NSW GOVERNMENT | Department of Primary Industries

OUT14/9444

Ms Jessie Giblett
Mining Projects
NSW Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

10 APR 2014

Jessie.Giblett@planning.nsw.gov.au

Dear Ms Giblett,

West Wallsend Colliery Modification 1 (MP 09_203 Mod 1)
Proposed Modification

I refer to your email dated 19 February 2014 requesting advice from the Department of Primary Industries (DPI) in respect to the above matter.

Comment by Crown Lands
Crown lands advise that the proponent has identified that some Crown road reserves occur in the predicted subsidence affectation zone and that the need to undertake any future subsidence remediation works within these Crown road reserves is unknown at this time. Crown public roads provide lawful access to freehold and leasehold land and the public have a right to access these roads.

It is recommended should the project be approved, that the proponent be required to monitor the impact that their activities are having on the Crown road reserves for the duration of the project. If any mine subsidence or other impact is identified, Trade & Investment, Crown Lands is to be notified immediately. Any damage to the Crown land is to be rectified by the proponent. Any Crown roads significantly affected by the project are to be closed and acquired by the proponent.

For further information please contact Mark Grace, Natural Resource Management Project Officer (Maitland office) on 4937 9331, or at: mark.grace@lands.nsw.gov.au.

Comment by Fisheries NSW
Fisheries NSW advise no issues.

For further information please contact Scott Carter, Senior Conservation Manager, (Port Stephens Office) on 4916 3931, or at scott.carter@dpi.nsw.gov.au

Comment by NSW Office of Water
NSW Office of Water provides general comments and recommendations in Attachment A, an assessment of the modification against the Aquifer Interference Policy (AIP) in Attachment B and Licensing Requirements in Attachment C.

For further information please contact Vanessa Hornsby, Water Regulation Officer (Parramatta office) on 8838 7816 or at vanessa.hornsby@water.nsw.gov.au.

Comment by Office of Agricultural Sustainability & Food Security
In accordance with procedures for mining projects that affect agricultural lands the Office of Agricultural Sustainability & Food Security has responded to direct to your Department by letter dated 6 March, 2014.

For further information please contact Rob Williamson, Leader Land Use Planning (Orange office) on 6391 3166, or at: rob.williamson@dpi.nsw.gov.au.

Yours sincerely

Kristian Hölz
Director Policy, Legislation and Innovation

Attachment A

West Wallsend Colliery Modification 1 (MP 09_203 Mod 1)
General Comments and Recommendations NSW Office of Water

Riparian Management:

The proposed modification involves the extraction of two new longwalls in the Southern Domain, LW 51 and LW 52. The project area lies within the catchment of Palmers Creek. The proposed longwalls LW 51 and LW 52 of the OCAL West Wallsend Colliery (WWC) underlie part of the headwaters to Palmers Creek.

Two first order watercourses cross the longwall footprint, and will be within the subsidence trough (goafed surface) once longwall extraction occurs. One of the two first order minor watercourses crosses the M1 motorway immediately north of the Bushrock Rd entrance to Wakefield Rd, which has two culvert controls on the residential road forming part of Bushrock Rd and Wakefield Rd, downstream of the large box culvert crossing by the twin carriageways of the M1 motorway. The other crosses under Wakefield Rd and the M1 motorway by culvert crossings north of the end line of the longwall blocks.

A hillslope stock dam, located about 100 m west of the 2nd order arm of the Palmers Ck headwater, is 300m outside the longwall footprint. The 2nd order section of the Palmers Creek headwater is aligned along the base of the proposed longwall subsidence trough, forming outside the subsided zone. The watercourses, as described above, have not been specifically inspected. However, they are comparable to upper headwater sections of Diega and Cockle Creeks located on the project site, which have been previously inspected prior to, and following, longwall subsidence.

Under sloping areas, greater than predicted subsidence has occurred quite recently. This includes the WWC (LW 41) in 2013.

The likely expression of subsidence at WWC of LW 51 and LW 52 blocks needs to be predicted based on the level of strain concentration within the stream channel and its surrounding bedrock, and the variation of extraction height which is proposed by WWC, on the recommendation of Ditton Geotechnical Services. Neither survey data relating to the depth of incision of the Palmers Creek headwaters, nor the reduced extraction height proposed by WWC has been presented in the materials provided, so comments will be limited to comparison to full height extraction, especially in Diega Creek, located to the north of Palmers Creek, which was undermined by WWC in 1999-2002.

