

Process Risk Assessment: Integra - Extraction Plan LW 17-20																				
	Step 2: Assess Type; Key Elements-These change depending on TYPE of Risk Assessment			Step 3: Identify the risks, causes and potential consequences				Step 4: Identify the existing controls to manage the identified risks		Step 5: Determine RCE	Steps 6, 7 & 8: Determine the Expected Consequence / Likelihood applicable to the Expected Consequence / Current level of risk				Step 10: PMC		Step 11: Treat the Risks			
Appendix B	Type of Risk Assessment	Key Element (CURA Context/Category)	Sub Key Element (If applicable)	Risk Description - Something happens.....	Consequence - resulting in:	Causes - Caused by	Risk Owner	Existing Control Description	Control Owner (Contact)	Risk Control Effectiveness	Expected Consequence Category	Expected Risk Consequence	Risk Likelihood	Current Risk Rating	Potential Maximum Consequence	Potential Maximum Category	Treatment plans/tasks (Description)	Task Owner	Due Date	Comments
Integra	Process	Natural Features	Bettys Creek Diversion	Surface subsidence effects / cracking leading to surface water travelling into lower strata	Loss of water resources from the surface Change to current water flow	Mine subsidence	Chloe Piggford	Extraction Plan LW 15-16 Asset Management Plan for Bettys Creek Water Management Plan. Existing reduced catchment.	Chloe Piggford	3	Environment	2	D	5	2	Environment	Prepare Surface Water Assessment.	Chloe Piggford	01-Aug-20	
Integra	Process	Built & Natural Features	Surface water (including Mount Owen Drainage Channels)	Surface subsidence effects / cracking impede drainage paths	Ponding of surface water in rail loop cutting	Mine subsidence	Chloe Piggford	Routine rail inspection	Chloe Piggford	3	Financial	2	C	8	3	Financial	Prepare Surface Water Assessment (include TP1 drain). Prepare Mt Owen Asset Management Plan for LW 17-20 and include TP1 drain. Include TP1 drain in weekly visual subsidence inspection form.	Chloe Piggford	01-Aug-20	
Integra	Process	Natural Features	Groundwater	Loss of groundwater / change to existing groundwater	Loss of water resources from groundwater Negative impact to groundwater system	Mine subsidence	Chloe Piggford	Water Management Plan. Groundwater Monitoring Program. Groundwater Impact Assessment.	Chloe Piggford	3	Environment	2	D	5	4	Environment	Prepare Groundwater Assessment for LW 17-20 (consider existing WMP and assessments).	Chloe Piggford	01-Aug-20	
Integra	Process	Natural Features	Ravensworth State Forest	Surface subsidence effects / cracking	Negative impact on native flora/fauna and/or its habitat	Mine subsidence	Chloe Piggford	Biodiversity Management Plan	Chloe Piggford	3	Environment	2	E	3	2	Environment		Chloe Piggford		
Integra	Process	Natural Features	Mt Owen Southern Remnant Offset area	Surface subsidence effects / cracking	Negative impact on native fauna and/or its habitat	Mine subsidence	Chloe Piggford	Biodiversity Management Plan	Chloe Piggford	3	Environment	2	E	3	2	Environment		Chloe Piggford		
Integra	Process	Cultural Heritage	Aboriginal archaeological sites	Surface subsidence effects / cracking or disturbance during subsidence remediation	Destruction of archaeological heritage site	Mine subsidence Failure to follow due diligence process	Chloe Piggford	Aboriginal Heritage Management Plan	Chloe Piggford	3	Environment	2	D	5	2	Environment	Include current Aboriginal Heritage Management Plan in submission of Extraction Plan LW17-20.	Chloe Piggford	01-Aug-20	
Integra	Process	Cultural Heritage	Historic archaeological sites	Surface subsidence effects / cracking	Impact on historic heritage site	Mine subsidence	Chloe Piggford	Historic Heritage Management Plan	Chloe Piggford	3	Environment	2	D	5	2	Environment	Include current Historic Heritage Management Plan in submission of Extraction Plan LW17-20.	Chloe Piggford	01-Aug-20	
Integra	Process	Public Safety	Public Safety	Unauthorised access into subsidence area	Injury to persons and property	Mine subsidence	Chloe Piggford	Fencing. Signage. Weekly inspections. Depth of cover. Subsidence predictions. Nature of subsidence and cracking expected (minimal in size). Locked gate.	Chloe Piggford	3	Health & Safety	1	E	1	1	Health & Safety		Chloe Piggford		
