Monitoring and Controls	Trigger	Action
Public Roads – LW30 -31		
 Centennial to establish subsidence monitoring / inspection sites for public roads prior to mining. Centennial to mark the centreline and edges of current longwall panel one month prior to public road being affected by subsidence. Centennial to notify Crown Lands one month prior to public road affected by subsidence from each longwall panel. Centennial to conduct weekly visual inspections of public roads when located within Active Subsidence Zone. Record results on the Subsidence Inspection Checklist. Centennial to conduct post-mining surveys following the development of subsidence (majority of subsidence developed when LW is completed or LW face is 800m past feature). Centennial to provide pre and post mining subsidence monitoring results to stakeholders. 	 LEVEL 1 – LOW Operations within prediction and approved impact Development of subsidence and impact as expected. Subsidence within predicted range (U95% CL). Negligible visible impact on gravel access roads. Possible minor tensile and compressive cracking to pavement not requiring immediate repairs. LEVEL 2 – MEDIUM Operations within approved impact but exceed or potentially exceed predictions Development of subsidence exceeding or potentially exceeding prediction (Upper 95% Confidence Limits). Tensile and compressive strains may increase 2 times predicted values due to crack development. Vertical subsidence greater than predicted. Typically minor impact to gravel access roads. Cracking may be visible on roads – development of minor compression hump near centre of longwall and minor tensile cracking to pavement at edges. Repairs to pavement may be required to reseal pavement. 	 Centennial to conduct post mining inspection and subsidence monitoring and provide results to the Landowner, RR and Crown Lands. Centennial to advise Landowner and Crown Lands of observed damage to the public road. Centennial to erect warning signs near affected area of road if necessary. Centennial to conduct post mining inspection and subsidence monitoring and provide results to the Landowner, RR and Crown Lands. Centennial to conduct repairs to damaged pavement.
CONTROLS Flood Modelling and Assessment LW30-31 (Umwelt 2020) determined that there was no predicted increase in flood hazard category on the access road at both the 1 year and 100 year ARI Storm Events.	 LEVEL 3 – HIGH Operations exceed approved impact Development of subsidence and impact greater than expected (Upper 95% Confidence Limits). Cracking to road pavement requiring immediate repairs to ensure public safety. Repairs required, reshaping road, restoring drainage and resealing pavement. 	 Centennial to immediately advise Landowner and Crown Lands of observed damage to the public road. Centennial to erect warning signs near affected area of road. Centennial to conduct post mining inspection and subsidence monitoring and provide results to Landowner, RR and Crown Lands. Centennial to conduct repairs to damaged pavement. Centennial to review results and predictions as per Extraction Plan. Centennial to notify external stakeholders including relevant government agencies in accordance with Incident Reporting S6 Condition 10 and WHS Regulations.

Monitoring and Controls	Trigger	Action / Response
Powerlines – LW30-31		
 Centennial to establish subsidence monitoring and inspection sites for public / private roads and adjacent powerlines prior to mining. Centennial to conduct pre and post mining 3D scanning and survey of power poles. Ausgrid to model and install mitigation works on affected section of the powerline. Centennial to mark the centreline and edges of 	 LEVEL 1 – LOW Operations within prediction and approved impact Development of subsidence and impact as expected. Subsidence within predicted range (Upper 95% CL). No noticeable impact to the surface or powerline network. Damage powerlines unlikely. LEVEL 2 – MEDIUM 	Centennial to conduct post mining inspection and subsidence monitoring and provide results to the Ausgrid, RR and SA NSW. Centennial to inspect powerlines.
current longwall panel on public/private road pavement one month prior to public road and powerlines being affected by subsidence. • Centennial to notify Ausgrid one month prior to powerline being affected by subsidence from each longwall panel. • Centennial to conduct weekly visual inspections of public/private roads and powerlines located along road easement when influenced by	 Operations within approved impact but exceed or potentially exceed predictions Development of subsidence exceeding or potentially exceeding prediction (greater than Upper 95% CL). Minor impact to powerline network No immediate mitigation / remediation works on poles, insulators and conductors is considered necessary. 	 Centennial to notify Ausgrid and RR of increased subsidence and any observed impact to powerline network. Ausgrid to conduct inspection and investigate the impact of increased subsidence on powerline network. Ausgrid to conduct repairs if considered necessary. Centennial to advise SA NSW of potential repairs. Centennial to review results and predictions as per Extraction Plan LW30-31.