Diega Creek located on the project site experienced surface fracturing following full height extraction in the late 1990s and to about 2003. WWC at the time did not conduct post-subsidence surveys or monitoring of the Diega Creek channel, as it was required to only monitor Wakefield Rd by the Department of Mineral Resources.

The two 1st order headwaters to Palmers Creek may be affected by mining subsidence. This may involve downward propagating surface fracturing. The risk of inter-connective fracturing from surface to the mine workings cannot be specifically assessed, based on the lack of data provided. However, avoidance of inter-connective fracture development appears to be a commitment of WWC, based on comments in s 6.2.4.1. This should be a specific requirement of any approval to mine in the vicinity of the headwaters to Palmers Creek.

Subsidence expression has a highly probable fracture expression, based on the likely extraction height of around 4m, and the imposed strains and altered strain vectors resulting from subsidence. Ditton Geotechnical Services predicts maximum surface fracturing to occur where landscape relief is at maximum, on ridge lines and side slopes to ridges. This may be the case

where extraction height is reduced beneath watercourses. However, specific comments cannot be provided without further explanation as to the modification of mining and extraction height near the Palmers Creek headwaters.

Recommendations:

1. A survey plan and monitoring program must be devised which will enable medium term monitoring verification of predicted subsidence resulting from longwall extraction. This should include pre- and post- photographic records of channel widths, sand infill and bedrock exposures which may be affected by changed long profile gradients or fractures. Surface fracture propagation should be minimised, and remediated if detected in the watercourse. Remediation may include hand grouting surface cracks should identified flows in the watercourse be lost, or become contaminated within the basal fracture network. Should levels decline (ie by slumping or headcut initiation), woody debris may be used to form debris barriers or lateral sills (keyed into both banks) installed to prevent headward migration of incision or development of headcuts.

2. Standard erosion control measures for any access and/or remediation actions are recommended as conditions of approval of the proposed extraction.

3. The minor nature of the headwater, and its relative inaccessibility reduces the level of risk associated with potential loss of flow. However, the undisturbed nature of the watercourse, and its contribution to Palmers Creek and riparian landholders downstream, should be considered in the recommendation of conditions to the approval.

4. Clarification is required regarding the proposed protection measures for the headwaters of Palmers Creek, including reductions in extraction height in LW 51/52.

Groundwater Management:

The two additional longwall panels are positioned outside the alluvial boundaries which would likely limit the amount of water take from the North Lake Macquarie Water Source and limit impacts on water users. However, the Groundwater Impact Assessment (GIA) undertaken by the proponent was done without a groundwater model and has primarily relied upon interpretation of impacts based on the potential extent of goaf fracturing. This methodology is insufficient to provide the information that would adequately address the Aquifer Interference Policy requirements.

The GIA does not provide supporting information to substantiate many of the statements made and consequently additional material from the West Wallsend Colliery website was sought. As part of this review, two pertinent points that warrant further work were identified.

1. <u>Water take and licensing requirements</u>

The proponent holds licence 20BL169793 with an allocation of 360 ML/yr from the Sydney Basin Porous Rock Aquifer. The proponent states that the water discharged from the mine is licensed and is almost entirely comprised of groundwater from the coal measure strata. At the end of June 2012, the total discharge from the mine averaged nearly 3 ML/day, most of which was coal measure groundwater. The proponent's Water Management Plan predicts this could increase to 5 ML/day in the future. Hence, the proponent does not hold a sufficient licensed allocation to cover the volume of take, as stated.

However, an application was made in 2009 to increase the entitlement (to 1000 ML) and the Office of Water requests that the proponent contact the Newcastle office to discuss additional information that is required to process this application.

So whilst the GIA refers to the WWC as a relatively dry mine, the Office of Water needs to better understand why a three-fold increase in allocation is required and the proportion of water taken from different water sources. Having been undertaken without using a groundwater model and based primarily upon interpretation on the potential extent of goaf fracturing, the GIA has not resolved the Office of Water's requirements.