Integra	Process	Infrastructure	Tracks / Roads (MTO & IUG)	Surface subsidence effects / cracking	Equipment damage/ remediation costs	Mine subsidence	Evert Smit	Weekly Inspection. Speed limits. Limited property access (fences/ signage). (Controls as per Extraction Plan LW 15-16 Built Features Management Plan).	Evert Smit	3	Health & Safety	1	D	2	1	Health & Safety	Prepare Built Features Management Plan for LW 17-20 (consider existing BFMP).	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Mt Owen Railway Service Road	Surface subsidence effects / cracking	Equipment damage/ remediation costs	Mine subsidence	Evert Smit	Weekly Inspection. Speed limits. Limited property access (fences/ signage). (Controls as per Extraction Plan LW 15-16 Built Features Management Plan).	Evert Smit	3	Health & Safety	1	D	2	1	Health & Safety	Prepare MTO Rail Line Asset Management Plan for LW 17-20 (consider existing BFMP).	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Gas drainage system (IUG)	Surface subsidence effects / cracking / horizontal movements	Damage to gas drainage infrastructure (gas wells and pipelines)	Mine subsidence	Evert Smit	Extraction Plan LW 15-16 Built Features Management Plan Real-time gas monitoring.	Evert Smit	3	Financial	2	D	5	2	Financial	Prepare Built Features Management Plan for LW 17-20 (consider existing BFMP) and include gas drainage infrastructure.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Ventilation fan site (IUG)	Surface subsidence effects / cracking / horizontal movements	Damage to ventilation infrastructure	Mine subsidence	Evert Smit	Solid foundations. Ground subsidence monitoring data Asset Management Plan. Shaft 3 Subsidence Assessment and surface infrastructure design.	Evert Smit	3	Financial	3	D	9	3	Financial	Prepare Built Features Management Plan for LW 17-20 (consider existing BFMP) and include ventilation fan site.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Ventilation fan site (IUG)	Surface subsidence effects / cracking / horizontal movements	Damage to ventilation shaft lining	Mine subsidence	Evert Smit	Built Features Management Plan Shaft design.	Evert Smit	3	Property Damage	2	D	5	3	Financial	Prepare Built Features Management Plan for LW 17-20 (consider existing BFMP) and include ventilation fan site.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	WOOP Dump (To be discussed)	Surface subsidence effects / cracking	Contour drains impacted and not functioning as designed/ remediation costs	Mine subsidence	Evert Smit	Rehabilitation monitoring (Mt Owen).	Evert Smit	3	Financial	3	D	9	3	Financial	Prepare MGO Key Features Asset Management Plan for LW 17-20 and review monitoring requirements based on proximity of LW operations to WOOP dump. Include WOOP dump in weekly visual subsidence inspection form.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Eastern Rail Pit (ERP) (MTO)	Tailings capping or void wall integrity reduced	Remediation costs Delay of extension of WOOP dump	Mine subsidence	Evert Smit	Subsidence assessment (Mod 8) Ground subsidence monitoring data.	Evert Smit	3	Financial	1	E	1	1	Financial	Prepare MGO Key Features Asset Management Plan for LW 17-20 and review monitoring requirements based on LW operations moving away from ERP.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Tailings Pit 1 (TP1) (MTO)	Dam walls integrity reduced	Remediation costs	Mine subsidence	Evert Smit	Extraction Plan LW 15-16 Tailings Pit 2 Asset Management Plan.	Evert Smit	3	Financial	1	E	1	1	Financial	Prepare MGO Key Features Asset Management Plan for LW 17-20 (consider existing Plan). Include TP1 in weekly visual subsidence inspection form. Obtain relevant approvals from Dams Safety NSW.	Chloe Piggford Evert Smit	01-Aug-20	Dams Safety NSW Approval required prior to mining
Integra	Process	Infrastructure	Tailings Pit 2 (TP2) (MTO)	Highwall integrity reduced Cracking around larger perimeter	Remediation costs	Mine subsidence	Evert Smit	Extraction Plan LW 15-16 Tailings Pit 2 Asset Management Plan.	Evert Smit	3	Financial	1	E	1	1	Financial	Prepare MGO Key Features Asset Management Plan for LW 17-20 (consider existing plan). Include TP2 in weekly visual subsidence inspection form.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Highwall (MTO)	Isolated failures on highwall - rock falls	Production delay/ loss of revenue/ remediation costs/ equipment damage/ personnel injury	Mine subsidence	Evert Smit	Geotechnical assessment (Mod 8). Subsidence assessment (Mod 8). Revised mine plan to shorten LW length. Geotechnical/subsidence monitoring (prisms and laser) including radar, drone. Mt Owen Strata Principal Hazard MP (e.g. bunds, road width).	Evert Smit	3	Health & Safety	3	D	9	4	Health & Safety	Prepare geotechnical assessment for LW 17-20 . Monitor of LW16 subsidence effects on highwall (e.g. radar during first 500m of LW16). Prepare Mt Owen Asset Management Plan for LW 17-20 (consider existing plan).	Chloe Piggford	01-Aug-20	Geotechnical assessment to be prepared by Mount Owen by Mt Owen Geotechnical Engineer.
