Hunter Environment Lobby Inc.

Planning Assessment Commission
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Submission of Objection:Wambo Mine – Modification 12 – Southern Longwall Modifications

Hunter Environment Lobby Inc. (HEL) is a regional community-based environmental organization that has been active for over 20 years on the issues of environmental degradation, species and habitat loss, and climate change.

In October 2006, HEL raised objection to the proposed Modification 6 of Wambo Mine, and the proposition to re-route and destroy North Wambo Creek. HEL warned at that time of irreversible consequences and significant environmental effects.

Further to this 2006 objection to Mod 6, in our submission of objection to this Mod 12 development on 6 May 2016, HEL outlined major concerns and called once again for an independent regional study of mining impacts on the Hunter River, as well as it's tributaries.

HEL also has concerns in regard to the cumulative biodiversity impacts of mining in the Hunter Region and the lack of adequate protection of biodiversity offsets and unreliable monitoring and regulation of their management.

Water Impacts and Salinity Management:

We consider that the proposal cannot be properly assessed for water impacts until the Federal Bioregional Cumulative Impact Assessment has been completed. The extent of impacts of mining on water sources in the Hunter Region is yet to be fully understood.

It is irresponsible under the principles of ecologically sustainable development to continue approving cumulative impacts on water sources within a vacuum of adequate assessment of current long term and irreversible degradation. The precautionary principle must prevail with any consideration of mine expansion in this heavily impacted area of the Hunter Valley.

We do not agree with the assessment of this proposal that additional impacts on water sources will be minimal. The impact of diffuse dispersion of salts and heavy metals from disturbed mined areas is not fully understood on a regional scale.

HEL is concerned that the current large volume of water make in the Wambo underground mine of over 1300 ML/year is significant and the discharge into Wollombi Brook may not be adequately managed under the Hunter River Salinity Trading Scheme (HRSTS).

HEL contributed considerable input into the 10 year review of the HRSTS. The Hunter Catchment Salinity Assessment conducted as part of the review identified that there are high levels of salinity in Wollombi Brook at Warkworth that need to be further assessed. This could be a result of combined discharge and diffuse dispersion from Wambo Mine.

There are a number of key areas where improved monitoring and assessment would enhance regulators and decision makers knowledge of the impacts of mining on the Hunter River catchment.

The Hunter Catchment Salinity Assessment Report (The Report) was prepared by the Office of Environment and Heritage for the NSW Environment Protection Authority in November 2013.

In the summary to this report it was outlined that the Hunter River Salinity Trading Scheme (the Scheme) operates to minimise the impact of saline water discharges from industry on the Hunter River.

It achieves this by allowing discharge of saline water only at times of high or flood flow in the Hunter River and uses a system of salinity credits to limit the amount of salt that can be discharged at any one time.

In anticipation of the ten-year review of the Regulation, the NSW Environment Protection Authority (EPA) commissioned the Office of Environment and Heritage (OEH) to conduct a desktop study (the Report) to evaluate the effectiveness of the Scheme based on available water quality and ecological health data.

‘There are a variety of potential sources of salinity in the Hunter River catchment including rainfall, atmospheric deposition, run-off and infiltration, weathering of geological strata, groundwater and a range of anthropogenic sources including the Scheme.

The Hunter River valley is generally considered to be saline due to the marine origin of some of its Permian sediments. However, recent land-use activities in the catchment may have contributed to rising groundwater levels in some areas and an increase in the salinity load reaching many streams.

Overlaid on the natural cycling of salts in the Hunter River catchment are anthropogenic sources – particularly mining, power generation and agriculture.

The Scheme restricts saline discharges from mining and power generation to times of high or flood flow. The Scheme's salinity targets apply only in the Hunter River between Glenbawn Dam and Singleton, and not within any of the tributaries.'[1]

However, on page 6 the Assessment Report says that Hunter River salt loads can also be affected by the major tributaries such as the Goulburn River and Wollombi Brook. The report continued that at times high EC levels in the Wollombi Brook at Warkworth in the mid to late 2000s (not related to flow) warrant further investigation.

