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23 January 2013

The Director General  
Department of Planning and Infrastructure  
GPO Box 39 Sydney 2001

Attn Mr Paul Freeman

### **Stratford Coal Extension Project - SSD 4966**

Following are comments and recommendations concerning the Stratford Coal Extension Project and the associated Environmental Impact Statement. This submission is made in our capacity as owners of a rural property at 314 Glen Rd Craven that would be adversely affected by aspects of the project as currently proposed.

The matters on which comments are provided are:

1. Scale of the project and the proposed mine plan including 24-hour mining operations
2. Impacts of noise and blasting
3. Impacts on flora and fauna, and the proposed offset areas

Recommendations are included at the end of each section, and are listed in aggregate at the end of the document.

### **1. Scale of the project and the proposed mine plan**

#### **Scale of the project**

The project constitutes a more substantial expansion of the Stratford mine operations than is implied by the description of the project as an “extension”.

SCPL proposes that: the mine lease area be significantly enlarged; the number of concurrently operating pits be increased from two to four (in year one); the operational workforce be doubled; the mine fleet be expanded by 32 additional excavators, haul trucks, dozers and graders; and the transport of product by rail be increased from 3.3Mtpa to 3.5Mtpa.

Contradictions in the EIS raise questions about the accuracy or significance of information presented about all but the first of these.

In section ES-1, it is maintained that the operational workforce would be doubled, with a total of up to 250 on-site personnel. Elsewhere in the EIS (ES-6) the project is credited with the creation of 250 direct and indirect jobs *in the Newcastle region*. Doubts about the veracity of the 250 on-site personnel figure are magnified by the projected Project ROM coal product figures, which peak at 2.6Mtpa – which is only marginally more than is currently produced from the existing Bowens Road North and Roseville West open cuts.

Figures provided in table 2-3 of the EIS indicate that in years 7-11 of the project, product coal produced at the SCM complex will reduce to 1.5Mtpa, which is less than half of the current maximum production. In the absence of further expansion at Stratford or Duralie, about which no information has been provided, a corresponding reduction in employment would presumably occur at that stage of the project.

In relation to the mine fleet, the assertion that there would be an expansion of some 32 additional machines raises questions about the retirement of the existing fleet. The noise modelling for the project has assumed the use of new machinery only (including smaller articulated haul trucks in the Roseville West Extension and the use of XQ haul trucks in the Avon North and Stratford East pits). For the noise modelling to be valid, the existing fleet could not be used in any part of the extension project and would have to be retired upon cessation of mining in the Bowens Road North open cut during the first year of the project.

### **Proposed mine plan**

The mine plan set out in the EIS has implications that would adversely affect residents and environmental values during and beyond the project timeframe. Those effects could be mitigated by adoption of a different mine plan.

The two main aspects of the mine plan that would exacerbate adverse impacts are the proposed concurrent operation of multiple open cut pits, and the proposed 24 hour mining operations.

Concurrent mining in the Roseville West Extension pit, the Avon North pit and the Stratford East pit (as well as the Bowens Road North pit in year one) would result in a greater noise footprint than would arise if those pits were developed sequentially.

As well as reducing the noise generated in the project area, sequential development of the pits would also enable the backfilling of at least one of the three voids proposed to remain at the end of mining and would significantly reduce the scale of the above ground waste rock emplacements that are proposed to be left in place after completion of mining.

No evaluation of the sequential development is presented in the EIS, other than indirectly through reference to the schedule of mining being indicative only, and subject to variation according to market demands for different product characteristics. The need to blend product is understood, but it is implausible that capacity to blend product from five pits (in year one, and including Duralie) is essential to the operation.

### **Recommendation**

- Concurrent mining operations in more than two open cut pits within the SCM mining lease area should not be approved.

### **24 hour mining operations**

The second aspect of the mine plan with major implications is the proposal to undertake mining 24 hours per day.

SCPL proposes to conduct mining operations in the Avon North and Stratford East open cuts on a 24-hour, 7-days-per-week basis. This proposal is strongly opposed within the community on the basis of predicted affects, current experience of noise from existing mining operations, and past experience of 24-hour mining that was discontinued ten years ago following completion of mining in the Stratford main pit.

Opposition to this aspect of the current proposal has been expressed throughout the public consultation process. The Community Consultative Committee and Gloucester Shire Council both recorded their objection in 2011 and, most recently, a public meeting held at Stratford on 22 November 2012 unanimously resolved to oppose a return to 24-hour mining operations.

No case has been made for the Avon North and Stratford East open cut operations to be subject to less

restrictive operating hours than currently apply to the Bowens Road North open cut. The simple assertion that restricting mining to daytime hours would not be economically feasible is not supported in the EIS by any information or analysis that would enable it to be assessed. Relevant information would include the assumptions made regarding coal prices over the project period.

The lack of justification for the 24-hour mining proposed in the mine plan clearly does not satisfy the Director General's Requirements which stipulate that the EIS must include a detailed description of the development, including need for the development and justification of the proposed mine plan.

If a detailed analysis of the effect of limiting mining operations to daylight hours has been done, that analysis should be made available to the Department for review. Important questions would be whether the same (optimistic) coal price of \$114 per tonne used in the EIS to predict socio-economic benefits of the project has been used in the financial viability analysis, and whether the proposed 24-hour operation derives from the company's objective of maximising the annual rate of return on capital investment rather than being essential to the viability of the project.