An independent review has been undertaken by Noel Merrick. In point 7, Appendix C of GIA, he alluded to the proponent that other methods, such as Tammetta (2012) equation, would identify groundwater impacts not constrained to just the goaf fracturing and likely extend further than what is being proposed. The point has been disregarded by the proponent. Utilising the equation presented by Tammetta (2012) using the WWC inputs indicates that complete groundwater drainage would extend to ground surface. Simply, there is a component of the 3 ML/day derived from the North Lake Macquarie Water Source that is yet to be quantified from a numerical model. Longwalls 51 and 52 will be in hydrological connection with the other longwalls and is part of the cumulative impact.

The WWC is a large mine that has been operational for such a period of time where it would be reasonable to assume that a calibrated numerical groundwater model should be readily available to guide an understanding of the licensing requirements and address the AIP requirements. It is requested that the proponent liaise with the Office of Water to determine how to satisfy these requirements.

2. Groundwater Dependent Ecosystems (GDE)

The proponent states that "In the vicinity of longwalls 51 and 52, no groundwater dependent ecosystems were identified in the field studies, so that no further consideration of this aspect is required". However, no detail or reference is provided for the GDE field studies mentioned. The West Wallsend Colliery Water Management Plan (WMP) version 5 indicates 3 types of GDEs exist within the current lease area, two of which are endangered ecological communities (EEC). The WMP refers the reader to the Biodiversity Management Plan (BMP) for further details. The BMP shows that the floristic mapping undertaken does not extend to cover longwalls 51 and 52.

It can be concluded that floristic/GDE field studies have not been completed for LW 51 and 52. Given the point above about the potential for complete groundwater drainage extending to ground surface and the fact the proponent is seeking to triple their allocation, the area overlying and enveloping should be mapped for GDEs and any EEC added to the BMP.

Recommendations

1. The proponent develops a numerical groundwater model to support an assessment of the AIP requirements and resolve their outstanding licensing requirements.
2. The proponent undertakes a floristic mapping above and enveloping longwalls 51 and 52 to identify GDEs and where such a GDE is listed as an EEC, added to the BMP.

Water Licensing:

The Office of Water requires WWC:

1. to identify the volumes of water they are taking from the fractured rock groundwater source and from surface water sources and
2. to account for all water coming into the mine from all different water sources.

Note: The fractured rock water source is managed under the *Water Act 1912* and is not subject to an embargo. There is an opportunity to obtain the required licences to account for all take from this water source. The proponent would be required to purchase licences on the open market to account for the take of surface water which is managed under the *Water Management Act 2000.*

Recommendations:

1. WWC liaise with the Office of Water to provide relevant information to finalise outstanding water licensing issues.
2. WWC obtain all relevant water licences under the *Water Management Act 2000/ Water Act 1912* to cover all take of water from all relevant water sources.

End Attachment A

Attachment B

West Wallsend Colliery Modification 1 (MP 09_203 Mod 1)
Office of Water assessment of the West Wallsend Colliery
Longwalls 51 & 52 proposal against the AQUIFER INTERFERENCE POLICY (AIP)

Table 1: Has the proponent:

	AIP Requirement	Proponent response	NOW Comment
1	Described the water source (s) the activity will take water from?		There will be take of water from the North Lake Macquarie Water Source and hard rock aquifers of the Sydney Basin.
2	Predicted the total amount of water that will be taken from each connected groundwater or surface water source on an annual basis as a result of the activity?	Since the current study has found that there is negligible chance that the proposed mining will drain groundwater from the Palmers Creek alluvium, then no licence will be required. The future water makes in the mine have been estimated by analysing historical water inflows, and probably represents a more credible estimate than could be produced by "complex modelling".	The relative volumes of take from the two water sources on an annual basis have not been estimated by a groundwater model. No details of the 'analysis of historical water inflows' as mentioned was provided for NOW assessment. Over emphasis on fracture analysis and insufficient understanding by the proponent of how aquifer depressurisation not only reduces baseflow discharge but also establishes hydraulic gradients towards the mine workings. These are the water balance components a groundwater model can help resolve.
3	Predicted the total amount of water that will be taken from each connected groundwater or surface water source after the closure of the activity?		No longer term post mining estimates of water take have been estimated for the activity.
4	Made these predictions in accordance with Section 3.2.3 of the AIP? (refer to Table 2, below)	13 monitoring bores, 6 with dataloggers were established in 2009 and two new bores in the alluvium. These bores will have at least 2yrs data prior to mining.	No details within this report. Further details from within the WMP (version 5) covering bores, hydrographs, water quality data, outline of what is to be collected and when, data quality procedures etc.