In the Catchment Overview of the Assessment Report an outline is given about the soils and underlining geology of the region. 'The Hunter River valley's stream sediments are strongly controlled by its underlying geology. Features such as major fault lines separate the Carboniferous rocks exposed along the northern areas of the valley from the central Permian-age coal measures and the Triassic sandstones in the south and south-east.

Extensive folding and faulting of the Carboniferous rocks have resulted in the formation of steep country leading up to the Barrington Tops which is underlain by basalt. The Permian rocks have eroded to form the main corridor of the broad valley.

Due to marine transgressions during their formation, some of these rocks are high in salt content, which has resulted in naturally high salinity levels in many of the central valley streams and drainages. Additionally, the valley is often prone to dryland salinity due to extensive clearing of the native vegetation and elevated or intersected saline groundwater tables.'[2]

This comprehensive overview of the natural landforms and systems is overlaid by another whole layer of explanation of how anthropogenic changes have altered the amounts of salinity we find in the rivers and tributaries and how they have passively or actively managed to get there.

In the section headed 'Sources of salinity in the Hunter catchment', the Report highlights how overlaid 'on the natural cycling of salts in the Hunter River catchment, however are anthropogenic sources; particularly mining, power generation and agriculture.

These activities can either remove salts from the river system (e.g. via water extractions) or add them into the system (via licensed discharges and/or overland run-off). The multiplicity of salt sources and the highly variable spatial and temporal interaction of natural and anthropogenic sources make management of salinity in the Hunter River catchment a very complicated issue.

[1] P5 Hunter Catchment Salinity Assessment 2013
[2] Page 8 Hunter Catchment Salinity Assessment 2013

This issue receives even greater focus when the catchment is affected by drought and when competition for sufficient water of suitable quality can become an area of conflict.'[3]

Changes brought by man are indeed complicated, and when overlaid on the natural salt bearing areas, we do see an even more complex patchwork. As the report states, 'most salt efflorescences occur in the Wollombi Brook valley between Broke and Singleton.

The Mulbring Siltstone, in particular, generates a large number of salt scalds and salt-affected streams. Salinisation of soils, streams and groundwater in the Central Lowlands is closely related to rock type, and the intensity of halite salting is greatest in provinces where groundwater has the strongest connatemarine signature.

Some point sources of natural salt contamination existed before European settlement in the Central Lowlands or were contemporaneous with it, as evidenced by early geographic names with salinity connotations – such as Saltwater Creek. Forest clearing has undoubtedly exacerbated degradation of the land by promoting salting under conditions of increased run-off, erosion and rising water tables in the Central Lowlands.' [4]

Salt levels are measured in water by the amount of electicity that can be conducted between two points, that is called the 'EC' of a particular volume of water, whether in stream or in a laboratory.

Once again, in the Report, areas in the study area of the Hunter and tributaries are compared and noted and the 'higher variability in EC levels is seen again downstream of the Wollombi Brook junction.'[5] So we see natural salt levels in this area are very variable before any anthropogenic changes are added.

We see an interesting scenario in page 36 of the Report, as it teases out the reasons why there may be higher EC readings in the 2000's as well as why further assessment is necessary – under the heading of Wollombi Brook monitoring stations.

'Results of comparisons for the Wollombi Brook monitoring stations suggest the following:

- Flow and EC records for Wollombi Brook at Bulga (210028) suggest higher flows in the 1970s & 1980s compared to the 2000s. Limited flow data were available for the 1990s. EC records for the 1970s & 1980s and 1990s were slightly lower than EC levels in the 2000s but this may be affected to some degree by sample size differences. EC levels exceeded 1000 µS/cm on some occasions and there appears to be a declining trend since the early 2000s. The median EC level over the period 1970 to 2013 was 674 µS/cm.
- Flow and EC records for Wollombi Brook at Warkworth (210004) suggest higher flows in the 1970s & 1980s compared to the 1990s and 2000s. EC

[3] Page 10 Ibid
[4] Page 18 Ibid
[5] Page 31 Hunter Catchment Salinity Assessment 2013

records for the 1970s & 1980s and 1990s were obviously lower than EC levels in the 2000s. EC levels exceeded 1000 µS/cm for most of the 2000s with some very high EC levels (approaching 10,000 µS/cm) recorded. The EC–flow relationship demonstrates that EC concentrations were often not well-correlated with flow.

