



Strategic Regional Land Use Plan

Upper Hunter





Upper Hunter Strategic Regional Land Use Plan

© State of New South Wales through the Department of Planning and Infrastructure

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More than two million hectares of our State's most valuable agricultural land as well as the critical water sources that supply it are now subject to protections never before seen in NSW. Much of that land is located in the Upper Hunter.

Since coming to office, my Government has worked to deliver a balanced land use policy for this State – a comprehensive package that acknowledges both the strong growth being experienced in the mining and coal seam gas industries and the need to ensure that our rich agricultural sector is protected.

The Government's Strategic Regional Land Use Policy does just that. This plan for the Upper Hunter region forms a key part of the overall policy package. It follows one of the most extensive community consultation programs ever undertaken in NSW and strongly reflects the public and industry feedback.

Importantly, the plan also complements the extensive range of statewide initiatives put in place by this Government to better

regulate exploration and coal seam gas activities such as the creation of a Land & Water Commissioner and strict industry codes of practice as well as an Aquifer Interference Policy that protects vital water sources.

The Upper Hunter region is one of the State's most fertile and productive agricultural areas. The agricultural industry is worth around \$5.9 billion annually to the regional economy, with dairy, horse breeding, viticulture and beef cattle industries being major contributors.

For the first time, large-scale mining or coal seam gas projects proposed on the most valuable of these agricultural lands must be independently and scientifically assessed before a development application can even be lodged.

Importantly, the potential impacts on the agricultural value of the land and its water supplies will be the key focus of this expert, upfront assessment and must be thoroughly addressed by any mining or coal seam gas company wanting to operate in these areas.

The national and international significance of the Upper Hunter's wine and thoroughbred industries has also been recognised, with large areas of the region also identified for heightened protection.

At the same time, the plan supports sustainable growth and certainty for the mining industry in the right places and subject to a rigorous planning process.

It also recognises that the region's most valuable asset is its people and the strong communities they form. The plan outlines a comprehensive set of actions aimed at minimising the impacts of mining and coal seam gas development, including issues such as air quality, noise and community health.

This policy also ensures there's a sound platform in place to provide the infrastructure, housing and community services needed to support the region's expected growth.

I thank the many Government agencies and industry groups who have worked so closely and tirelessly to produce this landmark document that will ensure strong protection for our most valuable agricultural assets.

Barry O'Farrell
Premier

Contents

Executive Summary	6
Introduction	6
Key Challenges and Actions	7
<hr/>	
Chapter One – Introduction	9
Purpose of this Plan	9
Background	9
Public Consultation	11
<hr/>	
Chapter Two – Describing the Region	12
<hr/>	
Chapter Three – Balancing Agriculture and Resources Development	18
Background	18
Challenges	20
Policy Response	21
<hr/>	
Chapter Four – Infrastructure	36
Background	36
Challenges	38
Policy Response	41
<hr/>	
Chapter Five – Economic Development and Employment	43
Background	43
Challenges	44
Policy Response	47
<hr/>	
Chapter Six – Housing and Settlement	49
Background	49
Challenges	50
Policy Response	53
<hr/>	
Chapter Seven – Community Health and Amenity	55
Background	55
Challenges	60
Policy Response	61
<hr/>	
Chapter Eight – Natural Environment	63
Background	63
Challenges	64
Policy Response	64

Chapter Nine – Natural Hazards and Climate Change	67
Background	67
Challenges	68
Policy Response	70
<hr/>	
Chapter Ten – Cultural Heritage	71
Background	71
Challenges	72
Policy Response	72
<hr/>	
Chapter Eleven – Implementation	76
The Gateway Process	76
Strategic Agricultural Land Verification Processes	79
Strategic Planning	81
New and Revised Policies	81
Statutory Processes	82
Upper Hunter Urban Development Program	82
Assessment, Regulation and Enforcement	82
Governance and Consultation	83
Monitoring and Review	83
<hr/>	
Appendix	84
Critical industry cluster mapping criteria	84
<hr/>	
Bibliography	85
<hr/>	
End notes	90
<hr/>	
Figures	
Figure 1 - Key policy initiatives	10
Figure 2 - Hunter Valley Coal Rail Network	37
Figure 3 - Upper Hunter ambient air quality monitoring – PM ₁₀ - 2009	56
Figure 4 - Category frequency of 24-hour average PM ₁₀ concentrations in NSW (1994-2009)	57
Figure 5 - Wind energy resources - Upper Hunter region	69
Figure 6 - Solar energy resources - Upper Hunter region	69
Figure 7 - Fugitive emissions from coal mining in NSW	70
Figure 8 - Application of the gateway process to greenfield and brownfield proposals	77
Figure 9 - Proposed Gateway Process	80
<hr/>	
Maps and Tables	
Map 1 - Map of the Region	16
Map 2 - Coal Resource	26
Map 3 - Coal Seam Gas Resource	28
Map 4 - Other Mineral Resources	30
Map 5 - Catchment Boundaries	32
Map 6 - Strategic Agricultural Land (SAL)	34
Table 1 - Values used to identify strategic agricultural land	21
Table 2 - Indicative Gateway criteria	78

Executive Summary

Introduction

The NSW Government is committed to balancing strong economic growth in regional NSW with the protection of our most valuable agricultural land and sustainable management of our natural resources. In the Upper Hunter region, it is particularly important to minimise land use conflicts arising from the rapid growth of coal mining activities and the recent emergence of the coal seam gas industry.

The Upper Hunter Strategic Regional Land Use Plan represents one component of the Government's broader Strategic Regional Land Use Policy which comprises multiple initiatives being staged over time to address land use conflict in regional areas, particularly focused on managing coal and coal seam gas issues. The plan provides a clear strategic framework for the Upper Hunter, delivering the necessary context for Government investment priorities, servicing strategies and local environmental plan making.

The plan is a whole of Government plan which has been developed in consultation with a range of stakeholders, including local government and the Strategic Regional Land Use Policy Stakeholder Reference Group. The Stakeholder Reference Group includes representatives of the Association of Mining Related Councils, Total

Environment Centre, NSW Minerals Council, Australian Petroleum Production and Exploration Association, NSW Farmers Association, Nature Conservation Council of NSW, NSW Irrigators Council, Hunter Valley Wine Industry Association, and Thoroughbred Breeders of the Hunter Valley.

The draft Strategic Regional Land Use Plans for the Upper Hunter and New England North West Regions were exhibited for public comment between 8 March and 14 May 2012. During this time approximately 1,600 written submissions were received. A public forum and five drop-in sessions were held across the Upper Hunter. In addition, online forums were set up on the Department of Planning and Infrastructure's website which received more than 5,700 page views.

Submissions and feedback received during the public exhibition period were comprehensively reviewed as part of the finalisation of this plan. The finalised plan and broader Strategic Regional Land Use Policy incorporates a number of key revisions and additional initiatives in response to issues raised during consultation, including:

- The creation of a Land and Water Commissioner position with an advisory role in relation to exploration activity across the state.
- Agricultural impacts must now be assessed at the exploration stage through an Agricultural Impact Statement.
- The amount of mapped strategic agricultural land in the Upper Hunter region has increased by almost 73,000 hectares to more than 470,000 hectares.
- The Gateway process has been revised to focus on the scientific assessment of the agricultural land and water impacts of mining and coal seam gas projects located on strategic agricultural land. Other matters such as the socio-economic impacts and benefits of the proposal will be considered at the development application stage.



- The Gateway process has also been revised to focus on new greenfield projects and brownfield projects involving expansion beyond their lease area - the projects likely to have the most significant impact on strategic agricultural land.
- The Aquifer Interference Policy has been introduced statewide to protect the state's crucial water resources, including impacts associated with mining and coal seam gas activities. The policy sets out the assessment requirements to ensure that impacts on groundwater systems are minimised.
- The 'exceptional circumstances' provision that would have allowed certain mining or coal seam gas projects to bypass the Gateway has been scrapped.

The plan is to be comprehensively reviewed every five years, so it can adjust to new information as it becomes available.

Key Challenges and Actions

This plan outlines a range of key challenges facing the Upper Hunter region and lists clear actions to address these challenges.

Balancing Agriculture and Resource Development

While the region makes a major contribution to the state's production of many agricultural commodities, it also contains approximately 40 per cent of the state's currently identified total coal reserves and large reserves of coal seam gas. The plan includes maps of the region's mineral resources and areas of strategic agricultural land. Strategic agricultural land includes both land with unique natural resource characteristics, known as biophysical strategic agricultural land, and clusters of significant agricultural industries that are potentially impacted by coal seam gas or mining development, known as critical industry clusters. Two critical industry clusters have been identified in the region - an equine cluster around Bylong, Scone and Denman and a viticulture cluster around Broke, Pokolbin and Denman.

The key policy response for resolving land use conflict between mining and coal seam gas proposals and agricultural land is the Gateway process. Under the Gateway process, mining and coal seam gas proposals that are located on

strategic agricultural land will have their impacts on agricultural land and water resources rigorously assessed by a panel of independent experts before a development application can be lodged. This will include an assessment of potential aquifer impacts based on the advice of the Minister for Primary Industries and the Commonwealth Independent Expert Scientific Committee.

If the panel considers that the proposal does not meet the Gateway criteria relating to agricultural and/or water impacts, it can issue a conditional Gateway Certificate. Any such conditions will be tailored to address the panel's issues in relation to the potential impacts of the proposal on agricultural land and water. Conditions could include, for example, the requirement for additional environmental studies or physical amendments to the project to avoid or minimise impacts. These conditions must then be comprehensively addressed through the assessment and determination of the relevant development application. This process will deliver greater balance and rigour to the assessment process and ensure that the impacts of mining and coal seam gas proposals on agriculture and water resources are assessed at a much earlier stage.

Infrastructure

Key infrastructure issues are identified, particularly those relating to the growth of the mining industry. These issues include road and rail capacity and increased demand for health and social services. A key action is the delivery of a fully costed infrastructure plan for the region.

Economic Development and Employment

The economic benefits and impacts associated with the growth of the mining industry are addressed. Issues include the uneven distribution of economic growth and impacts on other industries in terms of access to labour supply, land and infrastructure. A key action is the preparation of Regional Workforce Plans that will set out skills and workforce development strategies, including apprenticeship programs, to address labour shortages.

Housing and Settlement

Land supply and housing issues are highlighted, particularly associated with growth of the mining industry. New and more varied housing will be needed to cater for the expected population growth. Housing affordability across the region varies. There is likely to be ongoing demand for short-term accommodation and temporary housing. The plan commits the Government to working with the housing and development industry on models for delivering more housing for the region and a more diverse range of housing types.

Community Health and Amenity

The plan outlines a comprehensive suite of actions aimed at minimising the impacts of mining and coal seam gas, including air quality and noise, on community health and amenity. These actions include development of a cumulative impact assessment methodology for mining and coal seam gas development, and the preparation of a development assessment guideline on the health risks associated with dust.

Natural Environment

The plan describes the region's natural environment and biodiversity values. Key actions include the development of the Upper Hunter Strategic Biodiversity Assessment and the preparation of a database of existing biodiversity offsets which have been achieved in the region.

Natural Hazards and Climate Change

The plan identifies likely future weather patterns and challenges for the region, including increased flooding and bushfire events. The actions commit Government to working with local councils and industry to avoid flood and bushfire prone development and to encourage low emission energy development.

Cultural Heritage

The region is rich in both Aboriginal and historic cultural heritage, however urban and mining growth have the potential to further impact on known and yet-to-be-identified cultural heritage places, objects and landscapes. Actions include the completion of Aboriginal cultural heritage landform mapping and the compilation of a database of lands currently identified for cultural heritage conservation in the region.



Chapter One

Introduction

Purpose of this Plan

The NSW Government is committed to strong economic growth in regional NSW and, whilst increased investment and development in regional areas are key priorities, these must be balanced with the protection of agricultural land and the sustainable management of natural resources.

In the Upper Hunter region, it is particularly important to minimise land use conflicts arising from the rapid growth of coal mining activities and the recent emergence of the coal seam gas industry.

This plan represents the Government's proposed framework to support growth, protect the environment and respond to competing land uses, whilst preserving key regional values over the next 20 years.

An integral component of the plan is the introduction of a new decision making framework, known as the Gateway process. This process involves an early stringent assessment the potential impacts of mining and coal seam gas development on agricultural land and water resources. The Gateway process is explained in detail in Chapter 11.

Background

NSW 2021, the Government's 10-year strategic business plan, supports an increase of 30 per cent in the value of both primary industries and mining production by 2020, an increase in the share of jobs in regional NSW, an increase in the population of regional NSW, the protection of strategic agricultural land and improved agricultural productivity. The preparation of strategic regional land use plans by 2014 is also identified as a priority action. This plan covering the Upper Hunter region is one of the first two plans to be delivered.

Strategic regional land use plans are one component of the Government's broader Strategic Regional Land Use Policy which comprises multiple initiatives being staged over time to address land use conflict in regional areas, particularly focused on managing issues associated with coal mining and coal seam gas activity. This policy covers the entire process from exploration through land access to planning application and finally extraction, as shown in Figure 1 over the page.

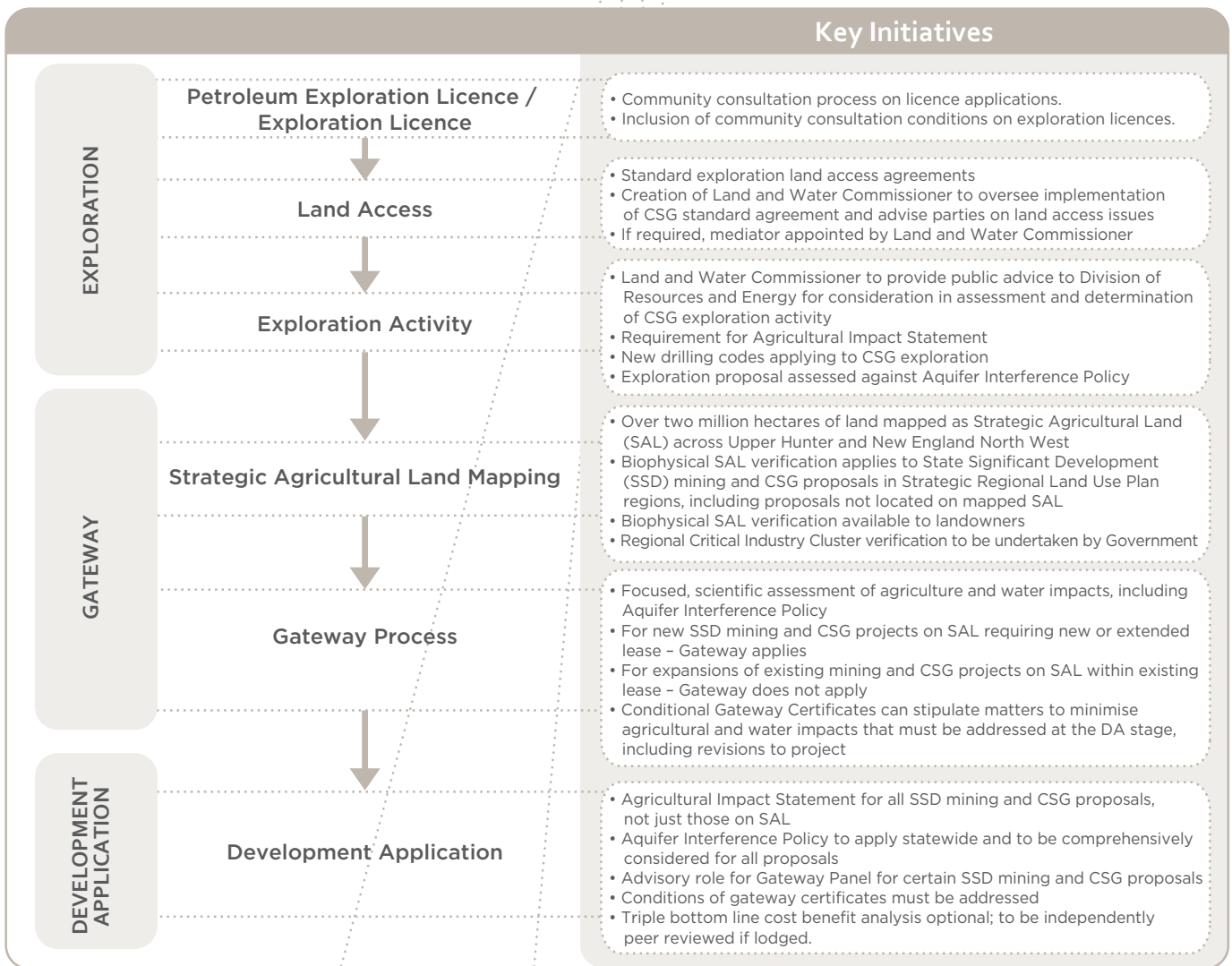


Figure 1 - Key policy initiatives

In developing this plan, the Government has been committed to consulting and engaging with a range of stakeholders on the issues affecting the region. This included an extensive public consultation process, a number of local government forums conducted by the Department of Planning and Infrastructure

and meetings of the Strategic Regional Land Use Policy Stakeholder Reference Group. The reference group was established to provide advice to Government on the implementation of the Strategic Regional Land Use Policy and is chaired by the Director-General of the Department of Planning and Infrastructure.

Stakeholder Reference Group

The Stakeholder Reference Group is an advisory body made up of representatives of the following stakeholder groups: Association of Mining Related Councils; Total Environment Centre; NSW Aboriginal Lands Council; NSW Farmers Association; NSW Minerals Council; NSW Irrigators Council; Australian Petroleum Production and Exploration Association; Nature Conservation Council; Hunter Valley Wine Industry Association; and Thoroughbred Breeders of the Hunter Valley.

It is noted that a regional landuse strategy has been in place for the Lower Hunter region since 2006. A review of the Lower Hunter Regional Strategy is now underway. The interconnections between the Upper and Lower Hunter regions' infrastructure, economies, and communities have grown in strength and significance with the continued growth of the mining industry in the Upper Hunter. The process of preparing and finalising the Upper Hunter Strategic Regional Land Use Plan and the concurrent review of the Lower Hunter Regional Strategy provide the opportunity for a greater focus on and better planning for these inter-regional connections.

Public Consultation

NSW Coal and Gas Strategy Scoping Paper

Submissions received on the exhibition of the NSW Coal and Gas Strategy scoping paper, which was exhibited between February and April 2011, were carefully considered in the preparation of the draft Upper Hunter Strategic Regional Land Use Plan. Further information, including access to the scoping paper and the submissions received, can be found on the Department of Planning and Infrastructure's website at: <http://www.planning.nsw.gov.au/tabid/205/ctl/View/mid/1081/ID/44/language/en-US/Default.aspx>

Draft Upper Hunter Strategic Regional Land Use Plan

The draft Strategic Regional Land Use Plans for the Upper Hunter and New England North West Regions were exhibited for public comment between 8 March and 14 May 2012. During this time approximately 1,600 written submissions were received. A public forum and five drop-in sessions were held across the Upper Hunter. In addition, online forums were set up on the Department of Planning and Infrastructure's website which received more than 5,700 page views.

The Government commissioned an independent consultant to prepare an analysis of submissions received, which is available at www.planning.nsw.gov.au/srlup. The issues raised with the most frequency during consultation were:

- regulation of mining and CSG exploration projects
- the "Gateway" process
- agricultural land mapping
- the proposed 'exceptional circumstances' provision
- aquifer impacts
- the natural environment



Chapter Two

Describing the Region

The Upper Hunter region, located approximately three hours north of Sydney, forms the inland part of the broader Hunter region, which is centred on the Hunter River valley and the City of Newcastle (located in the adjoining Lower Hunter region). The Upper Hunter comprises an area of 2.18 million hectares and includes the five local government areas (LGAs) of Singleton, Muswellbrook, Dungog, Upper Hunter and Gloucester (see Map 1).

The Hunter River is one of the largest river valleys on the NSW coast with a catchment of 2.2 million hectares. The broader Hunter region also includes sections of the Manning, Karuah, Hawkesbury/Nepean and Macquarie River catchments which extend beyond the boundaries of this plan. Because there is significant mining activity occurring in the Bylong-Wollar-Ulan corridor, in the western part of the Hunter River catchment, linkages to this area have been considered in this plan. This includes mapping of strategic agricultural land in the corridor to identify areas where the proposed Gateway process will apply.

The Upper Hunter region is unique in the diversity of its vegetation and landscapes, which include the alpine rainforests of the Barrington Tops, the dissected sandstone of the Great Dividing Range, open grasslands and woodlands, and rich alluvial floodplains.

The Aboriginal people whose traditional lands lie within the Upper Hunter region are the Wanaruah (upper area of the valley), the Worimi (east of Paterson River) and the Biripi (Gloucester area).

The Upper Hunter region has a population of approximately 67,500¹. Settlement is characterised by towns that have developed along the major river valleys initially in response to agricultural opportunities. Singleton is the largest of the towns along the valley with an estimated population of

approximately 13,700 followed by Muswellbrook with a population of around 10,200. The remaining towns in the region are significantly smaller and include Scone (4,600), Gloucester (2,400), Dungog (2,100), Aberdeen (1,800), Denman (1,400), Merriwa (950) and Murrurundi (800) (ABS 2006).

The population of the region is estimated to have grown at an average rate of 1.2 per cent per annum between 2006 and 2011. However, growth rates vary significantly across the region. Strongest growth has occurred where mining is most prevalent – Singleton (1.4% p.a.) and Muswellbrook (1.3% p.a.). In comparison, in Dungog Shire where there is no coal mining presence, growth has been 0.7% per annum.

The region's economy is currently underpinned by the main industries of coal mining, agriculture (particularly dairy and beef cattle and pasture production) and associated service industries, horse breeding, electricity production, tourism, viticulture and wine making.

The region's agricultural industries are supported by rich soils, a temperate climate, abundant quality water supply and proximity and access to Sydney's population and markets. Of particular significance, some key agricultural sectors including thoroughbred breeding and viticulture/wine making are nationally significant industries.

The thoroughbred horse breeding industry is focused around Scone in the Upper Hunter Shire and has grown to be one of the major horse breeding areas in the world. Australia's equine capital of Scone is the annual destination for the world's top breeding stallions with over 70 studs. Over \$2 billion has been invested in the region's stud farms and horses in recent years.

Boundaries of the Upper Hunter Strategic Regional Land Use Plan

The Upper Hunter region includes the five local government areas (LGAs) of Singleton, Muswellbrook, Dungog, Upper Hunter and Gloucester. The Upper Hunter Strategic Regional Land Use Plan also includes that part of the Cessnock LGA that is within the mapped viticulture critical industry cluster and also that part of the Mid Western Regional LGA known as the Bylong-Wollar-Ulan Corridor which is the subject of significant mining activity. These areas have been included in this plan for the purposes of mapping of strategic agricultural land and identifying the application of the Gateway process only.

Consideration of broader land use issues in that part of the Cessnock Council area included in this plan will be undertaken as part of the review of the Lower Hunter Regional Strategy. The Bylong-Wollar-Ulan Corridor will ultimately be incorporated into the Central West Strategic Regional Land Use Plan, which will address broader land use issues relating to mining in the corridor.

Similarly, the wine industry enjoys a strong and expanding base in the Singleton and Muswellbrook LGAs as a result of their suitability for wine making and the vineyard tourism market fuelled by the region's accessibility to Sydney. As the region's wineries are concentrated in an area that extends into the Cessnock LGA, this part of the Cessnock LGA has been included in this plan to ensure a holistic, strategic planning approach to this important industry.

In the eastern LGAs of Dungog and Gloucester, extensive beef cattle grazing and crop production remain the mainstay of the local economies. These industries also define the rural character of the region and support the ongoing management of rural resource lands. These two communities are experiencing relatively slow growth rates and are seeking ways to broaden and diversify their local economies. Of note is the growth of the nature tourism economy within Gloucester, which is the gateway to the Barrington Tops area.

The region is equally well known for its rich energy resource base and energy generation. Electricity generation is a major industry of the region making it the major supplier of energy to the NSW economy. Three of the Hunter's four power stations (Bayswater, Liddell, and Redbank coal fired power stations) are located within the Upper Hunter region (Muswellbrook and Singleton LGAs) and together the Hunter power

stations generate more than 60 per cent of all NSW electricity supply.

The region's status as a major supplier of energy is being further extended by the new economic opportunities in renewable energy technologies being taken up in response to its strong potential for wind, solar and geothermal projects. The Upper Hunter is one of six renewable energy precincts that have been established across NSW to promote and encourage renewable energy development in NSW.

Coal mining in the Upper Hunter has a long history and, driven by the current global resources boom, the region is currently at the centre of a significant coal mining boom. The greatest concentration of existing operating coal mines is between Singleton and Muswellbrook and a significant number of those mines are currently undergoing expansion supported by an increase in the export capacity of the Port of Newcastle. While the Upper Hunter LGA has not previously been a focus for mining activity, it may face increased pressure in the future as mining operations look to secure and extract additional coal resources. There are also some limited opportunities for coal mining and coal seam gas extraction near Stratford in the Gloucester LGA (refer to map 2 for regional coal resources and map 3 for coal seam gas resources).

