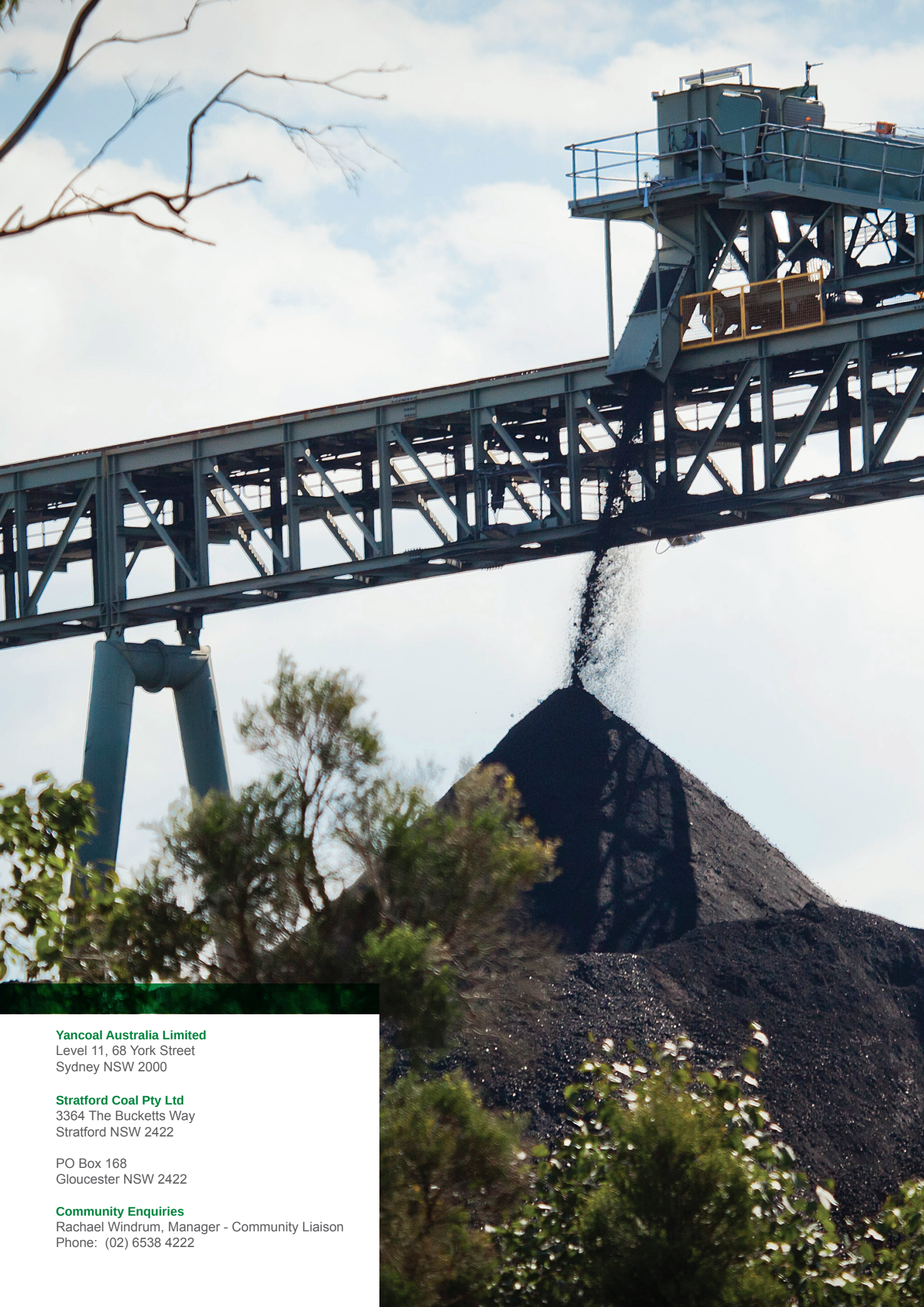
Stratford Extension Project

Technical Overview

November 2012

STRATFORDCOAL

Part of the Yancoal Australia Group



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OVERVIEW

The Stratford Mining Complex is an open cut coal mining operation located in the Gloucester Basin approximately 100 kilometres north of Newcastle in New South Wales (Figure 1).

Stratford Coal Pty Ltd (SCPL) is the owner and operator of the Stratford Mining Complex. SCPL is a wholly owned subsidiary of Yancoal Australia Limited (Yancoal)[1].

The nearby Duralie Coal Mine is also owned by Yancoal and is located approximately 20 kilometres south of the Stratford Mining Complex (Figure 1). The Stratford Mining Complex and Duralie Coal Mine collectively comprise Yancoal's Gloucester Basin operations.

Stratford Mining Complex

The current mining activities at the Stratford Mining Complex include coal extraction from the existing Stratford Coal Mine and Bowens Road North Open Cut open cut mining operations. Coal production commenced at the Stratford Mining Complex in 1995.

The approximate extent of the existing and approved surface development at the Stratford Mining Complex is shown on Figure 2.

Major components include open cut pits, mine waste rock emplacements, run-of-mine (ROM) pad/coal stockpiles, water management infrastructure/storages, coal handling and preparation plant (CHPP), co-disposal areas, product coal stockpiles, rail infrastructure and other infrastructure areas.

ROM coal excavated from the open cut pits is delivered to the ROM pad and then conveyed to the CHPP for processing. The CHPP also processes ROM coal transported from the Duralie Coal Mine on the North Coast Railway and small quantities of CHPP rejects recovered by excavation from the western co-disposal area at the Stratford Coal Mine (Figure 2).

Blended coal products are transported by rail to the Port of Newcastle for export, and to domestic customers.

Approximately 125 people (including Yancoal staff and on-site contractor personnel) are employed at the Stratford Mining Complex.

Mining operations have historically (i.e. between 1995 to 2003) been conducted up to 24 hours per day. SCPL is currently approved to operate the Bowens Road North Open Cut from 7.00 am to 7.00 pm and the Roseville West Pit between 7.00 am and 10.00 pm. Coal handling, processing and transportation are currently conducted up to 24 hours per day.

1. On 28 June 2012, Yancoal Australia Limited was listed on the Australian Stock Exchange and merged with Gloucester Coal Ltd (GCL) under a scheme of agreement on the same date. SCPL is now a wholly owned subsidiary of Yancoal Australia Limited.

STRATFORD EXTENSION PROJECT

The Project provides for the continuation and extension of operations at the Stratford Mining Complex. The Project would allow an additional 11 years of mining at up to 2.6 million tonnes per annum.

The Project would approximately double the operational workforce (i.e. a total of up to 250 onsite personnel).

Operation of the Project is likely to result in an average annual stimulus of some 714 direct and indirect jobs in New South Wales.

