on the residents of Pelaw Main.

From the outset it was clear that the proposed PMB would traverse a State-listed Endangered Ecological Community (EEC), being Kurri Sands Swamp Woodland (KSSW). This scenario could not have been avoided and a preferred alignment was largely based upon minimising the area crossed and potential impacts upon this community. However, restrictions pertaining to noise impacts upon the village of Pelaw Main dictated that the alignment needed to be located further east than the most ideal location purely in terms of minimising ecological impacts.

Later in the assessment process, the Lower Hunter Spotted Gum – Ironbark Forest (LHSGIF) community was also listed as an EEC. This also affects the proposed PMB but the impact is considered minimal. These comments in relation to the two EEC's apply equally to the nationally-listed threatened species that will be affected by the PMB. These include Acacia bynoeana, Eucalyptus parramattensis ssp. decadens and Grevillea parviflora ssp. parviflora. While a small proportion of these species and their habitat may be affected by the PMB, the vast majority will be retained in adjoining environs.

The current location of the Pelaw Main Bypass achieves the best conservation outcome for known and potentially occurring threatened species and vegetation communities whilst achieving important economic, social and development outcomes.

Within the framework of the HEZ project, and given the location of the HEZ Spine Road, there are no other more feasible alternatives to the position of the Pelaw

Main Bypass. Furthermore, the design and location of the PMB is consistent with the RTA's strategic planning and the future alignment of a proposed extension of the F3 Freeway, from Seahampton to Branxton.

Pelaw Main Bypass will connect John Renshaw Drive with Leggetts Drive in Kurri Kurri. As the introduction of the HEZ will progressively change the local land use pattern and increase traffic pressure on local roads, the proposed bypass will improve the network connectivity, providing a more direct route option for traffic on John Renshaw Drive to reach the HEZ, as well as improve the accessibility between centres such as Cessnock and Newcastle. It will enhance the access to the HEZ in the east and relieve the traffic pressure on other roads through Kurri Kurri.

Potential traffic users of PMB would be motorists travelling:

- between Newcastle and Cessnock via John Renshaw Drive and Lake Road;
- between Newcastle and HEZ (eastern access) via John Renshaw Drive;
- between Newcastle/Lake Macquarie and Cessnock via George Booth Dr and Lake Road;
- between East Maitland and Cessnock via Buchanan Road and Lake Road; and
- between East Maitland and HEZ (eastern access) via Buchanan Road.

Without a PMB, regional background and HEZ-bound traffic would divert to a number of potential travel routes including:

- Cessnock Road, Northcote Road, Mitchell Ave, Victoria Street, Tarro Street through Kurri Kurri;
- Lang Street, Main Road through Heddon Greta; and
- Stanford Street, Leggetts Drive through Pelaw Main.

Having forecast the above travel pattern, PB also looked at how HEZ–bound traffic would access the site with and without PMB. The key findings were:

- Without PMB in place, about 20 percent more HEZ traffic would use the northern access at Station Street than with the PMB. This traffic change

would reduce available intersection capacity along the Cessnock Road and Northcote Street routes; and

- Traffic increase on Stanford Street through Pelaw Main.

The next section quantifies the impact on the road and intersections without PMB but with varying levels of development at HEZ.

9.9 Impacts on Roads and Intersections

In assessing HEZ's impact on roads and intersections, PBs investigated traffic volumes on the broader road network comprising both regional and local roads. They forecast traffic levels at 26 road locations in relation to estimated road capacity and forecast future level of service (LoS) at 15 key intersections. With this investigation, traffic indicators were reviewed under four traffic scenarios:

1. S1, background traffic growth for 2010 without HEZ
2. S2, background traffic plus 67 ha of HEZ for 2010
3. S3, background traffic growth for 2016 without HEZ
4. S4, background traffic plus 206 ha of HEZ for 2016

In conjunction with the above, PBs also ran a number of models to vary the amount of development at HEZ to identify critical development thresholds so that the scenarios did not allow intersection LoS to fall below level D. This was an iterative process and the above four scenarios provided sufficient input to estimate the HEZ threshold capacity.

The results indicate HEZ would increase traffic on key regional and local roads by varying amounts. In 2010, peak hour traffic on Leggetts Drive just north of HEZ eastern access would increase from 350 to 680 vehicles. The increased traffic volumes on Leggetts Drive are still comfortably within its capacity as a state road (as stipulated in the RTA road hierarchy plan).

In determining the HEZ threshold capacity, intersection operation is more critical than the capacity of road links between intersections. In general, intersection LoS A to C represents satisfactory operation, while D represents "near capacity" and E

represents “at capacity”.

This traffic assessment shows LoS for 15 intersections for scenarios S1 and S2. Modelling results estimated LoS would reduce to between C and D for five intersections during AM peak and six intersections during PM peak, attributable to a combination of background traffic growth and HEZ traffic. Two intersections along Northcote Street showed LoS D, indicating limited spare capacity with 67ha development in Precinct 1 of HEZ.

Potential HEZ growth beyond 67 ha would further reduce LoS at both intersections and trigger upgrading works to increase intersection capacity. Modelling results from the above investigation indicate the existing road network in Kurri Kurri has the capacity to accommodate up to 67 ha of HEZ development without upgrading works, although some intersections would be close to capacity and therefore subject to occasional delays.

On the basis of this additional modelling, the following conclusions are made:

- The state and local road network has the capacity to accommodate approximately 67 ha of additional HEZ development, which is assumed to be occupied around 2010, without the need for major upgrading works including the PMB; and

- In terms of traffic demand, the critical timing for major infrastructure improvements, intersection upgrading and/or construction of the PMB, occurs shortly after 2010, based on current market take-up rates, or when development at HEZ exceeds 67 ha. However, this should be reviewed with actual traffic data over time.

9.10 Connectivity of the Precinct 1 Road with the Broader HEZ Estate

The Precinct 1 Concept Plan is part of a larger parcel of land zoned for industrial and employment generating purposes. The road design has been planned to link into the overall road pattern of the entire HEZ estate and surrounding area.

Precinct 1 roads have also been designed to perform a number of other functions to achieve sustainable development. These include retaining or creating environmental corridors and habitat, facilitating water sensitive urban design, bushfire mitigation and effective landscaping; while providing direct vehicular and pedestrian connectivity throughout the estate.

10. Air Quality

Air Quality impacts have been considered for the facility component as required in the Director Generals Requirements. Consistent with the approach to the management of the estate in a global approach SKM have been engaged to review, update and improve the usability of the Air Quality Management Strategy (Appendix J) that they originally prepared for the estate. The review has sought to address contemporary requirements and critically more clearly outline the requirements and obligations for lot developers and operators to follow. Greater understanding of the requirements must improve the ability to incorporate air quality considerations into the developments prepared and submitted for determination within the estate.

The revised strategy provides guidance on site selection, impact assessment and management of impacts that are required to be undertaken for proposals to develop and operate within Precinct 1 and the wider HEZ Estate.

The implementation of the Air Quality Management Strategy (Appendix J) is proposed as part of the Draft Statement of Committments (Appendix A) for the assessment of applications within the Precinct and the broader HEZ Estate in the future Precinct developments.

