(Property 1) Mandalong rd Mandalong. Flooding

Umwelt identifies that no significant adverse impacts on catchment areas and water course alignments are likely within the Southern Extension Area as a result of the predicted subsidence. I own property that is affected by the Mandalong mine footprint but is on the boundary of the Southern Extension footprint, (Property 1) Mandalong rd Mandalong. The Northern aspect of the property is affected by long wall subsidence by the original Mandalong mine footprint. This property experiences large amounts of flooding as it is situated on the valley floor. The property is 40 acres and i estimate that 80% of the property is flood affected , some hazardous. The Southern Extension footprint is not mining under the Southern area so that will not have an adverse impact on catchment areas and watercourse alignments that have changed due to the result of predicted subsidence under the property. However long wall panels commence upstream within, I would calculate as 1 km in distance from my property and continues to cause subsidence on the valley floor for an estimated 2.5 km to the beginning of the flood catchment area for the Southern end of the Mandalong Valley. The long wall panels in the Southern Extension area that are within the flood catchment for Mandalong Valley are what I believe to be long walls 25 to 32. There is predicted subsidence levels in panel 28 on the valley floor in the flood catchment area of up to 1.2 metres. These levels of subsidence and the excessive flooding in these catchment areas I believe needs more scrutinized flood research applied. Although my property is on the boundary of the Southern lease Extension my property could be adversely affected by changes to the catchments and water course alignments on my holding. The position of the house and shedding on portion (Property 1) Mandalong rd Mandalong in a substantial flood is surrounded by hazardous flood water. There is an area surrounding the residents that is not flood affected. In a 1 in 100 year flood the house and shedding i have been told are within the flooding area. With a reminder that the predicted subsidence of 1m is occurring on the Northern aspect of my property from the original mining that may already exacerbate hazardous flood depth in that area and also contribute to changes to the flooding on the residue of the property , I think the situation should be thoroughly reviewed as the flooding within this holding is hazardous and dangerous in areas. Any changes to flooding which are increased by the operations and infrastructure of the Mandalong Mine Project I believe need to be considered by project assessors even though my property and residence is on the boundary of the Southern Extension lease and not within the flood research area. I requested a copy of the original flood studies for lease 1 at Mandalong and the flood study fell short of covering the entire first lease foot print on the flood plain. (Property 1) Mandalong rd Mandalong and I believe one other property on the other side of Chapmans rd Mandalong was not included in the flood model. Both properties have dwellings surrounded by hazardous and significant flooding .I believe these properties need to be incorporated into the flood changes impact. I would also like to alert you to the access road being constructed for the proposed infrastructure surface area is within a very short vicinity to the southern boundary to my property. The modelled impacts on flood depths were typically limited to approximately 100 metres downstream of the conceptual road crossing over Moran's creek. My property boundary is just outside this assessment zone. The assessment of the construction location and actual design for the construction of this road across the flood plain i believe needs to be clearly defined with the consideration to the impediment and alterations to depth and flow of floodwater that will affect adjoining properties to this site. A causeway at surface level may be the only plausible design .I request that a detailed design of a road that can traverse the flood way without impeding any of the flow of flood water is necessary before any approvals are issued. The EIS shows a design

idea where flood water is impeded in a catchment area on the south side of the road . I believe that it is vital that there is no interference to the natural flood water course in this location. The valley floor i.e. flood plain in this location is narrow and I don't believe an all weather access would be an option . It is important that the infrastructure does not increase the hazardous flooding and jeopardise the safety of the residence on my property or their livestock .I request that with the information provided to the department that the hazardous flood issues on adjoining properties within the first lease be a high priority when considering the impacts of the infrastructure access road. I object to a road in this location.

(Property 2) Mandalong Road Mandalong.

The level of subsidence combined with the flooding in Moran's creek on the western side of the flood zone on my property directly behind my infrastructure has not been researched and documented in the flood studies. The dwelling on this property is within the flood plain and combined with one of the highest levels of subsidence in the Southern Lease Extension. I believe it is necessary that all dwellings that are within the floodplain need to have the 2D flood research applied. I would like the western section of the property to be incorporated into the studies. Umwelt states that there is no dwellings currently identified as being inside the flood extent for the 100 year ARI design storm event under the existing conditions . I believe this design should include the flooding on the western side of the property as I am affected by the flood events that occur on the valley floor in a storm event. Can Centennial show details of previous mining activities on the valley floor in the Mandalong floodplain involving a dwelling of 1.2m . I believe one of the conditions of consent with Mandalong Mine is the dwellings are to be within the safe serviceable and repairable level set by the MSB SSR tilt 7mm/m i.e. The level of tilt on my dwelling is 9.3. I believe the conditions state these levels require landowner agreement . I object to the subsidence that will occur from the Southern Lease Extension if the lease is approved .I have included photos that will show you the areas and information of importance. This will help you visually understand the information provided. I have provided photos of Mandalong Valley of the flood levels that occur that will provide information that may help to research impact on flooding that may be increased from long wall subsidence levels and the location of the access road across the flood plain from the Southern Lease Extension approval. There were photos taken within 2011 of a flood that occurred which was not a 1 in 100 year event .I also supply photos of flooding that occurred in 1989 of some of the floodplain along Mandalong Valley which includes property Mandalong rd. One of the photos shows evidential flooding on the northern aspect of (Property 2) Mandalong rd Mandalong where the subsidence prediction for that area is I believe 1m . I also have provided flood photos from a flood that occurred in 2007 of Mandalong road near Curtis road where the council has a flood level measuring sign located. During the Southern Lease Extensions EIS public submission process there was a sufficient rainfall event that gave me the opportunity to record some flood levels. On the 18.11.2013 I took consecutive photos within a one hour period along the flood plain starting at (Property 1) Mandalong rd Mandalong and finished at ..... Mandalong rd Mandalong. I was able to photograph flood levels where there are council flood level measure signs located. This was not a large flood but the photos of flooding in a larger flood in 1989 compared to photos which include some of the same locations of the levels I captured in the recent rain event can clearly show the factual levels of flooding that are reached. Past weather event records at these times may help with research.