This is clearly different to the patterns of EC and flow upstream at Bulga. Overall, the EC data implies impacts either from saline groundwater moving into Wollombi Brook or from mining. Further assessment is necessary to fully understand the underlying mechanisms yielding high EC levels in Wollombi Brook at Warkworth. Median EC over the period 1970 to 2013 was 740.5 µS/cm, however, the median EC level during the 2000s was 891.1 µS/cm.'[6]

As can be seen by those startlingly high readings, there is reason to ask for further assessment, as the Hunter Catchment Salinity Assessment has intimated.

'Most tributary monitoring sites also showed a decreasing relationship between EC and flow (see Appendix B). An exception to this last generalisation was Wollombi Brook at Warkworth, where the EC–flow relationship demonstrates that EC concentrations were often not well-correlated with flow (as would normally be expected and appeared to be the case for most other monitoring stations, including the upstream Wollombi Brook site at Bulga).

Overall, the flow and EC data at Wollombi Brook at Warkworth implies impacts either from saline groundwater and/or mining. Further assessment is necessary to fully understand the underlying mechanisms which yielded the high EC levels at Warkworth, but these relatively high levels have the potential to reduce the opportunities of the Scheme by increasing the EC contributed by Wollombi Brook waters where they join the Hunter River. Fortunately the very high EC levels of the mid to late 2000s have now declined, but still need ongoing monitoring.'[7]

The Report goes on to ask what other sources of salinity in the Hunter catchment could influence the operation of the Scheme in the future? It reiterates that Hunter River salt loads can also be affected by the major tributaries such as the Goulburn River and Wollombi Brook.

'While the Scheme itself does not apply to the Goulburn River upstream of Kerrabee, high salinity water from tributary sources can affect EC levels and discharge opportunities in the Hunter River downstream of their confluences. Goulburn River salt loads are highly variable and dependant on subcatchment source, but can at times be greater than the salt load measured in the Hunter River at Denman.

Three mines (Ulan, Wilpinjong and Moolarben) currently have discharge licences in the Upper Goulburn River catchment, and further mining and CSG exploration is proposed for this area.

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[6] Page 36 Ibid
[7] Page 41 Hunter Catchment Salinity Assessment 2013

With this likely expansion of mining and coal seam gas extraction, and the lack of realtime monitoring in the both the upper and lower sections of the Goulburn River catchment, strategic real-time monitoring of flow and salinity in other areas of the Goulburn River catchment is recommended.

Further assessment is necessary to fully understand the underlying mechanisms which yielded the high EC levels in Wollombi Brook at Warkworth, but these relatively high levels also have the potential to reduce the opportunities of the Scheme by increasing the EC contributed by Wollombi Brook waters where they join the Hunter River.

Fortunately the very high EC levels measured in the mid to late 2000s have now declined, but still need ongoing monitoring. Most other monitoring stations throughout the catchment showed little evidence of increasing EC levels, except potentially during the 2000 to 2007 drought.

The interaction of rainfall, flow and groundwater contribution needs further assessment in these areas to fully understand the effects of drought on surface water EC levels in the Hunter River catchment.

A return to drought conditions in the Hunter River catchment could lead to reduced flow and increases in EC levels in the Hunter River and its tributaries and decrease the opportunities for saline discharges under the Scheme.'[8]

So it is seen that HEL raised concerns regarding potential impacts on Wollombi Brook as a result of the Wambo Coal Mine. HEL also raised concerns about the management of discharge into Wollombi Brook under the Hunter River Salinity Trading Scheme (HRSTS).