The Project would involve the extension of mining into three new open cut mining areas (Figure 2):

- Roseville West Pit Extension;
- Avon North Open Cut; and
- Stratford East Open Cut.

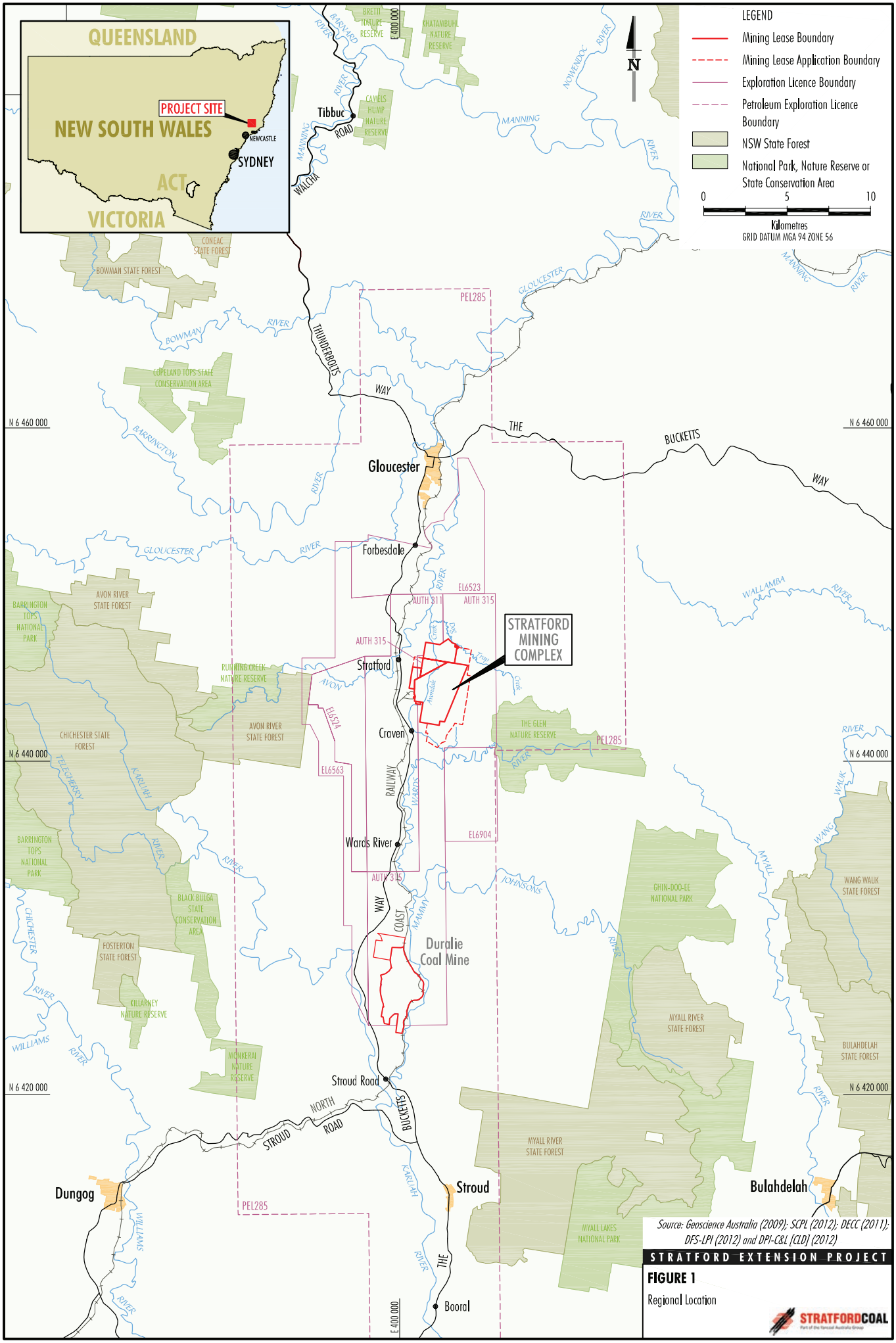
The Project would also involve continuation of mining in the Bowens Road North Open Cut (in Year 1 of the Project) and opportunistic recovery of CHPP rejects from the western co-disposal area.

Waste rock (including overburden and interburden) mined during the development of the Project would continue to be used to in-fill the mine voids behind the advancing open cut mining operations, and to extend the existing Stratford Waste Emplacement and the Northern Waste Emplacement (Figure 2).

The approved capacity of the CHPP and coal handling fixed infrastructure would be adequate to meet the Project processing rates such that no major upgrades to the CHPP and coal handling fixed infrastructure are required for the Project, with the exception of a new rotary breaker for raw coal preparation.

The general arrangement of the Project would use the existing infrastructure and service facilities at the Stratford Mining Complex.

Based on the planned maximum production rate, the coal reserve for the Project is approximately 21.5 million tonnes of ROM coal.



Source: Geoscience Australia (2009); SCPL (2012); DECC (2011); DFS-LPI (2012) and DPI-C&L [CLD] (2012)