Proposed Infrastructure Site ,Transgrid easement relocation and Access road.

I do not agree with the positioning of these proposals in these locations, reasons being i.e. the necessary clearing of bush to facilitate this project ,loss of fauna habitat, loss of flora, introduction to the location of noise pollution ,contaminates ,ground vibration from shaft sinking, lighting, human activity, weeds , visual disturbance and erosion in an area with erosion problems . These properties owned by Centennial for the infrastructure location, and adjoining privately owned properties provide a large holding of natural environment that support an area for the preservation of local flora and fauna species. With the level of urbanisation and developments in surrounding districts to this location, I believe that it is important to preserve clusters of natural areas like this that are privately owned , so as to provide a secure future for the natural environment in this area. I believe animals are very susceptible to ground vibrations. I believe that the vibration of the shaft sinking for the ventilation fans from the surface down to the main heading, for the period of time necessary to complete this part of the project, will definitely have a detrimental effect on all the fauna within the vicinity of the vibration. I believe the location of the infrastructure should be relocated to a more suitable site. I believe the fauna within this location may not adapt to the high impact of human activity necessary to construct and run this site in this location. I object to the infrastructure site construction process and the site location. I enjoy the wildlife in this area.

Centennial Coal has proposed the relocation of a section of Transgrid staunchions within the Southern Lease Extension. If the staunchions were relocated who would own easements? Would the easements be bequeathed to the property owners?. The property owners may wish to utilize the land that is no longer burdened by the Transgrid infrastructure and the easements would restrict any development occurring.

5.1.5 Surface Infrastructure Constraints Electricity Commission Lines.

A number of mine layouts were drawn up in an attempt to avoid the tension towers within the Southern Extension Area by relocating long walls around them or developing main headings under them. However due to the location of the tension towers in the thick seam location(long walls 25-37) at the start of the project and in a area where the projects are already short, the impact on the Projects financial viability made these option unfeasible.

Mandalong Mine Subsidence Management Plus Plan 2012.

1.1 Background

In August 2002, Centennial purchased the Mandalong Mine Project from Powercoal Pty Ltd. A project review was undertaken and a modified mine design was adopted. Seedsman Geotechnics Pty Ltd(SGPL) was contracted to assess the maximum long wall panel width that could be used whilst still maintaining impacts to residential properties to within the safe serviceable and repairable(SSR) criteria as defined in the consent conditions. In addition a vertical subsidence level less than 500mm was set as a target for areas in the floor of Mandalong Valley(Flood Plain Area).

9.3 Review of Measured Subsidence from Existing Mandalong Mine

Mandalong Mine received Development Consent DA 97/800 on 14th October 1998, with the long wall panel width set as a maximum width of 250m. The development consent imposed conditions requiring landowner agreement if the mines forecast subsidence levels resulted in dwelling being impacted beyond the Safe, Serviceable and Repairable(SSR) condition, impacts to land use and or create a flood hazard. The definition of SSR used by the MSB is understood to mean the following: Residences after mining are left on a residual tilt of less than 7mm/m. These consent conditions encouraged Centennial Mandalong's decision to establish a more conservative mine design in order to ensure a balance existed between the economic viability of the mining project and the interest and demands of stakeholders. Since commencement of long wall mining in 2005, Centennial Mandalong has complied with relevant consent conditions with all private dwelling remaining Safe, Serviceable and Repairable

9.4.5 Practical Angle of Draw

The following subsidence profile limits are advised by DGS(2013) as appropriate for minimising impact to Transgrid Tension Towers and other sensitive environmental or Aboriginal Heritage features. Subsidence -50 to 100 mm Tilt - 1.5to 2mm/m. Curvature - 0.06 to 0.1km.