11. Soil and Water

The assessment of the soil and water cycle management impacts presents an integrated water cycle management strategy (Appendix L) for the Hunter Economic Zone and responds to the requirements of Department of Planning Director General requirements. The report also describes the impacts of the Precinct 1 industrial development and broader HEZ development.

The proposed greater HEZ will replace 900ha of forest with a mix of urban development primarily for industrial purposes

The potential impacts on the natural runoff regime and ground water processes are great but will be managed through the principals of Water Sensitive Urban Design (WSUD) which utilises an alternative approach to traditional stormwater management to achieve the following outcomes:

- Protecting habitat by preserving the geomorphic form of waterways;
- Protecting downstream water quality through the control of industrial pollutant generation and reduction of typical urban stormwater pollutant loads;
- Protecting downstream development from increased flood flows;
- Reducing potable water volumes imported from external catchments through demand management and stormwater harvesting; and
- Reducing the generation of wastewater and reducing impacts at the point of discharge to receiving waters.

Potential and Residual Impacts of the HEZ

The HEZ site is crossed by intermittent creeks which drain to Wallis and Swamp Creeks that in turn feed downstream wetlands and supply water for agriculture. (refer figure 15) Many of the creeks within the HEZ Site are in good condition providing important frog habitat however several creeks are actively eroding due to hydrologic changes associated with historical mining on the site. This erosion continues to propagate upstream during high flow events which is a source of sediment pollution to downstream waterways and requires intervention to prevent

further degradation of in stream habitats and ongoing water quality issues downstream. A program of in-stream channel Improvements are proposed to halt the active erosion of waterways and improve the existing condition of streams protecting these habitats from further impacts.

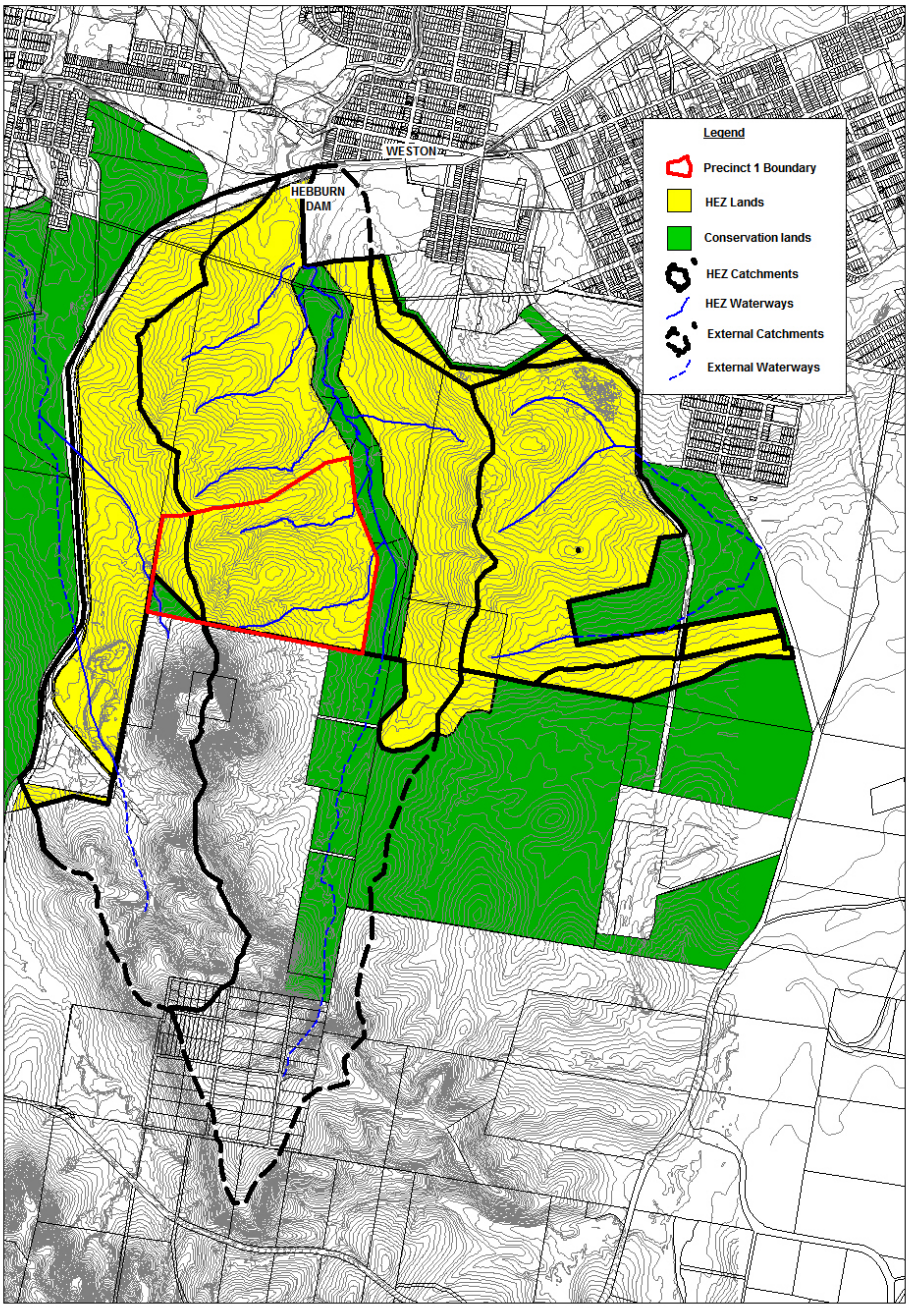


Figure 15 – Catchments and waterways within the HEZ Estate

Soils across the site typically comprise heavy clay overlaid by a 100mm horizon sandy top soil. The soils are derived from weathered siltstone, sandstone and coal have been identified as highly erodible (Hunter Central Catchment Management Authority, 2001) while the clay beneath is particularly dispersive. These soil types are prone to erosion when topsoil is removed by storm flows exposing dispersive clay soils beneath. Subsequent swelling of the clay causes creek bank slump. Other areas of the site are highly porous such as those underlying the Kurri Sands lowland forest. Mining operations have left large deposits of coal mining spoil which are thought to contribute to high nutrient loads in downstream waterways. The proposed industrial development within the Site has the potential to introduce soil contamination associated with illegal dumping, poor site management and irresponsible practices.

Stormwater treatment devices required on all sites within Precinct 1 and the greater HEZ will partially intercept stormwater borne pollutants, however these systems are designed to treat stormwater pollutants associated with frequent rainfall (heavy metals, sediments, litter and nutrients) and the threat of significant chemical spills must be controlled with industrial site design (physical isolation of chemicals with bunds and roofed work areas), site management (spill management and proper chemical handling) and operator education aimed at reinforcing the link between on site activities and environmental impacts.

Geotechnical investigations have identified the local groundwater table is some 10 to 20 m below ground. Areas of high infiltration have been recorded, and creeks are likely to be fed from localised and transient perched water table occurring after rain. The impact of underground mine workings on local and downstream groundwater tables is not well understood. The increase in impervious areas associated with Precinct 1 and the greater HEZ development have the potential to reduce groundwater infiltration rates at the local scale, however given the scale of the development within the greater catchments, Precinct 1 and the greater HEZ site are not expected to alter the regional groundwater table and will therefore have only a marginal impact on groundwater recharge.