subsidence within the Active Longwall Subsidence Zone. Record results on the Subsidence Inspection Checklist. Centennial to conduct monthly visual inspections for the following six months and record results on the Subsidence Inspection Checklist. Centennial to be in regular contact with private property owner during the development of	 LEVEL 3 – HIGH Operations exceed approved impact Development of subsidence and impact greater than expected. Damage to powerline network that causes loss or potential loss of service. 	 Centennial to immediately advise Ausgrid of observed damage to the powerline network. Ausgrid Emergency Service - 1800 627 005 Ausgrid to inspect any damage to powerline network and arrange repairs. Centennial to promptly notify RR and SA NSW of increased subsidence and observed impact to powerlines. Centennial to conduct post mining inspection and subsidence
 Centennial to conduct post-mining surveys following the development of subsidence (majority of subsidence developed when LW is completed or LW face is 800m past feature). Centennial to provide pre and post mining subsidence monitoring results to Ausgrid, RR and SANSW. 		 monitoring and provide results to Ausgrid, RR and the SANSW. Centennial to review results and predictions as per Extraction Plan LW30-31. Centennial to notify external stakeholders and government agencies in accordance with Incident Reporting requirements DC S6 Condition 10 and WHS Regulations.

Monitoring and Controls	Trigger	Action
Built Feature – Telstra Communications Network CAN Local Aerial copper cable 10/0.64	rk	
Centennial established subsidence monitoring / inspection sites for private access roads and adjacent communications lines Centennial to mark the centreline and edges of current longwall panel on road pavement one month prior to private access roads and communications being affected by subsidence. Centennial to notify Telstra one month prior to communications being affected by subsidence from each longwall panel. Centennial to conduct weekly visual inspections of private roads and communications located along road and	 LEVEL 1 – LOW Operations within predicted subsidence and impact. Development of subsidence and impact as expected. Subsidence prediction – tilt and strains within Upper 95% Confidence Limits No interruption of service. Continue operations and monitoring program Unlikely remedial work will be required. LEVEL 2 – MEDIUM Operations within approved impacts but exceed or potentially exceed predictions Development of subsidence exceeding or potentially exceeding 	 Centennial to conduct post mining inspection and provide subsidence monitoring results to Telstra, RR and SA NSW. Centennial to notify Telstra Integrity Services and Comms Network Solutions that subsidence predictions have exceeded or potentially exceeded predictions. Comms Network Solutions to inspect Telstra network for any
powerline easement when influenced by subsidence within the Active Subsidence Zone. Record results on the Subsidence Inspection Checklist. • Centennial to conduct monthly visual inspections for the following six months or until next longwall, and record results on the	 subsidence prediction (Upper 95% Confidence Limits). Tensile and compressive strains may increase 2 to 3 times predicted values due to crack development. No or minor impact to communication network. No interruption of service. Continue operations and monitoring program 	 damage and provide report to Centennial and Telstra. Centennial to conduct post mining inspection and provide subsidence monitoring results to Telstra, RR and SA NSW.
 Subsidence Inspection Checklist. Comms Network Solutions to inspect cable after completion of longwall panel. Centennial to conduct post-mining surveys following the development of subsidence (majority of subsidence developed after 2 months) when LW is completed. Centennial to provide pre and post mining subsidence monitoring results to Telstra, RR and SA NSW. 	 LEVEL 3 – HIGH Operations exceed approved impact Development of subsidence and impact greater than expected (Upper 95% Confidence Limits). Damage to aerial copper cable phone line causing interruption to Telstra communications service. 	 Centennial to notify Telstra Integrity Services and Comms Network Solutions that subsidence predictions have exceeded. Centennial to provide notification to RR and SA NSW Centennial to arrange a Review Meeting to review survey results, cable inspections and proposed action to remediate damage to communication network. Centennial to notify external stakeholders including relevant government agencies in accordance with Incident Reporting S6 Condition 10 and WHS Regulations. Centennial to conduct review and predictions as per adaptive management process as detailed in the Extraction Plan LW25-31.