Long walls 25 to 30 are all located in the floor of Mandalong Valley(Flood Plain Area), the long walls located on Mandalong rd Mandalong are long walls 27-30. The subsidence on the valley floor ranges from - 0.8 long wall 27, -1.2 long wall 28 where the dwelling is situated, - 1.2 long wall 29 and -1.2 long wall 30. The consent conditions for private stakeholders on the valley floor(flood plain) and the consent conditions for private stakeholders dwelling to be kept within the Safe, Serviceable and Repairable(SSR) condition residual tilt of less than 7mm/m, are exceeded i.e. subsidence between -0.8 to -1.2. And Tilt of 9.3. I believe the development consent conditions need to be followed. The possible relocation of stanchion's tension towers 35, 37, 38, 40 and 43 on TL 24 should not be given priority over the consent conditions that apply to private stakeholders within the Mandalong Mine Southern Lease Extension Proposal. The seam thickness and the projects financial viability being unfeasible if the long walls are not approved to be extracted at the levels defined in the long wall mining layout proposal, and the long wall layout proposal being subject to a possible costly relocation of the Transgrid staunchions should have no bearing over Centennial being required to adhering to the consent conditions already current to the Existing Mandalong Mine.

4.4 Flood Regimes

Comparing the modelled flood extents for the predicted subsided landform(refer to Figures 4.3 and 4.6) to that of the existing conditions(refer to Figures 3.4 to 3.5) indicates that for the 100 years ARI design storm event there is no change expected in the habitability of identified dwellings within the Southern Extension Area in response to the predicted subsidence. The modelling indicates that no dwellings are currently identified as being inside a flood extent for the 100 year ARI design storm event under the existing conditions(refer to Figure 3.4 and 3.5) or within the modelled flood extent for the 100 year ARI design storm event for the predicted subsided landform, (refer to Figures 4.3 and 4.4). However three residences are close to the 100 ARI design storm event level and will need to be conformed with actual survey data prior to undermining as part of the Subsidence Management Plan process.

(Property 1) Mandalong Road Mandalong that is within and (Property 2) Mandalong Road Mandalong that is without the footprint of the Southern Lease Extension are both within the floodplain i.e. Valley floor of Mandalong Valley. I believe the 2D Flood Research needs to be applied to the west side of the property at (Property 2) Mandalong Road Mandalong. I believe (Property 2) Mandalong Road Mandalong should be included in the impact assessment process for the Southern Lease Extension.

10.1.5 Private Residences 'Flooding Potential'

Mitigation and Management

The existing floor levels of all residences within the Southern Extension Area will be established prior to mining as part of the pre-mining condition surveys (if not already known) to be undertaken by Centennial Mandalong and / or the MSB. If detailed assessment confirms that the three residences will have an increased flood potential as a result of undermining , appropriate management strategies will be developed and implemented in consultation with the stakeholder and relevant government agencies. Such strategies may include mitigation works, landholder compensation and/or compulsory property purchase.

I do not know if Property 2 is included in these three houses because the flood models didn't include the flooding on the west side of the property where the dwelling and surface improvements are. I request that these issues that may prevail from predicted impacts from the Mandalong Mine approval and the time frame that may occur from approval to the Southern Extension, and the extraction of the longwalls involved that require the consultation with the stakeholder, be rectified before the lease approval. I believe this is fair to all parties involved as the sections of the mine plan that affect these properties will be dealt with before the extraction process begins. This may help eliminate any devaluation that may occur to the property owned by the stakeholder within that time frame.

5.1.4 Social Considerations

Community expectations were identified as a single consideration to the mine layout. Mandalong Mine has been conducting long wall mining since 2005 and has a very good record of maintaining manageable and acceptable subsidence impacts. As previously advised, one of the aims of the project is to maximise resource recovery while at the same time maintaining simular subsidence-related surface impacts to that currently being experienced by the community and environment as a result of the existing Mandalong Mine Workings.

5.1.5 Surface Infrastructure Constraints

Private Residences, Businesses and Associated Infrastructure

The mine planning process aimed to design a mine layout that limited the impacts to primary residences within Safe, Serviceable and Repairable(SSR) standards defined by the Mine Subsidence Board(MSB) and relevant Australian Standards(AS). In general terms, the MSB advises that for buildings to have no greater than "slight impact" (as per AS2870 2011) and remain within the SSR standards, tilts should not exceed 7 millimetres per metre(mm/m) and tensile or compressive ground strains should not exceed 4 mm/m. Between 7mm/m and 10mm/m of tilt there could be a need to re-level the structure to maintain serviceability, which would mean that the impact increased to "moderate" (as per AS2870 2011), however remaining within the SSR standards. Above 10mm/m most houses will need some re-levelling work and if it is of low tolerance to ground movement(for example, brick construction) there could be a "severe" impact. If that were the case, it is likely that the house would need to be vacated during undermining and the property acquired by the mining company, or another agreement established with the land holder prior to mining. On this bases, the intention of the detailed mine design exercise was to limit impacts so that severe impact is avoided and property acquisition is not required. As part of this mine design exercise, an assessment was undertaken by DGS (2012) to compare the predicted subsidence impacts to houses with 160 metre(option 1), 200 metre(option 2) and 300 metre(option 3) wide longwalls. Figure 29 illustrates the predicted tilts at identified built structures within the Southern Extension Area. This demonstrates that a mine layout with longwall widths between 160 metres and 200 metres can achieve the aim of maintaining the majority of residences within SSR standards, while 300 metre wide longwalls would result in a large number of residences sustaining impacts beyond the SSR standards. Figure 29 Predicted Subsidence Impacts on Built Structure with Varying Longwall Widths. The constraint on the mine layout associated with minimising subsidence impacts to residences means that impacts to other surface improvements, such as sheds, dams, access roads and fences, should remain within the SSR standards. While vertical subsidence does not typically result in structural damage to a house, if the house is situated close to a watercourse, subsiding the house may increase the flooding risk. While there are a number of houses within the Southern Extension Area located in close proximity to the 100 year ARI flood level, the detailed modelling undertaken in the surface water assessment (Umwelt 2013) indicates that these residences are not actually within the 100 year ARI flood level for either the pre-mining landform or post-mining landform(i.e. with surface subsidence impacts). Regardless Centennial Mandalong will confirm the existing floor levels of these residences prior to undermining as part of the Extraction Plan process.