The existing water quality of local creeks is poor. Monitoring undertaken during previous studies has identified high nutrient and sediment levels within the site and downstream waterways. There are no obvious point sources of pollutants, but high

levels of nutrients, turbidity and salinity are presumed to occur from existing urban runoff, the presence of mining wastes within the catchment, historical septic tank use and effluent discharge from the Kurri Kurri Waste Water Treatment Works. Stormwater runoff from Precinct 1 and the greater HEZ development has the potential to exacerbate water quality problems, but the risk of this will be significantly reduced through the proposed stormwater treatment across the site.

Management of Impacts of the HEZ through WSUD

Without proper management, the proposed and existing industrial development within Precinct 1 and the greater HEZ Site could potentially exacerbate local erosion, flooding and water quality, and further degrade protected conservation areas. The HEZ Water Cycle Management Strategy (Appendix L) establishes a series of best practice stormwater management objectives to protect aquatic and groundwater environments from the potential impacts of industrial development.

The strategy is proposed to be implemented via the Draft Statement of Committments (Appendix A) requiring all development within the HEZ estate to be designed in accordance with the requirements of the strategy

By implementing a strategy of stormwater harvesting on individual lots and at the cluster scale, potential runoff volumes associated with development will not reach creeks and will there by preserve the ephemeral hydrologic regimes of local creeks and frog habitat. Where existing development or proposed development cannot meet stormwater harvesting and reuse targets, infiltration of treated stormwater will be implemented to recharge groundwater and reduce runoff volumes.

During times of heavy rain swales and detention storages will act as buffers that slow the arrival of stormwater to local creeks to protect them from erosive flows. Where the underlying soils are conducive to infiltration, groundwater recharge will be encouraged through French drains and infiltration areas. This will replenish base flow concentrations and reduce stormwater loads to creeks.

Typical urban stormwater pollutants (suspended solids, litter, oils, heavy metals, nitrogen and phosphorous) will be managed to meet pollution control targets set by the Department of Environment and Climate Change and adopted by the Growth

Centres Commission for development in Sydney's north west and south west growth centres. These reduction targets represent current best practice stormwater management and are more stringent in the control of sediment and phosphorous than those commonly adopted in NSW.

Attainment of the pollution control targets for both private and public areas is likely to be through the use treatment trains which may include:

- Swales and bioretention pods
- Bioretention with pre-treatment from sedimentation areas.
- GPTs and wetlands.

Combinations of bioretention, wetlands and gross pollutant traps will be incorporated into lot and road designs to meet best practice management pollutant reduction targets adopted to protect more significant waterways across the state. Stormwater pollutant loads will increase post development of the site, however these pollutant export events will be associated with storm events when significant flushing of downstream waterways is occurring. Impacts are not considered to be significant given the existing apparent poor water quality of receiving waters near the site and the relatively infrequent occurrence of pollutant events.
On site detention basins will be incorporated into lot design to attenuate flood flows and prevent the development from flooding downstream areas. No net increase in the 100-year discharge will result from the sites development.
The intermittent waterways that cross the site flow only after heavy rain and are likely fed by localised and intermittent perching of the ground water table. The permanent groundwater level is some 10 to 20 m below ground surface and does not express itself as permanent waters within the site boundary. Downstream wetlands may be Groundwater Dependant Ecosystems during dry periods, and changes to the infiltration within the site (if any) are considered to have a negligible effect.

The proposed development will reduce typical volumes of potable water imported from external catchments through demand management and stormwater harvesting at the lot scale. The HEZ Association is in a good position to encourage the sharing of harvested stormwater where water intensive industry can use underutilised stormwater from neighbouring lot/s.

The design of lots to exclude stormwater from work areas will relieve the need to discharge captured water to the sewer and in so doing will reduce the generation of wastewater. This will provide environmental benefits in so far as reducing impacts at the point of wastewater discharge.

Proper implementation of the Strategy will deliver a sustainable outcome to the HEZ that is supported by sound technical guidelines and practical implementation at each lot without unreasonable impost to the developer.

12. Noise and Vibration Impacts

12.1 Overview

The Project, with regard to Precinct 1, involves the sub-division of a 129 ha section of the HEZ for future industrial and employment generating developments. The sub-division of this Precinct in itself does not generate any noise or vibration impacts and until specific developments have been identified in later stages of the Project, these impacts cannot be practically or accurately identified and assessed.

In lieu of the identification of specific noise and vibration impacts, this section discusses some of the general impacts on sensitive receivers that may be generated as a result of the development of Precinct 1 and includes:

- a description of potential noise and vibration generated by facilities that may be developed within Precinct 1
- the identification of sensitive receivers and description of existing acoustic environment
- a review of relevant noise and vibration legislation and guidelines
- a preliminary assessment of noise and vibration impacts at identified sensitive receivers
- general noise and vibration mitigation measures

A detailed technical report on the identification and management of potential noise impacts is provided in Appendix K.

12.2 Precinct 1 – noise and vibration emissions

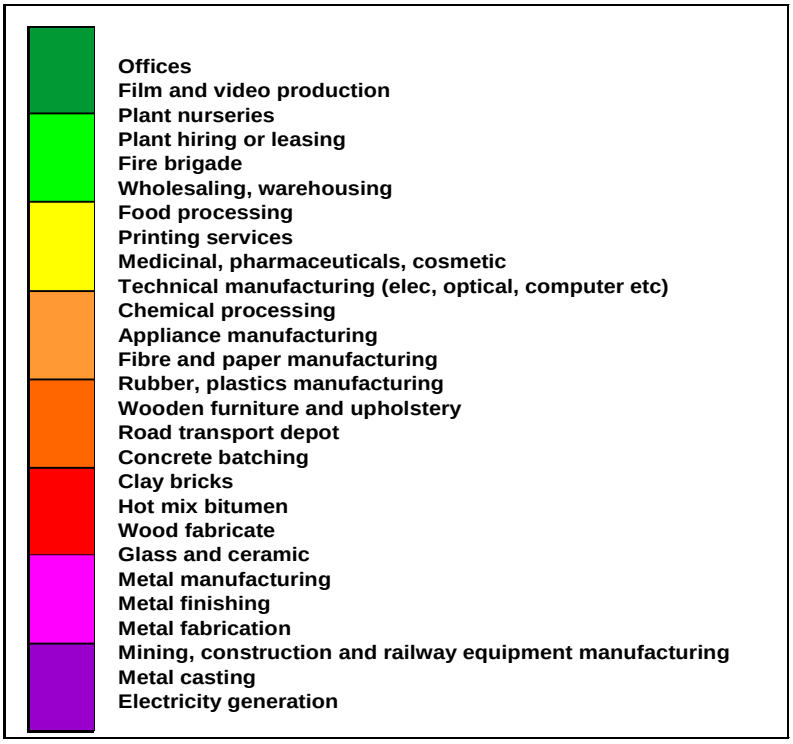
With the exception of the WIPS Management facility, specific developments within Precinct 1 have not been identified. However, approximately 49 developments are expected within the Precinct and, based on typical Sydney metropolitan industry mixes, a large range of facility types is possible, from office and warehousing space to manufacturing facilities and electricity generation. The noise emissions from these facilities will vary considerably, as will noise types (e.g. tonal / intermittent / continuous) and operating times (e.g. 24 hours / day only). In addition, construction of each facility and cumulative traffic increases will have impacts on the noise

amenity of surrounding sensitive receivers.