We see in the Response to Submissions June 2016 Attachment 6 of the EA - Dr Frans Kalf was commissioned by WCPL to conduct a peer review of the Groundwater Assessment, and found it adequate, professional and detailed (Attachment 6 of the EA).

(KA Peer Review of HydroSimulations Groundwater Assessment of the South Wambo Underground Mine Modification
KALF AND ASSOCIATES Pty Ltd Hydrogeological, Numerical Modelling Specialists)

See below:-

'The site water management strategy for the Wambo Coal Mine is based on the containment and re-use of mine water within the water storage dams at the Wambo Coal Mine. This limits the potential for off-site release of salt and heavy metals.

WCPL currently holds 48 credits to discharge water from site under the HRSTS in accordance with the requirements of the scheme and the conditions of EPL

[8] Page 53 Ibid

529. These arrangements require flow in Wollombi Brook to exceed 500 megalitres per day (measured at the Bulga gauging station) for water releases to occur.

As noted by HEL, the HRSTS undergoes regular reviews. WCPL will comply with the regulated outcomes of any of these reviews. WCPL reviews and updates its site water balance annually in accordance with the conditions of the Development Consent (DA 305-7-2003).

The annual review of the site water balance under Condition 25, Schedule 4 of the Development Consent (DA 305-7-2003) would continue to review and confirm that these inflows can be managed by the approved water management system, or initiate corrective action if required.

There is additional contingent capacity for water storage at Wambo Coal Mine (i.e. the approved Montrose Water Storage Dam with a nominal capacity of 1,500 megalitres).''[9]

However, there is no answer to the Report of the Hunter Catchment Salinity Assessment that says, 'return to drought conditions in the Hunter River catchment could lead to reduced flow and increases in EC levels in the Hunter River and its tributaries and decrease the opportunities for saline discharges under the Scheme.' We take that to mean for the Scheme as a whole.

HEL requested an independent assessment of the water impacts of Wambo Coal Mine be conducted, and we note that in addition to Kalf's peer review, the potential impacts on water resources will be independently assessed by the DP&E, the DPI Water and the Planning Assessment Commission (PAC).

HEL wants to ensure that all these agencies are cognisant of the Hunter Catchment Salinity Assessment Report that there is a need to fully understand the underlying mechanisms yielding high EC levels in Wollombi Brook at Warkworth.

We are concerned, as is the Independent Expert Science Committee (IESC), that high salinity readings at groundwater monitoring sites P114 and P116 could be indicating leakage from the South Wambo Dam.

Of greater concern is that the DPI Water request for paired monitoring bores at this site on approval of Wambo Mod 14 has not yet occurred. We disagree with the Department of Planning and Environment (DoPE) that this monitoring is independent to consideration of the Mod 12 proposal.

The South Wambo Dam is directly over the proposed changes to mining the higher coal seams in Area 2. This needs detailed assessment and consideration. The potential subsidence impacts under South Wambo Dam of the proposed changes to multi-seam mining need to be further investigated. This could cause greater leakage of saline water into the surrounding landscape.

[9] Page 23 South Wambo Underground Mine Modification – Response to Submissions on the Environmental Assessment

This issue is yet another demonstration of the history of poor regulation and monitoring of impacts at the Wambo Mine site.

HEL has major concerns that the proposal could cause an exponential increase in the transmission of saline water to the alluvium over the long term.[10]

Biodiversity Impacts

HEL is concerned that the history of subsidence impacts on the Fenwick property 'Oakdale', that are still occurring 20 years of post mining, has not been taken into account when considering the long term impacts of subsidence on areas of biodiversity.

The Remnant Woodland Enhancement Program (RWEP) is the key biodiversity offset mechanism for the Wambo Mine surface disturbance. However, a large portion of the RWEP, including the proposed additional 41.6 ha offset area is overlying the proposed changes to mining in Area 2.

These changes include 7 new longwall panels in the Woodlands Hill coal seam which is above the approved Arrowfield and Bowfield Seams.