I believe the information, consent conditions, information I have supplied i.e. 100 year ARI flood level modelling not being included where the surface improvements exists on property2 , ponding that will occur within the Western flood gulley where the access road traverses through where there is subsidence prediction between -1.0 to -1.2, dwelling tilt of 9.3mm/m ,subsidence prediction under dwelling of -1.2 m , property being located on the valley floor within the flood plain, levels exceeding standards and targets, or current conditions of consent for subsidence levels on the floodplain within the Mandalong Valley being exceeded in the EIS submission supplied by Mandalong Mine , sets a basis for the requirement for the longwalls within Mandalong Valley Southern Lease Extension Area to be adjusted to the necessary levels to ensure the stakeholders

properties are not adversely affected from these post mining predictions. I believe these impacts imposed on Property 2 Mandalong rd Mandalong by Centennial Mandalong Mines Southern Lease Extension may have the potential to devalue the property If the Lease Extension is approved under this mine plan that has been submitted.

5.1.1 Geological Constraints

Seam thickness is a significant constraint to the mine layout and project economics. Centennial Mandalong plans to extract the thick seam coal to the West of the main heading first, (LWS 25 to 37) for the best financial outcome over the first six years of the Project. New development equipment will need to be purchased for the thin seam area to the east of the main headings. Seam thickness has a major influence on the design of longwall and chain pillar widths for subsidence and mine serviceability.

LWS 27-30 are located on Property 2 Mandalong Road Mandalong.

5.1 Mine plan

As part of the pre-feasibility phases undertaken for the Mandalong Southern Extension Project, a detailed exercise was under taken in parallel with the exploration drilling program baseline environmental surveys and the development of the subsidence model for the Southern Extension Area. Various mine layouts were developed and assessed in response to information being received on geological, geotechnical, environmental, surface infrastructure and mining constraints. The preferred layout at the conclusion of the feasibility phase for coal extraction within the Southern Extension Area is the proposed mine plan shown on figure 21.....The panels proposed within the Southern Extension Area are Narrower due to subsidence constraints. Furthermore, the proposed longwalls in the western extent of the Southern Extension Area are relatively short due to geological and other surface infrastructure constraints. The proposed mine plan in the Southern Extension Area aims to maximise recourse recovery while at the same time maintaining similar subsidence-related surface impacts to those currently being experienced by the community and environment as a result of the existing Mandalong Mine workings.

I feel that the necessary adjustments to the mine plan that I believe may need to exceed the conditions of consent for stakeholders and the environment, and the possibility of an expensive relocation of Transgrid lines that may be necessary to exceed the levels of subsidence on the valley floor (floodplain) should not take priority over the coal extraction process adhering to the subsidence profiles already researched and applied by Mandalong Mine. These actual levels of subsidence and recognition of impacts incurred on surface improvements and the local environment, I believe are necessary for the reduction in impacts . I believe these standards and conditions should not be abandoned because of the necessary extraction of the longwalls (25 to 37) in order for Centennial Coal to have the best financial outcome needed to make the project feasible. I believe the extraction process should stay within the guidelines provided by the departments

involved and the data already being utilised in order to maximise resource recovery while at the same time maintaining similar subsidence- related surface impacts to that currently being experienced by the community and environment as a result of the existing mine workings.

5.1.6 Analysis of Alternatives

Using the information overview obtained from the exploration drilling program, baseline environmental surveys and development of the subsidence model, Centennial Mandalong assessed various mine plan layouts in consideration of the above Geological, Geotechnical, Environmental and Surface Infrastructure constraints, as well as constraints associated with mine ventilation, gas management and mining equipment...

Alternative of 300 metre wide longwall panels

- A large number of dwellings and associated building structures would likely exceed the SSR standards defined by the MSB.
- Tilts and strains above the SSR standards for dwellings could also cause damage to Aboriginal heritage items located within the Southern Extension Area.