The Noise, Vibration, Electrical Interference and Lighting (NoVEL) Strategy was developed with the intention of managing the potential variety of noise emissions in the planning stage by assisting to site facilities appropriately. Locations within the HEZ were identified where noisier facilities could be established without resulting in a significant impact on sensitive receivers. Guidance as to the relative magnitude of facility noise emissions was provided in the NoVEL Strategy and a summary is provided in Figure 10-1.

Precinct 1 has been identified in the NoVEL Strategy as a location suitable for moderately noisy operations, where, on an area-based average, a sound power of between 50 dB(A) and 60 dB(A) per square metre is permissible (orange to red in figure 10.1.

Figure 12-1 Estimated hierarchy of noisy industry, with quieter land uses to the top.



Part of adopting the NoVEL Strategy is to complete a detailed noise impact assessment for each facility, which involves carrying out an inventory of noise

sources and comparing the expected noise emission level with the permissible value for that area. Where it is not conclusive that no significant noise impacts on sensitive receivers would result from operation of that facility, a detailed noise impact assessment is then required. Hence, noise sources would be identified and assessed on a site by site basis under an 'umbrella' noise management strategy, which would manage potential cumulative noise impacts.

Vibration may be generated through construction activities, such as piling, rolling or blasting, and through operations such as stamping or pressing. Due to the large distances between potential sources of vibration in Precinct 1 and sensitive receivers, it is unlikely that vibration would pose a threat to the human comfort or structures outside the HEZ. However, any substantial sources of vibration shall be identified and documented as part of the NoVEL Strategy for each facility seeking to establish itself within Precinct 1.

12.3 Sensitive receivers and acoustic environment

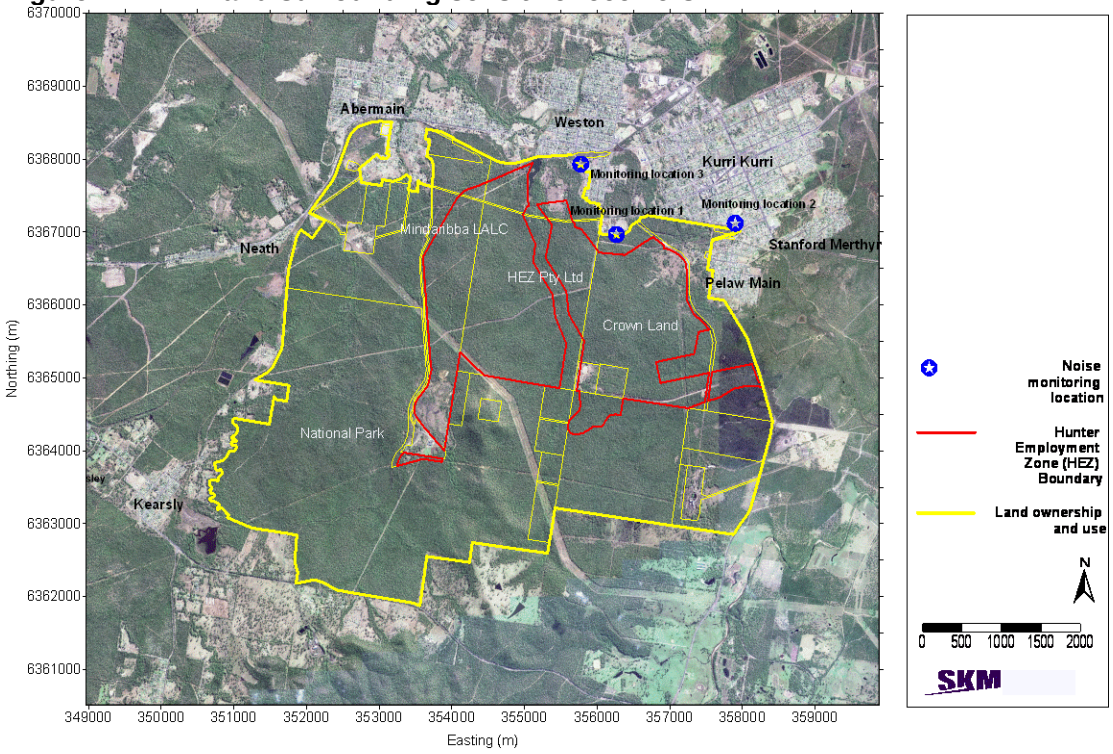
The HEZ is bounded by the residential suburbs of Abermain and Weston to the north, Kurri Kurri to the northeast, Pelaw Main to the east and Neath to the west. Elrington and Abernethy are located to the south of the HEZ and Kearsley to the southwest, beyond the National Park. Due to the location of Precinct 1 within the HEZ, the majority of sensitive receivers are to the north, approximately 2 km – 3 km from the development site. In addition, a National Park borders Precinct 1 to the south and west, and should be considered as a sensitive land use.

Unattended background noise monitoring was undertaken by SKM (2002). A summary of results is provided in **Table 12-1.** In general, there is no existing contribution of industrial noise to the area, which experiences, on average low noise levels, particularly at night.

Table 12-1 Summary of ambient noise levels (SKM 2002).

Monitoring location	Time period	L_{A10}	L_{A90}	L_{Aeq} (from existing industry)
Location 1: Rear of Kurri Kurri Hospital	Day	42	30	<30 dB (A)
	Evening	41	31	<30 dB (A)
	Night	43	31	<30 dB (A)
Location 2: Coronation Street	Day	54	39	<30 dB (A)
	Evening	53	38	<30 dB (A)
	Night	44	30	<30 dB (A)

Figure 12-2 HEZ and surrounding sensitive receivers



12.4 Noise and vibration legislation and guidelines

Industrial estate noise control planning

Where several developments are proposed for an area, as is the case for the HEZ and Precinct 1, the INP (DECC 2000) recommends that these developments should be assessed as a group by setting project specific noise limits for the entire industrial estate so that the total impact from all proposed or potential developments does not cause the amenity to deteriorate.

In order to maximise the HEZ's development flexibility (i.e. types and numbers of industries) and to minimise the cumulative noise impacts on surrounding receivers, the following steps were adopted to allocate the available noise limits for both day and night operations. The technical paper in Appendix K should be referred to for additional detail.

1. Determine day and night time assessment criteria in accordance with the INP (DECC 2000).
2. Divide the HEZ into equal-sized individual lots.
3. Determine, with the aid of a model, the total noise emission from each lot, as an area average (dB/m^2), that is possible without exceeding the pre-determined limits.

Compliance with the INP's amenity and intrusiveness criteria is required by each development. The intrusiveness criteria limit the noise from any development to a level 5 dB (A) above the background noise, whilst the amenity criteria protect against successive developments continuously increasing the ambient noise. A summary of amenity criteria for relevant sensitive land uses is provided in Table 12-2.

Table 12-2 Amenity criteria (DEC 2000).

Type of receiver	Indicative noise amenity area	Time of day	Recommended L_{Aeq} noise level, dB(A)	
			Acceptable noise level (ANL)	Recommended maximum
Residence	Suburban	Day	55	60
		Evening	45	50
		Night	40	45
Area specifically reserved for passive recreations (e.g. National Park)	All	When in use	50	55

Impacts on fauna

The INP aims to protect the acoustical amenity of (human) residents that are potentially affected by noise from industrial sources. Whilst not specifically addressing the impacts on animals, the *INP* provides guidance for setting planning noise levels for *Areas specifically reserved for passive recreation (e.g. National Parks)*, where L_{Aeq} levels of 50 dB (A) to 55 dB (A) are recommended as upper limits.