The need to limit noise impacts on residents must be recognised as a natural constraint on mining development in the closely settled Gloucester Valley. Critical to limiting the noise impact of current mining operations has been the restriction of mining to daylight hours. If any mining proposal is not viable within that constraint, then the proposal should not be approved.

#### Recommendation

- The proposal for 24-hour mining operations in the Avon North and East Stratford open cuts should be rejected. Mining operations (including waste rock removal) at the Avon North Open Cut and Stratford East Open Cut should occur should be limited to the same operating hours proposed for the Roseville West pit extension, ie 0700 hrs – 1800 hrs seven days per week for the duration of the project.

## **2. Impacts of Noise and blasting**

### **Noise**

The concurrent operation of multiple, widely separated pits within the project area would result in a substantial increase in the area potentially affected by intrusive noise. Night-time noise levels in year 7 are predicted to exceed the project specific noise levels (5dBA above RBL) over an area of some 7km x 7km. - Noise above the rated background noise level is predicted to occur over an area of around 10km x 8km. The much-enlarged "noise footprint" of the expanded project area will result in significantly more residents experiencing noise from the SCM.

Experience has demonstrated that the predicted noise and blasting impacts from the existing SCM operations understated the area within which residents would experience intrusive noise, yet the same methodology has been applied in the preparation of the current EIS.

Although SCPL has progressively acquired properties around the Stratford mine complex and has entered into a number of Landowner Agreements, intrusive noise and impacts of blasting continue to generate a high number of complaints. The number of complaints about intrusive noise has increased by around 500% over the 5 year period from 2007.

The fourteen residential properties from which intrusive noise or blasting impacts has been reported are all located outside the Noise Affection Zone of the current SCM operations.

Intrusive noise from the current operations is frequently experienced at this property, which is located some 4.5km from the Stratford CHPP. This noise has been the subject of complaints to SCPL over the past several years. It is evident that the noise nuisance arises from particular operational factors such as height of the product stockpile and position of stockpile dozer work and is not explained by weather conditions. However, despite the consistency of the nature of the noise described in the recorded complaints, and patterns such as timing, SCPL has not identified/acknowledged the source of the noise and consequently has been unable to propose changes that might help mitigate the noise.

This experience, which is common among property owners that have registered complaints, has led to a lack of confidence in the utility of the complaints management process as a component of adaptive noise management at the SCM.

The distances over which the intrusive noise is experienced, and the common descriptions of “roaring machine-like noise”, “low rumble”, “dozer or heavy truck noise”, “low hum behind a vehicle roaring noise” strongly indicate a significant low frequency component in the mine noise that is poorly attenuated by air & distance.

The Industrial Noise Policy points out that where a noise source contains certain characteristics, such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, there is evidence to suggest it can cause greater annoyance than other noise at the same noise level (INP p 28).

The INP further states that where a noise source contains such characteristics, an adjustment is to be applied to the source noise level received at an assessment point before it is compared with the project-specific noise level to account for the additional annoyance caused by the particular characteristic.

Noting that C-weighting is more responsive to low-frequency components of noise within the audibility range of humans, the INP recommends that both A- and C- weighted noise levels should be measured and assessed over the same time period to determine whether an adjustment for low frequency noise should be made (INP, Table 4.1).

The current use of an A-weighting filter in noise monitoring at the SCM is inadequate for this purpose because such A- weighting filters progressively de-emphasise frequencies below 500Hz.

Although noise from most mining operations could reasonably be assumed to contain characteristics such as intermittency, irregularity or dominant low-frequency content, it appears that no investigation or assessment has been undertaken of the characteristics of noise that would be generated in the extended mining operations, and there has been no consideration of need for relevant adjustments to be made to the predicted noise levels to account for the greater annoyance caused by those characteristics.

Indeed, the failure to adjust for such noise characteristics may go some way toward accounting for the discordance between predicted/measured noise impacts and the experience of nearby residents as recorded in the complaints register.

The Director General’s Requirements stipulate that when addressing reasonable and feasible mitigation measures regarding noise, vibration and blasting, the EIS must include *evidence* that there are no such measures available other than those proposed.

Mitigation measures proposed by SCPL include: installation of acoustic bunding along haul roads; use of XQ mobile fleet for new large haul trucks and dozers; and “generally” limiting the removal of waste rock at the Stratford East open cut to daytime hours for the first five years. However, SCPL maintains that no further noise mitigation measures– such as limiting the hours of mining operations or additional acoustic bunding – would be feasible and reasonable.

This unsubstantiated assertion clearly does not meet the Director General's Requirements.

The EIS notes that some elevated night-time noise levels at some locations could be avoided by restriction of mining at Avon North Open Cut and Stratford East Open Cut (in Years 6 to 11) to daytime only. - In the absence of evidence that such a restriction of operating hours would not be economically feasible, SCPL should be required to adopt the restricted operating hours as a noise mitigation measure.

On the basis of the limited at-source noise mitigation measures that are proposed by SCPL, it is predicted in the EIS that the proposed PSNL would be exceeded at 18 private receivers (App C, Table33). According to the information presented in the EIS, seven of those properties are not subject to a Landholder Agreement and are not within the noise management zone of the existing SCM.