As these potential impacts do not meet the aim of continuing to conduct mining at Mandalong Mine in an environmentally responsible manner despite the better financial outcome for Centennial Mandalong the mine plan option with 300 metre longwall width was rejected.

Alternative of longwall panel width less than 200 metres

After assessing various other mine layouts, it was concluded that a mine plan with longwall panels of 200 metres wide and less, even though it will be harder to maintain a production level of 6 Mtpa, should be adopted in order to reduce surface subsidence impacts. The economic impact to Centennial Mandalong associated with this decision is detailed in the Economic Impact Assessment (Aigis 2013) contained in Appendix F and summarised in section 10.17.

- Longwall widths of 180 metres are proposed in the north-west extent to minimise the potential for connection between the underground mine workings and the alluvial ground water aquifer associated with Morans Creek; and

While Centennial Mandalong did consider longwall widths less than 160 metres wide it was determined very early in the feasibility faze that there would not be any significant reduction in surface impacts and it was not a financially viable option. Longwalls width of less than 160 metres would require additional development gateroads and long wall moves, which would reduce the coal available for extraction and reduce mining efficiencies

"I believe as these potential impacts from longwalls 25-37 do not meet the aim of continuing to conduct mining at Mandalong Mine in an environmentally responsible manner, and despite the better financial outcome for Centennial Mandalong, the mine plan option for longwalls should be

rejected and mine layouts supplied that will reduce the extraction of coal from the longwalls in order to reduce the subsidence impacts necessary to comply with the current consent conditions".

Mandalong Mine Subsidence Management Plan February 2012 1.2 Objective.

The prime objective of the plan is to anticipate and maintain the effects of long wall extraction so as to prevent adverse impacts in the surface improvements and natural features, where potential unacceptable effects are identified, the plan aims to provide measures to the mitigate or remediate.

9.0 Subsidence.

The subsidence assessment has considered the DRE's Guideline for Applications for Subsidence Management Approvals (Department of Mineral Resources 2003) and has been prepared to address the DGRs (Section 1.7.2) subsidence effect and impact predictions for the proposed mine plan have been based on subsidence monitoring data from the existing Mandalong Mine operation and two empirically-based models developed for the United States Coalfields (referred to as ACARP 2003 and SDPS 2007, respectively).

The proposed mine plan in the Southern Extension Area comprises long wall panel widths of 160 metres, 180 metres and 200 metres, with cover depths ranging from 180 metres in the north-east to 480 metres in the south-west(average of 300 metres). Long wall extraction heights will vary between 1.8 metres and 4.6 metres, depending on seam thickness. The long wall panel geometries have been designed to control mine subsidence effects to tolerate on appropriate levels in accordance with the stakeholders and government agency requirements (DGS 2013).

I don't believe the subsidence level on Property 2 Mandalong Road Mandalong is tolerable or appropriate in accordance to me, the Stakeholder and Government agency requirements (DGS 2013).

I approached Centennial for information that would verify the accuracy with the existing Mandalong Mine predictions compared to actual subsidence levels that occur. I was issued with End of Panel Report Mandalong Mine March 2013.

Longwall 13 Figure 5

I believe figure 5 shows up to -0.3 subsidence levels over the predicted levels. This concerns me as the predicted levels on Property 1 Mandalong on the flood plain is -1.2 and the predicted subsidence on the flood plain of is -1m which combined with the proposal of the Infrastructure Access road may have levels higher up to -0.3 than already predicted in areas with hazardous flooding already occurring and both locations involving dwellings and surface improvements.

10.1.4 Private Residences

There are 114 residences located above the proposed mine workings in the Southern Extension Area Twenty-four houses are single or double storey brick structures on slabs and 90 are timber framed clad structures on strip and pad footings.

As undertaken by Centennial Mandalong above longwall panels 1 to 12 in the existing Mandalong Mine workings to date, it is intended to limit the potential subsidence impacts to the majority of the residences within the Southern Extension Area to safe, serviceable and repairable (SSR). The definition of SSR used by the MSB is understood to mean the following:

- Residences after mining are left on a residual tilt of less than 7mm/m.

I believe in this paragraph the word majority means that some of the subsidence's predicted in the mine layout provided by Centennial Mandalong will conclude in some residences being affected by levels above the safe, serviceable and repairable (SSR). Because these levels are already realised with these residences, I believe that the circumstances that prevail from the longwall plan provided that create these levels of subsidence should be rectified before the Stakeholders are burdened with the properties that will be involved with these levels that have been exceeded before approval of the mine layout.

9.1 Subsidence Development Mechanism

The Maximum subsidence usually occurs in the middle of the extracted long wall panel and is dependent on the extraction height, panel width, cover depth, over burden strata, strength and stiffness, and bulking characteristics of the collapsed strata in the caving and fracture zones.

The dwelling and surface improvements on Property 2 Mandalong Road Mandalong is in the middle of the longwall panel 28 and near Morans Creek. Longwalls that have already been extracted and that can be viewed from the roads within Mandalong Valley show areas of the deepest level of subsidence that has occurred, and within the duration of periods of rain you can see the water laying within these areas. I have concerns with the overall ponding and/or flooding that may occur in the vicinity of the dwelling and surface improvements.