While coal mining, mostly for export, has long been a major economic activity in the region, the coal seam gas industry is in its infancy. Coal seam gas provides an alternative to coal based energy production and has potential to reduce energy costs to consumers and result in lower greenhouse gas emissions. The region contains significant gas resources and exploration is well advanced in the Gloucester and Singleton (Broke) areas, extending into the Cessnock LGA.

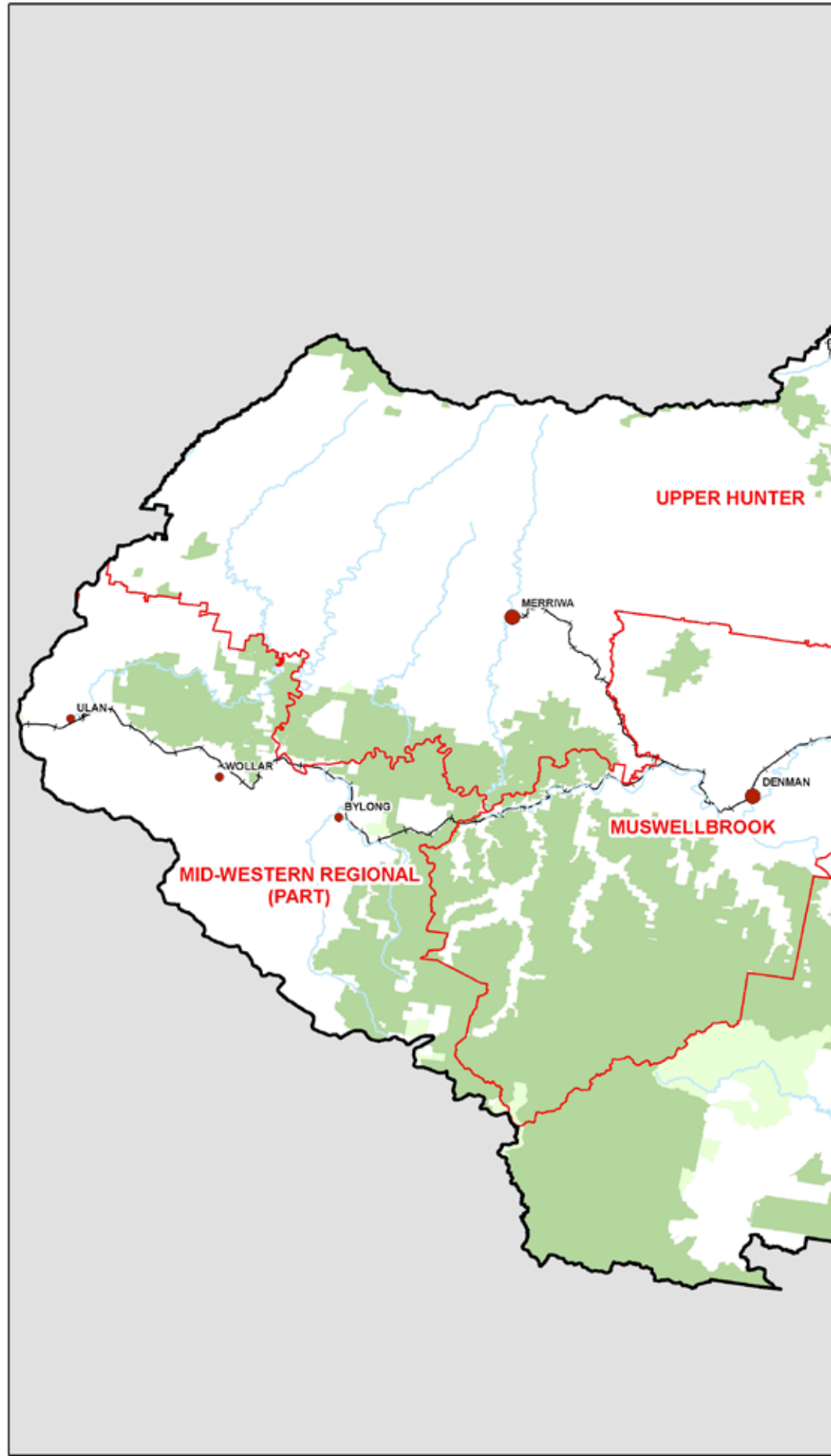
The emergence of the coal seam gas industry and the rapid expansion of coal mining activity have resulted in growing concerns over conflicts with other land uses and industries as well as the need to minimise and better manage the environmental, health and amenity impacts of this type of development.

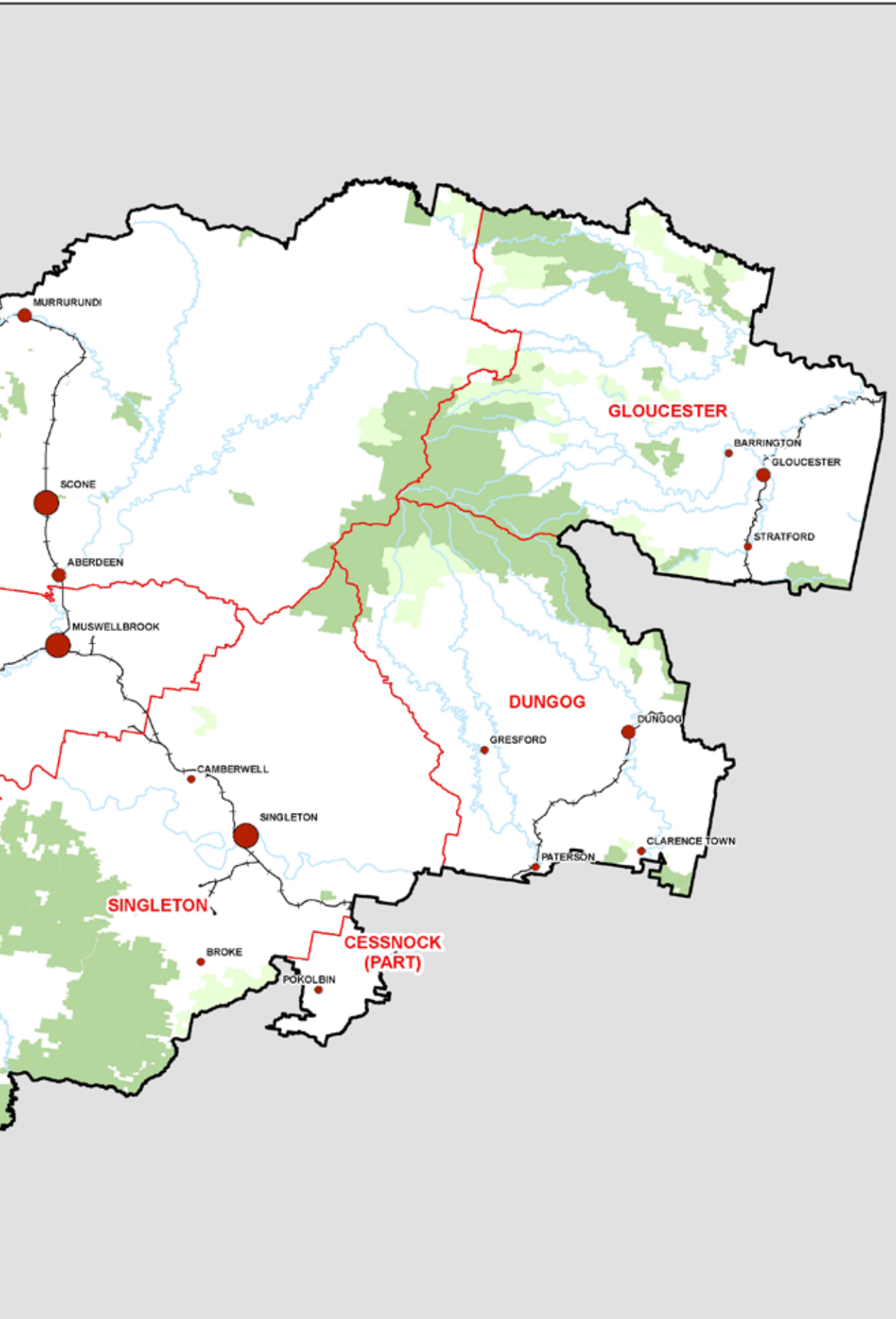


Map 1
Strategic
Regional Land Use
Plan
Upper Hunter
Map of the Region

Legend

- Major Town
- Town
- Village
- Upper Hunter Region
- Local Government Area
- Highways
- Major Roads
- Rivers
- Railways
- State Forests
- National Park Estate





Balancing Agriculture and Resources Development

Background

Natural resources in the Upper Hunter region include its soils, water, minerals, forests, solar energy, geothermal reserves, and wind. With a long history of settlement, the region's rural landscapes have largely been created by the primary industries that have been using and developing these resources. This chapter focuses on agriculture and mining and the natural resources and rural landscapes that the agricultural and mining industries depend upon. Agricultural, mineral and energy resources in the Upper Hunter make major contributions to both the state and national economies and so the potential loss of the resource bases of any of these sectors is a significant planning issue.

Agriculture

The Upper Hunter region comprises just 2 per cent of the area used for grazing and cropping in NSW but provides a much greater contribution to the NSW production of many agricultural commodities, particularly equine, viticulture, milk and beef cattle.

The region has an established international reputation for thoroughbred breeding and wine making and provides 80% of the total value of stud horses exported by Australia². It also produces 15% of milk, 6% of cattle for slaughter, 5% of wine grapes, 8% of herbs and garlic and 6% of olives in the state. It also grows approximately 90% of the state's industrial hemp³. Other emerging specialist agribusinesses in the region include mushrooms, cut flowers, turf and nurseries, stud cattle, land-based aquaculture, goats and essential oils⁴.

The temperate climate, rainfall, reliable water resources and extensive fertile soils of the region make it well suited to cropping and intensive

agriculture. Significant advantages for agricultural production also result from the combination of the region's natural resources, infrastructure and strong marketing advantages such as accessibility to urban centres and markets.

Also contributing to the attraction for agricultural industries are the region's 'clean green' branding, its agricultural heritage and established connections with regional tourism, agricultural processing and service industries such as poultry processing, specialist veterinary services and mechanical and electrical engineering.

The most productive and highest value cropping lands in the region are the alluvial floodplains along the major rivers and the volcanic soil plains of the Upper Hunter LGA. These naturally fertile lands are suitable for regular cropping and highly improved pastures. Lands suitable for grazing industries, orchard or viticultural developments and farm forestry typically occur on the adjoining lower slopes where there is access to reliable water sources. The region's reliable water supplies and capacity for year round pasture production are valued by all agricultural sectors.

Grazing is the region's dominant agribusiness sector in terms of employment, area involved and the overall economic returns. Beef cattle is the most widespread sector, followed by dairying and horses. Sheep and wool production are also significant in the Upper Hunter LGA.

In the north western part of the region the leading agricultural activities are mixed farming (beef cattle/sheep and broad acre crops such as wheat, sorghum, barley, sunflowers and canola). Lucerne production is a widespread crop in the region. Intensive agricultural enterprises are of particular significance in Singleton, Dungog and Gloucester LGAs.

The leading intensive industries are thoroughbred breeding and training, dairying, viticulture, cut hay production and poultry.

More detail on the significant viticulture and equine industries that are located in the region is included later in this chapter.



Mineral resources

Coal

Geologically, much of the region is underlain by the Hunter coalfield, a world class coal deposit with approximately 60 coal seams containing predominantly high quality thermal coals and lesser quantities of soft coking (steel making) coals (see Map 2). A significant proportion of the coal in the Hunter coalfield is at comparatively shallow depths making it accessible to large-scale, multi-seam open cut mining operations; however in the west and north west of the region, most coal seams are at depths that would likely preclude future open cut mining operations. The Hunter coalfield contains approximately 40 per cent of the state's currently identified total coal reserves, with sufficient recoverable coal to last for at least several decades at predicted future mining rates.

The Gloucester coalfield is relatively small but contains a large number of coal seams, five of which have economic potential, mainly as high quality semi-soft coking coal. The Gloucester coal seams are steeply tilted, often greater than 45 degrees, with significant faulting, thereby limiting predictability and making exploration difficult.

The Bylong-Wollar-Ulan corridor, in the Mid Western Regional LGA, is located within the Western Coalfields. It is the site of significant existing and proposed open cut and underground mining activity. Parts of this corridor are relatively unexplored but current figures indicate that the area contains around 9 per cent of the State's coal resources under title, and currently produces approximately 11 per cent of NSW's coal production.

Coal seam gas

The coal seam gas industry in the Upper Hunter Region is in its infancy, with no commercial production at this stage. However, the region contains large reserves of coal seam gas and is highly prospective for conventional gas which, in combination, has the potential to play a significant role in the delivery of reliable energy in a carbon-constrained economy, provide security of supply for domestic gas and alleviate the state's reliance on imported gas (see Map 3).

Other mineral resources

The region contains other mineral deposits as well as numerous extractive resource operations supplying local and regional needs. The majority of the non-energy resources are extractive materials such as hard rock aggregate, sand and gravel and the region contains several large quarries (see Map 4).

The region's coal, coal seam gas and other mineral resources have been mapped (see Maps 2, 3, and 4). Key features include:

- Coal resources (comprising existing and approved mines, areas subject to an existing exploration licence, and known areas of resource potential) cover an area of approximately 926,758 hectares or 39% of the region.
- Coal seam gas resources (comprising areas of high, medium and low potential) cover an area of approximately 967,675 hectares or 40% of the region.
- Other known mineral resources cover an area of approximately 36,718 hectares or 1.7% of the region.

Water

The region includes a significant portion of the Hunter-Central Rivers Catchment Management area, and a smaller proportion of both the Hawkesbury Nepean and Macquarie River catchments (as shown in Map 5). Natural resource management agendas for these areas are provided for in the Hunter-Central Rivers and Hawkesbury and Nepean River Catchment Action Plans (CAPs) which must be taken into consideration in any decisions regarding the future management of natural resources for the region, as will the NSW Government's Water Quality Flow Objectives for each catchment.

As the Bylong-Wollar-Ulan corridor is experiencing significant mining growth and is located within the Hunter River Catchment, the entire Hunter River Catchment, including the corridor, is included in this plan for the purposes of considering the impacts of mining on agricultural land and resources.

Water quality is an important factor influencing the ability of our waterways and aquifers to sustain a broad range of community needs, such as town water supply, irrigation, watering stock, drinking water, aquatic food production and recreation needs.

Dryland agriculture relies on rainfall without supplementary irrigation. For irrigated agriculture, the water needs to be of sufficient quantity, reliability and quality to service the purpose to which it is being used. Not all irrigated agricultural enterprises have river frontage and, for those that don't, access to groundwater is essential for viability.

Mining and coal seam gas extraction have the potential to impact on water quality in aquifers and surface water resources through their operations and treatment and disposal of their waste water. In addition to affecting water quality, mining activities can remove water from surface systems and aquifers and can impact on water tables and water pressure.

The water sources in the region are managed under the Water Act 1912 where a water sharing plan is yet to commence or the Water Management Act 2000 where a water sharing plan has already commenced.

These water sharing plans establish important water access, trading and accounting rules and these will affect which type of licence is required, how much entitlement is required and from where this entitlement could be sourced. The water sharing plans also establish distance rules which are aimed at minimising third party impacts of any activity on existing water users and high priority groundwater dependent ecosystems.

The Aquifer Interference Policy has been introduced statewide to protect the state's crucial water resources, including impacts associated with mining and coal seam gas activities. The policy outlines how the volumes of water taken as part of an aquifer interference activity will be licensed and accounted for. It also sets out minimal impact considerations against which the NSW Office of Water will assess proposals to ensure that impacts on groundwater systems are minimised.

Challenges

Agricultural, mineral and energy resources in the Upper Hunter make major contributions to the regional, state and national economies and retaining the resource bases for each of these sectors is a major issue for the region. The key challenges for the region revolve around maintaining and growing agricultural productivity while also supporting the development of other industries that are competing for nearby or even the same land, such as mining, coal seam gas and urban expansion.

Key regional challenges include:

- Improving the balance between competing land uses – particularly achieving co-existence where possible between mining, coal seam gas development and agriculture.
- Maintaining or enhancing opportunities for environmentally responsible mining and coal seam gas development to deliver reliable energy supplies to the state that reduce energy costs and carbon emissions and that generate economic wealth to the state.
- Maintaining or enhancing future opportunities for sustainable agriculture.
- Defining and protecting strategic agricultural land.

Policy Response

Mapping strategic agricultural land

To help address the challenge of achieving balanced land use outcomes in the region, areas with particularly high agricultural values have been identified and mapped in consultation with key industry representatives and industry experts. These areas are referred to as strategic agricultural land.

Strategic agricultural land is highly productive land that has both unique natural resource characteristics (such as soil and water resources) as well as socio-economic value (such as high productivity, infrastructure availability and access to markets.) Based on this definition, two

categories of strategic agricultural land have been identified: biophysical strategic agricultural land and critical industry clusters.

Biophysical strategic agricultural land is land with a rare combination of natural resources highly suitable for agriculture. These lands intrinsically have the best quality landforms, soil and water resources which are naturally capable of sustaining high levels of productivity and require minimal management practices to maintain this high quality. As these lands are rare, the NSW Government is putting mechanisms in place to protect these strategic land assets.

Strategic agricultural land is identified according to the values and criteria in Table 1.

Value	Criteria
Biophysical Strategic Agricultural Land	<ul style="list-style-type: none"> land that falls under soil fertility classes 'high' or 'moderately high' under the Draft Inherent General Fertility of NSW (OEH), and land capability classes I, II or III under the Land and Soil Capability Mapping of NSW (OEH), and reliable water of suitable quality, characterised by having rainfall of 350mm or more per annum (9 out of 10 years); or properties within 150m of a regulated river, or unregulated rivers where there are flows for at least 95% of the time (ie the 95th percentile flow of each month of the year is greater than zero) or 5th order and higher rivers; or groundwater aquifers (excluding miscellaneous alluvial aquifers, also known as small storage aquifers) which have a yield rate greater than 5L/s and total dissolved solids of less than 1,500mg/L. <p>OR</p> <ul style="list-style-type: none"> land that falls under soil fertility classes 'moderate' under the Draft Inherent General Fertility of NSW (OEH), and land capability classes I or II under the Land and Soil Capability Mapping of NSW (OEH), and reliable water of suitable quality, characterised by having rainfall of 350mm or more per annum (9 out of 10 years); or properties within 150m of a regulated river, or unregulated rivers where there are flows for at least 95% of the time (ie the 95th percentile flow of each month of the year is greater than zero) or 5th order and higher rivers; or groundwater aquifers (excluding miscellaneous alluvial aquifers, also known as small storage aquifers) which have a yield rate greater than 5L/s and total dissolved solids of less than 1,500mg/L.
Critical Industry Cluster	<ul style="list-style-type: none"> Industry clusters that meet the following criteria: <ul style="list-style-type: none"> - there is a concentration of enterprises that provides clear development and marketing advantages and is based on an agricultural product; - the productive industries are interrelated; - it consists of a unique combination of factors such as location, infrastructure, heritage and natural resources; - it is of national and/or international importance; - it is an iconic industry that contributes to the region's identity; and - it is potentially substantially impacted by coal seam gas or mining proposals.

Table 1 - Values used to identify strategic agricultural land

The critical industry cluster (CIC) criteria included in Table 1 ensure socio-economic values are appropriately considered in the strategic agricultural land mapping. A CIC is a localised concentration of interrelated productive industries based on an agricultural product that provides significant employment opportunities and contributes to the identity of the region. The cluster also needs to be potentially substantially impacted by coal seam gas or mining proposals.

Based on this definition, an equine cluster around Scone, Bylong and Denman and a viticulture cluster around Broke, Pokolbin and Denman have been identified as strategic agricultural lands.

Equine cluster

The horse breeding cluster includes a highly integrated concentration of horse breeding facilities and related infrastructure covering thoroughbred and stock horse breeding centres and numerous other equine developments and support services, such as a specialised veterinary centre⁵. In 2009 - 2010 the region provided 80 to 90 per cent of the total value of stud horses exported by Australia. It is also the headquarters for the NSW Stockhorse Society.

The attraction for equine interests to the region lies in its combination of a temperate climate, protected aspect and varied terrain combined with a lack of tropical diseases and accessibility to Sydney. The breeders are supported by the aggregation of equine industry infrastructure and good transport routes.

Viticulture cluster

The viticulture cluster includes a highly integrated concentration of vineyards and associated wineries and tourism infrastructure in a rural landscape. The region's unique terrain and climate, its heritage vines and diversity of soil types all contribute to the specific quality and characteristics of grapes produced in the area, especially Hunter semillon and shiraz. Also of importance is the Hunter Valley wine tourism branding based on its natural environment and visual landscape attributes and its proximity to metropolitan areas.

The mapped viticulture cluster includes the Pokolbin and Broke-Fordwich Geographic

Indication (GI) sub-regions⁶ industry proposed GI subregions covering the Parish of Belford and localities of Lovedale and Mount View and part of the Upper Hunter Wine GI around Denman.

The identification, description and mapping criteria for the horse breeding and viticulture clusters were developed through workshops held with industry representatives and further revised following feedback from the public exhibition period. Mapping criteria for each cluster are outlined in the Appendix.

Key features of the strategic agricultural land map include:

- Biophysical strategic agricultural land covers approximately 211, 060ha or 8.8% of the region.
- The equine critical industry cluster covers 233,286ha or 9.7% of the region.
- The viticulture critical industry cluster covers approximately 107, 135ha or 4.4% of the region.

Note: All mapping figures in this chapter are based on the total area of the Upper Hunter region and the Bylong-Wollar-Ulan corridor (total area of 2.41 million hectares).

When considered with coal and coal seam gas resource maps, these maps also show that 13.9% of the region comprises an available coal resource overlain by strategic agricultural land (4.4% open cut; 9.5% underground) while 16.5% of the region comprises a coal seam gas resource overlain by strategic agricultural land.

The mapping of strategic agricultural land indicates (see Map 6) broadly where it occurs throughout the region. As the mapping is at a regional scale, it is not intended to be used for property-level interpretations but to provide a regional-level indication of areas that potentially have strategically significant agricultural value.

Due to the regional scale of the strategic agricultural land maps in this plan, it is important that appropriate processes are in place to provide for site-specific verification that particular sites do in fact meet the strategic agricultural land criteria. These processes are outlined in Chapter 11.

The Government is also undertaking a regional-scale verification process for the mapped CIC areas of the Upper Hunter region. This will involve field

work and extensive consultation with landowners and industry groups to develop a database of existing equine and viticulture land uses and revised CIC maps. This is to ensure that the areas mapped as CICs do in fact meet the criteria on the ground.

Application of strategic agricultural land mapping

The principal application of the strategic agricultural land mapping is a 'trigger' of the new Gateway process which is described in detail in Chapter 11 – Implementation (see breakout box).

The gateway process

The Gateway is an independent, scientific and upfront assessment of how a State significant mining or CSG proposal on strategic agricultural land will impact the agricultural values of the land on which it is proposed to be located. It will consider proposals at a very early stage before a development application is lodged.

To pass the Gateway unconditionally, a proposal must demonstrate that it meets the Gateway criteria relating to agricultural and water impacts.

If a proposal can't demonstrate that it meets these criteria, it will be subject to stringent requirements – included as conditions of a Gateway certificate – that must be addressed at the development application stage.

The Gateway assessment will be undertaken by an independent panel of experts in fields such as agricultural science, water, and mining against explicit, objective criteria.

The Gateway will be given statutory force through an amendment to State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

Agricultural Impact Statements

All State significant development and infrastructure proposals (including mining and coal seam gas proposals that have passed the Gateway) which would potentially impact on agricultural resources or industries are required to prepare an Agricultural Impact Statement (AIS) to demonstrate that impacts on agricultural land and resources are avoided or minimised to acceptable levels. In addition, an AIS is also required for exploration activities requiring approval under Part 5 of the Environmental Planning and Assessment Act 1979.

The new Land and Water Commissioner will provide advice during the assessment of exploration activity on mapped strategic agricultural land.

Within a broader land use context, the mapping may also be used by councils to assist with identifying appropriate zonings and planning provisions for inclusion in local environmental plans to reflect the high value of agricultural land in the region.

A cumulative impact assessment methodology to manage the cumulative impacts of mining and coal seam gas proposals, including impacts on agricultural lands and resources, is also being developed (see Chapter 7).

Objectives

- Ensure protection of strategic agricultural land and the water resources it relies on.
- Ensure security and clarity for agriculture and mining and coal seam gas industries.
- Ensure a balanced use of land by competing industries.
- Provide enhanced future opportunities for sustainable mining and agricultural industries.