	AIP Requirement	Proponent response	NOW Comment
			Over emphasis on fracture analysis and insufficient understanding of aquifer depressurisation and how this reduces baseflow discharge. These are the water balance components a groundwater model addresses.
		States no impact on Palmers Ck alluvial aquifer so there will be no need to comply with any access rules	Similar point as above. Also, misses the point about cumulative impacts given the Newstan Colliery. Also see point 5 of the independent review where Dr Merrick alludes to point that depressurisation effects extend beyond just the goaf fracturing. This is an important point the proponent seems not to grasp.
		No impact on nearby private bores (Slattery's bore) due to the distance from the mine	
		In the vicinity of longwalls 51 and 52, no groundwater dependent ecosystems were identified in the field studies, so that no further consideration of this aspect is required.	No detail or reference is provided for the GDE field studies mentioned. The West Wallsend Colliery Water Management Plan (WMP) sourced from West Wallsend Colliery web site indicates 3 types of GDEs exist within the existing lease area. The WMP refers the reader to the Biodiversity Management Plan (BMP) for further details. The BMP, also sourced from West Wallsend Colliery web site, shows that the floristic mapping undertaken does not extend to cover LW 51 and 52. Conclude that floristic/GDE field studies have not been completed for LW 51 and 52.
		No change in Palmers Creek alluvial aquifers and highly connected river systems, as it is well outside the zone of subsidence impacts	No hydrographs or contours showing pre and

	AIP Requirement	Proponent response	NOW Comment
		No enhanced connection is expected between the alluvial aquifer and the fractured rock aquifers in the overburden due to the separation distance between the two aquifers River Bank Instability or High Wall Instability. There is no chance of river instability as the alluvial plain is outside the subsidence angle of draw.	post mining Permian groundwater levels, noting that goaf fracturing will be extensive, thick coal seam sequence to be mined and relatively shallow mining depths. Risk of saline discharges to shallow aquifers post mining is a concern. Noted that the subsidence angle of draw is not expected to intercept alluvium. There have been several events with the most recent being Aug/Sept 2013 where subsidence related impacts may have exceeded predictions leading to detrimental impacts on local tributaries. As above.
5	Described how and in what proportions this take will be assigned to the affected aquifers and connected surface water sources?	States no measurable impact on Palmers Ck alluvial aquifer. The water discharged from the mine is licensed and is almost entirely comprised of groundwater from the coal measure strata. At the end of June 2012, the total discharge from the mine averaged nearly 3 ML/day (Porteous, 2012) most of which was coal measure groundwater. The Water Management Plan predicts this could increase to 5 ML/day in the future. An application has been made for this additional allocation.	The report lacks supporting details to validate the statements made. The proponent holds 20BL169793 with a 360 ML license. An application has been made to increase this to 1000 ML. NOW correspondence provides advice that to process the licence there is a need to quantify the relative contribution take of water from the North Lake Macquarie Water Source.
6	Described how any licence exemptions might apply?		No discussion on licences held or required. The West Wallsend 2012 Annual Review Report, sourced from West Wallsend Colliery web site, outlines

	AIP Requirement	Proponent response	NOW Comment
			that they hold groundwater license 20BL169793. This is for take of water from the hardrock aquifer only.
7	Described the characteristics of the water requirements?		No discussion on mine water requirements provided in the GIA. The WMP refers the reader to the WWC SWMP assessment.
8	Determined if there are sufficient water entitlements and water allocations that are able to be obtained for the activity?	The water discharged from the mine is licensed. An application was made in 2009 to vary the allocation and still awaiting feedback from NOW	No details on water entitlements held. Previous NOW correspondence advises proponent that in order to process the licence there is a need to quantify the relative contribution of the 1000ML water take derived or taken from the North Lake Macquarie Water Source. This is where a groundwater model is required.
9	Considered the rules of the relevant water sharing plan and if it can meet these rules?	States no measurable impact on Palmers Ck alluvial aquifer so there will be no need to comply with any access rules.	The take of water from the North Lake Macquarie Water Source associated with the West Wallsend Colliery has not been quantified. It is unknown what volume of groundwater take would be attributed to the West Wallsend Colliery.
10	Determined how it will obtain the required water?	As above	As above
11	Considered the effect that activation of existing entitlement may have on future available water determinations?	As above	As above
12	Considered actions required both during and post-closure to minimize the risk of inflows to a mine void as a result of flooding?		Underground mine.
13	Developed a strategy to account for any water taken beyond the life of		No discussion provided.