STRATFORD EXTENSION PROJECT

FIGURE 1

Regional Location

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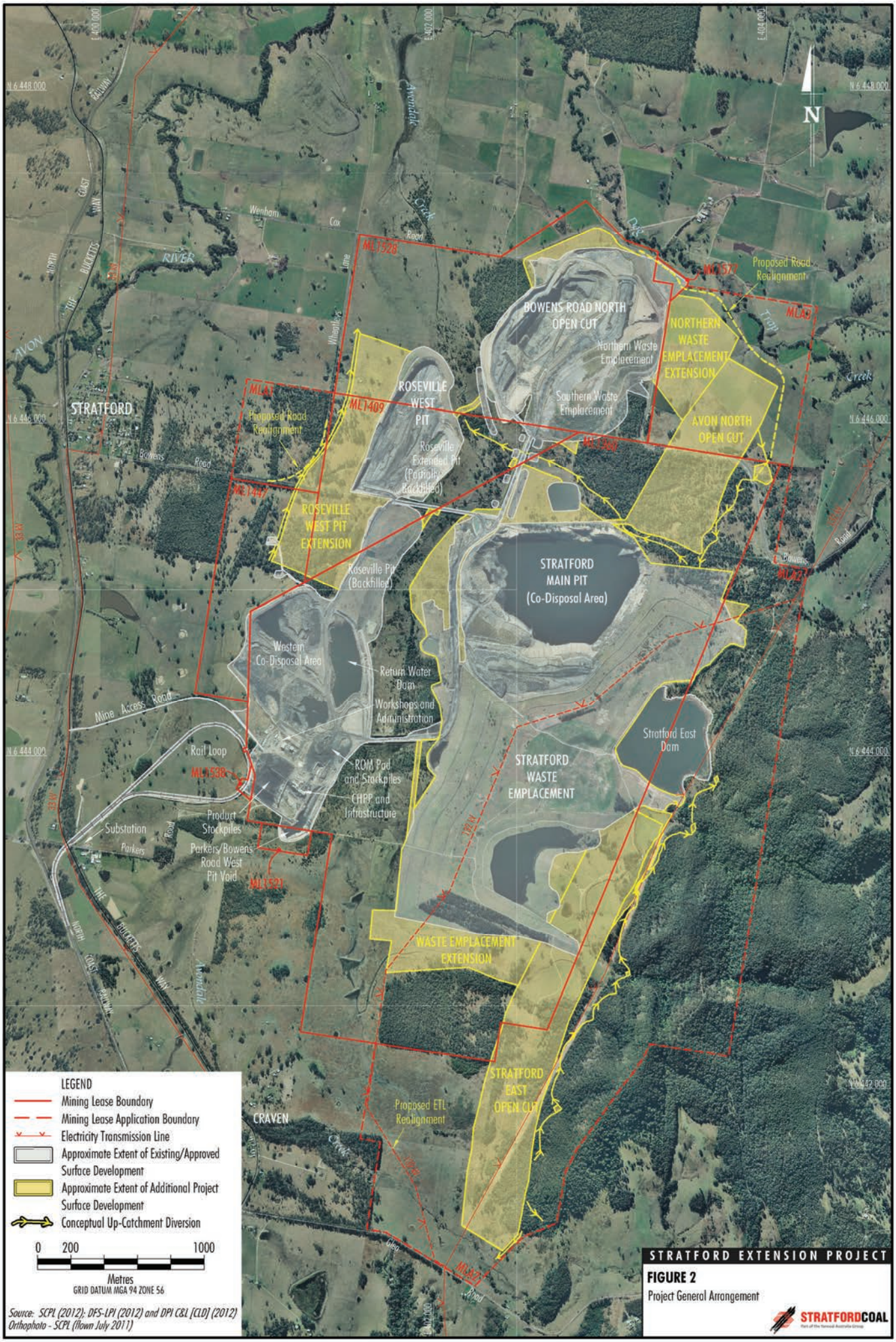

N
BOWENS ROAD NORTH OPEN CUT
NORTHERN WASTE EMPLACEMENT EXTENSION
Northern Waste Emplacement
Southern Waste Emplacement
AVON NORTH OPEN CUT
ROSEVILLE WEST PIT
Roseville Extended Pit (Partially Backfilled)
ROSEVILLE WEST PIT EXTENSION
Roseville Pit (Backfilled)
STRATFORD MAIN PIT (Co-Disposal Area)
Western Co-Disposal Area
Return Water Dam
Workshops and Administration
Mine Access Road
Rail Loop
ROM Pad and Stockpiles
CHPP and Infrastructure
Product Stockpiles
Substation
Parkers/Bowens Road West Pit Void
STRATFORD WASTE EMPLACEMENT
Stratford East Dam
WASTE EMPLACEMENT EXTENSION
STRATFORD EAST OPEN CUT
Proposed ETL Realignment
Proposed Road Realignment
STRATFORD
CRAVEN
ML1528
ML1577
ML1409
ML1447
ML1538
ML1521
ML1427
LEGEND
Mining Lease Boundary
Mining Lease Application Boundary
Electricity Transmission Line
Approximate Extent of Existing/Approved Surface Development
Approximate Extent of Additional Project Surface Development
Conceptual Up-Catchment Diversion
0 200 1000
Metres
GRID DATUM MGA 94 ZONE 56
Source: SCPL (2012); DFS-LPI (2012) and DPI C&L [CLD] (2012) Orthophoto - SCPL (flown July 2011)
STRATFORD EXTENSION PROJECT
FIGURE 2
Project General Arrangement
STRATFORDCOAL

Mining Operations

Each of the open cut mining areas for the Project would be mined using conventional open pit methods.

The open cut mining areas would involve supporting infrastructure such as haul roads, bunding, soil stockpiles, hardstands and water management structures and have been designed to integrate with the existing Stratford Mining Complex operations and minimise the amount of additional infrastructure required.

Open cut mining operations would be conducted during the periods specified below:

- Bowens Road North Open Cut (Year 1) - mining operations would only occur between the hours of 7.00 am to 7.00 pm, seven days per week.
- Roseville West Pit Extension (Years 1 to 11) - mining operations would only occur between the hours of 7.00 am to 6.00 pm, seven days per week.
- Stratford East Open Cut (years 1 to 5) - mining operations would be conducted 24 hours per day, seven days per week, subject to compliance with noise limits. Fleet associated with the removal of overburden would generally only operate between the hours of 7.00 am to 6.00 pm, seven days per week.
- Stratford East Open Cut (years 6 to 11) - mining operations would be conducted 24 hours per day, seven days per week.
- Avon North Open Cut (Years 1 to 5) - mining operations would be conducted 24 hours per day, seven days per week.

Recovery of CHPP rejects by excavation from the western co-disposal area for re-processing would only occur between the hours of 7.00 am to 6.00 pm, seven days per week.

Coal Processing and Product Coal Transport

Product coal produced from the CHPP at the Stratford Mining Complex would continue to be stockpiled prior to being reclaimed and loaded to trains for transport on the North Coast Railway to Newcastle.

The handling and processing of ROM coal at the CHPP would continue to operate 24 hours per day, seven days per week.

CHPP Rejects Management

The Stratford Main Pit would continue to be used for co-disposal of CHPP rejects at the Stratford Mining Complex until the existing storage capacity is exhausted at which point in time alternative storage capacity would become available within the Avon North Open Cut void.

Water Supply and Water Management

The Project water management system would generally be based on the existing water management system with augmentations (e.g. additional diversions, sediment dams, flood levees and contained water storages) undertaken progressively over the life of the Project.

Contained water storages for the Project would include the existing Stratford East Dam, Stratford Main Pit, Return Water Dam and Parkers/Bowens Road West Pit. Once mining operations are completed in the Bowens Road North Open Cut and Avon North Open Cut during the life of the Project, the voids would also be used as contained water storages.

The Project water management system would be designed and operated to achieve no overflow from contained water storages to downstream watercourses including Avondale Creek, Dog Trap Creek and the Avon River.

Project Development Activities

Additional infrastructure and construction/development activities which are required to support the Project (including modifications and alterations to existing infrastructure) would be progressively developed in parallel with ongoing mining operations, including:

- realignments of sections of Wheatleys Lane, Bowens Road, and Wenham Cox/Bowens Road;
- relocation of a 132 kilovolt power line;
- relocation of a 33 kilovolt power line;
- installation of a new rotary breaker in the CHPP;
- noise management infrastructure upgrades and haul road bunding;
- realignment of a New South Wales Rural Fire Service fire trail;
- relocation of a Telstra phone line; and
- other minor upgrades including car park extensions, offices, bathhouse and muster areas, warehouse, fuel bays, boiler shed, tyre storage and workshop extensions (e.g. tyre fitting bays) for the Project mine fleet.