Actions

	Action	Lead Agencies	Timeframe
3.1.	Implement the Gateway process to provide an independent, scientific and upfront assessment of the impact of mining and coal seam gas proposals located on strategic agricultural land.	Department of Planning and Infrastructure Department of Primary Industries	November 2012 / Ongoing
3.2.	Require an agricultural impact statement for: <ul style="list-style-type: none"> • All State significant mining and coal seam gas development applications that may impact agricultural resources - whether or not they are located on mapped strategic agricultural land. • Exploration activity requiring approval under Part 5 of the Environmental Planning and Assessment Act 1979. 	Department of Planning and Infrastructure Department of Primary Industries	Immediate
3.3.	Include appropriate zonings and provisions in local environmental plans to protect agricultural land including, as a minimum, mapped strategic agricultural land.	Councils	Ongoing
3.4	Undertake a regional-scale review and verification of the equine and viticulture critical industry cluster maps to produce revised, ground-truthed maps which accurately reflect the location of critical industry clusters.	NSW Trade and Investment Department of Primary Industries	December 2012



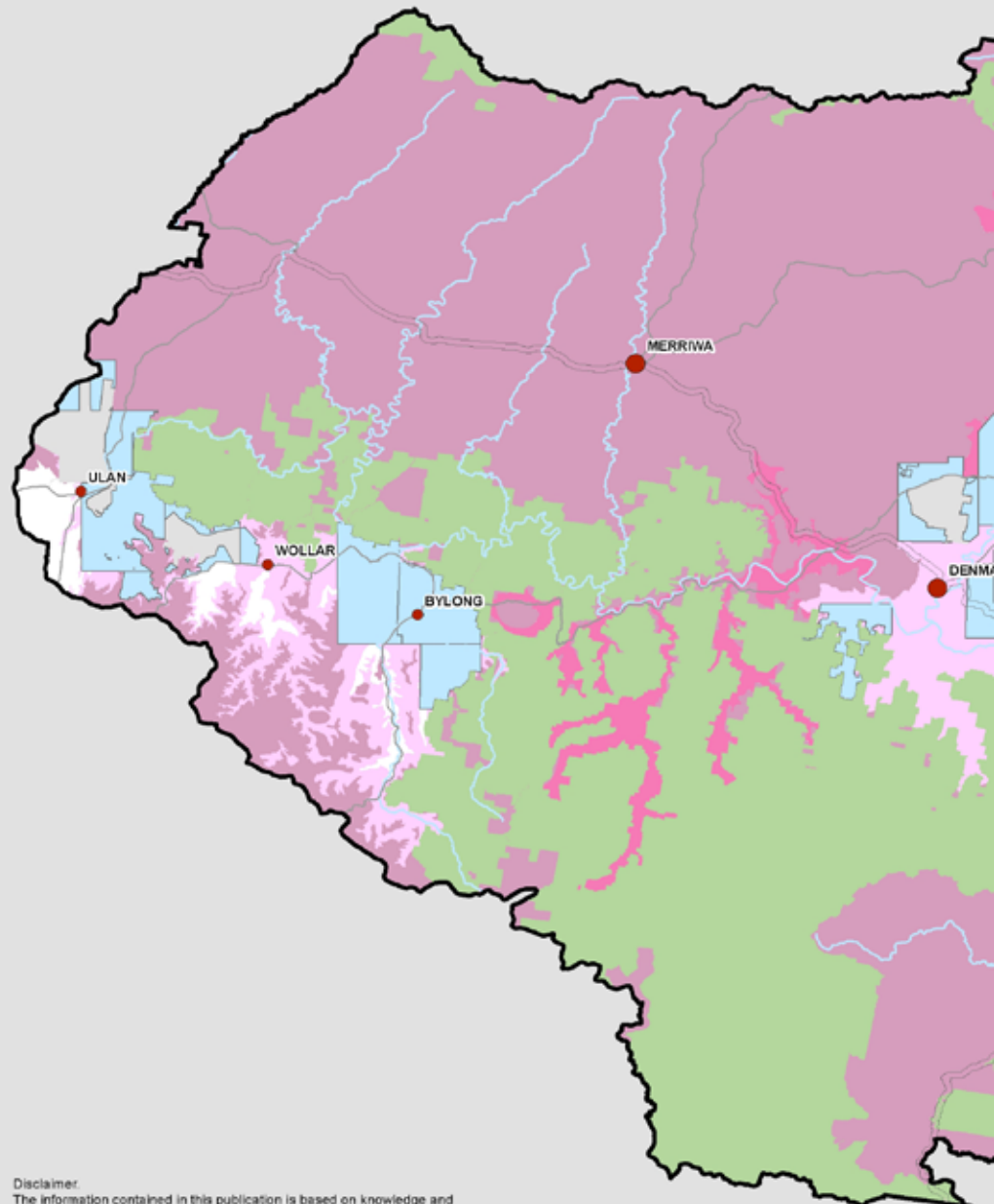
Map 2 Strategic Regional Land Use Plan

Upper Hunter

Coal Resource

Legend

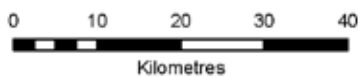
- Major Town
- Town
- Village
- Upper Hunter Region
- Highways
- Major Roads
- Rivers
- National Parks
- Existing exploration licence potential for new open cut and/or underground mine
- Existing mining title: open cut and/or underground
- Coal resource exploration potential: open cut and/or underground
- Coal resource exploration potential: underground (may include some open cut)
- Coal resource exploration potential: underground

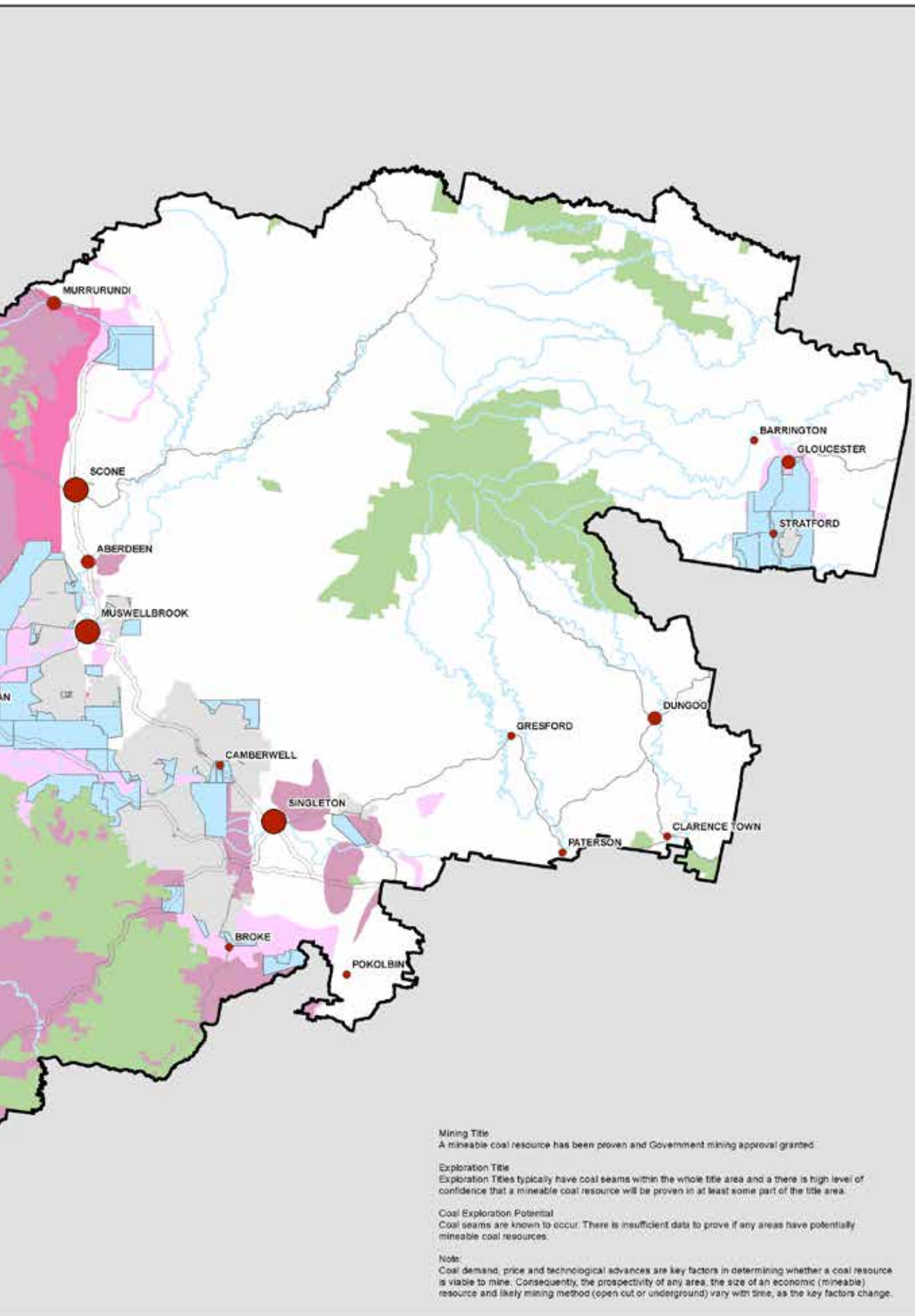


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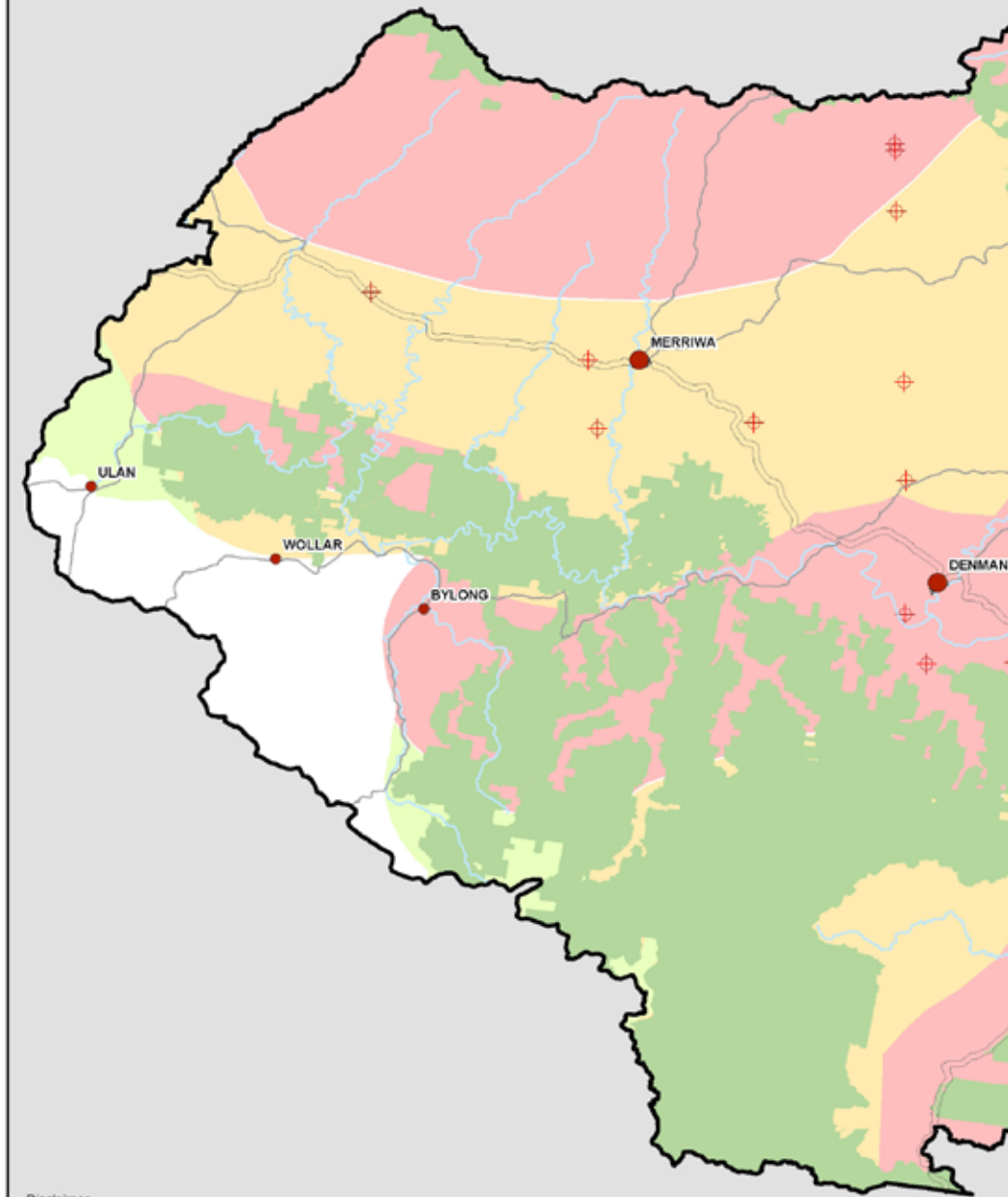
Map 3 Strategic Regional Land Use Plan

Upper Hunter

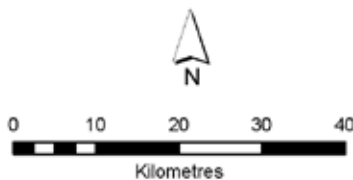
Coal Seam Gas Resource

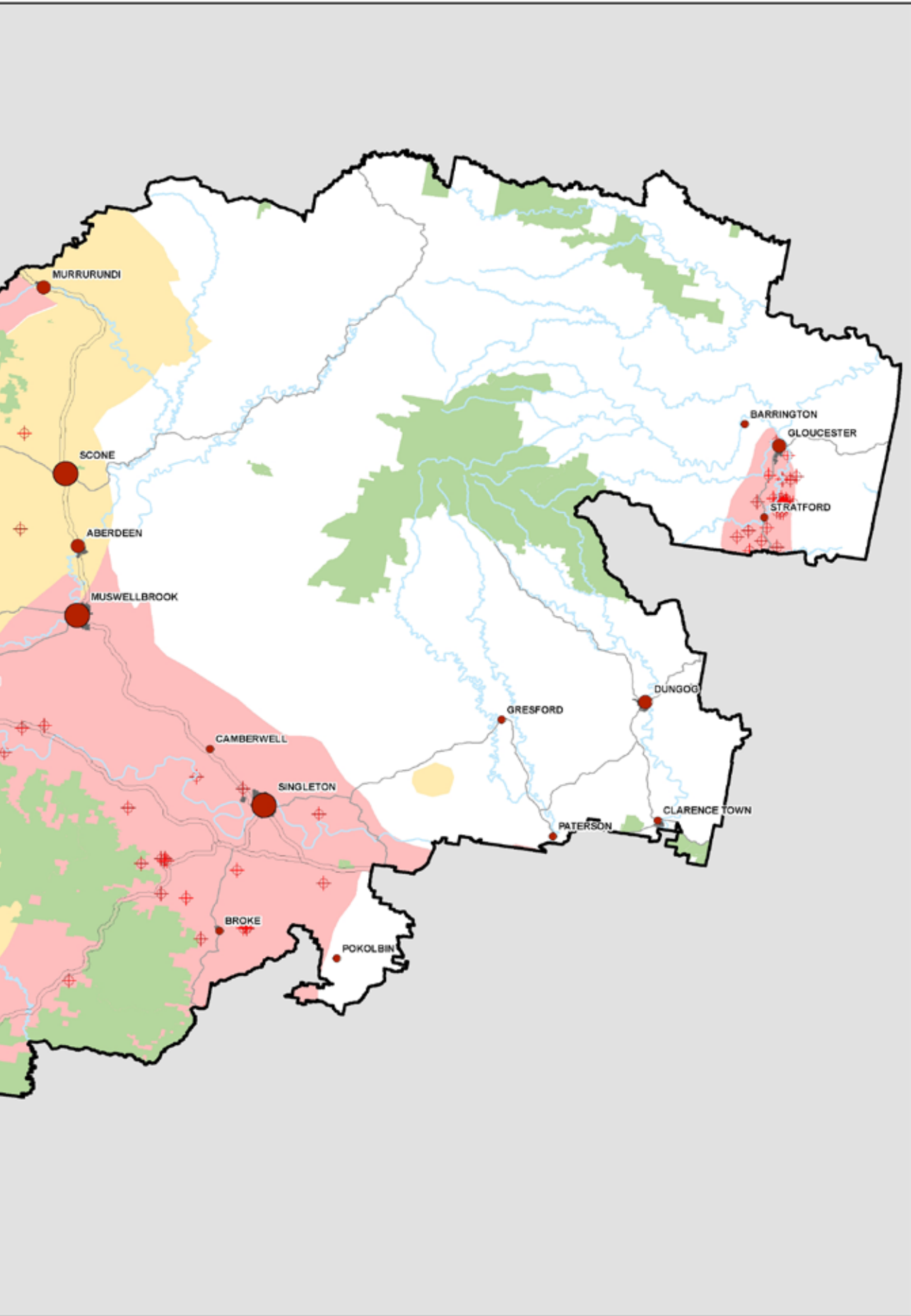
Legend

- Major Town
 - Town
 - Village
 - Upper Hunter Region
 - Highways
 - Major Roads
 - Rivers
 - National Parks
 - Coal Seam Gas Wells
- Coal Seam Gas Potential
- High
 - Moderate
 - Low



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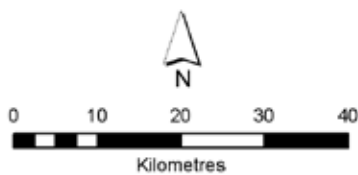
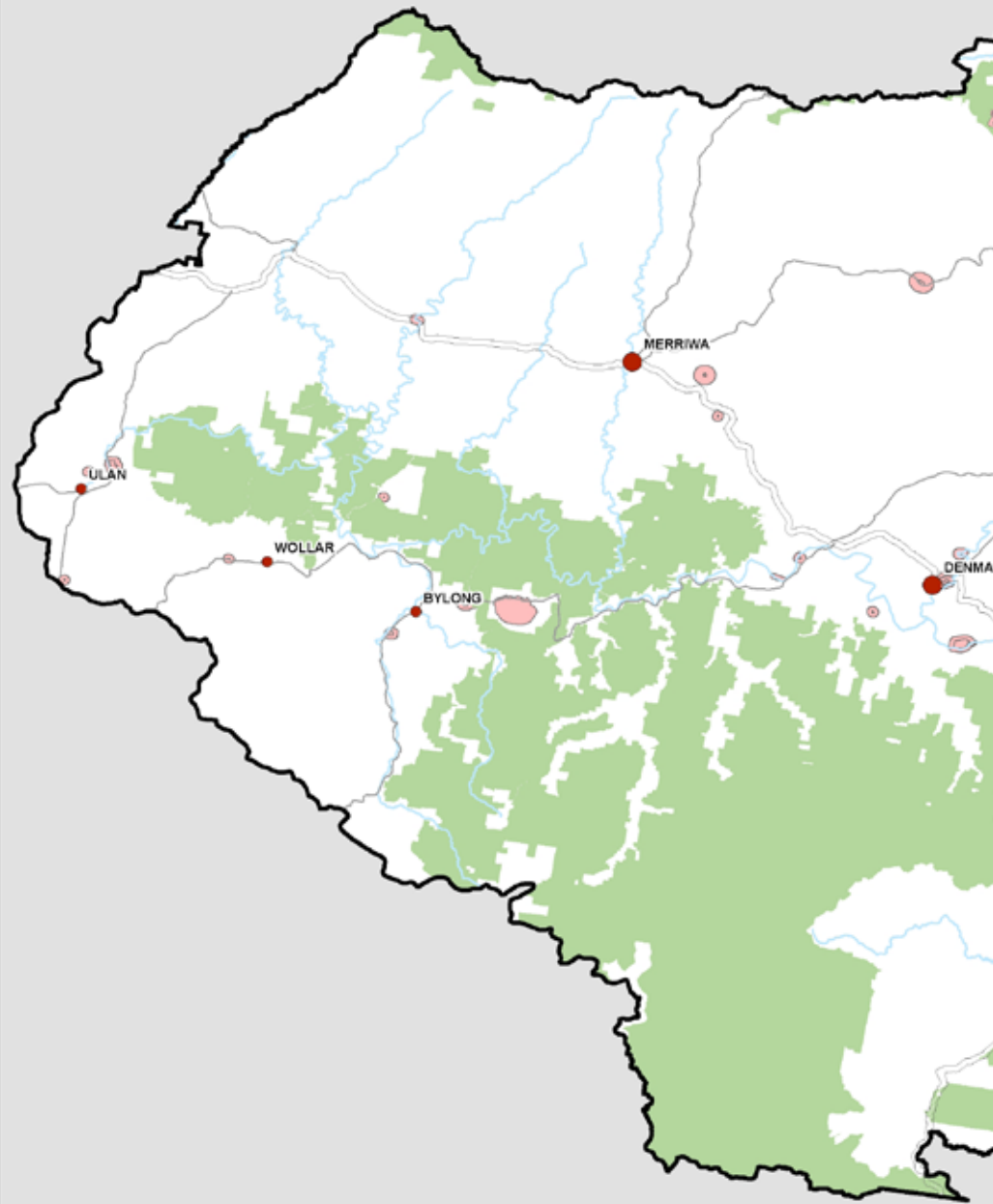


Map 4
Strategic
Regional Land Use
Plan
Upper Hunter

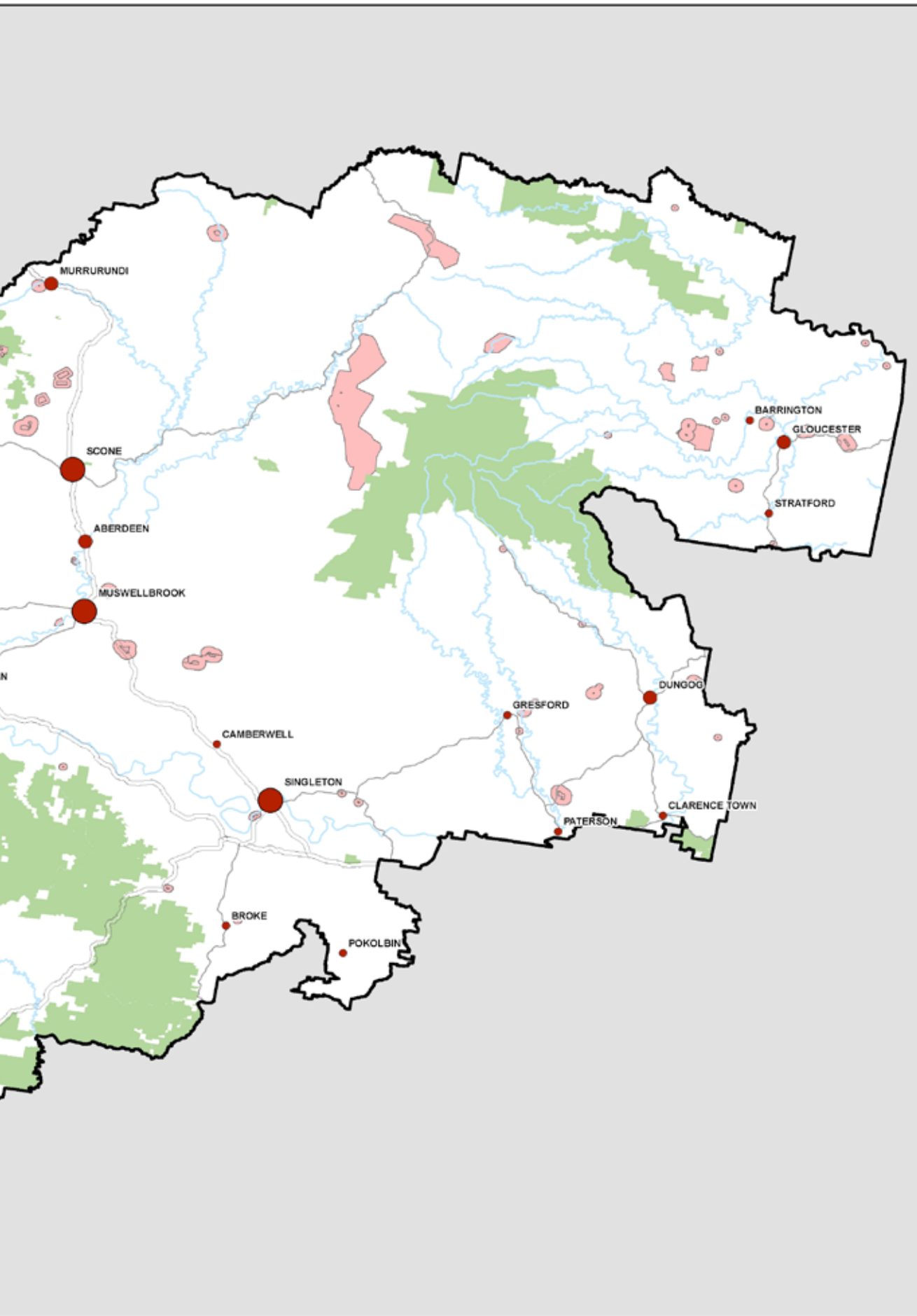
Other Mineral Resources

Legend



- Major Town
- Town
- Village
- Upper Hunter Region
- Highways
- Major Roads
- Rivers
- National Parks
- Other Mineral Resources