`10.5 Surface Water

The potential surface water impacts associated with the Mandalong Southern Extension Project, specifically subsidence and construction of the access road (including the crossing over Morans Creek) to the proposed Mandalong South Surface site in the Southern Extension Area, have been assessed by Umwelt (2013). Key areas of assessment were:

- Catchment area boundaries;
- Watercourse stability;

- Remnant ponding; and
- Flooding regimes.

The study area adopted by Umwelt (2013) for this assessment comprised the Southern Extension Area and an additional area external to the Southern Extension area covering the 26.5 degree of draw from the edge of proposed mine plan. The remainder of the project application area (to the north of the Study Area) was not assessed given that it comprises existing approved workings and infrastructure and there are no additional activities and disturbance proposed.

I requested Mandalong Mine to provide to me a copy of Post Mining Surface Hydrology- Mandalong Valley Based on Preferred Mine Plan for 1 in 100 Year Rainfall Event (Date: September 1997). The model shows that two properties have not been included in the flood model provided. I own property 1 Mandalong Road Mandalong and the location of this property is on the boundary of the Southern Lease Extension footprint and within the north of the Study Area. With this information provided and the possibility that the flood models on this amenity were not researched with the Existing Mandalong Mine Lease and Umwelt stating that the remainder of the application area (to the north of the Study Area) will not be assessed given that it comprises existing approved workings and there are no additional activities and disturbances proposed. I believe that Mandalong Road Mandalong and the property on Chapmans Road also not included should be documented and researched with the Southern Lease Extension in order to access any impacts on flooding that may be increased by the extension approval.

10.5.1 Existing Environment

- Anecdotal evidence, in addition to historical flood reports (Hughes Truman 2004, cited in Umwelt 2013), indicates that the Mandalong area has a history of flooding.

Several sections of the watercourses within the Southern Extension Area, including Wyee Creek, Mannering Creek (See plate 17) and Buttonderry Creek, Have been subjected to scouring, primarily in response to the construction of road culverts and bridges. In some places this has caused bank erosion and deposits of sandy sediment within the creek bed (Umwelt 2013).

I have concerns over the proposed access road to the surface site traversing across Morans Creek. The soils in this area that I have provided photographs of show the vulnerability of the creek banks and flood courses that are within the Mandalong Valley section of the Southern Lease Extension.

10.5.2 Impact Assessment

The key features of the Project that have the potential to impact on surface water resources within the Southern Extension Area are subsidence and the construction of the access road (including the crossing over Morans Creek) to the proposed Mandalong South Surface Site. Importantly, the potential subsidence impacts that will impact on surface water resources is primarily limited to vertical subsidence displacement, given that no connective cracking is predicted (DGS 2013) (See section 9.5).

Watercourse Stability

The existing characteristics of the water courses within the Southern Extension Area have the potential to be impacted as a result of changes to the profiles of the water courses caused y subsidence. this includes changes to the longitudinal grades of the watercourses, and associated changes to flow velocities and tractive stresses. Changes to the stability of a watercourse can result in increased scouring, changed channel geometry or re-routing of the watercourse. The existing environment has already undergone scouring as a result of constructed features, including culverts and bridges, however increased to scouring may degrade the existing water quality within and downstream of the Southern Extension Area.

- Morans Creek (watercourse 6)- Potential for increased scouring to occur in the vicinity of longwall 25. There is little difference in the modelled bank full velocities and tractive stresses for Morans Creek, with these parameters typically constant between the existing landform and predicted subsided land form.

Remnant Ponding

Ponding refers to pre- and post-mining depressions on the surface. Pre-mining ponding usually occurs in-channel along watercourses and may be altered in size and location as a result of subsidence. Changes to ponding can impact drainage patterns, flora and fauna and GDEs. Flat, low lying land may be susceptible to out-of-channel ponding or depressions forming after subsidence.

Predicted subsidence has the potential to affect remnant ponding in Morans Creek...the increased remnant ponding is predicted in the following areas:

- Morans Creek- in the vicinity of longwalls 25 and 26;

Umwelt states that changes to the stability of a watercourse can result in increased scouring, changed channel geometry or re-routing of the watercourse and also that Pre-mining ponding usually occurs in-channel along water courses and may be altered in size and location as a result of subsidence. With the information provided on surface water and remnant ponding and the photographs I have supplied I believe this is enough evidence to show the necessity to apply the 2D Flood Model Research applied to Morans Creek (watercourse 6) to the west of property 2 Mandalong Road Mandalong. Because of the location of the dwelling and surface improvements being in an area of flooding and potential ponding, areas in the gulley where ponding will be increased, increase of ponding and changes to surface water i.e. flooding where the access road to the house is located and the photographs showing the vulnerability of the creek banks and the vegetation located in the gulley and along the creek banks.