	AIP Requirement	Proponent response	NOW Comment
	the operation of the project?		
	Will uncertainty in the predicted inflows have a significant impact on the environment or other authorized water users? *Items 14-16 must be addressed if so.*		No uncertainty analysis.
14	Considered any potential for causing or enhancing hydraulic connections, and quantified the risk?	No enhanced connection is expected between the alluvial aquifer and the fractured rock aquifers in the overburden due to the separation distance between the two aquifers. No measurable impact on Palmers Creek alluvial aquifer	Noted that the subsidence angle of draw is not expected to intercept alluvium.
15	Quantified any other uncertainties in the groundwater or surface water impact modelling conducted for the activity?		Not addressed.
16	Considered strategies for monitoring and reassessing any predicted take of water throughout the life of the project, and how these requirements will be accounted for?		Not in this report but detail is available in Table 7.1 of the WMP.

Table 2: Determining water predictions in accordance with Section 3.2.3 (complete one row only – consider both during and following completion of activity)

	AIP Requirement	Proponent response	NOW Comment
1	For the *Gateway* process: Is the estimate based on a simple modelling platform, using suitable baseline data, that is fit-for-purpose?	Proposal is a modification under Part 3A of EP&A Act, and does not represent a major new development. This approach is consistent with the nature of the variation (ie. is "fit for purpose") and should be acceptable to the minister.	A groundwater model was not utilised. The assessment is based on goaf fracture predictions and statements on historical observations. The report lacked supporting data to validate statements made with respect to historical observations on water

	AIP Requirement	Proponent response	NOW Comment
			make and extent of depressurisation and related impacts.
2	For *SSD* or *mining* or *CSG production*, is the estimate based on a complex modelling platform that is: • Calibrated against suitable baseline data, and in the case of a *reliable water source*, over at least two years? • Consistent with the Australian Modelling Guidelines? • Independently reviewed, robust and reliable, and deemed fit-for-purpose?	As above	As above. The independent review was not provided but the main conclusions were summarised along with a response. There are a number of points from the independent review that highlight the limitations with the assessment undertaken. Particularly points 5 to 7.
3	In all other processes, estimated based on a desk-top analysis that is: • Developed using the available baseline data that has been collected at an appropriate frequency and scale; and • Fit-for-purpose?	As above	

1. Other considerations

These considerations are not included in the assessment framework outlined within the AIP, however are discussed elsewhere in the document and are useful considerations when assessing a proposal.

Table 3: Has the proponent:

	AIP Requirement	Proponent response	NOW Comment
1	Addressed how it will measure and monitor volumetric take? (page 4).		Pump site from Longwall 11 that can be measured.
2	Outlined a reporting framework for volumetric take? (page 4).		Addressed in the WMP.

End Attachment B

Attachment C

West Wallsend Colliery Modification 1 (MP 09_203 Mod 1)
Licencing Requirements

Water Act 1912

- No exemptions for licences under the *Water Act 1912* apply as a result of approval under the *Environmental Planning and Assessment Act 1979*.
- Licences required for all bores under Part 5 of the *Water Act 1912* (as defined under s105).
- Monitoring bores may require licensing under Part 5 of the *Water Act 1912* unless the bores meet the criteria for exempt monitoring bores as defined in the *Water Management (General) Regulation 2011*.
- Flood control works will require licensing under Part 8 of the *Water Act 1912*.

Application forms for licences and approvals are available on the Office of Water's website at www.water.nsw.gov.au.

Water Management Act 2000 (WMA)

- Water Access Licences are required to take water from any water source managed under the WMA.
- Exemptions for access licences are provided in Clause 18 and the Schedule 5 of the *Water Management (General) Regulation 2011*.
- Section 54 of the WMA provides details on harvestable rights.
- Requirements for access licence dealings are provided in the following documents:
- Section 71 of WMA.
- Access Licence Dealing Principles.

www.legislation.nsw.gov.au/maintop/view/inforce/subordleg+433+2004+cd+0+N

- Part 12 of the Water Sharing Plan.

www.legislation.nsw.gov.au/maintop/view/inforce/subordleg+347+2009+cd+0+N

End Attachment C