Short-term construction/development activities (e.g. noise attenuation infrastructure/bunds and road realignments) would require an additional construction workforce of up to approximately 30 people for short periods.

These construction/development activities would generally be restricted to daylight hours (i.e. 7.00 am to 6.00 pm).

Benefits of the Project

The Project would provide for the continuation of the Stratford Mining Complex and direct employment of 250 on-site personnel at maximum production, including a mixture of direct Yancoal employees and contractors.

The Project would involve the production of up to 2.6 million tonnes per annum of ROM coal with 21.5 million tonnes of coal extracted over the life of the Project. The CHPP at the Stratford Mining Complex would produce up to 3.5 million tonnes per annum of product coal from the Stratford Mining Complex and the Duralie Coal Mine.

The Project would produce a combination of saleable thermal and coking coal that would be sold to domestic and export markets.

Project coal production would contribute to New South Wales export income, State royalties and State and Commonwealth tax revenue, as well as contributing to electricity supply and manufacturing in Australia and other countries that purchase Project coal.

Along with the employment stimulus (i.e. 250 direct and indirect jobs in the Newcastle region and some 714 direct and indirect jobs in New South Wales at peak production), the Project would also make contributions to regional and New South Wales business turnover and household income.

A net benefit of between $145 million and $174 million would be forgone if the Project is not implemented. In addition, the Project would generate total royalties to the state of New South Wales in the order of $130 million over the life of the Project.

Stratford East Dam

STRATFORD EXTENSION PROJECT CONSULTATION

The Project consultation programme has been comprehensive and has included:

- Regular meetings and briefings with key State government agencies for feedback on environmental assessments and key mitigation measures, including the Department of Planning and Infrastructure, Environment Protection Authority (EPA), Office of Environment and Heritage and New South Wales Office of Water.
- Ongoing consultation with the Gloucester Shire Council, including representation of the Gloucester Shire Council on the Stratford Mining Complex Community Consultative Committee.
- Consultation with the Commonwealth Department of Sustainability, Environment, Water, Population and Communities regarding assessment under the *Environment Protection and Biodiversity Conservation Act, 1999*.
- Consultation with the community and affected landholders through the Stratford Mining Complex Community Consultative Committee and other Project-specific consultation mechanisms.
- Consultation with the community and affected landholders through Community Information Sessions.
- Involvement of and consultation with the Aboriginal community through the Aboriginal Cultural Heritage Assessment in accordance with relevant guidelines, including participation in surveys and meetings.
- Dialogue with service providers and other resource companies with existing or proposed activities in the vicinity of the Stratford Mining Complex that may potentially interact with the Project.

Community information sheets have been distributed by SCPL to inform the local community of the Project and to provide updates on progress of the EIS and specialist studies in November 2011, February 2012 and May 2012.

STRATFORD COAL COMMUNITY INITIATIVES

SCPL supports the local community through sponsorships of community organisations and direct community contribution payments to the Gloucester Shire Council. SCPL plays an active role in local communities through direct employment and financial contributions to regional events and facilities.

SCPL would continue to provide funding contributions to community programmes and groups during the life of the Project.

MANAGEMENT OF KEY ENVIRONMENTAL ISSUES

An environmental risk assessment was conducted to identify key potential environmental issues for the Project. The environmental risk assessment involved a workshop with a number of specialists. All of the potential environmental issues were ranked as low or as low as reasonably practicable by the risk assessment team.

The key environmental assessment issues for the Project are summarised below.

Noise and Blasting

Background noise levels (in the absence of the Stratford Mining Complex noise contribution) have previously been characterised as being approximately 30 to 32 A-weighted decibels (dBA). Project-specific noise levels (intrusive criteria) were developed from these background levels in accordance with the New South Wales *Industrial Noise Policy*.

An acoustic model was developed for the assessment of Project noise impacts. The acoustic model was used to investigate noise mitigation measures and to inform mine planning decisions with the objective of appreciably reducing Project noise levels.

SCPL conducted an investigation of feasible and reasonable noise mitigation measures for the Project, particularly in relation to night-time operations. In summary, Project noise mitigation measures would include:

- implementation of extra quiet conveyor drives and idlers on fixed infrastructure;
- implementation of extra quiet mobile fleet for all new large haul trucks and dozers;
- implementation of management controls on dozers (e.g. restriction of gear usage to first gear only on product stockpiles);
- daytime only operation of the Roseville West Pit Extension;
- Stratford East Open Cut waste rock fleet generally operated daytime-only during Years 1 to 5;
- emplacement of Avon North Open Cut waste rock in the Stratford Main Pit during evening and night-time;
- maximising in-pit waste rock emplacement opportunities;

- emplacement of out-of-pit waste rock behind acoustic bunding during Stratford East Open Cut evening and night-time operations (i.e. when in-pit dumping opportunities are not available);
- installation of approximately 8 kilometres of 6 metre high acoustic bunds along haul roads; and
- installation of approximately 4 kilometres of 6 metre high acoustic bunds around the rail loop.

With the implementation of the above noise mitigation measures, the following outcomes are relevant:

- Landholder agreements have been reached with the two privately owned receivers where relevant operational noise criteria would be exceeded during the daytime.
- During evening and night-time periods, operational noise would comply with the relevant criteria at all privately owned receivers during periods of calm meteorological conditions.
- Landholder agreements have been reached with nine out of the 16 privately owned receivers where relevant operational noise criteria would be exceeded during the evening and night-time periods under adverse meteorological conditions. A further three receivers are identified in the existing SCM Development Consent as being in the Noise Management Zone.

Indicative noise contours for night-time operations under adverse meteorological conditions for Year 7 is presented in Figure 3.

A quantitative cumulative assessment was also undertaken in consideration of Project noise levels in conjunction with noise levels associated with the approved Duralie Coal Mine, AGL Gloucester LE Pty Ltd's Gloucester Gas Project and Gloucester Resources Limited's proposed Rocky Hill Coal Project.

The noise assessment shows that exceedances of the New South Wales *Industrial Noise Policy* cumulative (amenity) criteria are only predicted to occur at receivers where Project-only exceedances have been predicted (as described above).

Noise Management Procedures

The private receivers where noise emissions are predicted to exceed the Project-specific noise levels can be divided into a Noise Management Zone and a Noise Affectation Zone. Proposed management procedures for receivers in these zones are described below.