Monitoring and Controls	Trigger	Action	
Property Access Roads			
 Centennial to conduct flood modelling and assessment to identify potential changes to flooding as per DC Schedule 4 Condition 6(h). Centennial to conduct property inventory and detail predicted impacts from subsidence in PSMP. Centennial to arrange SA NSW premining inspection of property and improvements to detail pre-mining condition. Centennial to establish subsidence 	LEVEL 1 – LOW Operation within prediction and approved impact Development of subsidence and impact as expected. Subsidence within predicted range (U95% CL). Negligible visible impact on gravel access roads. Possible hairline cracking on sealed roads. No change to flood hazard category. LEVEL 2 – MEDIUM Operations within approved impact but exceed or potentially exceed predictions Development of subsidence exceeding or potentially exceeding prediction (Upper 95% Confidence Limits).	 Centennial to conduct post mining inspection and subsidence monitoring and provide results to the Landowner, RR and SA NSW. Centennial to assist landowner with any SA NSW claim for damage to property. SA NSW to conduct post mining inspections and arrange any necessary repairs in consultation with Landowner. Centennial to conduct post mining inspection and subsidence monitoring and provide results to the Landowner, RR and SA NSW. Centennial to assist landowner with any SA NSW claim for damage to access road. 	
monitoring / inspection sites on property access if an increase in flood hazard is predicted. To be arranged in consultation with Landowner. Centennial to conduct post-mining	 Minor cracking to gravel access roads, but remaining safe, serviceable and repairable. Tensile cracking or minor compression humps may develop on sealed roads. Repairs may be required to reseal pavement. No change to flood hazard category. 	 Centennial to arrange prompt repairs to access roads to make safe and allow access to the property. SA NSW to conduct post mining inspections and arrange any necessary repairs in consultation with the Landowner. 	
surveys following the development of subsidence (majority of subsidence developed when LW is completed or LW face is 800m past feature). • Centennial to provide pre and post mining subsidence monitoring results to Landowner, RR and SA NSW.	 LEVEL 3 – HIGH Operations exceed approved impact Development of subsidence and impact greater than predicted Tensile cracks and/or compression humps develop on access roads that need repairing to ensure public safety. Tensile cracks and/or compression humps develop on sealed roads. 	 Centennial to conduct post mining inspection and subsidence monitoring and provide results to the Landowner, RR and SA NSW. Centennial to arrange prompt temporary repairs to make road safe and allow access to property. Centennial to assist landowner with any SA NSW claim for damage to property. SA NSW to conduct post mining inspections and arrange any necessary repairs in consultation with the Landowner. 	
Flood Modelling and Assessment LW30-31 (Umwelt 2020) determined that there was no predicted increase in flood hazard category on the access road at both the 1 year and 100 year ARI Storm Events.	Repairs required, reshaping road, restoring drainage and resealing pavement.	 Centennial to reassess flood hazard using actual subsidence data to determine if there is an increase in flood hazard at 1 year and 100 year ARI Storm Events. If flood modelling indicates an increase in flood hazard, Centennial to commence negotiations and carry out works as agreed by Landowner to provide suitable access to the property. Centennial to notify external stakeholders including government agencies in accordance with Incident Reporting S6 Condition 10. Centennial to review results and predictions as per Extraction Plan. 	

Monitoring and Controls	Trigger	Action
Steep Slopes		
 Centennial to conduct pre mining steep slope inspection and assessment by Geotechnical Engineer. Centennial to conduct subsidence monitoring and inspections as per the Public Safety Management Plan and Subsidence Monitoring 	 LEVEL 1 – LOW Operation within prediction and approved impact Development of subsidence and impact as expected. Subsidence within predicted range (Upper 95% Confidence Limits). Negligible visible impact on gravel access roads. Negligible impact to steep slopes. Negligible indications down slope rock or bolder movements. No rock mass instability. Minor opening of rock joints that does not cause dislodgement of rocks. 	 Centennial to conduct weekly visual inspections of land when steep slope zones are located in active subsidence zone and along pubic access roads. Centennial to conduct post mining inspection and subsidence monitoring and provide results to the RR and Landowner.