For the most seriously affected of those properties, SCPL proposes additional at-receiver mitigation measures. This approach may be cost effective for SCPL but is greatly inferior to applying additional mitigation at-source. For rural receivers, acoustic insulation of premises does nothing to attenuate the noise nuisance experienced when working outdoors. Furthermore, a high level of acoustic insulation of premises on rural properties has adverse implications for safety and for farm management. This is due to the reduced capacity of residents to detect sounds of events such as approaching vehicles, falling trees, machinery malfunction and distressed or escaped stock.

Although the Socio Economic report prepared for SCPL by Gillespie Economics comments that "It is expected that the owners of the properties located within the Project noise affection [sic] zone would be granted the opportunity to be acquired by SCPL", the company does not in fact propose to acquire any property at the owner's request - regardless of the level of exceedance of the PSNL. That is, there is no proposed "Acquisition Zone".

That position contrasts with the condition in the Bowens Road North approval that requires SCPL to acquire a property if requested by the landowner, where intrusive noise exceeds the noise criteria by 5dBA. A similar requirement should apply to any new approval.

Further, we do not accept that the owners of any properties deemed to be only "marginally" affected by noise that exceeds the PSNL should be excluded from additional mitigations available to owners of properties deemed to be "moderately" affected. Nor do we accept that the obligation on SCPL to negotiate agreements with property owners should be limited to the highest exceedances of the PSNL.

There is no justification for the property owners affected by noise levels in excess of the PSNL criteria to be afforded lesser mitigating arrangements than those applying under the Bowens Road North conditions of consent.

Should the project be approved, the marginal/moderate categorisation used in the EIS should not form the basis of relevant conditions of consent. Rather, the conditions of consent should require SCPL to offer at-receiver mitigations at all private residences where the PSNL is exceeded. These would include acoustic insulation, air-conditioning and/or negotiation of a landholder agreement.

In the event that the property owner judges the installed acoustic insulation ineffective and it has not been possible to reach agreement on terms of a property agreement, then SCPL should be required to acquire the property upon the request of the owner.

If, despite these objections, the categorisation presented in the EIS is to stand, then as a minimum, the category ranges must be amended to describe exceedances *up to 2dBA* above PSNL, and exceedances *2dBA and above*. Otherwise, dispute would arise as to which category an exceedance of 2.5dBA for example should be assigned. Similarly, the threshold for inclusion in the Noise Affection zone

should be expressed as *5dBA and above*, rather than *>5dBA* as proposed in the EIS.

The summary tables listing receivers where PSNL exceedances are predicted to occur include only those properties where the exceedance would affect residential premises. Properties that are predicted to experience intrusive noise over a substantial part of the property area, but not including a residence, have been excluded. On the basis of mapping presented in the EIS, it is apparent that there are a further seven privately owned properties, that are not subject to a Landowner Agreement, where exceedances would affect more than 25% of the property area (properties 25, 34, 59, 284, 289, & 298).

The Noise Criteria in the SCM Development Consent (DA 23-98/99) and the BRNOC Development Consent DA 39-02-01) both stipulate that the noise criteria must not be exceeded “at any residence on privately owned land *or on more than 25 percent of any privately-owned land*”. Because of the likely impact on the use and value of the affected properties the same requirement should be applied to the currently proposed project.

In addition to the seven privately owned receivers with predicted intrusive PSNL exceedance that are not subject to a Landholder Agreement, another eighteen privately owned receivers with predicted PSNL exceedance are recorded as being subject to an existing Landholder Agreement. The number of those existing agreements that were negotiated on the basis of impacts from current operations (that are nearing completion) as opposed to impacts from operations proposed in the extension project is not disclosed.

Unless the existing agreements that fall into that category are renewed or re-negotiated, then the private receivers to which they relate should not be excluded from the properties identified in the conditions of consent as those where the noise criteria must be met.

### Recommendations

- All noise sources associated with the project should be assessed to identify noise characteristics of tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content. Both A- and C- weightings should be used to determine low-frequency components.
- Where analysis of noise sources identifies any of the characteristics listed above, the correction factors listed in the INP should be added to the predicted noise levels at the receiver before comparison with the criteria.
- C-weighted measurements should be included in all noise monitoring. Where those measurements indicate a significant low-frequency component in noise at a receiver, the correction factors listed in the INP should be added to the measured noise levels at the receiver before comparison with the criteria.
- The marginal/moderate categorisation used in the EIS should not form the basis of relevant conditions of consent. SCPL should be required to offer at-receiver mitigations at *all* private residences where the PSNL is exceeded. These would include acoustic insulation, air-conditioning and/or negotiation of a Landowner Agreement.
- Where the PSNL is exceeded by 5dBA or more at a private receiver, SCPL should be required to acquire the affected property if so requested by the landowner. The acquisition procedures should be the same as those set out in condition 11.2 of the Bowens Road North development consent (DA-39-02).
- The same provisions that apply to private residences where the PSNL is exceeded should apply to all properties where the exceedance affects more than 25% of the area of the

property.