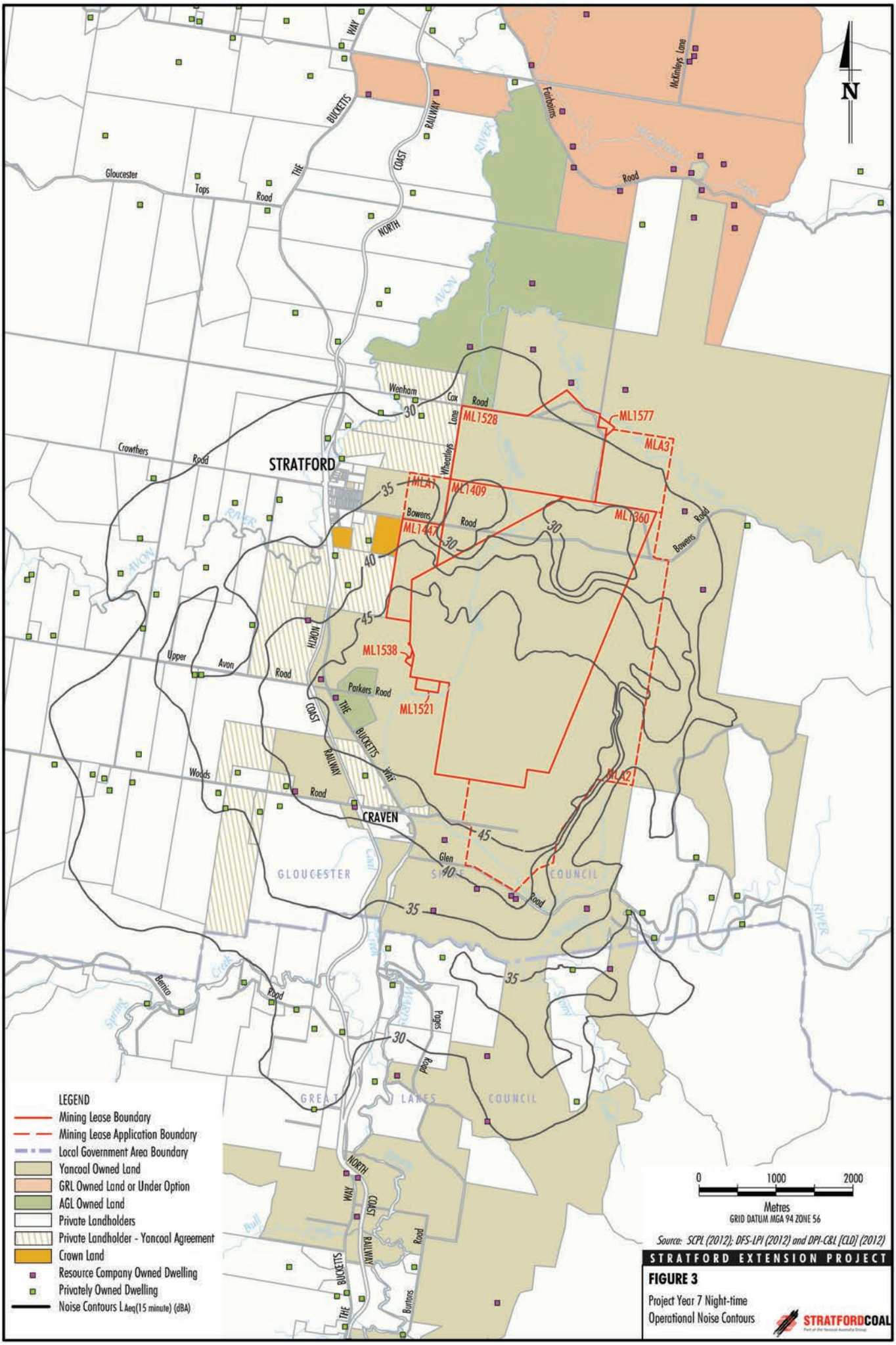
These procedures would continue to be documented in the Noise Management Plan and would form part of the adaptive management approach to Project noise management that would include real-time noise monitoring and meteorological forecasting.

Noise Management Zone

Depending on the degree of exceedance of the Project-specific noise levels, potential noise impacts in the Noise Management Zone could range from marginal to moderate (in terms of the perceived noise level increase).

Additional management procedures for the Noise Management Zone would include:

- noise monitoring on-site (i.e. measurement of machinery and plant sound power levels) and within the vicinity of the Stratford Mining Complex, including real-time noise monitoring;
- prompt response to any community concerns or complaints;
- refinement of on-site noise management and mitigation measures and operating procedures where practicable; and
- implementation of reasonable and feasible acoustical mitigation at receivers (which may include measures such as enhanced glazing, insulation and/or air conditioning), in consultation with the relevant landowner, where noise monitoring shows noise levels which are 3 to 5 dBA above Project-specific noise levels.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STRATFORD
CRAVEN
GLOUCESTER COUNCIL
GREAT LAKES COUNCIL
ML1528
ML1577
MLA3
ML1409
ML1360
ML1441
ML1538
ML1521
MLA2
30
35
40
45
Wenham Cox Lane Road
Crowthers Road
Wheatleys Lane
Bowers Road
Upper Avon Road
Parkers Road
Woods Road
Glen Road
Benito Road
Pages Road
Buttons Road
McKinleys Lane
Fairbairns Road
Gloucester Tops Road
THE BUCKETTS WAY
COAST RAILWAY
NORTH
AVON RIVER
LEGEND
Mining Lease Boundary
Mining Lease Application Boundary
Local Government Area Boundary
Yancoal Owned Land
GRL Owned Land or Under Option
AGL Owned Land
Private Landholders
Private Landholder - Yancoal Agreement
Crown Land
Resource Company Owned Dwelling
Privately Owned Dwelling
Noise Contours LAeq(15 minute) (dBA)
0 1000 2000
Metres
GRID DATUM MGA 94 ZONE 56
Source: SCPL (2012); DFS-LPI (2012) and DPI-C&L [CLD] (2012)
STRATFORD EXTENSION PROJECT
FIGURE 3
Project Year 7 Night-time Operational Noise Contours
STRATFORDCOAL

Noise Affectation Zone

Management procedures for the Noise Affectation Zone would include:

- discussions with relevant landowners to identify and assess any concerns or complaints regarding Project noise emissions;
- implementation of reasonable and feasible acoustical mitigation at receivers (which may include measures such as enhanced glazing, insulation and/or air conditioning), in consultation with the relevant landowner, where noise monitoring shows noise levels from the mine which are greater than 5 dBA above Project-specific noise levels; and
- negotiated agreements with landowners where required.

Real-time Noise Management

The existing Noise Management Plan would be revised to include:

- an additional real-time noise monitor in the vicinity of Stratford Village to augment the existing realtime monitoring and management system;
- implementation and management of a meteorological forecasting system which would be used as part of a pro-active management (i.e. alert) system in conjunction with the real-time monitoring and management system; and
- details of revised triggers for the Project real-time monitoring and management system.