Vibration

The two main effects of vibration in buildings can be categorised into:

- The effects on the occupants (i.e. human annoyance); and
- The effect on the building structure (i.e. structural damage).

The most relevant guideline for assessing the impacts of human comfort of vibration is BS 6472: - 1992 *Evaluation of Human Exposure to Vibration in Buildings*, which provides specific guidance for the assessment of human exposure to vibration, generating events. For continuous vibration, the vibration level (measured in terms

of peak particle velocity) should not exceed the levels presented in **Table 12-**.

Table 12-3 Vibration Limits (mm/s)

Place	**Time**	**Continuous or intermittent vibration (mm/s)**
Critical working areas (Hospital operating theatres, precision laboratories etc)	Day or Night	0.1
Residential	Day	0.18 to 0.37
	Night	0.14

There are two commonly used standards that provide guidance on the expected levels of building damage from vibration, these are the *German Standard DIN 4150: Part 3-1986 Structural vibration in buildings – effects on structures*; and *British Standard BS 7385: Part 2 – 1993 Evaluation and measurement of vibration in buildings.*

The levels presented in these standards are significantly higher than that which would apply for human comfort. Consequently compliance with the human comfort criterion would automatically result in compliance with building damage criterion, with a considerable margin of safety.

Mine subsidence

Specific areas within the proposed boundaries of the HEZ contain shallow mine workings from former under-ground mine operations. The area is a Mine Subsidence District over the entire HEZ site, and immediate areas. This requires the design of the buildings to conform with Mine Subsidence Board standards of Construction, and vibration generating industry (presses and the like) identifying any potential impacts to the workings below.

12.5 Noise impact assessment

Preliminary assessment

The premise of the NoVEL Strategy is that the location of an industry in relation to sensitive receivers plays a vital role in influencing the impact of noise. Since the level of noise decreases with distance from the source, it is logical that industries, which anticipate being noisy relative to other developments within the HEZ, would seek to establish themselves further from sensitive receivers in order to provide confidence that noise issues would not manifest themselves upon commencement of their operations.

A series of noise planning maps was developed that indicate the level of noise emissions from various regions within the HEZ that should not result in adverse noise impacts on sensitive receivers. These are attached as part of the NoVEL Strategy in Appendix K.

Industries wishing to develop a site within the HEZ, having determined their likely operating hours, can consult the relevant map and identify suitable locations. Finally, a preferred development site may then be determined in conjunction with other environmental constraints, e.g. air quality, flora and fauna and heritage as well as site development guidelines.

This tool is valuable for site selection of noisy and quiet sites. Through good planning, noisy sites would not be developed near sensitive receivers and quieter sites would not occupy land that otherwise could be developed for noisier operations.

Detailed noise assessment, monitoring and reporting

Although the pre-assessment may determine that the proposed development would be located such that the risk of adverse noise impacts would be low, all proposed development applications (DA) to Council would still require the preparation of a site-specific environmental management plan (EMP) as part of the DA process, including noise impact assessment and compliance monitoring, in accordance with

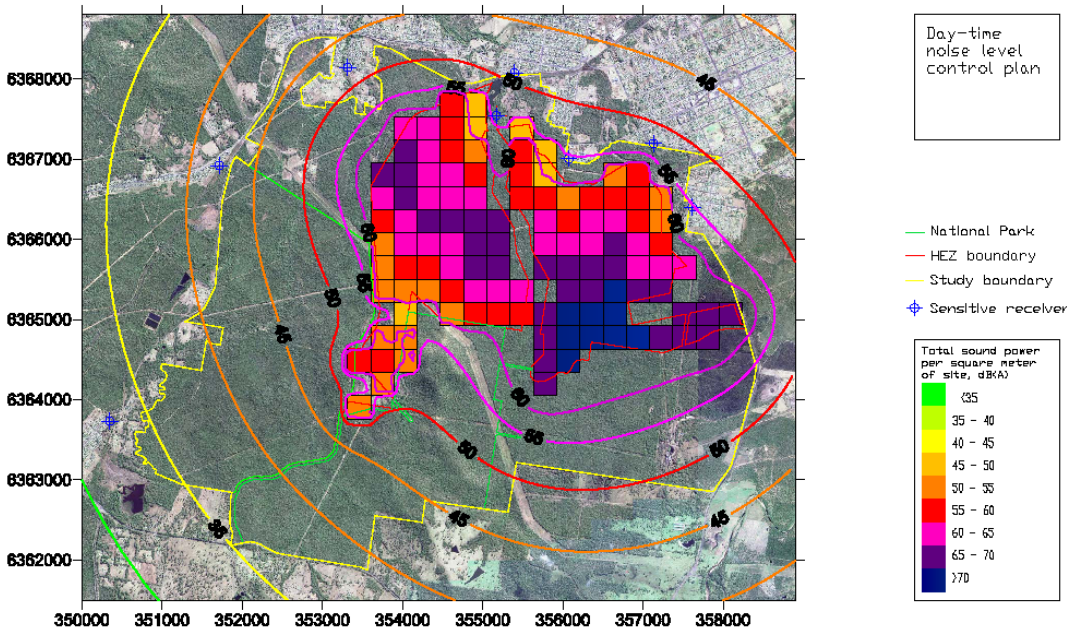
the Development Control Plan.

The following steps should be followed when developing a site specific EMP for noise.

1. **Emissions identification**. Each industry will review and document within the EMP their potential to generate noise. A total A-weighted sound power level for all sources on site should be estimated and averaged across the area of the lot.
2. **Analysis**. Refer to the noise control planning map relevant to the industry's proposed operational hours and compare the estimated area source sound power with the colour key. An example is presented in Figure 12-3.

   If the estimated area-averaged sound power level determined in Step 1 is **lower** than the value given for the relevant coloured zone, the operational noise is not likely to be significant and a only a brief assessment of noise is required. If the area-averaged sound power level is **equal to or greater** than the value given for the relevant coloured zone, operational noise needs to be assessed in greater detail (see Step 3).

Figure 12-3 Example noise control plan



3. **Detailed assessment.** A noise model has been generated for the HEZ and surrounding area and is maintained by the HEZ Association. The model provides a mechanism for assessing the on-going and cumulative acoustical impacts from industry developing within the HEZ in a systematic way and on a continuous basis. The modelling approach would be in accordance with the requirements of the INP.

   Later entrants to the HEZ, which may require detailed assessment, will access the most recent version of the acoustic model. Where several industries may be completing their EMPs at any one time, the modelling for all such industries will be undertaken as a single exercise to ensure cumulative impacts are always assessed.

4. **Management measures.** Where identified as necessary through detailed assessment, measures for the management of noise impacts will be documented in the EMP. Management measures are discussed below.

5. **Monitoring.** Compliance noise monitoring would be the responsibility of industry developing within the HEZ, in particular where they have the potential to impact on the local environment. All noise monitoring should be undertaken in accordance with the requirements of the INP, and relevant Australian Standards for monitoring procedures and instrumentation.