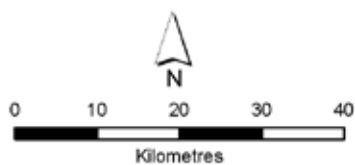


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Map 5
Strategic
Regional Land Use
Plan
Upper Hunter
Catchment Boundaries

- Legend**
-  Upper Hunter Boundary
 -  Hunter-Central Rivers
Catchment Management
Authority
 -  Other NSW Catchment
Boundaries





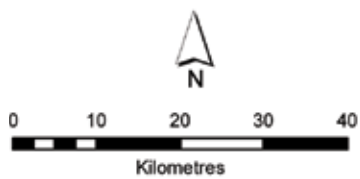
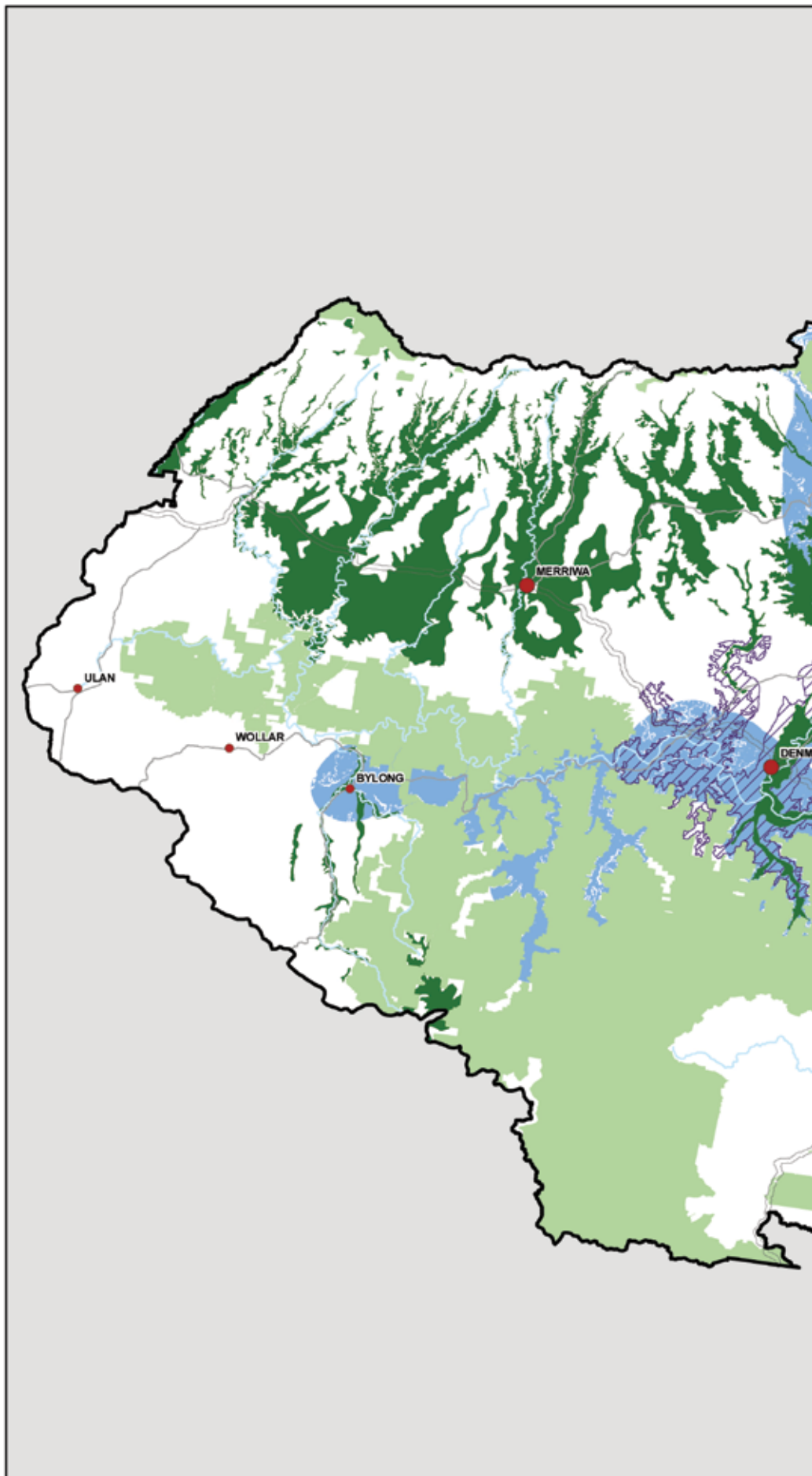
Map 6
Strategic
Regional Land Use
Plan

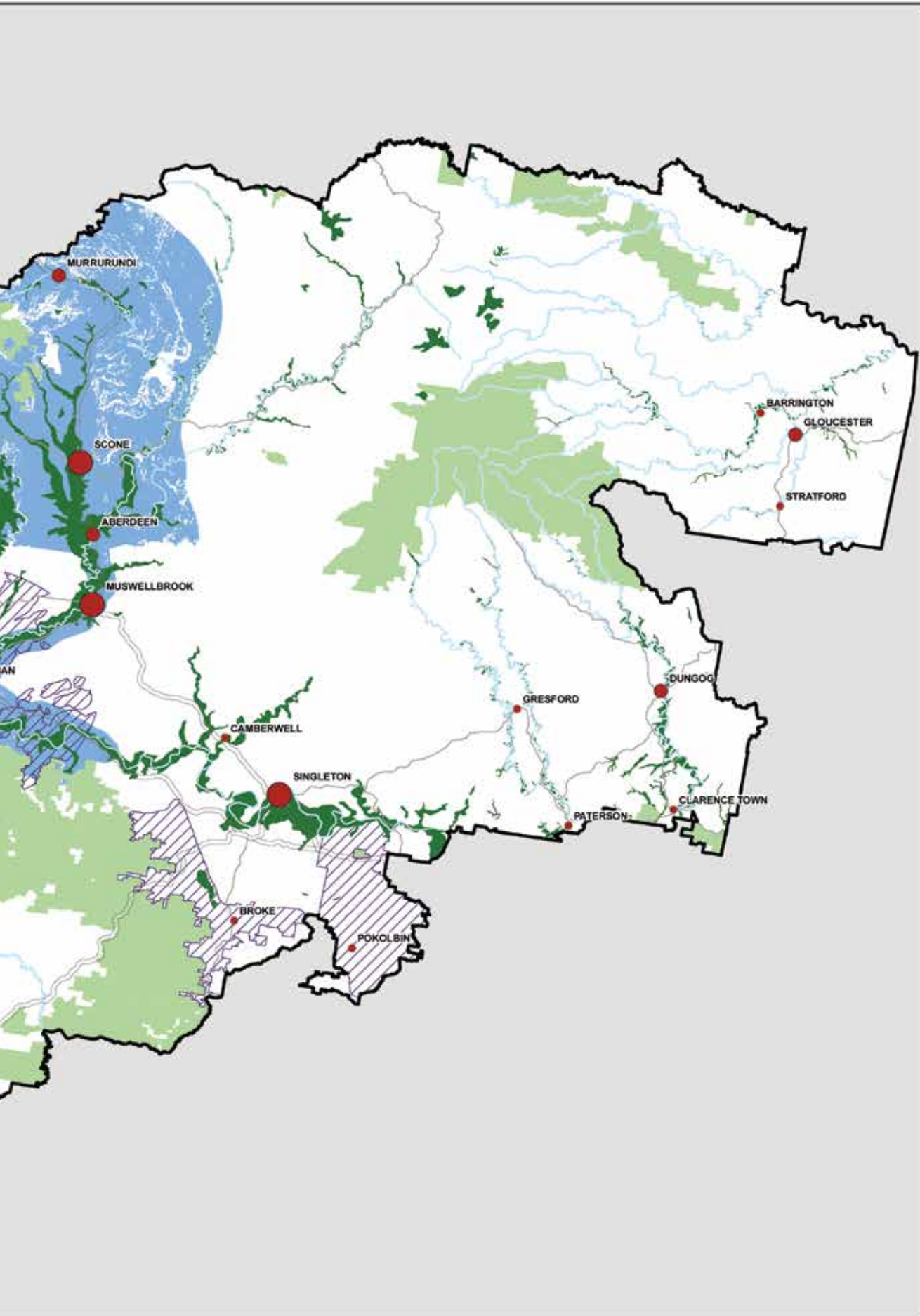
Upper Hunter

Strategic Agricultural
Land (SAL)

Legend

- Major Town
- Town
- Village
- Upper Hunter Region
- Highways
- Major Roads
- Rivers
- Biophysical SAL
- SAL - Viticulture
Critical Industry Cluster
- SAL - Equine
Critical Industry Cluster
- National Parks





Chapter Four

Infrastructure



Background

The growth of the coal and gas extraction industries will be one of the most significant factors in shaping the communities and the infrastructure needs of the Upper Hunter region over the next few decades.

The growth of these sectors will require infrastructure provision and upgrades, for example to rail infrastructure linking the mining areas to the Port of Newcastle and upgrades to the coal loading capacity of the port. The coal seam gas industry is likely to require upgrades to existing pipelines or new pipeline infrastructure. Infrastructure is also necessary to support the other important economic activities in the region such as the viticulture and equine industries, power generation and tourism.

Increased activity and population growth will impact on infrastructure provision in local communities. Issues such as road safety and accessibility for motorists (including heavy vehicles) and pedestrians will also require infrastructure investment to meet the demands generated by industry. Demand will increase for social infrastructure such as health, education, emergency services and community and recreation facilities. Housing growth will require additional or augmented infrastructure such as water, sewer, drainage, energy and roads.

Current status of key infrastructure in the region

Key existing infrastructure and new infrastructure investments in the region are briefly outlined below.

The New England Highway is part of the National Land Transport Network and provides an inland north-south route for freight between Hexham and the Queensland Border. It performs a vital role in servicing the Hunter Valley coal mines and power stations, providing a means of regional freight distribution to the Northern Tablelands. The Gwydir, Oxley, Bruxner Highways and Waterfall Way provide east-west links between the New England and the Pacific Highway, although they are not easily accessible for freight with sections that are narrow, winding and steep. The Golden Highway provides for regional freight distribution linking the Port of Newcastle to the Upper Hunter, Dubbo, central western and far western NSW.

The 2011 NSW Freight Supply Chain Study identified a relationship between inbound mine road freight and mine production. As production grows, inbound road freight is anticipated to grow by approximately 3-5% per annum. These inbound flows are concentrated along the New England and the Golden Highways.

The Hunter Valley railway network comprises track from Newcastle to Werris Creek and Ulan via Muswellbrook, including the Main Northern Railway line. The network carries coal, grain, intermodal freight, minerals and some passenger traffic and passes through the centre of several towns including Scone, Singleton, Muswellbrook, Dungog and Gloucester. The Hunter Valley Coal Rail Network (HVCRN) uses this infrastructure for the export of coal (refer to breakout box “Hunter Valley Coal Rail Network” and Figure 27).

The region also includes major water utilities (including a number of water treatment plants at power stations and dams), public hospitals (at Singleton, Dungog, Gloucester, Muswellbrook and Denman) and education facilities.

To support development in the region, a number of major new infrastructure investments are planned or underway, financed from a range of funding sources:

- Upgrades on the HVCRN over the next five years to increase rail network capacity in line with production and port capacity.

- Road upgrades including a new bridge over the Hunter River at Aberdeen to allow for higher mass limit vehicles between Muswellbrook and Tamworth and a new two lane bridge over the Great Northern Railway Line.
- Construction of the Hunter Expressway between the F3 and Branxton.
- The upgrade of the airstrip at Scone Airport (\$2.5 million), to support the equine and agricultural industry⁸.
- A water supply pipeline from Glenbawn Dam to Scone to cater for future growth.

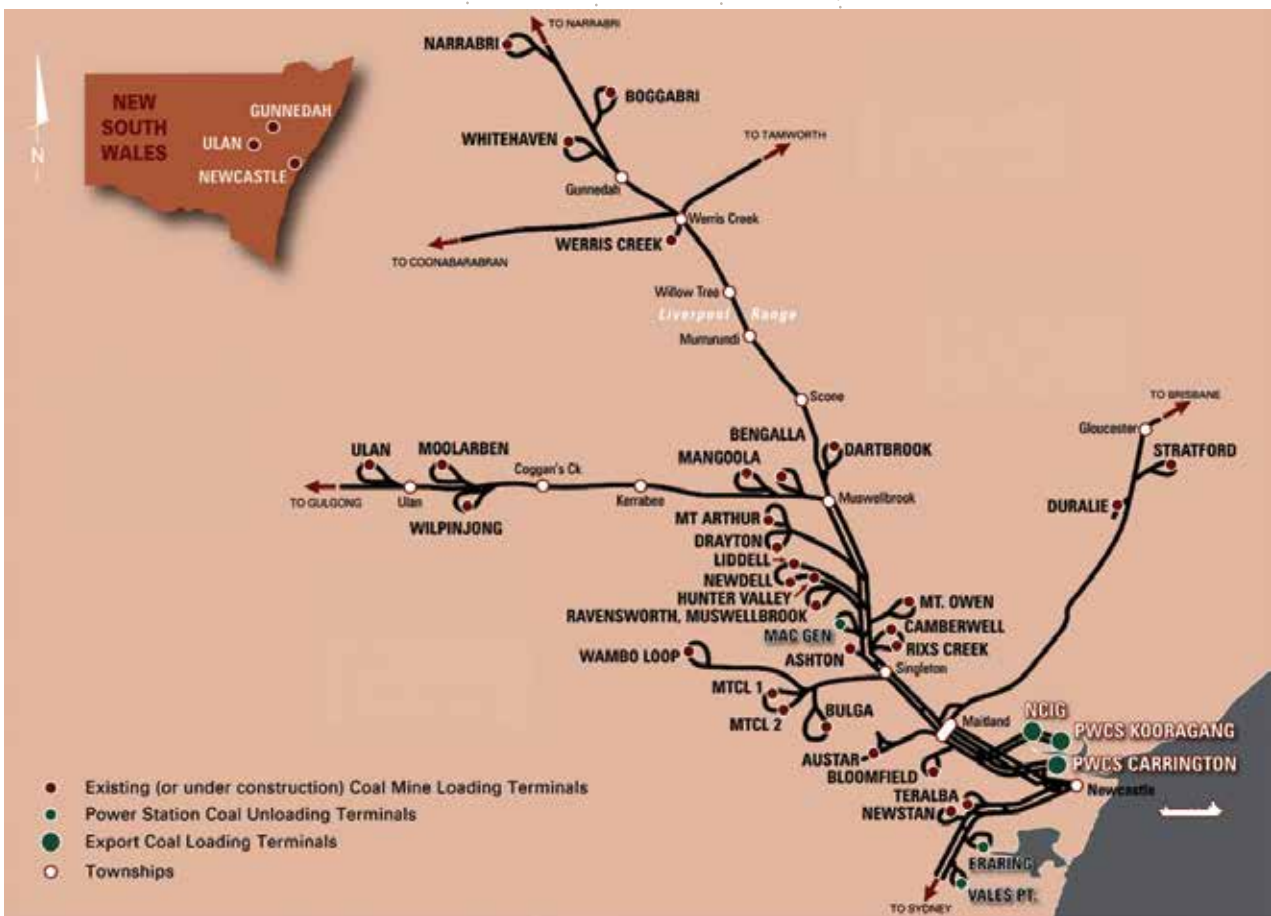


Figure 2 – Hunter Valley Coal Rail Network

Hunter Valley Coal Rail Network

Spread over more than 450 kilometres, the Hunter Valley Coal Rail Network (HVCRN) is the largest coal export operation in the world. It comprises a number of coal mines as well as related infrastructure including the rail network, coal loading terminals and Port of Newcastle.

At this time, the HVCRN consists of

- approximately 35 coal mines owned by 13 coal producer members of the Hunter Valley Coal Chain Council;
- coal rail haulage distance up to 450 kilometres;
- more than 30 coal loading points;
- three coal terminals; and
- the movement and loading of approximately 1,000 coal vessels a year from the coal terminals to the Port of Newcastle.

Coal exported from the Upper Hunter region is transported via the HVCRN, primarily to the Port of Newcastle (Port Waratah).

The HVCRN Coordinator provides the central planning and coordination for the HVCRN, including day to day planning and scheduling as well as long term capacity planning. The membership of the HVCRN has been expanded to include all current HVCRN producers and key service providers including Australian Rail Track Corporation (ARTC), Newcastle Port Corporation and 14 producers.

A significant portion of the railway network is leased to ARTC as identified in Figure 2. ARTC has recently extended its lease to cover the Northern Railway Line from the Gap to Boggabilla, allowing this 370 kilometres of track to be included in future investment and capacity planning. As well as the railway leased by ARTC, a network of branch lines is managed by Transport for NSW (through the Country Regional Infrastructure Authority).

(Source: Hunter Valley Coal Rail Network)

The NSW Long Term Transport Master Plan

The NSW Long Term Transport Master Plan will provide an overarching strategic framework to guide transport service and infrastructure delivery in NSW over the next 20 years, building on the NSW Government's current commitments. The Plan is being developed through a twelve month process of consultation and research.

The rail component of the draft NSW Long Term Transport Master Plan was released for public comment in mid 2012 and the final NSW Long Term Transport Master Plan is scheduled to be released in November 2012.

Challenges

Capacity issues in the HVCRN including rail network and the Port of Newcastle

It is estimated that export coal demand in 2011 was about 135 million tonnes per annum (mtpa). This is projected to increase to around 163 mtpa in 2012, 190 mtpa in 2013, 209 mtpa in 2014 and 216 mtpa in 2015 before stabilising at around this level.

The capacity needs of the Hunter Valley rail network are assessed in ARTC's 2011-2020 Hunter Valley Corridor Capacity Strategy, a draft 10 year program of works, which provides for a range of infrastructure treatments to increase rail network capacity in line with production and port capacity.

To cater for the projected growth in the coal industry in the Hunter Coalfield, significant upgrades are required to the rail network into

the Port of Newcastle, and to the coal loading capacity of the port. Issues include:

- Coal demand on the rail line between Muswellbrook and Narrabri is expected to continue to increase. Capacity increases will need to be accommodated on the Muswellbrook - Werris Creek - Narrabri line.
- The Port of Newcastle is forecast to reach capacity by 2014. The proposed construction of Terminal 4 would increase the capacity of the annual coal export throughput of the port by between 60 to 100 million tonnes per annum and ensure sufficient terminal capacity to meet the long term needs of coal producers.

Regional and cumulative impacts on infrastructure

The effects of mining projects on infrastructure can occur at, and beyond, a regional level. They can also result in cumulative and spill over effects into other local government areas and regions.

The impacts from the anticipated growth of the coal industry in the adjoining New England North West and Central West regions is likely to have cumulative effects on infrastructure capacity in the Upper Hunter, with a subsequent flow on effect further south in the Lower Hunter region, towards the Port of Newcastle. For example, an increase in coal mining activity in the New England North West and Central West regions will require greater capacity on the HVCRN to transport coal from the mines to the port, for export. There is a need to identify and predict the direct and cumulative impact on infrastructure at a regional level, and across different regions.

Rail infrastructure capacity

There is a perception in some sectors that agricultural freight from the region is being 'pushed' off the rail network and onto trucks. However, evidence suggests that there is sufficient capacity for non-coal freight on the rail network.

The ARTC Hunter Valley Corridor Strategy methodology makes an allowance for seven daily non-coal trains to Narrabri. At present, non-coal freight and passenger trains average 4.7 trips per day, well below the seven trips that could be accommodated. At this time, non-coal freight in



this region is not expected to grow substantially beyond the allocation. Further, all of the non-coal freight trains are significantly shorter than the 1,328 metre train lengths permitted on the corridor. This gives scope for increased grain freight volumes through increased train lengths.

Clarification of the status of infrastructure capacities and gaps would assist with managing stakeholder perceptions and expectations.

Impacts on local communities from infrastructure for mining, coal seam gas and agriculture

A number of councils made submissions to the NSW Coal and Gas Strategy scoping paper and the draft Upper Hunter Strategic Regional Land Use Plan, raising concern about the implications of the growth of the coal and gas industries on local infrastructure requirements and the capacity for local councils to fund upgrades and mitigation works.

Increased rail based coal haulage and train lengths can cause traffic delays for motorists and emergency service agencies at level crossings and can cause access and safety issues for motorists and pedestrians in towns that are divided by the existing railway line (e.g. Singleton, Scone, Muswellbrook and Aberdeen).

To address these access and safety concerns, consideration needs to be given to identifying infrastructure projects and funding sources to mitigate impacts and should include consideration of:

- improved traffic management through towns (in particular Singleton);
- improvements to rail crossings and corridors through towns (e.g. Scone overpass and Singleton overpass upgrade);

- the potential for town bypasses (e.g. the Federal Government has funded studies identifying the need for a Muswellbrook bypass); and
- intersection and pavement upgrades, and corridor acquisitions (e.g. Muswellbrook rail corridor bypass).

Consideration also needs to be given to the issue of road quality and maintenance requirements. The Government monitors the condition of the road surfaces on state roads in the Hunter region to assist in identifying where improvements are required. The expansion of the mining industry will have an impact on the councils' local roads programs including additional maintenance, upgrades to roads and timber bridges, and sealing of some rural roads.

Capacity of existing social infrastructure

Demand for social infrastructure, including health, community and social services, education and emergency facilities is likely to increase as a result of population and economic growth and any existing deficiencies are likely to be compounded.

In regions experiencing mining growth, health facilities, schools, pre-schools, early child care centres and tertiary education are experiencing increased waiting lists and enrolments. Further increases are likely to create demand to expand built infrastructure.

Infrastructure to support new housing and employment areas

Along with social infrastructure, new and augmented infrastructure will be required to support housing and employment areas, including public transport, utilities and telecommunications infrastructure.

Funding of infrastructure

Infrastructure can be provided in a number of ways as the planning and delivery of infrastructure is shared between many parties such as local, state and federal governments as well as developers through development contributions and private sector investors.

The NSW Government's new infrastructure governance processes will help ensure that state



infrastructure is delivered in a timely way. The new governance framework will, under the guidance of Infrastructure NSW, include:

- preparation of a 20 year State Infrastructure Strategy;
- preparation of five year infrastructure plans;
- sector State Infrastructure Strategy statements (for example, water);
- coordination of major infrastructure projects (exceeding \$100 million).

Together, Infrastructure NSW and the Department of Planning and Infrastructure will provide a robust set of structures and processes for the management of the state's infrastructure. This will allow planning, prioritising, funding and delivery of infrastructure in a coordinated, efficient manner across Government for all levels of infrastructure leading to better economic and social results across NSW.

To facilitate infrastructure for regional growth, the NSW Government has announced funding for several infrastructure programs including:

- **Hunter Infrastructure and Investment Fund (HIIF):** \$350 million program over four years to improve the Hunter region's infrastructure to support growth and maintain and enhance liveability. Specific initiatives in the 2012-13 Budget include:
 - \$43.5 million on the upgrade of the New England Highway through Maitland;
 - \$16.8 million on the planning and land acquisition for the new Hunter Valley Hospital; and
 - \$62.5 million in grants to local Councils until 2014-5 for projects including Hunter wine region roads and Cardiff's Main Street.

The HIIF is administered by the Hunter Development Corporation which is undertaking a Hunter Region 20 Year Infrastructure Plan in cooperation with Infrastructure NSW and the Department of Planning and Infrastructure. This will help guide future infrastructure investment in the Hunter Region

- **Resources for Regions:** a \$160 million program aimed at assisting communities to address local infrastructure issues and the local impact on mining affected communities. In the 2012-13 Budget the NSW Government allocated an initial \$9.9 million from the Resources for Regions program under Restart NSW to help meet the local infrastructure needs of Singleton and Muswellbrook.
- **Restart NSW Fund:** announced in August 2011 for the delivery of essential infrastructure. Thirty (30) per cent of funding from this program will be reserved for projects in regional areas.
- **Local Infrastructure Renewal Scheme:** a five year, \$70 million, program to assist councils pay for large local infrastructure projects by providing interest subsidies to help cover borrowing costs on significant loans to tackle infrastructure backlog.

Policy Response

As the Upper Hunter region experiences the projected growth in coal and coal seam gas industries and associated population growth, the demand for new or upgraded infrastructure will increase. In order to predict and manage this increased demand, an integrated and fully costed infrastructure plan for the region will be delivered.