- Private receivers that are subject to Landholder Agreements that were entered into on the basis of impacts from current or now-completed mining operations as opposed to the proposed new operations should not be excluded from the properties identified in the conditions of consent as those where the noise criteria must be met.
- If the categorisation of properties according to degree of exceedance of the PSNL is not rejected, the category ranges must be amended to describe exceedances *up to 2dBA* above PSNL, and exceedances *2dBA and above*. Similarly, the threshold for inclusion in the Noise Affection zone should be expressed as *5dBA and above*, rather than *>5dBA* as proposed in the EIS.
- The new mining fleet XQ trucks and other machinery proposed to be used in the operation of the Avon North, Stratford East and Roseville West Extension open cuts – on which the noise modelling has been based – must be deployed from the commencement of those operations.
- Noise mitigation works within the project area should be installed prior to opening the Avon North and Stratford East pits or the extension of the Roseville West pits.
- SCPL should be required to adopt – as a noise mitigation measure – the same restricted hours of operation for the Avon North and Stratford East developments that are proposed for the Roseville West Extension, ie 0700 hrs – 1800 hrs seven days per week for the full duration of the project.
- At-receiver noise mitigation such as enhanced glazing, insulation and air conditioning, and / or negotiation of Landowner Agreements in respect of properties where the modelling predicts exceedance of PSNLs should be completed prior to project commencement.
- A noise monitoring site should be established south of the Stratford East open cut prior to commencement of any works in connection with that pit.

### **Blasting**

The blasting impact assessment indicates that proposed vibration and /or air blast criteria would be exceeded at six private properties (that are not party to a landholder agreement) when blasts in the Avon North and Stratford East open cuts are above MIC 680 kg.

SCPL proposes that in the Avon North open cut and the Stratford East open cut the MIC would be reduced to 680kg “where necessary to achieve the relevant ground vibration criteria and / or air blast criteria at all receivers”. This is not adequate. *Both* criteria must be achieved at all receivers.

As the predictions for the Stratford East open cut are based on data from monitoring sites some distance from the proposed new pit, a significant margin of error must attach to them. Further, no adjustment has been made to the predicted impacts to reflect the specific building design, foundations and specific siting of individual premises. In some cases, such as the residence on this property, transmission of ground vibration is likely to be exacerbated by the fact that the building foundations rest on hard rock strata that strike roughly north - south and dip westwards under the proposed Stratford East open cut.

The Stratford East open cut will involve blasting in strata that abut the hard volcanics forming the eastern edge of the Gloucester geosyncline. There is no indication in the EIS that the greater transmissivity of those volcanics has been taken into account in the ground vibration modelling.

These factors suggest that the potential for transmission of ground vibration may be underestimated in the EIS, with the consequence that the potential for structural damage and human discomfort may be significantly understated, and the southern and eastern extent of the area where ground vibration criteria are likely to be exceeded may similarly have been underestimated.

Review of blasting-related complaints made by residents of Stratford village clearly indicates discomfort with ground vibration levels that meet the current 5mm/s criterion. Despite monitoring data indicating ongoing compliance with blasting criteria, nine blast complaints were recorded in 2010, twenty two in 2011, and forty one in the period January - Oct 2012. Practically all complaints about blasting impacts have been from residents of Stratford Village, with a smaller number from properties to the west of the village. This is not unexpected given the closeness of the existing Roseville West pit.

The conditions of consent for the BRNOC operation provide that if requested by the owner of a residence within 2km of the blasting locations, SCPL is to arrange and meet the cost of an inspection of the material condition of any structure on the property. This requirement should also apply to any blasting undertaken in connection with the proposed expanded operations.

The EIS notes but does not adopt the recommendation in relevant ANZEC guidelines that a PVS of 2mm/s be considered as the long-term regulatory goal for control of ground vibration. Twenty years since that recommendation was made, it is inappropriate for ground vibration criteria of 5mm/s PVS to continue to be applied for new developments such as the Avon North and Stratford East open cuts.

Monitoring records of blasting in the current Roseville West and Bowens Road North pits show that a criterion of 2mm/s PVS is achievable, and this should be applied as the standard for the proposed new pits. This is particularly important if the intent of the criteria remains the minimisation of annoyance and discomfort to persons at noise sensitive sites (including residences) caused by blasting.

As mining in the Stratford East pit advances southward it is likely that Glen Road will be subject to temporary closures when blasting is undertaken in the pit. Adequate notice of such closures affecting Glen Road, and local roads north of the project area, must be provided to affected residents by inclusion of a notice in the local newspaper. Additionally, since Glen Road is a through road, signage will be needed at the Waukivory end of the road advising non-local road users that access may be interrupted.

### Recommendations

- Where a residence on a property is within 2km of the blasting location, SCPL should be required to arrange and meet the cost of preparing a material condition report in relation to any structures on the property if requested by the property owner. The general terms of this requirement should reflect those that apply in the BRNOC conditions of consent, but should make clear that a property owner is entitled to obtain such a report prior to the commencement of blasting in new operations, and to obtain further reports after the new operations have commenced.
- The blasting criteria in the conditions of consent should require that, at any private receiver, a PVS level of more than 2mm/s must not be exceeded on more than 5% of the total number of blasts over a period of 12 months, and that the level must not exceed 5mm/s at any time
- The current consent limits of 1 blast per day on site, (unless an additional blast is required following a misfire) and 3 blasts per week (averaged over any 12 month period) should apply to the extension project.