Rail Noise

The existing/approved average product coal rail movements of 2.5 trains per day would be unchanged for the Project (i.e. no increase in yearly train movements). However, for short periods when the port demand for coal is high, an additional daily peak product coal rail movement would be required.

The increase in rail noise level as a result of peak Project-related movements is 0.6 dBA. This noise level increase would not be perceptible to most people.

Blasting

Project blasting activities would be designed to minimise the effects of blasting on nearby receivers. This would be achieved by reducing the Maximum Instantaneous Charge (MIC) (or other relevant blasting parameter) according to the proximity of blasts to nearby receivers.

With the proposed reduction in MIC, the Project blasting emissions would comply with the relevant blasting criteria with the exception of three privately-owned receivers where exceedances of the amenity criteria are predicted. These predicted effects have been recognised during landholder consultation, and relevant agreements have been reached.

Air Quality

Air quality data has been collected in the vicinity of the Stratford Mining Complex during the period 1995 to 2012. The data shows that air quality in the area generally complies with relevant EPA criteria.

A Best Practice Measures study on air quality emission controls was undertaken by SCPL in 2012 for the Stratford Mining Complex in accordance with EPA requirements. As a result of the study, the following additional best practice measures were identified:

- vehicle speed restriction to 60 kilometres per hour;
- use of larger capacity vehicles to transport coal and waste rock;
- increased intensity of haul road sprays;
- watering of wind erosion areas; and
- vegetative groundcover on wind erosion areas.

These measures have been adopted as part of the Project Air Quality Assessment.

No exceedances at any privately-owned receiver was predicted, either Project-only or in consideration of background concentrations.

The existing Air Quality and Greenhouse Gas Management Plan describes that a Tapered Element Oscillating Microbalance (TEOM) analyser would be installed to monitor particulate matter concentrations continuously, at a location in close proximity to Stratford. For the Project, a second TEOM would also be installed to monitor particulate matter concentrations continuously, at a location in close proximity to Craven. These monitors would enable SCPL to pro-actively and re-actively manage the potential short-term particulate matter emissions from the Project, to prevent or minimise potential impacts at privately owned receivers.

The management plan would also be updated to include a meteorological forecasting system as part of the Project. This system would predict meteorological conditions for the coming day to determine in advance where the risk of dust emissions may occur (e.g. based on wind speed, direction, rainfall and atmospheric stability).

Vegetation Cover to Control Wind Erosion on the Stratford Waste Emplacement

Flora and Fauna

The existing Stratford Mining Complex is located in a rural setting characterised by cattle grazing on native and improved pastures. The portion of existing mining leases not currently subject to mining is managed for a combination of biodiversity conservation (i.e. biodiversity enhancement area) and cattle grazing.

The Project area is situated on the western edge of a very large area of native vegetation, including The Glen Nature Reserve and surrounding forested private land, the Myall River State Forest and Ghi-Doo-Ee National Park to the south and south-east. Much larger areas of natural vegetation also exist in the Barrington Tops complex of State Forests and National Parks located to the west of the Avon River valley.

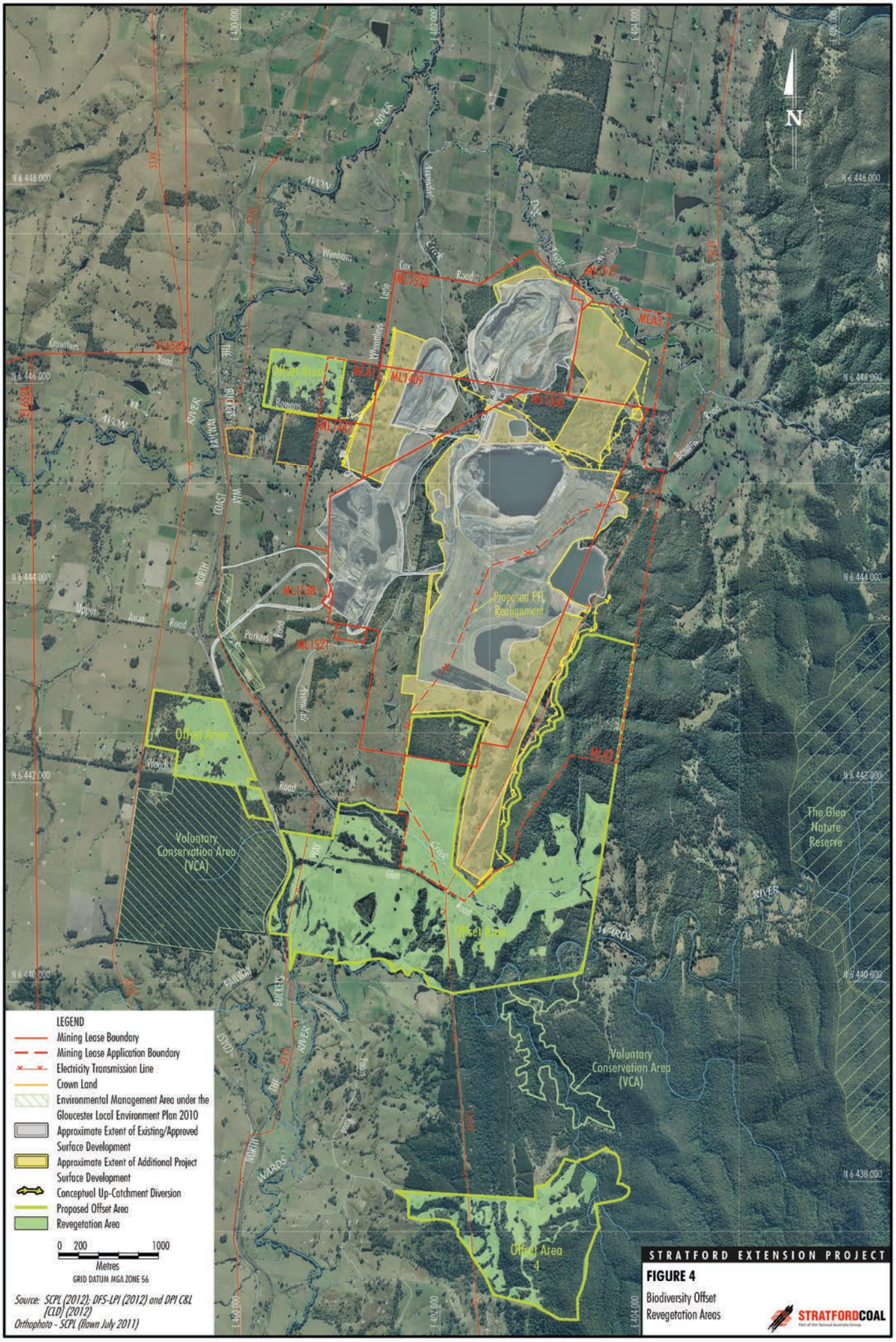
Refinements to the Project design were made during the assessment process to minimise land disturbance and associated impacts on flora, fauna and their habitats. The additional surface development associated with the Project would involve the clearance of approximately 105 hectares of native vegetation types and approximately 195 hectares of cleared land with a small portion containing planted trees (approximately 1.3 hectares).