6. **Reporting**. All of the above steps should be recorded and documented in, and as part of, the site specific EMP.

7. **Complaints.** The site-specific EMP will be required to contain measures for addressing complaints. Where complaints arise regarding noise, an investigative report should be undertaken on a phased approach. An initial investigative report should be undertaken to assess the validity of the complaint, and if considered necessary, a more detailed investigation. Where complaints are considered to be valid, the report should include detailed measurements, comparison with the relevant conditions standards, and recommendations for preventing further complaints.

Vibration

Although sensitive receivers outside the HEZ are unlikely to be adversely impacted by vibration generated by construction or operation of facilities within Precinct 1, facilities wishing to establish within the area are required to report activities of substantial vibration such as piling and blasting during construction or stamping and pressing operations and a detailed vibration assessment would be required to ensure neighbouring structures and facilities would not be adversely affected.

12.6 Noise mitigation

General noise control measures to ensure noise levels at residences are at a practical minimum and assessment criteria are met are provided in Table 12-4.

Table 12-4 General noise control measures

Management plan	An operations environment management plan should be prepared, which specifies the applicable noise limits, describes how these limits will be met, and how complaints will be recorded and handled.
Equipment selection	The equipment used should be the quietest reasonably available. Use equipment with effective silencer or muffler design. Where tonal noise is identified, equipment should be redesigned with manufacturers' advice or enclosed. Equipment should be specified to comply with the occupational noise limit of 85dB(A) at 1m.
Plant and site layout	Noisy equipment should be sited behind structures, which act as barriers, or at a greater distance from noise-sensitive areas. If noisy equipment emits noise strongly in one direction, it should be oriented so that noise emissions are directed away from noise-sensitive areas. The site should be designed to maximise the distance from the dominant noise sources to residences, using intervening buildings as barriers.

Plant construction	Consider noise and vibration during detailed design of the plant including: the minimisation of vibration and structural-borne noise the number and placement of open doors, windows, louvers insulation of walls/ceilings in noisy areas separate 'rooms' for noisy plant such as generators, compressors motors and mills as appropriate
Enclosures	Effective noise enclosures should be utilised for noisy equipment.
Maintenance	Equipment should be regularly and effectively maintained.
Reversing alarms	Where reversing alarms are used, their acoustic range should be limited to the immediate danger area and/or during night-time operations, alarms should be switched off and substituted for flashing lights, subject to site OHS requirements.
Monitoring	Monitoring of noise levels during construction should be regularly undertaken to ensure compliance with the set noise limits.
Communication	Maintain communication with community groups and relevant stake-holders, including appropriate channels for complaints.

13. Bushfire Assessment

The design and layout of precinct 1 has been designed in consultation with specialist bushfire Risk management advice.

The inclusion of this advice at the design stage has facilitated the provision of the significant portions of required and recommended Asset Protection Zones within the internal road network.

This road network of Asset Protection Zones is supplemented by lot level Asset Protection Zones. These are clearly delineated within the Precinct design layout plan prepared by EDAW in support of the proposal.

The Bushfire Threat Assessment Report (Appendix N) includes ongoing management and assessment requirements for future lot development to achieve. These requirements are proposed to be implemented via the Draft Statement of Committments (Appendix A) prepared in support of the submission.

14. Subdivision

Precinct 1 of the Hunter Economic Zone (HEZ) is an area of land comprising approximately 129ha zoned for industrial and employment generating purposes. The land within precinct 1 is serviced by an existing central spine road known as HEZ Drive. HEZ Drive intersects with Leggetts drive to the east. Leggetts Drive provides road transport linkage to Pelaw Main and Kurri Kurri to the immediate north and to Newcastle and the Pacific Highway to the north east. To the south Leggetts drive provides linkages to Lake Macquarie, the Central Coast and Sydney via the F1 Freeway.

The existing HEZ Drive dissects Precinct 1 and currently terminates at the northern boundary of the precinct. The land to the immediate north is known as Precinct 3.

Currently under construction is the easterly extension of the central spine road which crosses the central 7(b) Environmental Protection (Conservation) Zone corridor covering Chinamans Hollow Creek. This road ceases at the eastern extent of the HEZ Pty Ltd controlled lands within land known as Precinct 2. A north south extension of the road is also being completed which will terminate at a current unformed road reserve that is an extension of Lang Street. The Concept Plan includes the continuation of this road to connect with Station Street at Weston, described as the “Station Street extension” within the Concept Plan application package.

In addition to the current road construction works, approvals are in place and being implemented for the provision of an Energy Australia sub-station, construction of a water reservoir and pumping station as well as trunk sewer mains and trunk water supply lines for Hunter Water. These construction programs are well advanced for this infrastructure with the electricity sub-station being live.

These existing elements have become fundamental matters for consideration in the design of the proposed subdivision layout along with the lands environmental attributes. The subdivision design has incorporated a number of existing and pending land use approvals in the design layout.

The existing land use approvals under construction within Precinct 1 include:

- a peak generation plant on proposed lot 210; and
- an aluminium extrusion plant on proposed lot 410.

The undetermined applications before Cessnock City Council within Precinct 1 include:

- a heavy plant maintenance facility on proposed lot 130;
- a new road to service proposed lot 130;
- a native plant propagation nursery on proposed lot 90; and
- an estate convenience service and food outlet on proposed lot 110.

All of these uses will utilise or propose to utilise the constructed or under construction roads and utilities within Precinct 1.

The road pattern prepared for the Estate has integrated the existing estate spine access drive, to be known as HEZ Drive, and has sought to integrate a number of fundamental principles to ensure the maximum efficiency of the estate and the integration of the ecological management considerations for the estate.

The subdivision and Precinct layout has sought to provide opportunities to:

- Maximise the supplementary vegetating retention within lot front setbacks;
- Integrate the road pattern with the topography of the site to maximise WSUD opportunities for future development of the land;
- Demonstrate that vegetation retention targets required by the EPBC Act 1999 approval for the site can be met and exceeded;
- Integrate Bushfire management and protection requirements into the estate design without compromising the ecological and vegetation objectives for the site;
- Provide a design and configuration to facilitate the efficient provision of trunk infrastructure to the estate;
- Provide lot sizes and configurations that readily accommodate lots in the target 2 to 5 hectare range and are in modular form that will allow amalgamations and reconfigurations without compromising the underlying objectives of the design;
- Ensure the internal road layout is capable of accommodating B-Double

vehicles;

- Ensure that fundamental internal infrastructure issues do not become a constraint to large scale industrial and employment uses developing on the lots to be created.

The design and layout proposed has achieved these objectives, and as demonstrated within the accompanying technical assessments a framework has been provided that will facilitate the responsive development in a manner that will deliver upon the objectives of the original LEP that zoned the land for employment generating purposes.

14.1 Cessnock LEP 1989

The land to which the Concept Plan applies is within Zone No 4 (h) (Hunter Employment Zone), 5(b) Special Uses (Railways); 1(a) Rural "A" and Zone No 7 (b) (Environmental Protection (Conservation) Zone).

No development is contemplated within the 7(b) zoned lands other than already approved infrastructure and access routes.