- Blasting in the Avon North and Stratford East pits should be limited to the maximum MIC 400kg that is proposed to apply in the Roseville West Extension pit.
- A south-eastern noise monitoring site (recommended in the preceding section) should incorporate blast monitoring.
- At least one ground-vibration blast monitor should be sited on outcropping rock of the strata being blasted in the Stratford East and Avon North open cuts.
- Notice of proposed temporary road closures should be published one week in advance in the Gloucester Advocate and on the SCPL website. A minimum of 24 hours notice of any *additional* closures must be advised to affected residents by phone or email.
- Signage should be placed at the Glen Rd / Waukivory Rd intersection advising that Glen Rd may be closed at a point before the Bucketts Way exit.

### **3. Impacts on Flora and Fauna, and the proposed offset areas**

#### **Impacts**

Increased fragmentation of remnant woodland and forest habitats through clearing in the project area would remove or severely limit linkages to the forested areas east of the project area. The resulting reduction in habitat connectivity would act as a barrier to dispersal and migration of some fauna.

As that impact would continue until vegetation becomes established in the offset areas, biodiversity enhancement area and on the post-mine landforms, the isolation of the small remnant habitats in the project area would increase the risk of local species loss for fauna that utilise them, particularly species with low mobility.

Among those most likely to be significantly impacted are the threatened Squirrel Glider and Brush-Tailed Phascogale, which are highly dependent on the availability of tree hollows for nesting.

Sections of the EIS that compare areas of vegetation to be cleared with areas to be offset, are deficient in that they focus almost exclusively on vegetation type and community (eg “dry sclerophyll forest”, but provide no information on the age structure of the vegetation. With some exceptions, such as Koalas and Glossy Black Cockatoos which rely on specific species as food sources, the age structure of the vegetation can be of more critical importance to threatened species utilising it than its type and composition.

Most of the area of native vegetation that would be cleared for additional surface development, some 97.7ha, is described as wet sclerophyll forest, dry sclerophyll forest and grassy woodland. The proposed offset areas include larger areas of these forest types, but mostly have a much lower density of hollow-bearing trees than occurs in some parts of the areas proposed to be cleared.

In Eucalypt forests, the formation of tree hollows takes around a hundred years, and a further 50 years may be needed for development of large hollows needed by fauna such as the Squirrel Glider and Glossy Black Cockatoo. Until plantings on currently cleared offset areas mature, there would be a substantial net loss of habitat for fauna requiring mature trees for nesting & feeding. (Around half of the aggregate offset area is currently cleared). Because of the long period of time required for their development, tree-hollows should be recognised as a limited resource that is not renewable within the time scale of a human lifetime.

Land clearance is a key threatening process under the EPBC Act, and clearing of native vegetation and loss of hollow-bearing trees are listed as key threatening processes under the TSC Act. Loss of tree hollows will be one of the most direct and significant impacts of clearing proposed to occur for the expansion of mining at the SCM. If that clearing proceeds, the greatest impact will be on the Squirrel Glider and the proposed mitigations are likely to be less effective for that species than others because of its dependency on the limited supply of slow-forming tree hollows.

To replace lost hollows until offset re-growth matures, SCPL proposes to implement a nest box placement program.

It is acknowledged in the EIS that the nest box installation program is unlikely to compensate for the direct loss of large hollow-bearing trees, but SCPL's consultants maintain that it is "likely to assist in the short to medium-term with the replacement of potential roost/nesting habitat for some species until existing regrowth vegetation becomes sufficiently mature to develop hollows." (App. F, p93).

However as most of that regrowth vegetation is only 50-60 years old or less, the development of hollows can be expected to take another 50 or more years. Hence habitat supplementation by installation of nest boxes would have to be maintained over that timeframe if a persistent net reduction in biodiversity is to be avoided.

The predicted duration of the East Stratford project is only about ten years and there can be no confidence that installed nest boxes will be maintained for at least another 50 years beyond that.

Along with a lack of demonstrated effectiveness of nest box programs, the practical difficulties of maintaining the placed nest boxes over such an extended period highlight the inferiority of nest-box placement compared to the alternatives of avoiding clearance of areas with high tree-hollow density and including more areas with at least moderate tree-hollow density in the areas to be offset.

On the basis of the AMBS survey information (Fig 21 App F) it is asserted in the EIS that the density of tree hollows in the proposed offset areas is comparable with the low densities found in the project area (App F p116). However the more detailed surveys done by Ecobiological in 2010 show that while the majority of the forest and woodland areas in the project area have low densities of tree hollows (less than 10 per hectare), in several places densities of 10 – 20 per hectare were recorded. In four distinct areas the densities were found to exceed 20 per hectare.

Of great concern is the fact that some of the highest densities found in the project area and proposed offset areas, with densities of more than 20 per ha in places, are in areas proposed to be cleared in the south-west corner of the Avon North open cut and at the southern end of the Stratford East open cut.

To reduce the risk of local species loss for fauna that utilise the tree hollows, clearance in the Stratford East and Avon North open cuts should not extend into those remaining areas of high tree hollow density.

### **Proposed offset areas**

SCPL's aim to locate offsets close to the areas of lost habitat is supported because it will assist in restoring the original floral and faunal composition, increase the probability of colonisation and better incorporate localised habitat characteristics and ecological processes.