SCPL would prepare a Biodiversity Management Plan which would mitigate impacts on flora and fauna due to Project activities, including vegetation clearance procedures, weed and feral animal control and salvage and relocation of habitat features.

In addition, residual impacts on flora and fauna would be offset through a biodiversity offset strategy. The biodiversity offset strategy for the Project involves conserving areas of land with existing conservation values and providing active management to maintain and enhance their values (Figure 4).

The proposed offset areas are located on land currently managed for pastoral purposes, adjacent to the Project to the south and north-west and further south. An arrangement would be made to ensure protection in perpetuity and management of the identified biodiversity offset areas (or equivalent).

Areas of existing native vegetation communities would be enhanced (approximately 490 hectares), areas of cleared land would be revegetated (approximately 435 hectares) and 10 hectares of existing planted trees would be retained.


N
LEGEND
Mining Lease Boundary
Mining Lease Application Boundary
Electricity Transmission Line
Crown Land
Environmental Management Area under the Gloucester Local Environment Plan 2010
Approximate Extent of Existing/Approved Surface Development
Approximate Extent of Additional Project Surface Development
Conceptual Up-Catchment Diversion
Proposed Offset Area
Revegetation Area
0 200 1000
Metres
GRID DATUM MGA ZONE 56
Source: SCPL (2012); DFS-LPI (2012) and DPI C&L [CLD] (2012)
Orthophoto - SCPL (flown July 2011)
Proposed ETL Realignment
Offset Area 1
Offset Area 2
Offset Area 3
Offset Area 4
Voluntary Conservation Area (VCA)
Voluntary Conservation Area (VCA)
The Glen Nature Reserve
ML1528
ML1577
ML1409
ML1521
ML1562
MLA3
MLA2
AVON RIVER
WARDS RIVER
Wenham Cox Road
Bowens Road
Parkers Road
Upper Avon Road
Crowthers Road
Wards Road
Glen Road
Buckets Road
Offset Area
Woods
Glen
Creek
Lane
Hill
Gap
Railway
Pipeline
E 400 000
E 402 000
E 404 000
E 406 000
N 6 448 000
N 6 446 000
N 6 444 000
N 6 442 000
N 6 440 000
N 6 438 000
STRATFORD EXTENSION PROJECT
FIGURE 4
Biodiversity Offset Revegetation Areas
STRATFORDCOAL

The biodiversity offset areas would provide for a range of ecological gains including:

- The addition of the biodiversity offset areas as new protected areas enhances nature conservation in the region.
- The proposed biodiversity offset areas are suitably located because they are local to the area proposed to be disturbed and therefore have a greater chance of maintaining and improving the biodiversity that would be impacted.
- The revegetation of biodiversity offset areas is designed to provide connectivity between isolated woodland remnants. This would facilitate movement of animals between remnants and the large block of forest to the east and south of the Project area, thereby re-establishing genetic exchange across the landscape.
- Numerous threatened species are known to inhabit the biodiversity offset areas or conservation areas that directly adjoin the biodiversity offset areas.
- The biodiversity offset areas support all native vegetation types within the Project disturbance areas[2] and have a greater diversity of vegetation types than occur on the Project area.
- The management of the biodiversity offset areas would include animal pests and weed management.

The Project incorporates a range of measures targeted specifically at maintaining the Squirrel Glider population, including a nest-box programme and monitoring. Because the Squirrel Glider is currently known to occur in a few relatively small patches, the biodiversity offset strategy has the potential to improve the conservation of the local Squirrel Glider population in the medium to long-term.

2. With the exception of Derived Grassland, which is derived as a result of previous land use activities from other habitat types recorded in the surface development area and biodiversity offset areas.

Surface Water

The Project is located in the surface water catchment of the Avon River only. The Avon River is a tributary of the Gloucester River which ultimately flows to the Manning River.

The existing Stratford Mining Complex is located within the Avondale Creek and Dog Trap Creek sub-catchments of the Avon River.

The Project would result in progressive extension of the open cut mining operations and associated subsequent re-use of runoff captured from operational catchment areas. Compared to the existing/approved total catchment area excised by the Stratford Mining Complex, the proposed Project catchment is small enough such that it is not expected to result in a measurable change to downstream flows in Avondale Creek, Dog Trap Creek or the Avon River.

Avondale Creek

Avon River

The Project water management system is to be operated with the objective to achieve no contained water storage overflow. The risk of a contained water overflow (i.e. spill) from the Project was evaluated as part of a detailed site water balance and the results demonstrate there is a very low risk of spill occurring from the contained water storages over the life of the Project life to Avondale Creek.

The potential for flooding in the Project area to impact on mine infrastructure (including open cut pits) would be managed through the construction of flood bunds. It is considered unlikely that any discernible 100-year average recurrence interval peak flow flood level increases (i.e. afflux) would extend upstream of Yancoal-owned land.

The existing Water Management Plan would be reviewed and revised to incorporate the Project, describing the operational site water management system and provisions for review of the site water balance, erosion and sediment controls, surface water (and groundwater) monitoring and management.

Groundwater

Geological and groundwater data supports the presence of two groundwater systems:

- Fractured rock groundwater system – including shallow rock aquifer and coal measures; and
- Alluvial groundwater system – including alluvial (narrow channel) sediments associated with Dog Trap Creek, Avondale Creek and the Avon River.

Privately owned bores in the vicinity of the Project are licensed for stock and domestic use, and include private bores in Stratford and a private bore to the south of the Stratford Mining Complex. Locally there is little reliance on groundwater bores as a source of water for agricultural enterprises as they predominantly rely on surface water sources which are more abundant and generally better quality.

Detailed numerical modelling has been undertaken as a component of a Groundwater Assessment to quantify the likelihood and magnitude of potential impacts from the Project and other developments in the region.

The detailed numerical modelling predicts:

- negligible impact on groundwater levels or groundwater yield for groundwater users with privately owned bores; and
- negligible drawdown in the aquifers of the alluvial groundwater system.

The Groundwater Assessment concludes that there is expected to be negligible change in groundwater quality as a result of mining in the short-term. Further, it is expected that groundwater quality would not be impacted by final void water quality post-mining, as the final voids would remain groundwater sinks (i.e. there would be no deleterious effect on the beneficial uses of any groundwater sources).

Irrigation on the Stratford Waste Emplacement

The existing groundwater monitoring program at the Stratford Mining Complex would be progressively extended for the Project.