We understand that several coal seams have already been extracted from this area. It is of great concern that the assessment of subsidence impacts for this Mod 12 proposal do not take into account previous movements resulting from the removal of the Whybrow and Wambo seams.[11]

The maximum predicted total subsidence is 8.2m with all extractions considered. There is no rigorous assessment of the impact of this scale of subsidence on areas of remnant biodiversity, including the offset areas in the RWEP.

There is recognition that there are likely to be some unconventional ground movements because of the multi-seam mining operations.

It appears that DoPE has relied entirely on the proponent's subsidence model with no indication of an independent review. This is entirely unsatisfactory. HEL considers that the subsidence impacts on the mine site and mine owned land are likely to be as great as those experienced on the Fenwick's property.

The assessment of current subsidence impacts and the predictive modelling relies entirely on information provided by the proponent.

HEL recommends that the PAC commission an independent subsidence review that includes inspections of areas that have been undermined.

There is recognition that the proposed shift from the deeper approved Bowfield Seam to the higher Woodlands Hill Seam could exacerbate fracturing up to the

[10] Page 19 Environmental Assessment Report, DoPE

[11] Page 14 Ibid

Wambo Seam, in which mining has caused fracturing up to the Whybrow Seam, in which mining has caused fracturing to the surface.[12]

The dismissal that this level of impact will be negligible on threatened species habitat overlying longwall panels and in the area of subsidence impact is unfounded.

The Mod 12 proposal will impact on 170 ha of the critically endangered *Central Hunter Valley Eucalypt Forest and Woodland* ecological community (CEEC) and 180 ha of potential habitat for the critically endangered Regent Honeyeater. HEL does not consider that enough assessment has been undertaken to demonstrate that impacts to these areas will be negligible.

The Regent Honeyeater is continuing to lose substantial areas of habitat from the floor of the Hunter Valley. The recently approved Mt Owen Mine expansion has caused the destruction of 451 ha of Regent Honeyeater habitat on that mine site alone. A similar area will be impacted by the Warkworth Mine.

This demonstrates the inability of DoPE to consider and assess the cumulative impact of habitat loss for this species.

The proposal also has the potential to damage the perched aquifer system supporting the critically endangered Warkworth Sands Woodlands ecological community that occurrs in Area 4. Because of key issues with the subsidence model, as outlined above, HEL has no confidence in the DoPE conclusion that there is no threat to this particular CEEC that has suffered cumulative loss in the region.

There is also concern that the impact of the placement of 5 venilation shafts, 2 centralised gas flaring plants and associated access roads and infrastructure is unknown and unassessed.

It is unsatisfactory for the assessment of these impacts to be left to the post approval Extraction Plan and Flora and Fauna Management Plan.

The impact of this increase in surface infrastructure should be assessed as part of the approvals process.

The impact of these proposed surface structures on the RWEP and other areas of critical habitat is currently unknown. This emphasises that fact that the RWEP, as an offset area, is not protected from ongoing impacts of subsidence and surface disturbance.

In regard to the protection of the RWEP, the new United Wambo joint venture proposal includes the destruction of an area of the RWEP by proposed expanded open cut mining footprint.

HEL considers that the biodiversity impacts of Mod 12 are unknown and the current and proposed offsets in the RWEP are not protected from future impacts.

[12] Page 19 Ibid

The mitigation of biodiversity impacts for this proposal are unsatisfactory and should not permissible.

Conclusion

HEL considers the cumulative impacts on water sources and biodiversity of the Wambo Mine have not been adequately identified or assessed.

The proposed changes to the approved mine are significant and should not be approved as a 75W modification. A greater level of detailed assessment is required.

The subsidence predictions of the proposal have not been independently reviewed or adequately ground-truthed

The current regulation of impacts of the Wambo Mine is unsatisfactory.

HEL recommends that the PAC not approve the proposal on the basis of the poor information provided.

Yours faithfully

Jan Davis
President