Similarly, despite the current poor condition of much of the area, the aim of restoration of habitat and biodiversity across the Craven Valley wildlife corridor, primarily through establishment of offset areas 3 and 4, is supported.

The Craven Valley wildlife corridor, which is sometimes described as the Barrington – Great Lakes Climate Change Corridor, links conservation reserves and other forested public lands on the eastern side of the Gloucester Valley with those to the west, and provides residential and dispersal habitat for a range of threatened and endangered species.

Aided by the presence of two VCA areas already established in or bordering the corridor, offset areas 3 and 4 would significantly enhance the condition and viability of the wildlife corridor.

We do however have concerns about particular aspects of the offset proposals. These relate primarily to: the adequacy of the offset ratio; factors that potentially diminish the environmental values of the offset areas; the suitability of offset area 1; the age structure and tree hollow density of the woodland and forests in the offset areas; and connectivity between the offset areas.

Although the proposed offset areas appear large in simple terms of combined area relative to the area to be cleared for the proposed expansion of mining operations, several factors diminish their adequacy.

These include:

- The young age of regrowth in much of the proposed offset areas, including lower density of tree hollows in most of the offset areas than exists in parts of the forest & woodland proposed to be cleared for the project.
- The long time required for new planting to mature sufficiently to provide habitat usable by impacted threatened species of fauna.
- Separation of offset areas 1 and 4 from areas 2 and 3.
- Small size and poor connectivity of offset area 1 with other areas of quality habitat.
- Closeness of offset area 1 to the urban environment of Stratford.
- The presence of occupied houses in the offset areas, with associated issues concerning domestic pets, noise and other disturbance.
- The presence of roads along the perimeters and within the offset areas.
- The presence of powerline easements (existing and proposed) through offset area 3.
- Expected development of coal seam gas wells & associated infrastructure in offset area 3.
- Uncertainty about the success of ongoing maintenance / enhancement of biodiversity in the offset areas.

There is extensive published evidence from Australian research that a large offset ratio is required to achieve no net loss of biodiversity. In large part, this is because of the uncertain prospects of success for aspects of the management plans designed to maintain and enhance biodiversity within the offset areas. In relation to the current proposal, there is for example considerable uncertainty about the success of habitat restoration in areas of currently cleared land that will be revegetated, and the use of nest boxes to compensate for lost tree hollows.

The value and viability of one of the proposed offset areas (area 1) is very doubtful. The habitat in offset area 1 is comprised largely of young regrowth grassy woodland and young regrowth dry Sclerophyll forest. The area is small, adjacent to the Stratford urban environment, poorly connected to other habitat areas and lies outside the recognised Craven Valley wildlife corridor. It has a tree-hollow density of less than 6 per ha.

Other areas of land already owned by SCPL would better offset the biodiversity impacts of the project and should be substituted for the proposed Offset Area 1. Areas that should be considered as alternatives include the ex-Allman property that links offset areas 3 and 4 and the northern portion of the ex-Billins property that adjoins offset area 3. Both of those properties are within the Craven Valley corridor. They contain areas of forest and woodland similar in age structure to that proposed to be cleared for the Stratford East open cut and areas of moderate tree-hollow density. Use of the ex -

Allman property as an offset would provide the additional benefit of practical contiguity between offset areas 2, 3 and 4. The currently proposed offset area 1 does not link to any of the other proposed offset areas.