Agricultural activities known to have been conducted in the Project area include cattle grazing for beef and dairy products, with small areas observed to have been used for cultivation for forage crops. There is, however, no evidence of crop production for grains (irrigated or unirrigated) or intensive horticulture.

Agricultural Resources

A review of the regional mapping in the *Upper Hunter Strategic Regional Land Use Plan* indicates that the nearest mapped biophysical strategic agricultural land is located on the Avon River approximately 2 kilometres to the west of the Project. Based on the agricultural limitations identified in the site soil survey, Rural Land Capability mapping, Agricultural Suitability mapping and review of regional mapping of strategic agricultural lands, the Project area does not include highly productive soils, nor does it include areas of high value or strategic agricultural lands.

The Project (plus a portion of the biodiversity offset areas) would result in the long-term disturbance or alteration of existing agricultural lands. The rehabilitation and mine closure strategy for the Project includes re-establishment of approximately 300 hectares of agricultural land suitable for grazing (Figure 5). This re-establishment of agricultural lands would be undertaken progressively as a component of the Project rehabilitation programme.

As has already been successfully demonstrated at the Stratford Mining Complex, SCPL anticipates rehabilitated agricultural lands would be of comparable Agricultural Suitability classification to neighbouring areas.

The Agricultural Assessment and Socio-Economic Assessment concluded that the Project has very little potential to materially affect regional agricultural production or demand for agricultural infrastructure, supplies and services at a local or regional level.

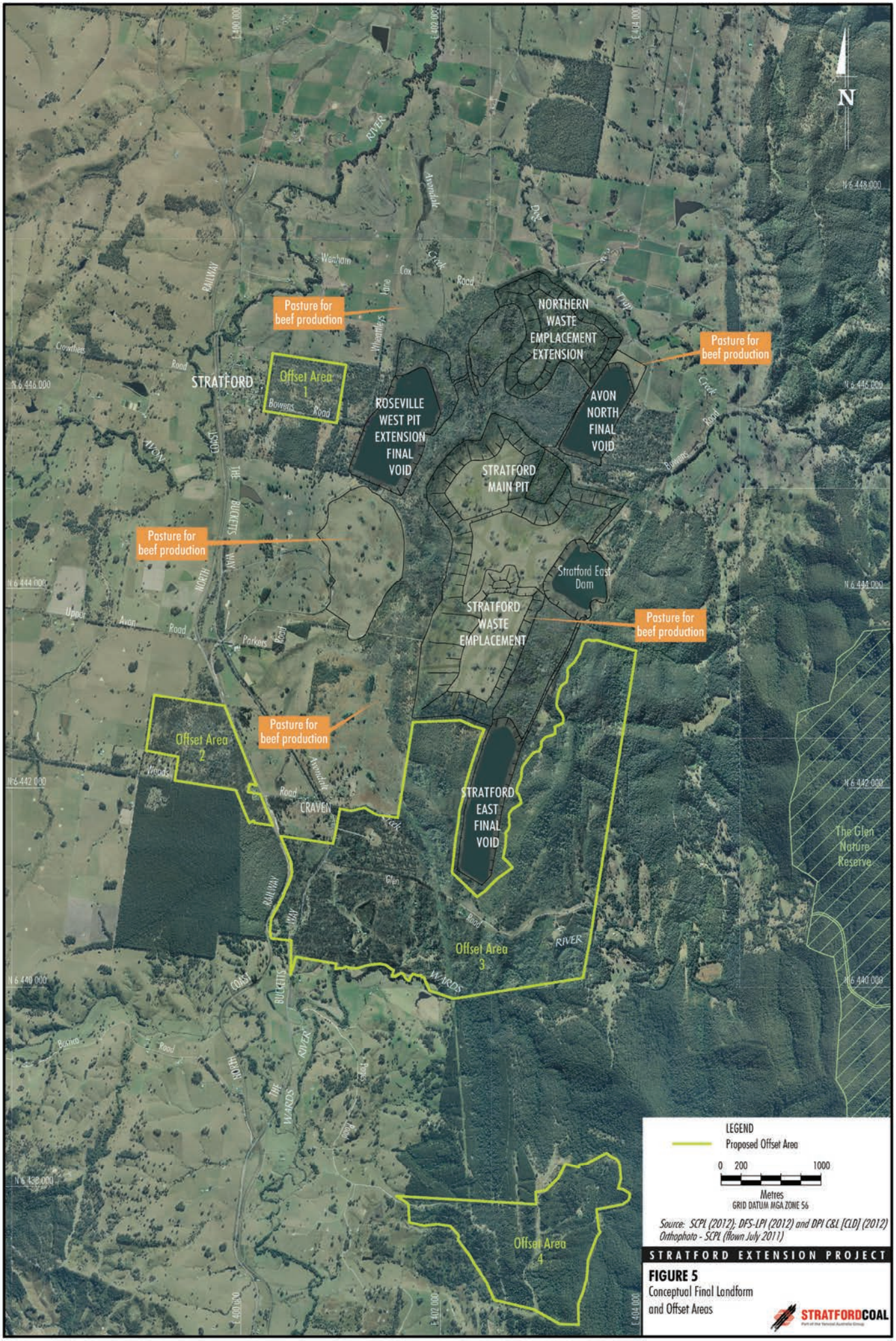
A Property Management Strategy has been prepared to facilitate the management of agricultural land in the Project area and on adjoining Yancoal-owned lands.

The implementation of the Property Management Strategy would serve to minimise the potential direct impacts of the Project on agricultural production within the Project area and Yancoal-owned land, and potential indirect impacts (e.g. weeds and pests) on surrounding agricultural lands.

Other Assessments

Assessments of potential impacts of the Project on aquatic ecology, heritage, land contamination, road transport, visual amenity and socio-economics demonstrated that the impacts would be negligible, within acceptable levels or could be readily managed.

Rehabilitation on the Stratford Waste Emplacement


N
Pasture for beef production
NORTHERN WASTE EMPLACEMENT EXTENSION
Pasture for beef production
STRATFORD
Offset Area 1
ROSEVILLE WEST PIT EXTENSION FINAL VOID
AVON NORTH FINAL VOID
STRATFORD MAIN PIT
Pasture for beef production
Stratford East Dam
STRATFORD WASTE EMPLACEMENT
Pasture for beef production
Offset Area 2
Pasture for beef production
CRAVEN
STRATFORD EAST FINAL VOID
The Glen Nature Reserve
Offset Area 3
Offset Area 4
LEGEND
Proposed Offset Area
0 200 1000
Metres
GRID DATUM MGA ZONE 56
Source: SCPL (2012); DFS-LPI (2012) and DPI C&L [CLD] (2012)
Orthophoto - SCPL (flown July 2011)
STRATFORD EXTENSION PROJECT
FIGURE 5
Conceptual Final Landform and Offset Areas
STRATFORDCOAL