Flood Regimes

Changes to the flood regimes (flood response) within and surrounding the Southern Extension Area are a potential consequence of the predicted subsidence and proposed surface infrastructure. Figure 39 shows the maximum modelled flood depths for the 100 year ARI design storm event for the predicted subsided conditions in Morans Creek, Wyee Creek (three branches), Mannering Creek and Buttonderry Creek.

The analysis of flood regimes within the Southern Extension Area indicated that increases to the maximum modelled flood depth for the 100 year ARI design storm event as a consequence of predicted subsidence between 0.1 and 0.4 metres within the main channels of the watercourses are possible (Umwelt 2013). These increases are generally limited to the immediate vicinity of the proposed longwall panels, as well as upstream of the proposed access road to the Mandalong South Surface Site where flood flows are constricted by the conceptual crossing over Morans Creek. The modelled impacts on flood depths were typically limited to approximately 100 metres downstream of the conceptual road crossing over Morans Creek (Umwelt 2013). The final design of the creek crossing will include drainage structures sufficient to minimise the local impacts on flooding.

5.1.3 Environment Constraints Creeks

The creeks traversing the Southern Extension Area present a major constraint to the mine layout, again, particularly in relation to maximum long wall widths an d associated subsidence impacts. A s outlined in section 10.5, the three most significant creeks in terms of location over the mine plan and proximity to residences in terms of potential increase flooding risk are Moran's Creek..... This assessment showed that the main impacts expected from subsidence were ponding and erosion due to grade changed in different sections of the creeks.

Figure 3.7 The Hydrological Study leaves out vital flood documentation on Mandalong rd Mandalong long walls 27, 28, 29 and 30. As you can see 3.4, 3.6, 3.7, 4.7, does not document a crucial part of flooding that occurres directly behind my dwelling. The drainage line is blue, which is a water course/creek. Figure 4.3, 4.4, 4.5. However Figure 4.2 shows pre-mining remnant ponding located at the Western side of my property where Moran's creek also runs behind my dwelling, and a gulley in front of my dwelling on the Western side which also is a flood catchment area.

10.7.4 Impact Assessment

Threatened species

Approximately 142 specimens of Melaleuca biconvexa were observed by RPS (2013A) in the Morans Creek drainage line near the northern parts of the proposed access road to the Mandalong South Surface Site. Centennial Mandalong has committed to aligning the proposed access road in order to minimise disturbance and avoid removal of any M. biconvexa specimens. This will be achieved as part of the detailed designed planning phase. RPS (2013A) advises that the construction of the Mandalong South service site and access road is not expected to significantly impact upon threatened species, populations or ecological communities listed under the TSC ACT 1995 or EPBC ACT 1999.

I have supplied a photograph of what I believe to be two Melaleuca biconvexa of which there is a grove of and I also believe by the description of the beautiful white flowers that they also exist in the gully on the western side of Mandalong Road Mandalong. The Department of Environment and Heritage has these tree's listed as vulnerable. Some of the threats listed:

- Clearing for Residential development.
- Most populations are on private land and there is poor threats knowledge about the species and its requirements by land managers.
- Alterations to the drainage hydrology of low-lying flood plains and swamps including swamp reclamation.
- Increased pollution and nutrients through adjoining developments and rubbish dumping.
- Grazing and trampling by stock causing root damage, prevention of seedling establishment and erosion.
- Potentially affected by Myrtle Rust.
- Competition from noxious aquatic weeds in particular Sagittaria platyphylla.

I believe subsidence will be an impact because it will change the drainage hydrology. They state most populations are on private land. Clearing, increased pollution and nutrients through development are also contributing factors. I believe all impacts that will have an effect from the Southern Lease Extension on this vulnerable species. The soil within these locations of Morans Creek that I have provided photographs of are already vulnerable pre-mining.

4.3 Remnant Ponding.

Moran's creek increased ponding in the vicinity of long walls 25 and 25. With the mapping taking into consideration Figure 3.7 the correct remnant ponding locations on my property have not been included in the assessment of the increased ponding for long walls 27, 28, 29,30. My home residence has a subsidence prediction of up to - 1.2 meters, so remnant ponding in Moran's creek and the flood gulley course will be significantly increased and also there will be a considerable amount of ponding in my pasture. I am a primary producer and increased ponding areas may decrease the viability of my farming amenity. Photo's of the topography of my land are supplied. My dwelling after subsidence o f- 1.2 meters will be at the lowest point of the depression, that is going to significantly increase ponding of water around my house yard. In periods of consistent rainfall, the yard already has ponding areas but having a dwelling in a concave area of 180 metres wide and - 1.2 metres deep with my residence in the bottom of it is almost definitely going to create a water problem. With the changes that may occur from the subsidence ,the location of my home could become a big issue. With the subsidence and these circumstances it is also likely that the flooding will go through our shed. This subsidence for this location in the valley catchment area on the valley floor I believe is too extreme, there are too many factors i.e. high subsidence, the topography of the land, a creek system traversing close to my residence and catchment off a mountain close to my residence, that combined may make it difficult for any significant changes to ground level which cause flooding to my infrastructure and yard to be corrected. I object to the level of subsidence that will occur if the Southern Lease Extension is approved.