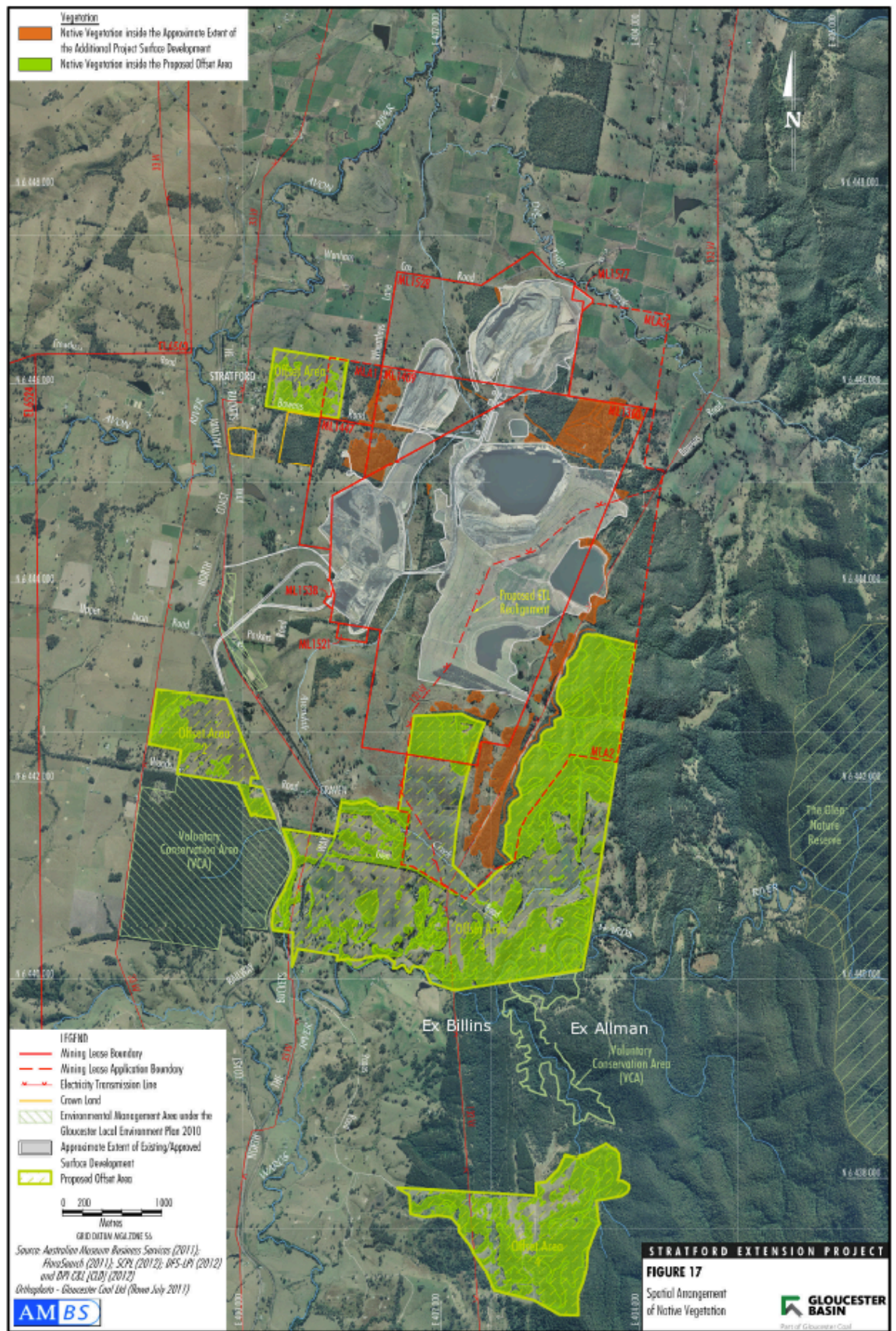
The location of those potential offset areas is shown in the figure at the end of this section.

SCPL indicates that a voluntary conservation agreement (VCA) would be sought in relation to the offset areas. The proposed offset areas may not meet the criteria for declaration of VCAs, but the covenants applied through VCAs provide an appropriate benchmark for the protection measures that should apply to the offset areas.

### Recommendations

- A higher offset ratio should be required. This is necessary to compensate for the generally low densities of hollow bearing trees in the offset areas, the long time lag that will occur in the establishment of replacement habitat; uncertain utilisation rate of artificial nest boxes; uncertainty of success of development of offset habitat; and the impacts on the proposed offset areas of houses, power transmission easements and planned coal seam gas infrastructure.
- More areas with at least moderate tree-hollow density should be included in the offset areas.
- SCPL should be required to nominate additional areas that would be used as supplementary offsets in the event that monitoring finds that habitat restoration in initial offset areas has not achieved long-term viability and functionality of biodiversity.
- The proposed offset area 1 should be rejected as it is not appropriately located and is unlikely to be of enduring viability. An alternative area within the Craven Valley corridor with better linkages to other offset areas, and with a higher tree-hollow density, should be identified from the survey data prepared for the EIS.
- Alternative areas to be considered as offset areas should include the ex-Billins and ex-Allman properties that adjoin offset area 3.
- Final acceptance of the proposed offset areas should be made conditional on Yancoal expressly ruling out future mining or exploration by Yancoal (or connected companies) in the offset areas.
- The Avon North and Stratford East open cuts should not extend into the forest / woodland area identified by Ecobiological as having more than 20 tree-hollows per hectare.
- The number of nest boxes to be placed in offset areas to compensate for losses due to clearing or isolation of habitat should be supplemented by additional boxes to provide habitat for fauna likely to be displaced from areas adjoining the expanded mining area due to disturbance from noise, lighting and blasting for the duration of the project.
- Where placement of nest boxes is required as a supplementary measure, that should occur in the more mature areas of forest and woodland in the offset areas prior to any clearance in the project area.
- The arrangements made for the in-perpetuity protection and management of the offset areas should provide specific protections no less comprehensive and restrictive than those that apply generally under VCAs.





Map showing location of potential alternative offset areas : Ex Billins & Ex Allman properties