The objectives of the 4(h) zone are:

(a) to encourage sustainable major industrial development or major employment-generating development that is conveniently accessible to urban centres and that has good road and rail access links, and

(b) to encourage ecologically sustainable development by prohibiting development that contributes to the degradation of the Wallis and Fishery Creeks water catchments, and

(c) to permit other development that is complementary, ancillary or related to existing development within the zone, and

(d) to prohibit development that exposes residences and the natural environment to unacceptable levels of pollution or hazard risk, and

(e) to minimise the clearing of native vegetation, and

(f) to facilitate the movement and survival of native fauna and flora by conserving native vegetation corridors.

These objectives are met by the proposed Concept Plan as:

- The development provides an estate design and layout for the development of a range of lots suitable for a diverse range of industrial and employment generating purposes. The lot pattern is based upon lot layouts that are readily able to be amalgamated to accommodate a variety of potential users targeted at potential demand in the 2 to 5 hectare lots size.
- The proposed wall and floor panel manufacturing use and the subdivision design and layout does not include development that would contribute to the degradation of the Wallis and Fishery Creeks water catchments.
- The design and configuration does not preclude or hinder the future provision of development that may be complementary, ancillary or related to existing development in the 4(h) zone.
- No development is proposed that is offensive or hazardous and a strategy framework has been proposed to manage and mitigate potential impacts upon air and water quality, noise, vibration and light impacts.
- The Concept Plan delineates the potential area of clearing to accommodate the development of the sites for industrial purposes while providing a strategy for the provision of vegetation and buffers within the setbacks that exceed the amenity and environmental attributes of the buffers and setbacks contemplated by the current DCP provisions. This is reinforced by the road pattern responding to the site topography and the setbacks therefore providing supplementary corridors to the central Chinamans Hollow Creek corridor.

The objectives of the 7(b) zone are:

a) to maintain the ecological integrity and viability of areas of conservation value, and

(b) to conserve biological diversity, and

(c) to conserve native ecosystems, and

(d) to prohibit development that would adversely impact on the conservation of native ecosystems and biological diversity, and

(e) to minimise the clearing of native vegetation, and

(f) to facilitate the movement and survival of native fauna and flora by conserving native vegetation corridors, and

(g) to protect the Aboriginal heritage values of land, and

(h) to protect the scenic qualities of land, and

(i) to prohibit the further subdivision of land within the zone.

The Concept Plan does not conflict with the objectives of this zone.

The proposed Station Street extension road through and across the 5(b) Special Uses (Railways); 1(a) Rural "A" are not prohibited by the relevant zones and are consistent with the zone provisions.

In addition to the zone provisions, Cessnock LEP 1989 contains a number of matters for consideration applicable directly to development undertaken within the HEZ Estate. The assessment and consideration of the Project Application for the wall and floor panel manufacturing facility is detailed within the accompanying volume of assessment for the Project element of the application.

The major consideration that arises from an assessment of the Concept Plan application for the precinct 1 layout against the provisions of Cessnock LEP 1989 relates to clause 56 of the LEP. The relevant clause states:

"56 Hunter Employment Zone—Subdivision of land within Zone No 4 (h), 5 (a) or 7 (b)

(1) This clause applies to land that is shown edged heavy black on the map marked "Cessnock Local Environmental Plan 1989 (Amendment No 60)—Hunter Employment Zone" and that is within Zone No 4 (h), 5 (a) or 7 (b).

(2) Consent must not be granted to the subdivision of land within Zone No 4 (h) or 5 (a) to which this clause applies unless the subdivision specifically relates to the use of the land for which consent has previously been or will concurrently be granted.

(3) Despite clause 17A and subclause (2), consent may be granted to the subdivision of land to which this clause applies solely for the purpose of subdividing areas of land within Zone No 4 (h), 5 (a) or 7 (b) along zone boundaries."

The Concept Plan includes a request for the subdivision of Precinct 1 contrary to this provision. The application seeks a determination to set aside this provision on the basis of the sound planning outcomes presented in the Environmental Assessment. That is, the endorsement of a Precinct layout and design as proposed provides a greater level of certainty to the highly desirable outcomes of vegetation and habitat management, water management and bushfire protection planning.

By setting aside the limitation on subdivision unless associated with a specific use,

the piecemeal implementation of the environmental objectives for the development of the estate that has characterised the assessment of the development to date is removed. Instead, the piecemeal approach is replaced with a comprehensive well researched and reasoned response to all of the competing site considerations.

The proposed solution has sought to optimise the balance between the environmental considerations and the economic considerations for the development and the subsequent employment opportunities introduced into the region.

The approval of the subdivision layout contrary to clause 56(2) is considered to be prudent given the significant estate management benefits that result.

14.2 Cessnock DCP

The provisions of Part E6 of Cessnock DCP address a range of issues including the elemental Environmental Management Strategies for the HEZ Estate. The Director Generals Requirements issued for the site have required these issues to be specifically addressed. The consideration of Flora and Fauna, Heritage, Traffic impacts, Soil and Water, and Noise and Vibration impacts are all addressed within the Appendices of this Environmental Assessment and the specific environmental assessment for the wall and floor panel manufacturing facility.

The preparation of the lot layout has addressed the principles of design to reflect the applicable site considerations and provision of a framework to maximise the efficiency and environmental responsiveness of the design. This outcome is reinforced in the specific assessments and considerations included in the Environmental Assessment.

The performance of the proposed wall and floor panel manufacturing facility against the DCP is addressed specifically within the volume addressing the facility component of the application.

The provisions of the DCP in relation to Urban Design at Section 6.3.5 will be addressed in this assessment.

Otherwise the DCP is focused towards the construction of buildings and is irrelevant to the proposed subdivision of precinct 1 as proposed in the Concept Plan.

The Environmental Assessment and precinct 1 framework proposes alternate solutions to the future development of the individual sites created within the estate which are reflected within the draft Statement of Commitments. The conflicts and alternate solutions to the DCP provisions are addressed in the following paragraphs.

14.2.1 Lot Sizes and Boundaries

The DCP reflects the LEP provision precluding pre-emptive subdivision. As addressed the prohibition of pre-emptive subdivision is a significant hindrance to the implementation of appropriate environmental protection and retention measures. The proposed Precinct design accommodates lot modules of generally 2 hectares or greater. This configuration has been pursued to permit easy amalgamation of lots to provide industrial lots in the range of 2 to 5 hectares.

The benefits of providing a Precinct configuration out weigh any consideration that may have been contemplated in the preclusion of pre-emptive subdivision.

Despite this the objective of the control is considered to be met through the provision of large parcels of land in a flexible configuration for employment generating uses as intended by the zone provisions.

14.2.2 Building Height and Scale

The Statement of Commitment has adopted a building height of 14m above finished ground level

14.2.3 Boundary Setbacks

The DCP imposes a 10m front setback requirement in conjunction with 5m

setbacks to the side and rear boundaries. It is proposed that future lot developers be provided with the opportunity to implement this control or the alternative as prepared by EDAW in support of the Concept Application submission. This flexibility is proposed to accommodate existing applications that have been prepared and lodged with Cessnock Council and those which have commenced preparation in accordance with contracts for sale already negotiated.

The alternative setback regime provides for a 20m retained setback to the proposed road networks, supplemented by a 10m transitional setback including opportunities for incorporating site water treatment measures and similar facilities. No setbacks are required to the side and rear boundaries in this configuration. Any setbacks that would be provided in addition to the required front setback would be landscaped in accordance with the landscape strategy prepared by EDAW for the Precinct.