 Centennial to conduct weekly visual inspections when steep slopes are within active subsidence zone. Centennial to provide pre and post mining subsidence monitoring results to RR and Landowners. 	 LEVEL 2 – MEDIUM Operations within approved impact but exceed or potentially exceed predictions Development of subsidence exceeding or potentially exceeding prediction (Upper 95% Confidence Limits). Cracking to gravel access roads, but remaining safe, serviceable and repairable. Cracking to surface not requiring major repairs or posing further risk to public safety. Opening of rock joints not likely to cause dislodgement of rocks. 	 Centennial to conduct post mining inspection and subsidence monitoring and provide results to the RR and Landowner. Centennial to inspect and erect warnings signs or barricades as per Public Safety Management Plan. Centennial to notify Landowner Centennial to arrange repairs to access roads or areas of potential rock instability in consultation with landowner. Centennial to notify Principal Subsidence Engineer of higher than expected subsidence. Centennial to arrange a Geotechnical Engineer to inspect any areas of suspected rock mass instability in consultation with Landowner. Centennial to review results and predictions as per Extraction Plan.
	LEVEL 3 – HIGH Operations exceed approved impact Development of subsidence and impact greater than expected. Surface cracking visible that may be dangerous to public safety. Opening of rock joints that may cause dislodgement of rocks. Rock fall and rollouts Overhang collapse Landslide Risks to public safety	 Centennial to review results and predictions as per Extraction Frant. Centennial to conduct post mining inspection and subsidence monitoring and provide results to the RR and Landowner. Centennial to inspect and erect warnings signs or barricades as per Public Safety Management Plan. Centennial to notify Landowner. Centennial to notify Principal Subsidence Engineer of higher than expected subsidence and impact. Centennial to notify DPIE as per S4 Condition 2 SSD-5144. Centennial to arrange immediate repairs to dangerous surface cracking (eg backfilling) any necessary repairs in consultation with the Landowner and RR. Centennial to arrange a Geotechnical Engineer to inspect any areas of suspected rock mass instability. Centennial to notify external stakeholders including government agencies in accordance with Incident Reporting S6 Condition 10. Centennial to review results and predictions as per Extraction Plan.

Monitoring	Trigger	Action
Dwelling Strain		
 Centennial to conduct property inventory and detail predicted impacts from subsidence in PSMP as per DC Schedule 4 Condition 6(h). Centennial to arrange pre-mining structural inspection of dwellings and buildings as per DC Schedule 4 Condition 6(h). Assessment includes structural integrity and any potential risks to health and safety. 	 LEVEL 1 – LOW Operation within prediction and approved impact Development of subsidence (U95% CL) and impact as expected. Strain < 5mm/m Strain Category 0-2 (AS2870-2011). No noticeable impact to dwelling. Possible hairline to fine cracks noticeable that can be easily filled. Possible slightly sticking doors or windows.	 Centennial to conduct subsidence monitoring on dwelling to determine strains and provide results to the Landowner, RR and SA NSW. Centennial to assist landowner with any claim for damage to property. SA NSW to conduct post mining inspections and arrange any necessary repairs in consultation with Landowner.
 Centennial to arrange SA NSW premining inspection of dwelling and improvements. Centennial to establish subsidence monitoring on dwelling and improvements in consultation with Landowner. Centennial to conduct post-mining surveys following the development of subsidence (majority of subsidence 	 LEVEL 2 - MEDIUM Operations within approved impact but exceed or potentially exceed predictions Development of subsidence greater than predicted (U95% CL), but impact as expected Strains approaching 5 mm/m Strain Category 0-2 (AS2870-2011). Minor impact to dwelling. Possible hairline to fine cracks noticeable that can be easily filled. Possible slightly sticking doors or windows. 	 Centennial to conduct subsidence monitoring on dwelling to determine strains and provide results to the Landowner, RR and SA NSW. Centennial to assist landowner with any SA NSW claim for damage to property. Centennial / SA NSW to arrange a structural inspection of the dwelling to insure that dwelling does not pose a risk to health and safety of occupants. SA NSW to conduct post mining inspections and arrange any necessary repairs in consultation with Landowner. Centennial to review results and predictions as per Extraction Plan.