This infrastructure plan will have a number of components:

1. Infrastructure identification: analysis is to include:
 - An audit of existing infrastructure and its capacity, including gaps in provision.
 - Review of relevant existing studies related to infrastructure within the region.
 - Infrastructure demand to support growth, with a focus on the demands and requirements to support expansion of the coal and coal seam gas industries.
 - Consideration of infrastructure requirements identified in submissions to the NSW Coal

and Gas Strategy and the draft Upper Hunter Strategic Regional Land Use Plan, e.g. the Scone overpass.

- Identification of regional infrastructure projects to include prioritisation, indicative costings, sequencing and responsible authority.
2. Cumulative impact: establishing a methodology for identifying and predicting the cumulative infrastructure impacts of coal mining and coal seam gas extraction at a local and regional level.
 3. Funding sources: investigation of options for funding local and regional infrastructure and establishing a range of mechanisms for the equitable sharing of infrastructure funding between users and across jurisdictions. In addition to considering the range of local, state and federal infrastructure sources that are available, options to be considered will include:
 - standardised annual levies for recurrent infrastructure costs (e.g. road maintenance);
 - section 94 levies for coal and coal seam gas industries based on, for example, per tonne of extracted material (for roads) or per employee (for community facilities);
 - standardised voluntary planning agreements for local infrastructure with consistent levies formula; and
 - cross-boundary infrastructure.
 4. Resource development monitoring program: establishing a resource development monitoring program, similar to the Urban Development Program run by the Department of Planning and Infrastructure to provide infrastructure providers and local Government with an indicative timeline of resource development such as coal mining and coal seam gas projects in the region.

Objectives

- Ensure sufficient infrastructure provision to cater for sustainable economic and population growth in the region.
- Ensure a balanced approach to infrastructure provision across all key industries, in particular to ensure that infrastructure growth to support the coal and coal seam gas industries does not adversely impact upon agriculture.

Actions

	Action	Lead Agencies	Timeframe
4.1	Prepare a fully costed infrastructure plan for the Upper Hunter region, in liaison with local, state and federal governments, business and the community to address key regional and subregional infrastructure needs.	Department of Planning and Infrastructure/ Infrastructure NSW NSW Trade and Investment Transport for NSW	June 2013
4.2	Prepare a guideline to provide a consistent framework and methodology for voluntary planning agreements (VPAs) between mining and coal seam gas companies and local councils relating to local infrastructure provision, including consideration of a regional VPA approach.	Department of Planning and Infrastructure	December 2012
4.3	Local environmental plans are to ensure housing and employment development occurs in areas which can be appropriately serviced.	Councils	Ongoing



Economic Development and Employment

Background

In terms of the current industry profile and economic challenges, the Upper Hunter region can be considered as two distinct subregions. The economy of the western subregion, within the local government areas (LGAs) of Singleton, Muswellbrook and Upper Hunter, is dominated by coal mining and agriculture. The eastern subregion, within the LGAs of Dungog and Gloucester is dominated by agriculture.

The scale of coal mining in the region is significant on a national scale with the coal mining industry making a major contribution to both the state and national economies.

Agriculture is the other major economic base of the region and is widespread throughout, although a number of industries congregate around particular areas. For example, the beef industry is significant in the Upper Hunter, Dungog and Gloucester LGAs, as is the equine industry around Muswellbrook, Denman and Scone and the wine industry near Singleton, Broke and Denman.

Mining activities

Coal is NSW's most significant commodity export - worth over \$14 billion in 2010/11. Approximately sixty per cent of this coal is mined in the Upper Hunter region⁹. It is estimated that 63 per cent of the gross regional product comes from mining⁹. Between 2006 and 2010, direct employment in mining in the region rose from 5,500 to more than 11,000¹⁰. Mining support industries, such as engineering, construction, transport, logistics and human resources have also become well established in Singleton and Muswellbrook.

Mining activity has grown significantly in the last five years and this growth is expected to increase in the coming years, with strongest growth in export demand predicted to occur during the years 2012-2016.

This degree of growth in export coal production is expected to generate a moderate increase in additional mining jobs in the region by 2020 with that level of mining employment likely to be maintained until at least 2025. In the future, coal seam gas extraction has the potential to become a significant industry for the eastern subregion and create additional employment opportunities.

Over the period to 2036, the region's workforce is expected to grow by between 7,400 and 8,200 jobs. Much of this increase will be driven by the growth of the coal and coal seam gas industries and focused in the LGAs of Singleton, Muswellbrook and Upper Hunter. Efficiency improvements in the mining industry will also support growth, without the need for additional labour.

Note that the above figures do not account for mining activity in the Bylong-Wollar-Ulan corridor.

Agriculture

Approximately 3,200 people were employed in agriculture in 2006¹¹, with the estimated total value of agricultural production being over \$5.9 billion a year.

The region boasts the world's second largest cluster of thoroughbred breeders, with 80 per cent of the total value of Australian stud horse exports. The industry is concentrated in the Muswellbrook, Upper Hunter and Mid Western LGAs, with the town of Scone and its surrounds being known as the 'horse capital of Australia'.

Wine grapes are also important in the region, concentrated in the Singleton, Muswellbrook and Cessnock LGAs. Both the thoroughbred and wine industry benefit from being clustered in these areas with the resulting critical mass attracting specialist staff, providing brand recognition and assisting with industry cooperation. As mentioned

in Chapter 3, the equine industry around Scone, Bylong and Denman and the viticulture industry around Denman, Broke and Pokolbin have been identified as critical industry clusters and have therefore been mapped as strategic agricultural land for the purposes of the Gateway process.

Beef, dairy and cropping are also important to the region's economy. The region produces 15 per cent of the state's milk and 6 per cent of the state's cattle for slaughter. Dungog and Gloucester in particular rely on beef cattle as a base for their economies. Although the number of dairy farms has declined recently, holdings and herd sizes are now much larger. Other important agricultural activities include: poultry meat, eggs, hay production and sheep. Although it is not a large industry in terms of total production, the Upper Hunter also produces 90 per cent of the state's total industrial hemp.



Other industries

Electricity generation is a well established industry in the Singleton and Muswellbrook areas. The Bayswater and Liddell power stations are significant power sources for NSW. The region has relatively undeveloped potential to generate power from coal seam gas and renewable energy sources. Its potential for solar, geothermal and wind power generation also makes the Upper Hunter one of the State's key renewable energy regions.

Tourism is an important industry for the region. The proximity of Dungog and Gloucester to the world heritage listed Barrington Tops National Park, as well as the rural landscapes and wine industry, underpins tourism in the Upper Hunter.

There is also significant employment in the region in service industries such as health care, education, retail and local administration. This type of employment is concentrated in the major

towns of Singleton and Muswellbrook. Defence is also a significant industry in Singleton.

The Upper Hunter has important economic connections with the surrounding regions. The Gloucester area has important connections to the Mid North Coast and the major regional centre of Taree. Many communities in the Dungog LGA have strong connections to the cities of the Lower Hunter, such as Maitland and Newcastle. There are important flows of commuters between the Upper Hunter and the Lower Hunter, including workers commuting on a daily basis to the Upper Hunter to work in the mining industry, which has implications for transport infrastructure connecting the Upper Hunter and Lower Hunter. These connections also mean that fly-in/fly-out or drive-in/drive-out¹² employees are much less likely in the Upper Hunter than in other regions of NSW.

The Upper Hunter also has important transport infrastructure connections with surrounding regions. Coal, grain and other freight from the Central West and the New England North West pass through the Upper Hunter en route to the Port of Newcastle. This is a significant consideration, given the potential for coal mining to expand in the Western coalfields around Gulgong and in the Gunnedah Basin.

Challenges

Land use conflicts

The strength of the mining industry creates many benefits directly to the Upper Hunter region. These benefits include lower unemployment, higher average incomes and increased business investment. March 2012 unemployment figures for the Singleton, Muswellbrook and Upper Hunter LGAs are at very low levels - between 1.1 and 2.1 per cent¹³. However, these benefits are not felt evenly across the region. There are areas and industries that do not directly benefit from the mining industry. There are also areas and industries that compete directly with the mining industry for resources, such as land, labour and water.

For example, there are concerns that the growth of mining is placing pressure on the thoroughbred and wine industries. If the critical mass of these industries declines (due to mine expansions or mining impacts) or the image of the region suffers, there could be appreciable damage to the wider industry and economy. In addition, the dairy

industry is having difficulty consolidating due to direct competition from mining companies for land. Significant and well established agricultural activities need to have confidence that their future in the region is secure and there are opportunities for their industry to develop and grow, particularly as these industries have the potential to continue sustainably well beyond the expected lifespan of most coal mines.

Good strategic planning, including the identification and mapping of mineral and coal seam gas resources and strategic agricultural land, and setting clear objectives for future land use, will allow both the mining and agricultural industries to continue to grow, providing a range of economic opportunities for the communities of the Upper Hunter region.

One of the major objectives of this plan is to provide a strategic framework for decisions about the use and management of agricultural land and resources. The Gateway process is a key initiative that will help balance the needs of different industries and communities. Chapters 3 and 11 describe how important rural lands will be managed into the future, through the identification of strategic agricultural land and the Gateway process.

The more narrow economic bases and slower population growth of the Dungog and Gloucester areas create particular planning challenges. Strategies to attract new industries and employment, to retain the existing population and to generate sufficient population to attract economic investment will be vital to these areas.

Demand and supply of employment land

Concurrent with the expansion of the mining industry, there has been substantial growth in mining related industries. As the mining sector grows, mining support activities are also expected to grow. As well as placing pressure on the supply of labour, this growth will place pressure on the supply of employment land. A November 2010 review for the Hunter Development Corporation¹⁴ identified that there is approximately 6,000 hectares of land capable of being developed as employment land in the Upper Hunter region. This indicates that at a regional scale there are no immediate problems in the supply of employment land to support economic growth.

At the local scale, there are some challenges regarding the planning and delivery of employment land that councils are currently working to address. In Singleton, while there is an adequate supply of zoned employment land, including 298 hectares at Whittingham, there is a relatively short supply of employment land serviced with infrastructure. Muswellbrook has adequate employment land available to meet demand over the short term. In Dungog and Gloucester, demand for industrial land is low. However, Gloucester Shire Council has identified and zoned land for future industrial uses near the cluster of coal mining and coal seam gas extraction activity at Stratford.

Given the potential for significant economic growth and demand for employment land in Singleton and Muswellbrook, particularly over the next five years, there is a need to closely monitor demand and supply for employment land regularly and to take action to ensure the planning and delivery of additional employment land, should the need arise.

Infrastructure is important to regional economies and regional economic trends can help shape demand for and the supply of infrastructure. This is discussed in Chapter 4.

Increasing the share of jobs in regional NSW

NSW 2021 – A Plan to make NSW Number One sets the Government's agenda for change in NSW. A key goal of the plan is to drive economic growth in regional NSW with a target of increasing the regions' share of jobs. One of the priority actions supporting this goal is to develop regional action plans which harness business opportunities and address impediments to growth in each region.

The relatively short supply of labour is an impediment to growth in the Upper Hunter region for a number of industries. The Regional Action Plan for the Upper Hunter region prioritises the development of new ways to boost the region's workforce through a Workforce Plan for the Upper Hunter addressing areas of critical labour shortage.

Demand and supply of labour

As well as land and water resources, many industries will need to compete directly for access to a workforce. In particular, the pressure the growth of the coal and coal seam gas industries will place on the supply of labour is emerging as one of the most critical issues for all industries in the region. Many businesses struggle to compete with the mining industry to attract or keep workers. The relatively short supply of workers has already begun to have an impact in Singleton and Muswellbrook and has been recognised as a problem in other regions of Australia that have experienced significant growth in the mining industry. This will require solutions that involve innovative thinking and cooperation between government, business and communities. Balancing opportunities for growth between different industries will be vital to ensure the future productivity of the region.

Economic diversification and resilience

Like many areas of regional NSW, economic diversification is an important challenge for the Upper Hunter. While mining is a well established industry in the Upper Hunter, and will continue to be a major industry for several decades, it is important to think about short and medium term opportunities that can help to diversify the regional economy and make it more resilient to change in the longer term. Economic diversification will require continual effort in four key strands:

- building on the strengths of existing industries such as mining, agriculture and tourism;
- developing new industries based on new opportunities, such as renewable energy and logistics;
- developing knowledge intensive activities; and
- increasing local populations to build ongoing critical mass for service industries.

The growth of the mining industry will result in demand for labour, which is likely to attract many more people to the region, resulting in stronger population growth. Over the long term, research suggests that stronger population growth itself is an important strategy to help ensure economic diversification and resilience. Population growth will be particularly important to major towns such as Singleton and Muswellbrook if these towns are to have the critical mass to sustain a viable service economy in the longer term.

The Upper Hunter Economic Diversification Report

The Upper Hunter Economic Diversification Report has been prepared for the NSW Government and the local councils of the Upper Hunter region (including Great Lakes). It is part of the Upper Hunter Economic Diversification Project which outlines strategies and initiatives for economic diversification and strengthening local communities in the region.

The report is clear that the future development of the region requires the generation of sustainable jobs that building on current advantages and create new areas of advantage.

Four key initiatives for economic diversification are recommended. These are:

- increasing local populations to build ongoing critical mass for service industries and associated jobs;
- building on specific industry strengths and local advantages and using these as a foundation for future growth;
- developing new areas of industry based on emerging opportunities such as agribusiness or renewable energy; and
- developing knowledge intensive industries including support for renewable energy support systems, education and training and research.

The report was released in 2011 following the endorsement of all councils in the Upper Hunter region.

It should also be recognised that the growth of the mining industry can lead to issues with social polarisation and loss of community cohesion. This can be a result of different attitudes towards the mining industry, the disparity in incomes between workers in the mining and non-mining industries, and the often transient nature of the mining workforce. Communities that are liveable and cohesive are more likely to be attractive as places to live and, therefore, building community cohesion must be seen as a key element of building a resilient and diverse economy.

Policy Response

Objectives

- Ensure an adequate supply of land for the needs of Upper Hunter industries.
- Ensure an adequate supply of labour for the needs of Upper Hunter industries.
- Diversify the region's economy and build economic resilience.
- Build cohesive and liveable communities by addressing conflicts in demand for resources and improving access to employment and training.

Actions

	Action	Lead Agencies	Timeframe
5.1	Local councils will zone land through their local environmental plans to ensure an adequate supply of employment land.	Councils	Ongoing
5.2	Prepare a Regional Workforce Plan in cooperation with Regional Development Australia (Hunter), local employers and industry groups, to address workforce and skills issues. The plan will clarify current and future demand and supply of skills in the region and devise skills and workforce development strategies, including apprenticeship programs, to address critical shortages in mining and other industries.	Department of Education and Communities Department of Primary Industries	2013
5.3	Work with mining and coal seam gas companies to develop a regional apprenticeship program to be funded by these industries.	Department of Education and Communities	2013
5.4	Work with local councils to implement the recommendations of the Upper Hunter Economic Diversification Report.	NSW Trade and Investment	Ongoing



Housing and Settlement

Background

The Upper Hunter region has a diverse range of towns and villages, rural landscapes and natural attributes that make it an attractive place to live. Most of the settlements are located along the New England Highway, which is the region's main transport corridor. The major towns of Singleton, Muswellbrook and Scone are situated on this strategic route, along with Aberdeen and Murrurundi. Other important settlements include Denman and Merriwa in the west of the region and Dungog and Gloucester in the east.

The major towns provide the main regional services, retailing, housing, health and education facilities, industry and related employment for the Region. These centres are linked to other towns and villages which provide local housing choice, retail and employment services to their districts. The region has an east west divide, created by the physical barrier of the Barrington Tops and the limited east-west road connections.

Its scenic environment, high quality urban services and facilities and convenient location to Sydney, the Lower Hunter and the Mid North Coast make the region attractive to tourists, tree-changers and others seeking lifestyle quality and choice. Dungog and Gloucester, in particular, have benefited from a modest increase in tree-change growth.

The region has an estimated population of 67,500¹⁵ and has experienced steady population growth since 2006. The majority of this growth has occurred in Singleton and Muswellbrook and, to a lesser extent, the Upper Hunter local government area (LGA), driven by the growth in mining and mining related industries which is expected to continue in the short to medium term.

The region's population is expected to grow in the coming decades with current projections estimating that the population will be between 82,000 and 83,500 by 2036. This is based on assumptions of modest increased demand for workers in the mining industry, as well as strong flow on effects from the mining industry to other industries in the region. These projections supersede the projections released by the NSW Government in 2008. With this increase in population, as well as demographic changes, the region will need between 8,500 and 9,200 additional dwellings by 2036.

Overall, the region has a higher than average young population (under 15 years) and lower than average working population of 20-44 year olds. Regionally, however, there is significant variation, with the Singleton and Muswellbrook LGAs having a higher than average young and working population, whereas in Gloucester LGA, the majority of the population is 55 years and over. Like the rest of regional NSW, there is a significant indigenous population which is growing. The largest concentration of indigenous people is in Muswellbrook.

Migration patterns show that different parts of the region relate strongly to adjacent regions outside the Upper Hunter. The Gloucester LGA, for example, relates strongly to the Mid North Coast region, while the Upper Hunter LGA relates to the New England North West and the Singleton, Muswellbrook and Dungog LGAs relate more closely to the Lower Hunter.

Understanding changing demography

Having an accurate picture of current population and demographic change is a significant challenge for the Upper Hunter region. Rapid changes to the regional economy associated with the growth in the mining and coal seam gas industries makes the assessment of longer term population trends more difficult than in many other regions. Even in areas where the growth of mining is more certain, other factors such as the level and nature of employment in each mine, the proportion of workers who will look to settle permanently in the local area and the proportion of workers who will bring their families with them, are much less certain and difficult to forecast.

In turn, it is difficult to accurately respond to changing demands on housing, employment, services and infrastructure. The Department of Planning and Infrastructure regularly revises official population projections to incorporate the latest demographic statistics and factors that will affect local population trends. The department is working with local authorities to better understand how future economic trends will impact local population change and housing growth.

Looking at the region's supply of housing, large detached houses with three or more bedrooms are the predominant form of housing currently available. Across the region, 91 per cent of the housing stock is detached houses. There is a shortfall in the provision of smaller dwellings including detached houses, townhouses and apartments with one or two bedrooms. The average household size across the region in 2011 was 2.6 persons per dwelling. This has declined from 2.8 in 1991.



In terms of the housing market and affordability, the region has seen housing prices increase over the last decade, similar to the majority of housing markets across the state. Housing affordability varies across the region, depending on supply and demand of housing in a particular local area. Overall, affordability is strongly linked to economic growth of the local areas. Singleton is currently the least affordable area both in terms of private purchase and private rental markets. Signs

of similar stress in the housing market can now be seen in and around Muswellbrook.

From the 2006 Census, 41 per cent of all low and moderate income households renting in the private rental market in Singleton and 39 per cent of all low and moderate income households renting in the private rental market in Muswellbrook are in housing stress – defined as households in the lower 40 per cent of income distribution paying more than 30 per cent of their income on mortgage repayments or rent¹⁶. In contrast, Gloucester and Dungog are still affordable, both in terms of housing purchase and private rental, as are large parts of the Upper Hunter LGA.

Challenges

Housing and residential land supply

New housing will be needed to cater for the expected population growth as well as growing demand for a wider variety of housing. The greatest demand for new housing is in the Singleton, Muswellbrook and Upper Hunter LGAs driven by the continued expansion of mining activities. Even in areas with low population growth, there will be demand for new dwellings to provide greater housing choice.

Ensuring an adequate supply of housing is a challenge for the region. This includes planning for new urban areas as well as planning for new

development within existing urban areas. Local councils have identified a steady supply of land zoned for housing across the region. All councils have identified housing growth opportunities to meet housing demand until at least 2026.

Of the two areas now experiencing strong growth pressure, Singleton has sufficient land zoned in the Singleton Heights area for approximately 2,000 new dwellings, while in Muswellbrook there is potential for a further 1,300 new dwellings in the zoned residential land at South Muswellbrook. This is expected to be adequate for these areas for the short to medium term. However, with the additional demands coming from the growth of mining, councils will need to continue to assess the adequacy of supply of housing in the region. Elsewhere, land has already been identified for potential future growth in Gloucester and the nearby village of Barrington. Councils will also need to consider the most appropriate options for long term housing growth to support the changing economic structure in the region.

Supporting residential growth with new or upgraded infrastructure will also be a challenge.

Housing mix and affordability

Housing affordability is highly varied across the region. However, one issue that is relevant across the entire region is the current lack of housing choice through the provision of smaller and more affordable housing options such as one and two bedroom houses and town houses. This current lack of housing choice is significantly contributing to housing stress. The vast majority of people identified as being in housing stress, as defined by Housing NSW, are single occupants who are unable to afford the larger housing stock¹⁷. While existing planning controls contain appropriate provisions to enable provision of smaller dwellings, action needs to be taken to further encourage the development of a wider choice of housing types to meet the full range of housing needs among the region's various communities.

Demand for housing is likely to change over time as the population and economy of the region grows and changes. Landcom (now Urbangrowth NSW) has recently investigated the potential changes to demand and supply for housing in the region in the short to medium term. These investigations point to the need for

more adaptable housing, which can cater to the needs of temporary construction workers, drive-in/drive-out mine workers, permanent residents and seniors. Innovative solutions to develop more adaptable housing that can meet the needs of different users over time will need to be explored further.

The provision of housing is an essential component of the physical infrastructure underpinning the mining industry and communities affected by the mining industry¹⁸. Specifically, it is affordable housing that is critical, not least to support the influx of miners, but to house the workers who provide essential support services. This includes affordable housing for construction workers and other local service providers, who do not have access to high incomes that are common in the mining industry and therefore might be priced out of a highly competitive private rental market. As has been the experience elsewhere in Australian mining townships, indigenous communities and low income residents are at risk of being displaced by increased demand across the housing market, specifically in the private rental market¹⁹.

Short term accommodation

The region has a significant demand for short term accommodation generated by a number of activities including mining, construction, tourism and agriculture. Currently the lack of private rental accommodation in areas such as Singleton and Muswellbrook has forced miners and mining companies to occupy hotels, motels and other forms of short term accommodation. This has created problems for other industries, such as tourism and the wineries that rely on the tourist market. A range of opportunities will need to be considered by councils to ensure appropriate supply of short term accommodation is available, including motels, hotels and bed and breakfast establishments. Short to medium term accommodation opportunities such as serviced apartments as well as short to medium term lettings should also be provided.

Temporary housing villages

The nature of the mining industry also requires various types of skill sets over the lifetime of the mine and therefore employees are required for different time periods. Subtle changes in working hours or employment conditions mean that fly-in/fly-out or drive-in/drive-out options may become more attractive for some employees and not possible for other employees. This can have immediate impacts on housing demand. In areas across Australia affected by a mining boom, the introduction of temporary housing to provide short term accommodation during work roster periods for mining employees has been seen as an effective means to address what is likely to be a temporary peak demand for housing. Temporary housing can also help to address difficulties in expanding permanent housing stock quickly and to avoid a potential oversupply of permanent housing in the longer term.

Temporary villages can have significant impacts on an established town, such as changes to the social structure, changes to the character of the town or placing pressure on existing services, and may not be appropriate or desirable for all communities. Balancing the need to deliver affordable housing quickly with the potential impacts of temporary housing villages is a challenge for the Upper Hunter.

Given the region's proximity to the Lower Hunter (and its supply of labour and housing), fly-in/fly-out or drive-in/drive-out employees are likely to be less common than in other regions of NSW. Nevertheless, it is important that effective planning for temporary housing be undertaken holistically, and in partnership with the relevant affected towns, particularly Muswellbrook and Singleton, to ensure that temporary housing solutions do not undermine the potential for more sustainable, longer term growth.

In recognition of these challenges, the Department of Planning and Infrastructure is preparing planning guidelines for the temporary accommodation of mining employees. These guidelines are aimed at ensuring that such accommodation is appropriately located, designed and managed to maximise social integration and economic benefits and to minimise land use conflicts and amenity impacts.

Rural residential and lifestyle housing

Rural residential and lifestyle housing is a popular housing choice throughout the region. This type of housing normally occurs around urban settlements and, if located appropriately, can contribute to the character, economy and social fabric of communities. If inappropriately located it can create problems such as land use conflict with other rural land uses, loss or alienation of valuable agricultural lands, social isolation for residents, an increase in the cost of providing local services and facilities and adversely impact on the environment. Rural residential and lifestyle housing growth should occur in close proximity to existing centres, towns and villages and is to be consistent with the settlement planning principles identified below with regard to residential lands.

Local character and liveable communities

The local character and overall liveability of the region's towns and villages is often one of the key features that make them so attractive to current and future residents. Maintaining local character and improving liveability is a challenge for all communities in regional NSW. Throughout the Upper Hunter, new development opportunities need to enhance, rather than detract from the distinct local character. Developments that satisfy a short term need but create long term problems by degrading the quality of the environment and overall liveability of a settlement should not be supported.