The flooding in Mandalong is a great concern because flooding of this degree combined with intermittent levels of subsidence along the valley floor will only increase the problems faced by residents, The NSW Government recently released the Strategic Regional Land Use Policy i.e., The Gateway Process. The process acknowledges the valuable agricultural resources that occur in some areas where mining may affect rural locations. This area is part of the Bio physical land mapping

system designed to have the Independent Scientific Research Committee apply more scrutinized research to these valuable farming areas .10.2.3 Biophysical Strategic Agricultural Land . BSAL assessment of this mapping system, I believe the results should be left to the research party allocated to undertake these studies.

I question the use of the existing flood study (Hughes Truman 2004) system being used for the 2013 Southern Lease Extension Area. I believe these types of baseline studies are compatible for areas with minimal flood occurrences but Mandalong Valley is I believe within the area of hazardous flooding with the high potential of capability of causing injury or death to people or animals. With this shown from photo's provided, and flood modelled provided by Umwelt's flood mapping, I request that the departments involved for approvals of Mandalong mine refer this approval to have the necessary extra scrutinised research by the Independent Scientific Research Committee.

Figure 31. Centennial states that since commencement long wall mining in 2005,Centennial Mandalong has complied with relevant consent conditions, with all private dwellings remaining safe serviceable and repairable. Subsidence impacts to infrastructure, including public roads and communication networks ,has been managed in accordance with approved SMPs and their serviceability has not been impacted (Centennial Mandalong 2012).

I understand that Centennial Coal purchased a significant amount of properties in Mandalong from the time of purchase of the lease from Powercoal in 1998 on. I understand that Centennial Coal has purchased Property to allocate the proposed infrastructure necessary for the Southern Lease Extension but as far as i am aware all other properties in the extension are privately owned. I believe because of the consent conditions that already apply to Mandalong Mine the necessary adjustments to the width of long walls and the minimising of extraction width of the coal seams be adjusted accordingly to within the SSR levels before approval. I believe it would be fairer to the Stakeholder i.e. property owner or resident to know at the time of the lease approval (if approved) that the future value of their privately owned property is not financially devalued because their property is going to be burdened for years with these subsidence predictions that are over the SSR levels set by the MSB. This situation could prevail until the levels are researched and altered at the time that the long walls are reviewed before commencing the extraction process ,this time frame may include years. I understand that the mining company are obligated to purchase such properties that have significant impacts ,or seek landowner agreement to exceed these levels, however the stakeholder may wish to sell the property prior to these negotiations becoming a priority of the Mandalong Mine extraction process. I believe it is important to rectify these adjustments prior to the approval of the lease extension. The fluctuation in market value experienced under normal economic circumstances will occur over time naturally , however the properties within the lease may be impacted with a drop in property value that will stay under values of properties that are not affected by subsidence predicted impact of that degree. The additional stigma to the properties that carry the burden of the levels over the SSR levels may have quite significant financial losses. I believe it is in the best interest of stakeholder emotionally and financially that these issues be rectified by Centennial Coal before approval.

10.18.2 Impact Assessment

The social impacts have been identified by Marshall (2013) via consultation throughout the Project and the specialist impact assessments. Marshall (2013) advises that the potential for adverse impacts on the social amenity of the area are primarily those resulting from subsidence impacts, noise, dust and visual. In the context of this Project social amenity (due to its location and land use characteristics) means the "intrinsic value" that residents place on the area, including rural character, peace and quiet, access to major facilities and visual amenity.

Underground mining will generally result in concerns by all residents who are affected by the mine, with concerns/fears being heightened when undermining is imminent.

Addressing concerns raised by landholders and to manage potential impacts to the local environment.

As outlined in Section 5.2, Centennial Mandalong responded to issues and concerns raised by residents in response to the originally proposed location of Mandalong South Surface Site. Potential alternative locations were investigated and the proposed site was selected as the preferred option. Subsequent communication with the concerned residents indicated that the concerns initially raised had been alleviated.

Marshall (2013) also notes that the Project is unlikely to:

- Significantly impact on surface water and groundwater resources (and the consequential association of landholder properties, livelihood and quality of life);
- Result in aesthetic degradation of the landscape;
- Result in general degradation of the area due to emissions of dust and noise; and
- Impact on the demand and value of real estate in the area.

After reviewing each area of potential impact/concert, including damage to properties and surface features from subsidence impacts, ponding and flooding, noise emissions, air quality emissions and visual/rural amenity, Marshall (2013) concludes that the majority of the Southern Extension Area will remain unchanged as a result of the Project. This includes existing land use, rural characteristic, the manner in which residents and visitors access and move around the area, and the aesthetic quality of the area (Marshall 2013)

I object to the Mandalong Mine Southern Lease Extension being approved for reasons stated in this letter and from information in the submission I have provided and information in the EIS submitted by the Mandalong Mine that I believe may impose impacts on the retained land owned by me that will be affected by the Southern Lease Extension approval.