developed when LW face is 800m past dwelling). • Centennial to provide subsidence monitoring results to Landowner, RR and SA NSW.	 LEVEL 3 – HIGH Operations exceed approved impact Development of subsidence and impact greater than expected and beyond SSR Strain >5mm/m Beyond SSR Strain Category 3 to 5 (AS2870-2011) Crack width > 5mm/to 25mm Windows and door frames distorting Service pipes disrupted Roof and floor beams lose bearing Windows broken Severe buckling and bulging of roof and walls Will require partial or complete rebuild. 	 Centennial to conduct subsidence monitoring on dwelling to determine tilt and provide results to the Landowner, RR and SA NSW. Centennial to commence negotiations with Landowner as per the Acquisition and Compensation process consistent with DC Schedule 5 Conditions 3 and 4. Centennial / SA NSW to arrange structural inspection to assess if dwelling is repairable. Centennial to arrange alternate temporary accommodation for occupants if necessary. Centennial to notify external stakeholders including government agencies in accordance with Incident Reporting S6 Condition 10. Centennial to review results and predictions as per Extraction Plan.

Monitoring	Trigger	Action
Dwelling Tilt		
 Centennial to conduct property inventory and detail predicted impacts from subsidence in PSMP as per DC Schedule 4 Condition 6(h). Centennial to arrange pre-mining structural inspection of dwellings and buildings as per DC Schedule 4 Condition 6(h).). Assessment includes structural integrity and any potential risks to health 	Development of subsidence (U95% CL) and impact as expected Tilt < 5mm/m Tilt Category A (AS2870-2011) No noticeable impact to dwelling. Possible sticking doors or windows Unlikely remedial work will be required LEVEL 2 – MEDIUM	 Centennial to conduct subsidence monitoring on dwelling to determine tilt and provide results to the Landowner, RR and SA NSW. Centennial to assist landowner with any claim for damage to property. SA NSW to conduct post mining inspections and arrange any necessary repairs in consultation with Landowner. Centennial to conduct subsidence monitoring on dwelling to
 and safety. Centennial to arrange SA NSW pre-mining inspection of dwelling and improvements. 	Operations within approved impact but exceed or potentially exceed predictions • Development of subsidence greater than predicted (U95% CL),	determine tilt and provide results to the Landowner, RR and SA NSW. Centennial to assist landowner with any claim for damage to
Centennial to establish subsidence monitoring on dwelling and improvements in consultation with Landowner	 but impact as expected Tilt 5 to 7mm/m Tilt Category B (AS2870-2011) 	 property. Centennial / SA NSW to arrange a structural inspection of the dwelling to insure that dwelling does not pose a risk to health and safety of occupants.
Centennial to conduct post-mining surveys following the development of subsidence (majority of subsidence developed when LW face is 800m past dwelling)	 Roof drainage overflowing or wet areas not draining effectively Adjustment of roof drainage or wet areas might be required 	 SA NSW to conduct post mining inspections and arrange any necessary repairs in consultation with Landowner and Centennial Centennial to provide alternate water supply if required.
Centennial to provide pre and post mining subsidence monitoring results to Landowner, RR and SA NSW.	 LEVEL 3 – HIGH Operations exceed approved impact Development of subsidence and impact greater than expected and beyond Safe, Serviceable and Repairable (SSR). Tilt >7mm/m Beyond SSR. Tilt Category C & D (AS2870-2011). Tilt on dwelling may be noticeable. Minor structural work might be required to rectify tilt. Considerable structural work may be required to rectify tilt >10mm/m. 	 Centennial to conduct subsidence monitoring on dwelling to determine tilt and provide results to the Landowner, RR and SA NSW. Centennial / SA NSW to arrange structural inspection to assess if the dwelling is safe, serviceable and repairable. Centennial to commence negotiations with Landowner as per the Acquisition and Compensation process consistent with DC Schedule 5 Conditions 3 and 4. Centennial to arrange alternate temporary accommodation for occupants if necessary. Centennial to notify external stakeholders including government agencies in accordance with Incident Reporting S6 Condition 10. Centennial to provide alternate water supply if required. Centennial to review results and predictions as per Extraction Plan.