## Consolidated List of Recommendations

1. Concurrent mining operations in more than two open cut pits within the SCM mining lease area should not be approved.
2. The proposal for 24-hour mining operations in the Avon North and East Stratford open cuts should be rejected. Mining operations (including waste rock removal) at the Avon North Open Cut and Stratford East Open Cut should occur should be limited to the same operating hours proposed for the Roseville West pit extension, ie 0700 hrs – 1800 hrs seven days per week for the duration of the project.
3. All noise sources associated with the project should be assessed to identify noise characteristics of tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content. Both A- and C- weightings should be used to determine low-frequency components.
4. Where analysis of noise sources identifies any of the characteristics listed above, the correction factors listed in the INP should be added to the predicted noise levels at the receiver before comparison with the criteria.
5. C-weighted measurements should be included in all noise monitoring. Where those measurements indicate a significant low-frequency component in noise at a receiver, the correction factors listed in the INP should be added to the measured noise levels at the receiver before comparison with the criteria.
6. The marginal/moderate categorisation used in the EIS should not form the basis of relevant conditions of consent. SCPL should be required to offer at-receiver mitigations at *all* private residences where the PSNL is exceeded. These would include acoustic insulation, air-conditioning and/or negotiation of a Landowner Agreement.
7. Where the PSNL is exceeded by 5dBA or more at a private receiver, SCPL should be required to acquire the affected property if so requested by the landowner. The acquisition procedures should be the same as those set out in condition 11.2 of the Bowens Road North development consent (DA-39-02).
8. The same provisions that apply to private residences where the PSNL is exceeded should apply to all properties where the exceedance affects more than 25% of the area of the property.
9. Private receivers that are subject to Landholder Agreements that were entered into on the basis of impacts from current or now-completed mining operations as opposed to the proposed new operations should not be excluded from the properties identified in the conditions of consent as those where the noise criteria must be met.
10. If the categorisation of properties according to degree of exceedance of the PSNL is not rejected, the category ranges must be amended to describe exceedances *up to 2dBA* above PSNL, and exceedances *2dBA and above*. Similarly, the threshold for inclusion in the Noise Affection zone should be expressed as *5dBA and above*, rather than *>5dBA* as proposed in the EIS.
11. The new mining fleet XQ trucks and other machinery proposed to be used in the operation of

the Avon North, Stratford East and Roseville West Extension open cuts – on which the noise modelling has been based – must be deployed from the commencement of those operations.

12. Noise mitigation works within the project area should be installed prior to opening the Avon North and Stratford East pits or the extension of the Roseville West pits.
13. SCPL should be required to adopt – as a noise mitigation measure – the same restricted hours of operation for the Avon North and Stratford East developments that are proposed for the Roseville West Extension, ie 0700 hrs – 1800 hrs seven days per week for the full duration of the project.
14. At-receiver noise mitigation such as enhanced glazing, insulation and air conditioning, and / or negotiation of Landowner Agreements in respect of properties where the modelling predicts exceedance of PSNLs should be completed prior to project commencement.
15. A noise monitoring site should be established south of the Stratford East open cut prior to commencement of any works in connection with that pit.
16. Where a residence on a property is within 2km of the blasting location, SCPL should be required to arrange and meet the cost of preparing a material condition report in relation to any structures on the property if requested by the property owner. The general terms of this requirement should reflect those that apply in the BRNOC conditions of consent, but should make clear that a property owner is entitled to obtain such a report prior to the commencement of blasting in new operations, and to obtain further reports after the new operations have commenced.
17. The blasting criteria in the conditions of consent should require that, at any private receiver, a PVS level of more than 2mm/s must not be exceeded on more than 5% of the total number of blasts over a period of 12 months, and that the level must not exceed 5mm/s at any time
18. The current consent limits of 1 blast per day on site, (unless an additional blast is required following a misfire) and 3 blasts per week (averaged over any 12 month period) should apply to the extension project.
19. Blasting in the Avon North and Stratford East pits should be limited to the maximum MIC 400kg that is proposed to apply in the Roseville West Extension pit.
20. A south-eastern noise monitoring site (recommended in the preceding section) should incorporate blast monitoring.
21. At least one ground-vibration blast monitor should be sited on outcropping rock of the strata being blasted in the Stratford East and Avon North open cuts.
22. Notice of proposed temporary road closures should be published one week in advance in the Gloucester Advocate and on the SCPL website. A minimum of 24 hours notice of any *additional* closures must be advised to affected residents by phone or email.
23. Signage should be placed at the Glen Rd / Waukivory Rd intersection advising that Glen Rd may be closed at a point before the Bucketts Way exit.
24. A higher offset ratio should be required. This is necessary to compensate for the generally low densities of hollow bearing trees in the offset areas, the long time lag that will occur in the establishment of replacement habitat; uncertain utilisation rate of artificial nest boxes; uncertainty of success of development of offset habitat; and the impacts on the proposed offset

areas of houses, power transmission easements and planned coal seam gas infrastructure.

25. More areas with at least moderate tree-hollow density should be included in the offset areas.
26. SCPL should be required to nominate additional areas that would be used as supplementary offsets in the event that monitoring finds that habitat restoration in initial offset areas has not achieved long-term viability and functionality of biodiversity.
27. The proposed offset area 1 should be rejected as it is not appropriately located and is unlikely to be of enduring viability. An alternative area within the Craven Valley corridor with better linkages to other offset areas, and with a higher tree-hollow density, should be identified from the survey data prepared for the EIS.
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30. The Avon North and Stratford East open cuts should not extend into the forest / woodland area identified by Ecobiological as having more than 20 tree-hollows per hectare.
31. The number of nest boxes to be placed in offset areas to compensate for losses due to clearing or isolation of habitat should be supplemented by additional boxes to provide habitat for fauna likely to be displaced from areas adjoining the expanded mining area due to disturbance from noise, lighting and blasting for the duration of the project.
32. Where placement of nest boxes is required as a supplementary measure, that should occur in the more mature areas of forest and woodland in the offset areas prior to any clearance in the project area.
33. The arrangements made for the in-perpetuity protection and management of the offset areas should provide specific protections no less comprehensive and restrictive than those that apply generally under VCAs.

Philip Greenwood

Graeme Healy

23 January 2013