The current DCP setbacks provide for the retention of 13.26% of mature trees compared with 17.68% in the 20m retention option proposed as the alternate solution with this application.

The 20m front setback with no side and rear setback option also removes the conflict with APZ provision requirements for bushfire planning and the retained 7(b) corridors throughout the perimeters of the Precinct that exist under the current DCP provisions.

Further benefits are derived as regardless of the internal subdivision pattern and lot layouts, strong landscape corridors are created along the road alignments that reinforce and comprise meaningful habitat protection potential.

14.2.4 Transport Considerations

The Precinct 1 design incorporates capacity for cycleways and pedestrian facilities as part of a comprehensive network to service the precinct and link to future development of the estate.

The Precinct 1 design does not preclude future lot developments complying with the

relevant provisions for internal access and design from the Cessnock DCP.

Due to the scale and nature of development on the HEZ Estate a variation to the DCP for on-site car parking provision should be implemented. Lot developers should have the option of providing car parking in accordance with the DCP or to determine the minimum number of vehicle parking requirements using appropriate guidelines for parking generation and servicing facilities based on development type comparison based on the RTA Guide to Traffic Generating Development or analysis drawn from surveyed data for similar development uses.

This flexibility would preclude low parking generating uses from being required to provide redundant car parking and therefore excessive hard surfaced areas on a development site.

14.2.5 Precinct Subdivision Statements of Commitment

The overall vision for the HEZ is to provide a high quality industrial and employment generating estate that is environmentally responsive and supports long-term employment generating activities.

It is envisaged that development on site will be within a modified bushland landscaped to compliment the surrounding protected and conserved lands.

To facilitate this vision a Draft Statement of Commitments (Appendix A) have been prepared to support achieving this outcome.

The objectives of the commitments are:

- To ensure that subdivision and development has regard for sustainable environmental management principles, and the efficient provision of infrastructure.
- To protect and manage bushland and habitat and on lands within the site not subject to industrial subdivision and development.
- To incorporate sustainable water management and erosion controls, including during construction.
- To ensure the protection of items of Aboriginal heritage significance.
- To establish appropriate pedestrian and vehicular access to and within the site.

14.3 Subdivision Summary

The proposed subdivision layout prepared for Precinct 1 has addressed in the design the environmental considerations of the land in a manner that provides a framework for the management of the environmental attributes. The management of these attributes has been balanced by the provision of development lots that sit within a modified bushland setting and provide a clear framework towards developing a vibrant estate providing a range of employment opportunities.

The provision of this level of certainty allows for the preparation of proposals for land within the estate to proceed on a sound footing while ensuring necessary utility services are co-ordinated and provided in the most efficient and responsive manner possible.

The piecemeal approach dictated by the current planning framework hinders the provision of the best environmental outcomes for the estates design and management and the efficient delivery of infrastructure.

The design ensures that all relevant linkages to surrounding land have been provided for to facilitate the future and ongoing development of surrounding lands also zoned for employment generating purposes.

The approval of the precinct design provides the efficient management of the land consistent with the objectives of the EPA Act 1979.

Endorsement of the precinct plan design to support the ongoing development of the lands in a structured manner to provide the required management of the environmental attributes of the site and employment generating development opportunities is appropriate.

15. Developer Contributions

There is no current Section 94 Contribution Plan that applies to the HEZ Estate.

Being a stand alone Greenfield development site the project does not rely upon any existing Council infrastructure to support its future operation and function. The project is directly providing all roads, drainage and water management facilities. In addition the development directly provides cycle path networks and a managed central environmental protection corridor for which the HEZ Association will be responsible for the on-going care and management. This includes obligations under the EPBC Act 1999 approval requiring on-going management and maintenance of the environmentally significant central habitat corridor.

Due to the obligations vested with the HEZ association Local and State Government is freed from the potential management obligations for these areas while the community enjoys the visual, amenity and biodiversity benefits delivered.

The framework of the HEZ Association is also responsible for the ongoing maintenance and management of all facilities beyond the roads which are to be dedicated as public roads. This again insulates the local authority from maintenance obligations for the off road cycleways and water management facilities for the estate.

There is considered to be no nexus to generate or require the provision of a Section 94 contribution plan or Developer Contributions plan for any of these facilities.

The servicing of the estate for water, sewer and electricity has been and will continue to be directly provided and negotiated with Hunter Water and Energy Australia. Again as the estate is in a large single ownership there is no requirement for the provision of facilities for which future developments will obtain benefit and cost recovery would be required. The beneficiary, being the HEZ Nominees lands will be directly providing the required services for their own lands.

The element for which a contribution regime could be required relates to traffic management and trunk road augmentation and upgrading.

The Traffic Impact Assessment prepared by PB's (Appendix I) forms the basis of a proposed Deed of Road Funding Agreement between HEZ Nominees, the RTA and Cessnock City Council. As there are consents in place and further undetermined applications to be completed through Part 4 assessments, the finalisation of this Deed of Road Funding Agreement is being separately pursued and is likely to be finalised and in place for implementation prior to the finalisation of the consideration and determination of this Environmental Assessment.

If the Deed of Road Funding Agreement is not finalised prior to the determination of this application, then completing of the Deed of Road Funding as part of the determination of the concept Plan would be appropriate.

16. Conclusions

The design and layout of Precinct 1 and the associated infrastructure of the Station Street extension and the Pelaw Main by-pass provides a comprehensive framework for the development of the estate for employment generating purposes. The approach has sought to work with the stated and underlying objectives of the existing planning framework and to demonstrate solutions that achieve these goals.

This approach has entailed seeking consent for the lot and road layout of the estate so that a reasoned solution to the site considerations in a co-ordinated approach is delivered. This is considered to be a superior outcome to the piecemeal and difficult to manage approach dictated by the current structure of the planning provisions of the Cessnock LEP which precludes subdivision in isolation from specific uses.

The ability to revisit this issue through the Concept Plan approach to accompany the Major Project Application for the WIPS Management facility has lead to the development of a Precinct design that provides solutions to:

- Achieving vegetation and habitat retention targets;
- Integration of ephemeral drainage lines and associated habitats into the Precinct layout design;
- Providing an alternate solution to existing DCP setback provisions that deliver improved habitat and biodiversity outcomes;
- Provision of a water cycle management approach that works more effectively with the environmental retention objectives of the development;
- Incorporation of bushfire management outcomes into the Precinct design that do not conflict with the desired vegetation and habitat management outcomes;
- Provision of a long term plan to provide required traffic management facilities for the development of Precinct 1 and subsequent precincts;
- Provision of a comprehensive management and assessment framework for Air Quality; and
- Provision of a comprehensive management and assessment framework for Noise & Vibration, Electrical Interference and Light management.

The result is a clear vision for the development and management of the estate to foster the delivery of employment opportunities and management and integration of the environmental considerations of the land.

Approval of the Concept Plan and associated Project Plan will deliver certainty to the future developers and occupants of the land and the community in regards to environmental outcomes delivers and management framework in place for the ongoing use and occupation of the estate.

These outcomes in delivering the employment and environmental outcomes anticipated by the initial rezoning of the land justify the assessment and undertaking the development under Section 75F of the Environmental planning and assessment Act 1979.

Appendices