Settlement planning principles

When planning for housing growth, the following settlement planning principles must be considered:

- Development will contribute to the diversity of housing types available. Any medium or higher density housing should be located in central and accessible locations to ensure access to a full range of services within a reasonable walking distance.
- Development will be located to maximise the efficiency of essential urban infrastructure, services and facilities, including transport, health and education.
- Development will respect and respond to the character of the area and the identified settlement hierarchy of the region.
- New residential areas will be planned with streets that make it easy for people to walk and cycle and with recreational and open space.
- New residential and rural residential areas will respect environmental and cultural heritage and avoid areas most affected by natural hazards or having high cultural significance.
- New residential and rural residential areas should minimise the potential for land use conflict with land needed for valuable economic activities, such as valuable agricultural lands and natural resource lands. This includes avoiding locations where possible adverse impacts associated with industry (such as noise, dust, visual impacts or other amenity impacts) are likely to affect future residents.
- New rural residential areas should be located adjacent to, or in close proximity to, existing urban centres and be within easy access of relevant infrastructure and services.

Policy Response

Objectives

- Ensure an adequate supply of housing to meet community needs.
- Ensure a greater diversity of housing types, including smaller housing types, rental housing and temporary housing.
- Improve the supply and range of affordable housing.
- Build cohesive and liveable communities by ensuring towns and villages are well designed, liveable and provide a range of housing types.

Actions

	Action	Lead Agencies	Timeframe
6.1	Work with Singleton and Muswellbrook councils to identify the nature of change in population growth and demand for housing and to identify sufficient land and other opportunities to facilitate an adequate supply of appropriately located housing to meet identified demand.	Department of Planning and Infrastructure	2012
6.2	Work with Urbangrowth NSW and the housing and development industry to develop models and demonstration projects for the delivery of more housing, and a more diverse range of housing types, focussing on the major towns of Singleton and Muswellbrook.	Department of Planning and Infrastructure Urbangrowth NSW	2013
6.3	Local councils will zone land through their local environmental plans to ensure an adequate supply of land for residential development and to facilitate delivery of a range of housing types.	Councils	Ongoing
6.4	Local councils will ensure that new residential development makes a positive contribution to liveability and character by ensuring residential areas are planned in accordance with the settlement planning principles in this plan.	Councils	Ongoing
6.5	Work with local councils, infrastructure providers and the housing and development industry to establish the Upper Hunter Urban Development Program. This program will monitor the supply of residential land and the delivery of new housing, as well as establishing priorities for the delivery of housing.	Department of Planning and Infrastructure	2013/Ongoing
6.6	Prepare guidelines for temporary workers accommodation for mining projects.	Department of Planning and Infrastructure	2013

Community Health and Amenity

Background

Community health and amenity is a product of the physical and social environments. The impacts of mining on the physical environment are addressed in chapters 3 and 8. Social impacts relating to issues such as housing affordability and social infrastructure provision are addressed in chapters 4 and 6. In addition, this plan aims to improve community welfare by providing greater certainty about where mining and coal seam gas development can occur in the region, thus reducing the potential for land use conflict and associated impacts.

A perceived decrease in human health and wellbeing (physical and psychological) is one of the key impacts from coal mining in the Upper Hunter region²⁰. Air, noise and visual pollution can cause cumulative impacts on communities – each new source of pollution adds to the overall impact on the region. Strategies for managing air, noise and visual pollution must address both individual sources and the cumulative situation. Whilst this chapter focuses on the health and amenity impacts relating to mining, it also addresses such issues where they relate to coal seam gas development.

Air pollution

The impact of air pollution on health and amenity is a major community issue in the region²¹. The main air pollutant from mining is dust, which is caused by vehicle activity, wind erosion from exposed surfaces, stockpiling, drilling, blasting, crushing and screening. From time to time, chemical air pollutants associated with blasting may also be emitted.

Dust affects community amenity because it is visible for a short but intense period, and may also deposit on washing or roofs and be transported from these surfaces to domestic water tanks.

Air pollutants affect community health because they may be toxic and affect the heart and lungs. Exposure to particles smaller than 10 microns (μm) in diameter (PM_{10}) is associated with adverse health effects. This association may be stronger for particles below 2.5 μm diameter ($\text{PM}_{2.5}$). $\text{PM}_{2.5}$ particles are predominately generated by combustion processes and tend to be elevated in colder periods (due to woodheating and cold air layers). There is no safe level of exposure, but the health risk decreases with lower levels of exposure.

Any new coal mine proposal must not cause exceedances of the health-based goals in the National Environment Protection (Ambient Air Quality) Measure (Air NEPM) at large towns such as Singleton and Muswellbrook. Under the Air NEPM, the 24-hour average PM_{10} concentration may not exceed 50 micrograms per cubic metre ($\mu\text{g}/\text{m}^3$) more than five days in a year. This standard is currently under review. NSW Health is preparing a development assessment guideline for the impacts on human health from dust emissions. This guideline will identify maximum thresholds for both incremental and cumulative dust, including at small towns and individual rural residences, and is due for completion by June 2013.

The size of a dust particle largely determines how long it spends in the atmosphere and how far it can travel from its source. In the Hunter Valley, northwest winds are most common in winter and south-easterlies are most common in summer. A mine to the northwest of a population centre would have a greater impact in winter when the prevailing winds transport the dust towards the population centre.

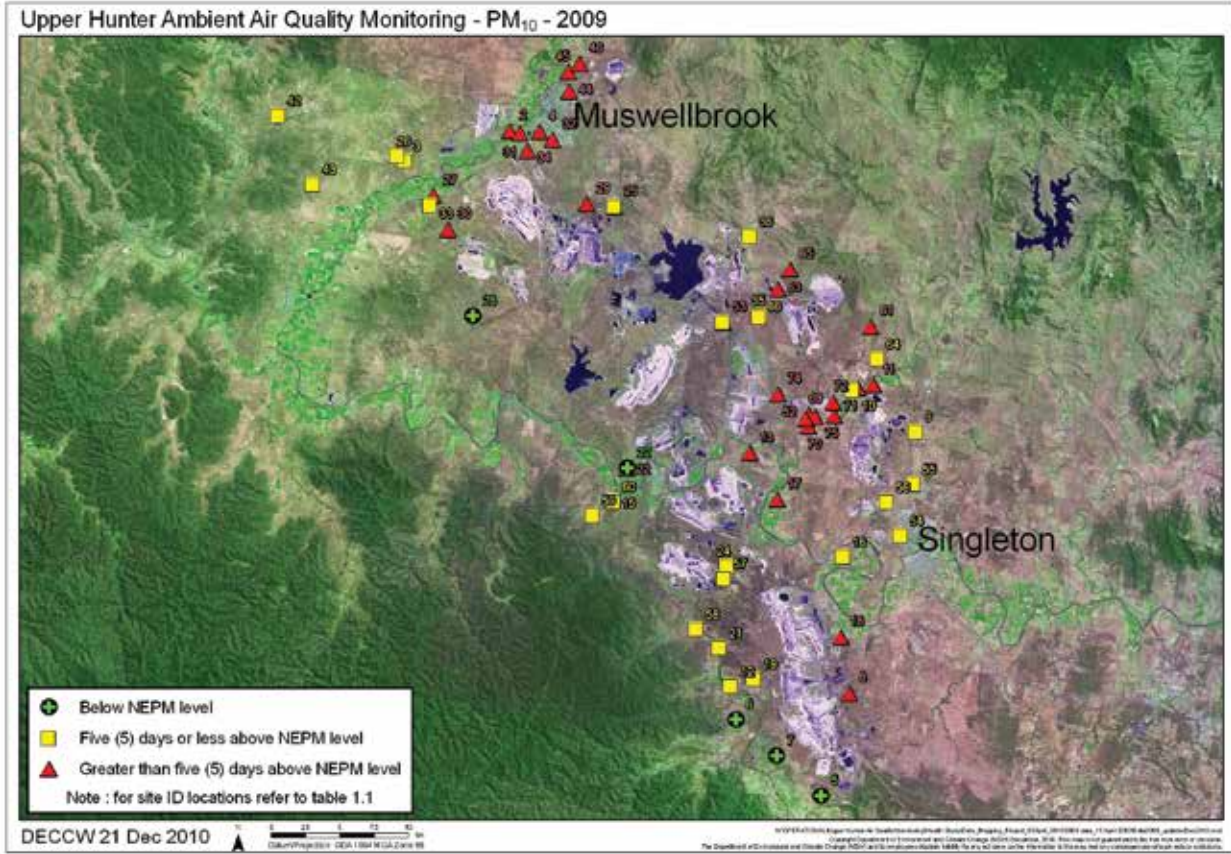


Figure 3 - Upper Hunter ambient air quality monitoring - PM₁₀ - 2009

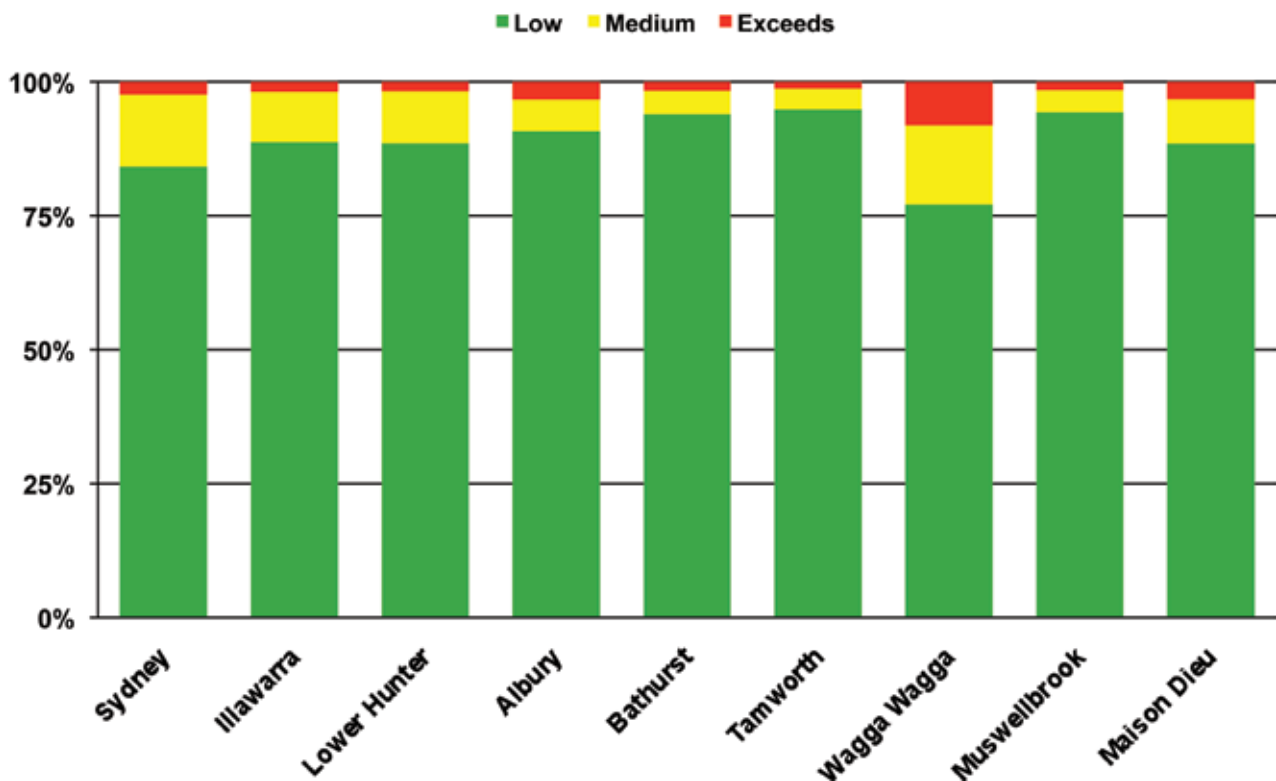


Figure 4 - Category frequency of 24-hour average PM_{10} concentrations in NSW (1994-2009)

'Low' is concentrations up to $33 \mu\text{g}/\text{m}^3$; 'Medium' is between 33 and $50 \mu\text{g}/\text{m}^3$; 'Exceeds' is more than $50 \mu\text{g}/\text{m}^3$

Data from two continuous sites at Singleton (Maison Dieu) and Muswellbrook for the period 2005-09 indicates that PM_{10} levels were above recommended levels for some years, however, in the context of monitoring data from the rest of NSW, these locations performed relatively well (see Figure 4).

The Office of Environment and Heritage completed the establishment of a network of 14 air quality monitoring stations in the Upper Hunter in February 2012. All of the stations will continuously measure PM_{10} , and record wind speed and direction to assist interpretation of the air quality monitoring data and the identification of the major sources of any dust events. The Singleton, Muswellbrook and Camberwell stations will also continuously measure $PM_{2.5}$. The network will:

- provide credible, reliable and real-time information on dust concentrations and trends and present real-time information using an interactive mapping system;
- provide SMS and email updates and alerts; and

- provide long-term information about dust concentrations to inform mine planning and management.

Mining and extractive industries must meet the air quality requirements of the Protection of the Environment Operations Act 1997 which requires that activities are carried out using practicable means necessary to prevent or minimise air pollution. Air pollution can be reduced on the mine site by rehabilitating mined land in a timely manner, reducing haulage vehicle speeds, watering stockpiles and ceasing activity during high winds. The health and amenity impacts of air pollution may be mitigated outside of the mine site by establishing buffer zones or buying properties affected by pollution.

Conditions of development consent for mines in NSW typically require the mine operator to actively monitor and manage air emissions from the mine. These conditions include real time dust monitoring, meteorological forecasting and provision for modifying operations on site to ensure compliance with emission limits. These conditions also include a requirement that mine

operators coordinate air quality management on their site with the air quality management at nearby mines to minimise the cumulative impacts of the mines.

Several mine operators in the Upper Hunter have entered into legally binding pollution reduction programs (PRPs) with the Office of Environment and Heritage. The PRPs require the mine operators to assess their current operations against best management practice and ensure they are taking all reasonable and feasible measures to reduce their particle emissions. The Office of Environment and Heritage's (2011) NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining establishes current international best practice benchmarks and identifies those which could be practicably implemented in NSW at existing and proposed coal mines.

Coal seam gas exploration and production has the potential to generate dust emissions during construction, mainly due to vehicle movements and drilling activities. During production, methane is vented or flared to the atmosphere and some fugitive methane emissions from the wells may occur. The field compressors used to compress the coal seam gas emit oxides of nitrogen and sulphur. Exposure to nitrogen dioxide and sulphur dioxide is associated with adverse health effects. The Air NEPM also sets standards for these air pollutants.

Noise pollution

Mines cause noise pollution by drilling and blasting, operating excavation equipment, handling and loading coal and transporting coal from the site. Low frequency noise pollution may be caused by stationary plant or poorly maintained mobile plant. To minimise noise pollution, the following measures are usually adopted:

- effectively maintaining the plant and equipment (e.g. equipment exhaust systems);
- restricting certain operations when meteorological conditions are not favourable;
- using noise abatement measures, such as construction of mounds or walls; and

- limiting the hours in which various mining operations may take place and setting limits for general operational noise.

Monitoring data from the Office of Environment and Heritage indicates that background noise levels in rural areas of NSW where there is no mining, other industry or road/rail traffic are generally less than 30 decibels (dB(A)). However, background noise levels are significantly higher than this in the Upper Hunter region due to existing mining activities, and are generally around 40dB(A) during the day and around 35dB(A) at night. Acute rail noise also exists in some parts of the rail network serving the coal export terminals at Newcastle.

The conditions of development consent for mines in NSW include noise limits in accordance with the NSW Industrial Noise Policy (INP). The INP applies the lesser of either intrusive criteria (5 dB(A) above the rating background level) or the maximum recommended amenity criteria (such as 40dB(A) at night for rural and suburban areas). Where the rating background level (RBL) is less than 30dB(A), then it is set to 30dB(A). The amenity criteria put an absolute ceiling on noise levels to make sure cumulative noise levels in a region are acceptable. The conditions of consent may also provide for land acquisition if operational noise levels still exceed limits once all other mitigation options have been exhausted.

A review of the INP has commenced, and will include consultation with all key stakeholders. The INP review will consider a wide range of options for addressing noise impacts from emerging mining precincts within rural areas.

In the 12 month period ending June 2012, the Department of Planning and Infrastructure's compliance office in Singleton received 296



complaints (including 185 noise complaints and 48 blast complaints) relating to coal mines in the Upper Hunter region between Bulga and Dartbrook. The department investigated all of the issues raised in complaints. When non-compliances were identified, enforcement action ranged from restrictions on mine operating hours to extensive additional monitoring requirements.

Coal seam gas activities can cause noise impacts during construction of the wells and pipelines, operation of the pumps and compressors and flaring at the well heads and process plant. Construction noise is generally managed by restricting hours of work near occupied dwellings and using low-noise equipment. Pumps and compressors may have acoustic treatments and flares may be shielded.

Visual amenity

Clusters of open cut mines have significantly altered the visual character of parts of the region. Although the New England Highway and the Northwestern rail line are screened from most mine-related visual impacts by topography, some villages and rural residents are exposed to nightlighting and views of the pits and overburdens.

Conditions of consent for new and extended mines impose requirements relating to visual amenity. During operation, the project should be screened from view using both on-site and off-site plantings, and man-made and natural landforms. The overburden should be designed and planted in a naturalistic form and the mine site should be progressively rehabilitated as the active working face moves on²². Nightlighting should conform to the relevant Australian Standards for reducing the impacts of outdoor lighting.

Following mine closure, proper rehabilitation is the key to reducing visual impacts. Rehabilitation at the mine scale is a complex and difficult task. The final landform should be naturalistic and revegetated with local flora. It is important that the community is included in the design of the rehabilitation program so that they have a sense of ownership over the final landform²³. The Department of Mineral Resources' (1999) Synoptic Plan: Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley of NSW aims to ensure that mine rehabilitation in the region is expedited and

conforms to the integrated regional landscape described in the plan. The Department of Planning and Infrastructure proposes to review this plan in conjunction with the development of the Upper Hunter Strategic Biodiversity Assessment (refer to Chapter 8) and in consultation with other government agencies, the NSW Minerals Council and community stakeholders.

Although above ground infrastructure associated with coal seam gas is not currently a significant visual element in the region, the expected growth of the industry means that it must be carefully managed to avoid adverse visual impacts which could arise with the development of surface infrastructure such as well heads, access roads and pipelines. This is a particularly significant issue in those parts of the region where key industries such as viticulture and associated tourism heavily rely on the region's visual qualities.

Water pollution

Mining and petroleum production have the potential to impact upon both water security and safety. Although mining accounts for approximately 1.4 per cent of the state's water consumption, this proportion may increase as mining expands. The risk of contamination of, or damage to, water sources is carefully considered during the development assessment process for each proposal.

In addition, the NSW Government has introduced a ban on the use of BTEX compounds in drilling and hydraulic fracturing and a ban on the use of evaporation ponds to protect groundwater and surface water resources. The Government has also introduced a new regulation requiring water licences where explorers take more than 3 megalitres of water per year from an exploration licence area.

The Aquifer Interference Policy has been introduced Statewide to protect the state's crucial water resources, including impacts associated with mining and CSG activities. The policy outlines how the volumes of water taken as part of an aquifer interference activity will be licensed and accounted for. It also sets out the minimal impact considerations against which the NSW Office of Water will assess proposals to ensure that impacts on groundwater systems are minimised.

Challenges

Increased mining activity increases cumulative impacts

Greater volumes of coal production mean an increase in potential air, noise and water pollution.

This will require increased use of monitoring and mitigation technology and (for dust) potentially greater use of water to manage impacts. As the health and/or amenity limits for air and noise pollution are reached, additional measures will be needed so that air quality and noise levels remain acceptable. Similarly, additional measures will be needed to manage water quality and quantity impacts from ongoing mining activity.

The Government is developing a cumulative impact assessment methodology to address this challenge. The methodology will consider whether cumulative impact thresholds or tipping points for air quality, noise and water can be adequately described, predicted and managed.

There has also been growing community concern about the impacts of blast fumes from open cut mines in the Upper Hunter. Following detailed consultation with the mining industry, the Department of Planning and Infrastructure has now required open cut mine operators in the region to develop new strategies to manage and minimise blast fumes. These strategies are to be prepared by the end of 2012.

Expanded residential and mining activities increase land use conflicts

Continued population growth will drive demand for increased residential development, particularly in the Singleton and Muswellbrook local government areas (see chapters 3 and 6). Even if no further mining were to occur, new homes may be built in areas that are already exposed to air, noise and visual pollution from mines. This risk is greater if the predicted increases in coal production occur.

The expansion of mining may also expose existing homes to air and noise pollution from more sources. More mines will make it more complex to locate the source of the emission.

Climate change may alter emission patterns

Climate change may alter local meteorological trends and lead to changes in air pollutant and noise emission patterns. Chapter 9 describes the climate projections for the region. Higher temperatures may dry out mine surfaces and generate more dust. Prevailing winds, localised winds and temperature inversions may change, which would change the way air and noise pollution are distributed.



Emission standards must remain stringent and relevant

It is important that standards and limits for noise and air pollution remain relevant and appropriate into the future. Additional information about the impact of noise and air pollution on community health and amenity may become available. Community health and amenity expectations may change. Altered emission patterns as a result of climate change may also require a different approach to regulation.

Maintaining visual amenity

The continued expansion of open cut coal mining and the growth of coal seam gas needs to be carefully managed to ensure that the visual impacts on the region are minimised in terms of both scale and duration.

Community consultation must continue to be relevant and appropriate as mining expands

It is important to ensure that communities are well informed about mining and coal seam gas development and their potential environmental impacts and how they will be minimised and managed as these industries expand in the region. The NSW Government guidelines for the establishment and operation of community consultative committees²⁴ must remain relevant and reflect best practice.

Policy Response

Objectives

- Ensure that the growth of the mining and coal seam gas industries does not significantly impact on community health and amenity.

Actions

	Action	Lead Agencies	Timeframe
7.1	Develop a cumulative impact assessment methodology to manage the cumulative health and amenity impacts of mining and coal seam gas proposals. This methodology will consider whether cumulative impact thresholds or tipping points can be adequately described and predicted. It will also address cumulative impacts on agricultural lands and water resources.	Department of Planning and Infrastructure Office of Environment and Heritage Department of Primary Industries	March 2013
7.2	Require all new coal mines and applications seeking to modify existing approvals to benchmark their proposals against best management practice defined in the NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining (2011) and ensure they incorporate all reasonable and feasible measures to reduce their dust emissions. Director-General's Requirements and development assessments will reflect these requirements.	Department of Planning and Infrastructure	Immediate / Ongoing

	Action	Lead Agencies	Timeframe
7.3	Continue to place legally binding pollution reduction programs on all existing coal mines requiring them to assess their current operations against best management practice and ensure they are using all reasonable and feasible measures to reduce their dust emissions.	Environment Protection Authority	Immediate / Ongoing
7.4	Require open cut coal mines to develop strategies to manage and minimise blast fumes.	Department of Planning and Infrastructure	December 2012
7.5	Commence review of the Industrial Noise Policy, including consultation with all key stakeholders, and consider a wide range of options for addressing noise impacts from emerging mining precincts within rural areas.	Environment Protection Authority	2013 (has commenced)
7.6	Review the Synoptic Plan: Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley of NSW (1999) in conjunction with the development of the Upper Hunter Strategic Biodiversity Assessment and in consultation with government agencies, the NSW Minerals Council and community stakeholders to ensure best practice rehabilitation and visual impact management for closed mines.	Department of Planning and Infrastructure	Mid 2014
7.7	Review the <i>Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects (2007)</i> in consultation with government agencies, the NSW Minerals Council and community stakeholders to ensure it remains relevant and reflects best practice.	Department of Planning and Infrastructure	June 2013
7.8	Prepare a development assessment guideline for impacts on human health from dust generated by mining and other activities. The guideline will include maximum thresholds for both incremental and cumulative dust emissions.	NSW Health Department of Planning and Infrastructure Office of Environment and Heritage	June 2013

Chapter Eight

Natural Environment



Background

The Upper Hunter region retains substantial natural heritage with nearly 60 per cent of the area blanketed with native bushland. The region also contains parts of the World Heritage Areas of the Gondwana Rainforest and Greater Blue Mountains.

The region overlaps with eight subregions identified in the Interim Bio-geographic Regions of Australia. The forested sandy plateaux of the Wollemi-Yengo region are located in the south, while to the north, and at a higher elevation, are the moist forests and sub-alpine areas of the Barrington Tops. Further inland are the open woodlands of the Merriwa region.

Because the natural environment in each subregion is different, protecting a representative and adequate proportion of the natural heritage of each subregion is important to ensuring that plants and animals persist in the landscape for future generations. Overall, 19 per cent of the region is within conservation reserves and four of the eight subregions are well conserved. The other four subregions: Valley Floor, Ellerston Tomalla, Gloucester Dungog and Merriwa, have less remnant vegetation and less area in formal reserves.

The Great Eastern Range initiative²⁵, a NSW program to recognise and protect the continental-scale corridor that runs from the Victorian alps to northern Queensland, has identified the Upper Hunter region as an important link that should be maintained as a priority. There are two main

vegetation corridors through the Region: one in the north-south dry forest link (Manobalai Range) and one in the east-west wet forest/rainforest link (Liverpool Range).

The aquatic habitats of the Hunter-Central Rivers region comprise freshwater, estuarine and marine environments. Both rare and common native fish species inhabit the Hunter River and tributaries. Freshwater fish habitat in the Hunter-Central Rivers includes montane swamps, floodplains, wetlands, streams and rivers. These broad habitat types provide niche habitats such as pools and riffles, gravel beds, boulders, snags, aquatic vegetation, riparian vegetation and riparian overhangs and undercuts.

Water quality is an important factor influencing the ability of waterways and aquifers to sustain healthy aquatic ecosystems. Recent State of the Catchment reporting (Department of Environment, Climate Change and Water, 2010) indicates that some key water quality parameters currently exceed guideline values. It is important that effective land use planning in this region is undertaken to prevent further water quality degradation. This is especially important as a variety of aquatic habitats within the region support a range of aquatic species including over 52 finfish species that inhabit freshwater and/or estuarine systems for at least part of their life cycle.

Both Commonwealth and New South Wales legislation makes provision for identifying and recovering threatened species and their habitats. There are more than 50 distinct terrestrial vegetation communities in the region, of which 17 communities are listed as Threatened Ecological Communities (TECs) under the NSW Threatened Species Conservation Act 1995 (TSC Act), with two communities listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), including the State and Nationally listed Grassy Box-Gum Woodlands.

The region is home to 80 NSW threatened and 18 nationally listed threatened animals as well as 58 NSW threatened plant species and 37 nationally listed plant species. The endangered Purple Spotted Gudgeon (*Mogurnda adspersa*) has also been recorded in the mid-Hunter catchment north of Singleton (listed under the NSW Fisheries Management Act 1994 (FM Act)). The northern distribution of the endangered Adams Emerald Dragonfly (*Archaeophya adamsi*), listed under the FM Act, potentially occurs within waterways of the Central Coast and southern Hunter subregions.

Challenges

The natural environment in the region is under ongoing pressure from development including an increase in mining and coal seam gas development. Between Singleton and Muswellbrook there is approximately 150,000 hectares of intensive coal mining with a ratio of open-cut to underground mining of 3:2.

Open-cut coal mining requires extensive removal and alteration to both terrestrial and aquatic ecosystems and large-scale excavation, with a surface area of between four and 15 hectares impacted per million tonnes extracted as a result of open-cut coal mining. This causes dramatic changes to the topography and ecology of these sites.

Approximately 13 threatened ecological communities listed under NSW legislation are known to occur in mining areas and as such are likely to be impacted. There are also two communities which are “Matters of National Environmental Significance” under the EPBC Act which are likely to be impacted by mining operations: Grassy White Box Woodlands and the Hunter Valley Weeping Myall Woodland.

Aquatic biodiversity is also impacted by mining and coal seam gas extraction because of the potential of these activities to directly impact key fish habitats (e.g. rivers and wetlands), water quality in aquifers and surface water resources through their operations and the treatment and disposal of waste water. Effective land use planning for future mining development is required to prevent a return of elevated salinity in the Hunter River catchment and to prevent further elevation of salinity elsewhere.

Further, the development of supporting infrastructure lines across the landscape adds to the fragmentation of habitats affecting landscape connectivity, altering fauna movement, isolating populations and altering connectivity of waterways.

Post-mining rehabilitation has the potential to contribute to biodiversity conservation in the longer term. Although outcomes from rehabilitation are uncertain, the location and design of rehabilitation can be used to maximise its landscape value in the future. Effective planning is required to design a post-mining landscape that will allow a number of different land uses including conservation.

Key regional challenges include:

- Identifying and protecting strategic regional conservation priorities and maximising the retention of areas of high-value terrestrial and aquatic biodiversity;
- Developing and applying appropriate measures to control, mitigate and regulate the impacts of mining activities (including cumulative impacts) on the environment; and
- Identifying opportunities to preserve and, where possible, reconnect both terrestrial and aquatic habitats and corridors.

Policy Response

Protecting biodiversity through strategic regional land use planning

The NSW Government supports a three stage approach to assessing development impacts on the natural environment:

- avoiding impacts on areas that possess high natural environmental values;
- mitigating where impacts to the natural environment cannot be avoided; and
- offsetting unavoidable impacts on high value terrestrial habitats and appropriate offsetting or compensation for impacted aquatic habitats.

Legislation

In NSW, the conservation of threatened species, populations and ecological communities is covered by the Threatened Species Conservation Act 1995, which focuses on the conservation of biodiversity (excluding fish and marine vegetation), and the NSW Fisheries Management Act 1994, which establishes provisions for the identification, conservation and recovery of threatened fish, aquatic invertebrates and marine vegetation. Both Acts cover the identification and management of key threatening processes which affect threatened species or could cause other species to become threatened.

Across Australia, "Matters of National Environmental Significance" are protected under the Environment Protection and Biodiversity Conservation Act 1999.

Conservation priorities in the Upper Hunter

A number of conservation planning products can assist proponents, communities and decision makers in state significant development assessments.

The NSW Government is committed to protecting and restoring priority land, vegetation and water habitats. This encourages investment in native vegetation management to be directed to where it will contribute the highest benefit to terrestrial biodiversity by improving the condition, extent and connectivity of vegetation formations at a State scale.

The key ecological concepts that are considered when assessing priority lands are:

- ensuring that State and National protected species and ecological communities are addressed;
- the degree to which habitats have been depleted in the past for terrestrial biodiversity; and
- the current viability of what remains for the long-term protection of both terrestrial and aquatic biodiversity.

The NSW Office of Environment and Heritage, NSW Department of Planning and Infrastructure and the Commonwealth Department of Sustainability, Environment, Water, Population and Communities are currently undertaking a Strategic Assessment under the EPBC Act of proposed new coal mines and mine expansions in the Upper Hunter Valley covering an area of approximately 30,000 ha in the local government areas of Upper

Hunter, Muswellbrook and Singleton. The aims of this work are to:

- Resolve Commonwealth and State threatened species/biodiversity issues in one, upfront process;
- Consider the impacts of all mines together and in a regional context;
- Consider how rehabilitation can contribute to biodiversity conservation in a regional context;
- Improve the process of finding and securing offsets; and
- Target offsetting to deliver regional conservation gains.

The strategic assessment is a single assessment based on the Biodiversity Certification Assessment Methodology that satisfies both Commonwealth and state legislation (excluding species and communities as listed under the Fisheries Management Act, 1994). It requires undertaking a detailed upfront assessment of likely impacts and the development of a co-ordinated offsetting and rehabilitation strategy among the coal mining companies involved.

Environmental offsets are a regular component of development approvals where impacts cannot be avoided or mitigated. Priority offsets will be identified in the development of the strategic assessment and will be used to guide developers and agencies in identifying preferred areas for investments in terrestrial biodiversity offsets through the assessment process.

The strategic assessment will be completed in 2014.

Whilst it is possible for biodiversity offsets to be provided on, and coexist with, strategic agricultural land, the agricultural value of potential offset sites, including the areas of overlap, should be assessed in detail in the identification of an appropriate biodiversity offset. Offsets may require negotiated agreements with individual landholders, and these agreements can support continued agricultural production on the land in many instances. Land set aside for biodiversity offsets should not result in the significant loss or destruction of agricultural resources or industries.

Offsets database

The Department of Planning and Infrastructure is currently developing a statewide offsets database to identify terrestrial biodiversity offsets associated with major project approvals. This mapping process will be used to inform future assessments so that these areas are not compromised by further development. It will include a spatial database to identify what biodiversity values are being offset.

Aquatic habitat compensation provisions

Before aquatic biodiversity offsets are considered, impacts must first be avoided and unavoidable impacts minimised through mitigation measures.

Only then should offsets be considered for the remaining impacts. If impacts can not be avoided, and unavoidable impacts minimised through mitigation measures, then offsets and/or compensation measures will be considered for the impact or loss of key fish habitats. Measures may include re-establishing habitat that has been removed or otherwise damaged, re-instating fish passage along waterways (removing barriers or building fishways or fish friendly waterway crossings) and improving water quality, amongst other options. Rehabilitation of degraded key fish habitat is recommended over fish habitat creation as it is very difficult to replicate aquatic ecological functions in a created habitat environment. Offset and compensation options for key fish habitats must meet the “no net loss” test (minimum 2:1 habitat replacement) and will need to be negotiated on a case by case basis with Department of Primary Industries (Fisheries NSW) as part of the environmental impact assessment process.

Objective

- Ensure that ongoing development in the region does not compromise high value terrestrial and aquatic biodiversity.

Actions

	Action	Lead Agencies	Timeframe
8.1	Develop, in consultation with the Commonwealth Department of Sustainability, Environment, Water, Population and Communities, the Upper Hunter Strategic Biodiversity Assessment to create a streamlined and ecologically effective approach to offsetting the impact of mining projects in the Upper Hunter.	Office of Environment and Heritage Department of Planning and Infrastructure Department of Primary Industries Commonwealth Department of Sustainability, Environment, Water, Population and Communities	Mid 2014
8.2	Compile a biodiversity offsets database of lands currently held in conservation as a result of development consents.	Department of Planning and Infrastructure	December 2012/ongoing

Natural Hazards and Climate Change

Background

Natural hazards have the potential to affect local and regional economies, future development, public safety, private property, infrastructure integrity and the insurance sector in the Upper Hunter region. For example, severe storms are estimated to have cost the broader Hunter region in excess of \$1.4 billion dollars over the past decade. In addition to severe storms, the primary natural hazards are flooding and bushfires.

Policies addressing many of the issues relating to natural hazards and climate change already exist. Each local council has a disaster management plan (Displan) and drought management plan. There are still some gaps in hazard planning at the local level such as areas where flood studies still need to be prepared or where recommendations from flood studies are to be implemented.

Greenhouse gas emissions in the Upper Hunter are higher than the NSW average. Coal mining and coal fired power stations are the primary sources of emissions in the region, emitting 25 per cent and 70 per cent of reported emissions respectively. Coal mine emissions primarily relate to methane that is inadvertently released or actively vented to the atmosphere during the course of coal mining:

These emissions can be captured and used for energy. Wind, solar, waste coal mine methane and geothermal resources provide opportunities for clean energy. The region has significant wind resources (particularly in the north) and moderate solar resources (see Figures 5 and 6). Geothermal resources have also been identified, with the Federal Government's Geothermal Drilling Program awarding a \$7 million grant in 2009 for a proof-of-concept project near Bulga. This resource may have the potential to support a

200 megawatt (MW) plant. Such initiatives have the potential to contribute to the 20% renewable energy target in NSW 2020.

Capturing waste coal mine methane and making energy from it reduces greenhouse gas emissions from coal mines and reduces demand for coal fired electricity. For example, coal mines in the Singleton LGA release approximately 380,000 tonnes of methane each year (8 million tonnes of CO₂ equivalent) as an incidental waste product from coal mining. This methane has an energy content of 20 petajoules, or enough to satisfy 18 per cent of the current annual electricity consumption of NSW. Opportunities should be explored for using waste coal mine methane to provide low emissions and potentially low cost energy for regional development. In mid 2010 a small gas-fired plant, generating electricity from waste coal mine methane in the Bulga area was approved. The plant is now under construction.

There is a significant amount of carbon in the vegetation and soils of the region, particularly in the Barrington Tops National Park. There are also opportunities for building the stores of carbon in vegetation and soils (biosequestration). Biosequestration has the unique ability to both mitigate and build resilience to climate change. Other benefits include biodiversity conservation, water quality maintenance, native vegetation restoration, salinity mitigation, soil health and erosion control. Increased biosequestration may also boost production of renewable products such as timber and biofuels that can replace more energy intensive, non-renewable products.

Upper Hunter councils have started regional climate change adaptation planning and in November 2010 prepared a Climate Change Adaptation Plan in partnership with the five

Lower Hunter councils, as well as Great Lakes and Greater Taree councils. This provides a good starting point for local and regional action on climate change. As more localised information becomes available it should be incorporated into the plan.

Challenges

Residential and commercial development in a number of towns and villages in the region is already constrained by flooding. Singleton is subject to flooding from the Hunter River and future development is severely constrained. A number of the towns and villages in Dungog LGA have limited opportunities for future expansion because they are directly affected by flooding of the Paterson and Williams rivers or impacted by road closures caused by flooding. Development around Gloucester and Muswellbrook is also constrained by flooding.

The existing residential areas in the region are relatively isolated from bushfire prone land, although this will impact upon the location of future residential areas and other rural development. Smoke from bushfires is also an important residential amenity issue. Councils should continue to implement existing policy frameworks to assess flooding and bushfire risks in relation to future development and avoid areas of high risk.

The region faces important climate change challenges, namely mitigating the impacts by reducing greenhouse gas emissions and adapting to the impacts such as the increasing intensity and frequency of storms, floods and bushfires.

The challenges for reducing greenhouse gas emissions will be:

- finding cost-effective ways to capture waste coal mine methane, particularly given the expected expansion of the sector (see Figure 7);
- ensuring compatible land uses in areas with good renewable energy resources (particularly wind and solar);
- protecting high value terrestrial carbon; and
- ensuring that opportunities for high value carbon forestry and ecological restoration are identified and integrated into local and regional planning.

The climate projections for the region are described in the NSW Climate Impact Profile and the Impacts of Climate Change on Natural Hazards Profile - Hunter Region. These documents provide information about the likely change in climate by 2050, the physical consequences of these changes and the impacts on land, settlements and ecosystems. In summary the projections include:

- increased average daily temperatures in all seasons;
- increased rainfall in all seasons except winter;
- increased flood frequency;
- increased summer storm intensity;
- more summer runoff;
- increased evaporation;
- more severe short-term droughts; and
- more frequent fires towards 2050.

The existing natural hazards could therefore further constrain development and put additional pressure on infrastructure such as stormwater systems, roads, rail, electricity transmission and water supply.

Climate change is also expected to have biodiversity impacts. For example, many native species are at the limit of their distribution and are therefore at risk of being lost in the region. Land modification will also restrict the ability of lowland ecosystems to expand upward. Consequently, future development will influence the severity and extent of climate impacts on these ecosystems.

The three main regional industries - agriculture, mining and tourism - are particularly sensitive to climate change risks. Agriculture could face multiple impacts from flooding, more severe short-term droughts and changes to temperature and rainfall. More frequent and severe flooding could also directly impact on mine operations and infrastructure including access to port facilities located outside the region. Tourism is also susceptible to severe weather events and disruptions to local and regional infrastructure.

Climate change will have community impacts. The region is home to a large community of older people whose numbers are expected to increase.

This group is particularly susceptible to the effects of heatwaves. The potential impact from changing natural hazards should be assessed for sensitive land uses (such as aged care facilities) that are vulnerable to emergency response. Impacts on essential infrastructure and its ability to serve the local community and fulfil any necessary emergency response or recovery functions should also be carefully considered.

Communities that grow rapidly due to changing land use, such as the rapid expansion of mining, can result in lower overall community knowledge of natural hazards and how to respond in times of emergency. Updating disaster plans and increasing community awareness and preparedness is important in addressing this issue.

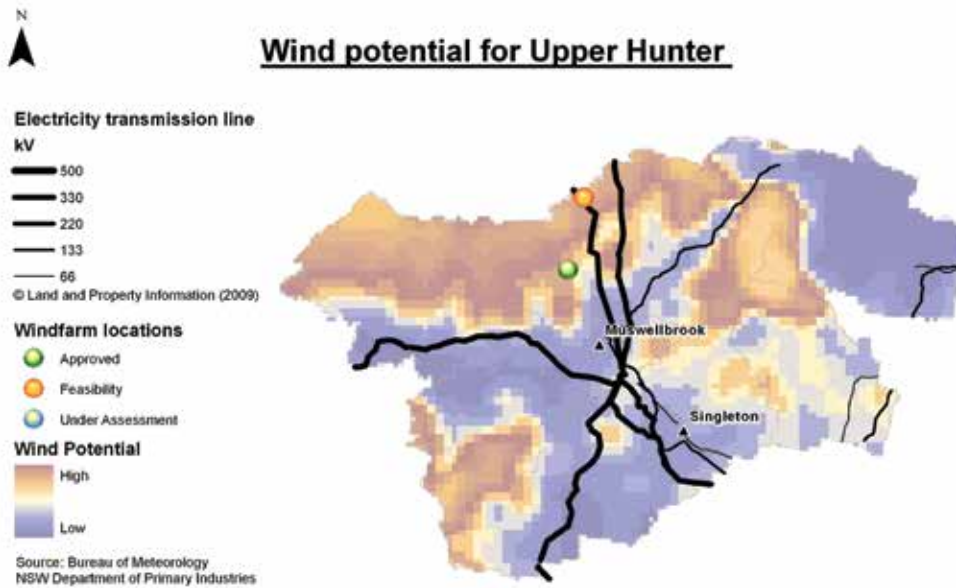


Figure 5 - Wind energy resources - Upper Hunter region

Source: NSW Office of Environment and Heritage

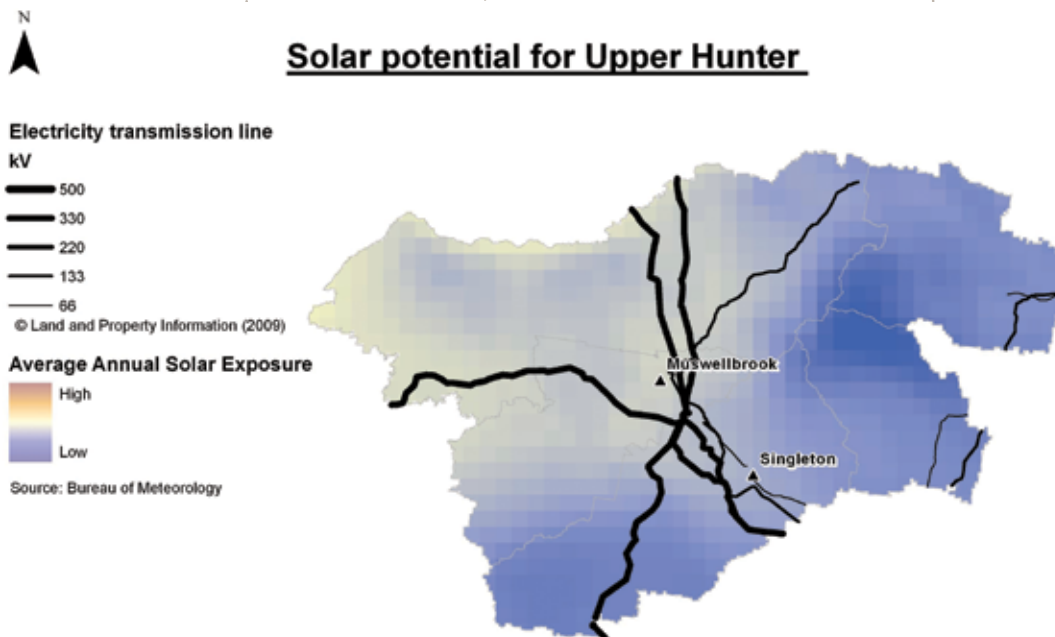


Figure 6 - Solar energy resources - Upper Hunter region

Source: NSW Office of Environment and Heritage

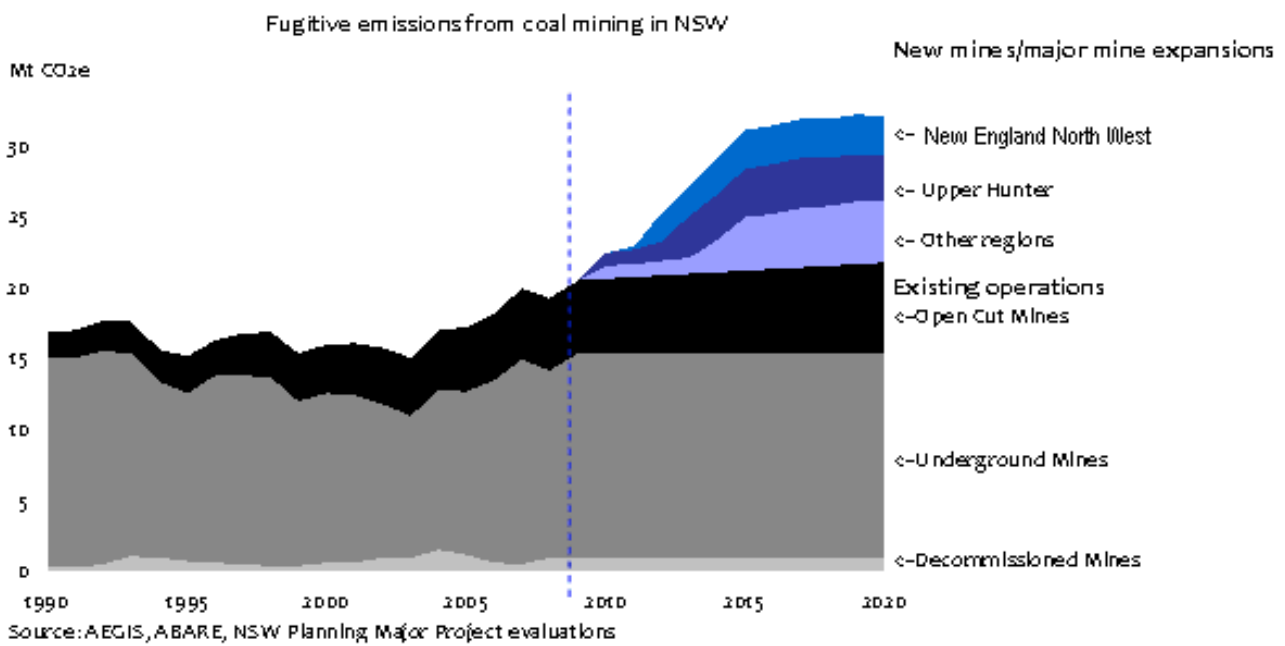


Figure 7 - Fugitive emissions from coal mining in NSW
 Source: Australian Greenhouse Emissions Information System (AGEIS), Australian Bureau of Agricultural and Resource Economics (ABARE), NSW Department of Planning and Infrastructure

Policy Response

Objective

- Minimise the impacts and risks of natural hazards and climate change through effective land use planning and the adoption of new technologies.

Actions

	Action	Lead Agencies	Timeframe
9.1	Ensure that local environmental plans zone areas subject to natural hazards appropriately to reflect the risks associated with the hazard and the limitations of the land.	Councils	Ongoing
9.2	Work with local councils and industry to develop opportunities to use waste coal mine methane to provide low emissions and potentially low cost energy for regional development.	Office of Environment and Heritage Environment Protection Authority	Ongoing
9.3	Work with local councils to identify significant renewable energy resources within local government areas and ensure compatible land uses.	Office of Environment and Heritage	Ongoing

Cultural Heritage

Background

Cultural heritage consists of places, objects and landscapes that connect us to the past that we value today and wish to pass onto the next generation. These places, objects and landscapes give us a sense of the past and form part of our cultural identity. Cultural heritage provides links between the past and present – it is an essential part of people’s cultural identity, wellbeing, connection and sense of belonging, and provides a sense of history and local and regional visual character.

As the Upper Hunter region is rich in both Aboriginal and historic cultural heritage, urban, regional and mining growth has the potential to further impact on known and yet to be identified cultural heritage.

Aboriginal cultural heritage

The Wonnarua (Wonnarauh) and Worimi nations occupy a large part of the region with the Gamilaroy and Wiradjuri lands to the west and the Biripi to the north. At the time of the 2006 Census, the Aboriginal population of the Upper Hunter was 2,059 people or 3.6 per cent of the region’s total population.

Government owned or controlled land tenure across this region amounts to approximately 30 per cent which is accessible to Aboriginal people to undertake cultural or educational activities. Therefore Aboriginal people in the region are predominantly reliant on partnership arrangements with public authorities for access to land, such as the Memorandum of Understanding (MoU) which exists between the Minister for Environment and the Central Coast Hunter Range Regional Aboriginal Joint Management Committee. The purpose of the MoU is to support Aboriginal people in determining how cultural activities are pursued and to participate in land

management decision making on reserved lands. In addition, Indigenous Land Use Agreements (ILUA) may be negotiated between native title groups and other parties (such as governments, pastoralists and utility companies) to set the terms of use and management for the area.

Over the last 30 years, cultural heritage studies have identified over 7,000 sites (objects) within the region which are registered under the National Parks and Wildlife Act 1974 (NPW Act). The Aboriginal site features located on these sites are dominated by stone artefact scatters but also include rock art sites, carved and scarred trees, grinding grooves, stone arrangements, burials and stone and ochre quarries. A small number of locations are documented as ceremonial/mythological places and resource and gathering sites.

Mount MacKenzie, an Aboriginal massacre site, is currently the only Aboriginal Place (declared under the NPW Act) within the region. Appletree is the only formally identified Aboriginal area protected under the NPW Act, and is located within the Wollemi National Park.

Historic cultural heritage

The Hunter Valley was one of the first large stretches of suitable pastoral land found early in the colony’s history. The opening of the Upper Hunter began at Patricks Plains where early residents grazed stock and grew wheat and maize. In the 1820s European settlement intensified as free settlement was quickly taken up and land was cleared.

European activities were undertaken extensively across the region and as such heritage items are located across the entire region, not just in the principal towns and village centres. A range of historic heritage landscapes exist

across the region ranging from extensive early pastoral holdings and agriculture and farming activities, to the development of public and private infrastructure and mining and extractive industries. Cultural heritage landscapes associated with past mining activities include the mines themselves, processing equipment, associated buildings and infrastructure and domestic dwellings including archaeological sites, spread over an extensive area.

Currently, 36 sites are listed on the State Heritage Register (under the NSW Heritage Act 1977) and represent major classes of heritage types in the study area - early colonial landscapes (encompassing landholdings and homestead complexes), government infrastructure (such as timber bridges and railway stations), grand municipal buildings and remnant native landscapes. However, for a range of 19th century homestead complexes within the region, there is a lack of detailed knowledge of their heritage values, historical associations, layout and condition.

Challenges

- The current identification and protection of both Aboriginal and historic cultural heritage within the region is not comprehensive, being reliant on statutory listings, baseline local and regional heritage studies, and other incomplete data sets.
- Identifying, recording, assessing and protecting cultural heritage throughout the region. It is acknowledged that a greater level of baseline information regarding cultural heritage will greatly assist in the planning and development decision making process.
- Facilitating access to areas that are important to Aboriginal people so they can use those places to undertake cultural or educational activities.
- Establishing a balance between development pressures, including the growth of the coal and coal seam gas industries in the Region, the consideration of cumulative impacts and the need to conserve significant cultural heritage.

Policy Response

Assessment Process

During the state significant assessment processes, cultural heritage is assessed in accordance with the following guiding principles:

- Impacts to cultural heritage, particularly significant cultural heritage should be avoided as a first priority. If impacts can be avoided then mitigation and management may not be required.
- Where impacts cannot be avoided, they must be appropriately mitigated and managed.
- Cumulative impacts/loss and intergenerational equity should be considered.
- Risks, consequences, costs and benefits of proposed actions should be considered.

Aboriginal cultural heritage

The Department of Planning and Infrastructure is currently developing, in consultation with the Office of Environment and Heritage (OEH), guidelines for state significant projects to ensure the early and thorough consideration of Aboriginal cultural heritage in the development assessment process. These guidelines will highlight the importance of undertaking an appropriate level of assessment and consulting with Aboriginal people in determining the significance of cultural heritage, including the significance of proposed impacts.





These guidelines can be complemented with the range of resources and policies OEH has already developed to support their heritage statutory functions, which encourage early consultation with Aboriginal people in planning processes to ensure their cultural values and concerns are taken fully into account in decisions to conserve, avoid or mitigate when avoidance is not possible.

OEH has commenced landform mapping and a desktop assessment of the region, which will build on the Aboriginal Cultural Heritage Regional Assessment undertaken in 2002 for the Brigalow State Forest. This regional assessment is aimed at providing a baseline of information that supports sustainable economic and environmental planning decisions. The new stage of the regional assessment is to understand how Aboriginal sites are linked to various parts of the landscape within this region.

The outputs from this stage of this regional assessment will include:

- landform mapping at a scale appropriate for cultural heritage purposes;
- identification of information gaps for the region;
- uniform and consistent landscape information for the region; and
- descriptive evidence based data-sets that highlight the relationships between Aboriginal cultural heritage and landform categories within the region.

OEH intends to use the results of the regional assessment as the basis of an investigation with Aboriginal people to incorporate the historical and contemporary values of Aboriginal culture and heritage in the region. The Aboriginal Sites Decision Support Tool (ASDST) which was recently developed by OEH and derived from known Aboriginal sites recorded in the Aboriginal Heritage Information Management System and related landscape features such as vegetation and geology will be used to input to and complement regional assessments. The ASDST assists in the identification and measurement of cumulative impacts on all Aboriginal site features across the landscape. It is ideally suited to identifying cumulative impacts through space and time on a regional scale. The outputs of these assessments and ASDST can provide macro and micro level heritage information to assist proponents in planning developments and consent authorities in determination decisions regarding conservation planning, environmental impact assessments and associated processes arising from this strategic regional land use plan.

The Department of Planning and Infrastructure is currently compiling a statewide database of lands currently identified for Aboriginal cultural heritage conservation as a result of previous development consents. This database will be used to inform future assessments and ensure that these areas are not compromised by further development.

Historic cultural heritage

OEH is currently preparing a regional heritage study of 19th century homesteads in the Hunter region to identify homesteads and landscapes of significance and their condition. This study will be used to inform the environmental impact assessment processes.

Objectives

- Protect and conserve significant cultural heritage now and for future generations (beyond the 20 year life of this plan), through managing the ongoing impacts from development, including local and regional development and mining activities.

Actions

	Action	Lead Agencies	Timeframe
10.1	Prepare Aboriginal cultural heritage assessment guidelines for state significant projects to ensure early and thorough consideration of Aboriginal cultural heritage in the assessment process.	Department of Planning and Infrastructure Office of Environment and Heritage	December 2012
10.2	Compile a database of lands currently identified for cultural heritage conservation as a result of development consents, established heritage studies, ongoing assessment and statutory heritage registers. The database will be used to inform future assessments and ensure that these areas are not compromised by further development.	Department of Planning and Infrastructure Office of Environment and Heritage	March 2013 / ongoing
10.3	Prepare a regional heritage study of 19th century homesteads in the Hunter region to identify homesteads and landscapes of significance and their condition to inform Environmental Impact Assessment processes.	Heritage Council of NSW Office of Environment and Heritage	December 2012
10.4	Complete the Aboriginal heritage thematic program to identify and list items of state heritage significance not currently on the state heritage register.	Office of Environment and Heritage	2014
10.5	Continue and complete landform mapping and a desktop assessment of the region to understand how Aboriginal sites, objects and places are linked to various parts of the landscape. It will be used as the basis for ongoing engagement and investigation with Aboriginal people about those values in regional planning and environmental impact assessment processes.	Heritage Council of NSW Office of Environment and Heritage	March 2013



Implementation

The sustainable management of land uses in the Upper Hunter region, and in particular the balancing of agricultural and mining activities, is complex. A successful implementation program will therefore require a suite of approaches to ensure that the various outcomes from this plan are delivered.

The Gateway Process

The key policy response for resolving land use conflict between mining and coal seam gas proposals and strategic agricultural land is the proposed Gateway process.

Under the Gateway process, a development application (DA) for State significant mining and coal seam gas development that requires a new or extended mining lease cannot be lodged and considered unless:

- the proposed development has been issued a gateway certificate or
- the land has been verified as not containing strategic agricultural land.

The criteria for State significant mining and coal seam gas proposals are listed under clauses 5 and 6 of Schedule 1 of State Environmental Planning Policy (State and Regional Development) 2011.

The Gateway process applies to State significant mining and coal seam gas proposals that extend beyond an existing mining lease or petroleum production lease area and are located on strategic agricultural land. The process applies to both greenfield proposals (new standalone projects) and brownfield projects that involve an extension beyond the existing mining or petroleum production lease area. The application of the Gateway process is illustrated in Figure 8.

The Gateway assessment will be undertaken by an independent Mining and Coal Seam Gas Gateway Panel, comprised of experts in fields such as agricultural science, water and mining. The Gateway process provides for a focused, scientific assessment of the impacts of a proposal on agricultural land and water resources. This will require a consideration of whether the proposal meets certain criteria, such as those listed in Table 2. These criteria will be further developed and will form part of the amendment of the Mining SEPP which will give legal force to the Gateway.

Application of the Gateway	
<p>Gateway will apply to:</p> <p>Greenfield mines</p> <p>New stand alone mines or GSG projects or project extensions beyond existing lease area (advisory only at DA stage if DGRs already issued)</p>	
<p>Gateway will apply to:</p> <p>Brownfield mine expansion beyond lease area</p> <p>Expansions of an existing mine or CSG project partially within and partially outside of the existing lease area (advisory only at DA stage if DGRs already issued)</p>	
<p>Gateway will NOT apply to:</p> <p>Brownfield mine expansion within lease area</p> <p>Expansions of an existing mine or CSG project within existing lease area (with such proposals still subject to the usual environmental assessment process under the Planning Act, including the requirement for an Agricultural Impact Statement and comprehensive assessment against the provisions of the Aquifer Interference Policy).</p>	
<p>Key:</p> <p> Existing Project Project Extension or New Project Existing Lease Area</p>	

Figure 8 - Application of the gateway process to greenfield and brownfield proposals

Having considered the Gateway certificate application against the criteria shown over the page, the panel will then either issue:

- an unconditional certificate, where the panel considers that the proposal meets the Gateway criteria, or
- a certificate subject to conditions, where the panel considers that the proposal has not demonstrated that it meets some or all of the Gateway criteria. The conditions of the certificate will comprise stringent requirements that must be addressed by the applicant in its DA and by the Planning Assessment Commission in its determination of the DA.

Figure 9 illustrates the proposed gateway process.

Through an early and targeted assessment of agricultural and water impacts, the Gateway will ensure that by the time a proposal reaches the DA stage, these impacts have been clearly identified and comprehensively addressed.

The Commonwealth Government has introduced measures aimed at strengthening regulation of coal seam gas and coal mining, including the establishment of an Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC). The IESC's advice is a key input at the gateway stage. Specifically, the IESC's advice will be considered by both the Minister for Primary Industries in providing advice to the gateway panel and by the gateway panel itself.

Value	Criteria
Biophysical Strategic Agricultural Land	<p>Whether the proposal would significantly reduce the agricultural productivity of the land based on a consideration of:</p> <ul style="list-style-type: none"> (a) Impacts on the land through surface area disturbance and subsidence; (b) Impacts on: <ul style="list-style-type: none"> (i) soil fertility (ii) rooting depth, or (iii) soil profile materials and thicknesses; (c) Increases in land surface microrelief or soil salinity, or significant changes to soil pH, and (d) Impacts on Highly Productive Groundwater, including the provisions of the Aquifer Interference Policy and the advice of the Minister for Primary Industries (note that the Minister for Primary Industries must take into account the advice of the Commonwealth Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development in providing advice at this stage).
Critical Industry Cluster	<p>Whether the proposal would lead to significant impacts on the critical industry cluster through:</p> <ul style="list-style-type: none"> (a) surface area disturbance, (b) subsidence, (c) reduced access to agricultural resources, (d) reduced access to support services and infrastructure, (e) reduced access to transport routes, or (f) loss of scenic and landscape values.
Consultation	Any advice on water impacts received from the Commonwealth Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development.

Table 2 - Indicative Gateway criteria

Independent Expert Scientific Committee

The Commonwealth Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC) will provide advice at the gateway stage to both the Minister for Primary Industries and the Mining and Coal Seam Gas Gateway Panel.

In addition, the IESC is preparing Bioregional Assessments in areas where coal seam gas and/or large coal mining development are underway or planned. These assessments will undertake a scientific analysis of the ecology, hydrology and geology of an area for the purpose of assessing the potential risks to water resources in the area as a result of the direct and indirect impacts of coal seam gas development or large coal mining development. One of the initial regions announced for Bioregional Assessment is the Gloucester Basin, part of which lies within the Upper Hunter Strategic Regional Land Use Plan boundary. Any outcomes from this assessment will inform, as relevant, the assessment of mining and coal seam gas proposals at both the Gateway and DA stages, as well as future reviews of the Strategic Regional Land Use Plans.

Strategic Agricultural Land Verification Processes

Due to the regional scale of the strategic agricultural land maps in this plan, it is important that appropriate processes are in place to provide for site-specific verification that particular sites do in fact meet the strategic agricultural land criteria.

It is proposed that the verification process for biophysical strategic agricultural land includes:

- If the site is mapped as biophysical strategic agricultural land, an applicant for a State significant mining or coal seam gas proposal can either accept that the land is strategic agricultural land or may choose to verify whether or not the land meets the criteria for biophysical strategic agricultural land. If a proposal is verified as meeting the criteria, then it will be subject to the Gateway process. If it is not, the proposal can proceed directly to the DA stage.
- If the site is not mapped as biophysical strategic agricultural land, an applicant for a State significant mining or coal seam gas proposal must verify whether or not the land meets the criteria for biophysical strategic agricultural land. If it does, then the proposal will be subject to the Gateway process. If it does not, the proposal can proceed directly to the DA stage.
- Landholders can also apply for a site verification certificate to verify whether or not their property contains biophysical strategic agricultural land. If it does, the land will be verified as biophysical strategic agricultural land.

In relation to critical industry clusters (CICs), the government is undertaking a regional-scale verification process for the mapped areas of the Upper Hunter region. This will involve field work and extensive consultation with landowners and industry groups to develop a database of existing equine and viticulture land uses and revised CIC maps. This is to ensure that the areas mapped as CICs do in fact meet the criteria on the ground.

As an interim measure, the CIC maps in this plan will operate as a gateway trigger, with applicants for a State significant mining or coal seam gas proposal in these mapped areas either accepting that their proposal is located on strategic agricultural land or having the option of seeking verification of whether the land meets the relevant CIC criteria. Proposals on land verified as meeting the criteria will be subject to the gateway, while those that are not can proceed to the DA stage.

The gateway and site verification processes, as well as the maps of strategic agricultural land, will be given statutory force through an amendment to State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

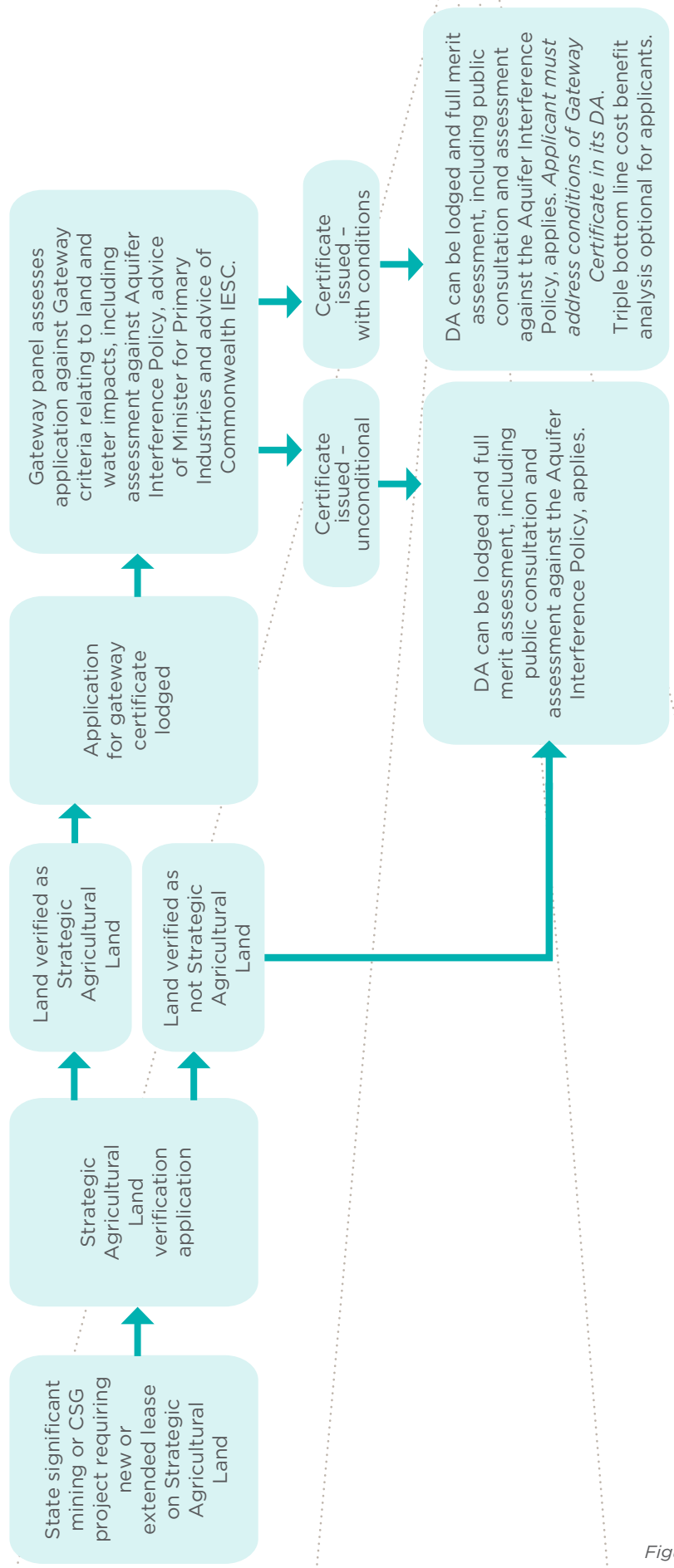


Figure 9 - Proposed Gateway Process

Strategic Planning

This plan provides a clear land use framework for the region, providing a context for whole of government decision making around investment priorities, servicing strategies, consolidating strategic centres and local environmental plan making.

This plan will also inform the development of the Hunter Regional Action Plan under the Government's NSW 2021 plan and Councils' integrated planning and reporting frameworks. There are opportunities for issues discussed in this plan, such as the availability of a skilled regional workforce, housing affordability and infrastructure requirements to be considered in these and other government policies and processes.

New and Revised Policies

Mapping and data

Strategic agricultural land has been mapped within this plan to indicate agricultural land that, due to its unique values and/or location, is considered to have a higher level of sensitivity to the impacts of mining and coal seam gas development. The strategic agricultural land mapping will continue to be reviewed and refined, through the biophysical strategic agricultural land and regional critical industry cluster verification processes outlined above.

The Office of Environment and Heritage will also complete landform mapping for the region to better understand how Aboriginal sites are linked to various parts of the landscape. An update of historic cultural heritage, with a focus on 19th century homesteads, will also be undertaken.

The Department of Planning and Infrastructure is completing a regional offsets database to identify biodiversity offsets and Aboriginal heritage conservation areas associated with major project, state significant development and state significant infrastructure approvals. This mapping process will be used to inform future assessments.

The NSW Government is also currently working with the Commonwealth Government to develop the Upper Hunter Strategic Biodiversity Assessment which will provide a long-term strategic approach to the provision and management of biodiversity offsets in the region.

Cost benefit analysis

As the Gateway assessment will be limited to a scientific assessment of the agricultural and water impacts of proposals, triple bottom line cost benefit analysis will not be considered at the Gateway stage.

Instead, cost benefit analysis will be available to applicants at the DA stage for consideration through the comprehensive merit assessment process. This will assist in the consideration of the potential economic, social and other benefits of a proposal against its possible impacts. It will be particularly relevant to projects for which the Gateway has issued a conditional certificate.

If a cost benefit analysis is prepared by the proponent it will be independently peer reviewed and considered by the Planning Assessment Commission in its determination of the DA.

Cumulative impact assessment methodology

The cumulative impacts of mining, in particular noise and dust impacts and loss of agricultural land and water resources, are acknowledged in this plan as important issues. The NSW Government is developing a specific cumulative impact assessment methodology for mining and coal seam gas applications to help in identifying thresholds and mitigation measures to manage these impacts. This methodology is scheduled to be completed in early 2013.

Infrastructure Planning and Delivery

The Department of Planning and Infrastructure and Infrastructure NSW will lead the preparation of a fully costed Upper Hunter Regional Infrastructure Plan. This infrastructure plan will review the infrastructure requirements of the region and develop a package of local and regional infrastructure to include prioritisation, staging, timing and funding of infrastructure. The infrastructure plan will also include a methodology to predict the impacts of the coal and coal seam gas industries on local and regional infrastructure as well as a program to monitor resource development.



Housing

The NSW Government will work in partnership with councils, Urbangrowth NSW and the development industry to develop policies and mechanisms that may improve the amount, type and affordability of housing in the region and will include consideration of permanent, short term, temporary and rental housing options.

Economic development and employment

Actions to address economic development and employment issues associated with the on-going growth of the mining industry include the preparation of a Regional Workforce Plan and the development of a regional apprenticeship program in partnership with mining and coal seam gas companies.

Climate change

The NSW Government will work with a range of stakeholders including local councils and industry on a number of climate change initiatives including opportunities to utilise waste coal methane, identifying renewable energy resources and climate change adaptation and mitigation strategies.

Community health and amenity policies

The NSW Government will work to deliver a number of policies that will support improved management of impacts from mining, including the cumulative impact assessment methodology, the preparation of a development assessment guideline for impacts on human health from dust generated by mining and other activities, review of the Industrial Noise Policy and review of the Synoptic Plan: Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley of NSW.

Statutory Processes

Local environmental plans and development control plans

Actions within this plan, including ensuring the adequate supply of employment and residential land, supporting delivery of housing choice, application of settlement planning principles and hazard management, will be delivered in part through councils' local environmental plans and development control plans.

Upper Hunter Urban Development Program

The management of residential growth and development by local councils will be supported by a new Upper Hunter Urban Development Program that will be established and administered by the Department of Planning and Infrastructure to monitor dwelling supply and uptake, guide housing policy and coordinate the staging, servicing and delivery of new development areas.

Assessment, Regulation and Enforcement

The NSW Government commits to a range of new, revised or continuing initiatives that will improve the assessment, regulation and enforcement of mining related land uses including:

- the creation of a Land and Water Commissioner position with an unfettered oversight and community advisory role with respect to exploration across the State.
- continuing with pollution reduction programs on coal mines, requiring them to assess current operations against best management practice;
- the benchmarking of new and modified coal mines against best management practice to minimise emissions;
- completing the establishment of an air quality monitoring network across the region; and
- an industry levy to fund additional enforcement resources within the Division of Resources and Energy.

Governance and Consultation

The NSW Government is committed to the implementation of the strategic outcomes contained in this plan. To this end, the government will consider an ongoing role for the stakeholder reference group that was established to guide the development of this plan in the monitoring and review of the plan. In addition, a cross-agency implementation group, to include local government representatives, will be established to oversee the implementation of actions under this plan.

To ensure that engagement processes relating to mining development are productive, the Department of Planning and Infrastructure will review the Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects (2007).

Monitoring and Review

As part of the establishment of the Upper Hunter Urban Development Program, the Department of Planning and Infrastructure will work with councils, industry and infrastructure providers to monitor the supply of residential land and the delivery of new housing.

Progress on actions established in this plan will be monitored annually through cross-agency implementation groups and on-going consultation with key stakeholders.

This Upper Hunter Regional Strategic Land Use Plan will be comprehensively reviewed every five years, so it can adjust to any demographic and economic changes and environmental impact information. This will assist local councils in reviewing their local environmental plans and community strategic plans.



Critical industry cluster mapping criteria

Equine Critical Industry Cluster

The equine cluster is spatially defined as land (excluding National Park and State Forest) having a slope of equal to or less than 18 degrees and falling within the following buffers:

- In the Upper Hunter LGA - within 15 km of the New England Highway;
- In the Muswellbrook LGA - within 2 km of the Muswellbrook Denman Road or the New England Highway north of Muswellbrook;
- In the Muswellbrook and Upper Hunter LGAs - within 2km to the north and 10km to the south of the Golden Highway between Sandy Hollow and the Muswellbrook/Singleton LGA boundary;
- In the Mid Western Regional, Muswellbrook and Upper Hunter LGAs - within 5km of the Bylong Valley Way or Martindale Road or the Baerami Creek Road or Widden Valley Road;
- In the Singleton LGA - within 2km to the north and 10km to the south of the Golden Highway between Jerrys Plains and the Muswellbrook/Singleton LGA boundary.

Viticulture Critical Industry Cluster

The viticulture cluster is spatially defined as the following land (excluding State Forests and National Park):

- the Broke-Fordwich and Pokolbin Geographical Indicators (GI) sub-regions;
- the parish of Belford and the suburbs of Lovedale, Nulkaba, Mount View and Rothbury;
- properties proximate to the Hunter Wine Country Private Irrigation District pipeline to the east of Lovedale road as well as those properties bounded by Mears Lane, Majors Lane and the Suburb of Lovedale; and
- land (excluding National Park and State Forest) within 20km of Denman, and that falls under soil fertility classes 'high', 'moderately high', 'moderate' or 'moderately low' under the Draft Inherent General Fertility of NSW (OEH), and land capability classes I, II, III, IV or V under the Land and Soil Capability Mapping of NSW (OEH), and is within 2km of a mapped alluvial water source.

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26. Great Eastern Ranges initiative is a program which recognises and protects the continental scale corridor that runs from the Victorian Alps to Northern Queensland while the draft NSW Biodiversity Strategy 2010-2015 describes the state's strategic approach to the conservation of terrestrial and aquatic biodiversity over a five year period to 2015. Including:
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