Integra	Process	Infrastructure	Highwall (MTO)	Isolated failures on highwall - slope failure	Production delay/ loss of revenue/ remediation costs/ equipment damage/ personnel injury	Mine subsidence	Evert Smit	Geotechnical assessment (Mod 8). Subsidence assessment (Mod 8). Revised mine plan to shorten LW length. Geotechnical/subsidence. monitoring (prisms and laser) including radar, drone. Mt Owen Strata Principal Hazard MP (e.g. bunds, road width).	Evert Smit	3	Health & Safety	4	D	14	5	Health & Safety	Prepare geotechnical assessment for LW 17-20 . Monitor of LW16 subsidence effects on highwall (e.g. radar during first 500m of LW16). Prepare Mt Owen Asset Management Plan for LW 17-20 (consider existing plan).	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Mt Owen North Pit (Open cut mining area)	Highwall/pit integrity reduced	Remediation costs	Mine subsidence	Evert Smit	Geotechnical assessment (Mod 8). Subsidence assessment (Mod 8). Revised mine plan to shorten LW length. Geotechnical/subsidence .monitoring (prisms and laser) including radar, drone. Mt Owen Strata Principal Hazard MP (e.g. bunds, road width).	Evert Smit	3	Health & Safety	3	D	9	4	Financial	Prepare geotechnical assessment for LW 17-20 . Monitor of LW16 subsidence effects on highwall (e.g. radar during first 500m of LW16). Prepare Mt Owen Asset Management Plan for LW 17-20 (consider existing plan).	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	West Pit (MTO)	Highwall or dump face instability	Operational downtime impacting RCHPP LOCCHP MTOCHPP	Mine subsidence	Evert Smit	Subsidence assessment (Mod 8). Strata Control Principal. Management Plan.	Evert Smit	3	Financial	2	D	5	3	Financial	Prepare Mt Owen Asset Management Plan for LW 17-20 and review monitoring requirements for West Pit.	Chloe Piggford	01-Aug-20	

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Integra	Process	Infrastructure	West Pit (MTO)	Water flow into underground mine workings including via goaf	Production delay/ pumping costs	Mine subsidence	Evert Smit	Subsidence assessment (Mod 8). Groundwater assessment (Mod 8). UG pumping system.	Evert Smit	3	Financial	1	D	2	1	Financial		Chloe Piggford		
Integra	Process	Infrastructure	West Pit (MTO)	Water flow into underground mine workings including via Shaft 3	Production delay/ pumping costs	Mine subsidence	Evert Smit	Subsidence assessment (Mod 8). Groundwater assessment (Mod 8). UG pumping system.	Evert Smit	3	Financial	2	D	5	2	Financial		Chloe Piggford		
Integra	Process	Infrastructure	Haul roads (MTO)	Surface subsidence effects / cracking	Production detail / loss of revenue/ equipment damage	Mine subsidence	Evert Smit	Subsidence assessment (Mod 8). OCE inspections. Road design (Crushed rock). Distance from LWs.	Evert Smit	3	Health & Safety	1	E	1	1	Health & Safety	Prepare Mt Owen Asset Management Plan for LW 17-20 and review monitoring requirements for Mt Owen haul roads.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Haul roads (Glendell)	Surface subsidence effects / cracking	Production detail / loss of revenue/ equipment damage	Mine subsidence	Evert Smit	Subsidence assessment (Mod 8). OCE inspections. Road design (Crushed rock). Distance from LWs.	Evert Smit	3	Health & Safety	2	D	5	2	Health & Safety	Prepare Mt Owen Asset Management Plan for LW 17-20 and include Glendell haul road and its management practices.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Powerlines (MTO & IUG)	Movement of powerlines	Damage to powerline infrastructure	Mine subsidence	Evert Smit	New powerlines. Single pole design and installation.	Evert Smit	3	Property Damage	2	D	5	4	Financial	Prepare Mt Owen Asset Management Plan for LW 17-20 (consider existing plan). Install sheaves prior to powerpoles entering active subsidence zone.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Water pipelines (MTO & IUG)	Movement of pipelines	Damage to water pipelines/ Environmental incident	Mine subsidence	Evert Smit	Extraction Plan LW 15-16 Built Features Management Plan. Differential flow monitoring. Pre- and post- and daily inspections. Double sleeved in environmentally sensitive areas.	Chloe Piggford	3	Property Damage	2	D	5	4	Environment	Prepare Built Features Management Plan for LW 17-20 (consider existing BFMP).	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Rail line and associated infrastructure (MTO)	Displacement of railway outside of design specs (i.e. geometry and stress)	Damage to railway/ derailment of train	Mine subsidence	Evert Smit	Knowledge base - subsidence monitoring. Extraction Plan LW 15-16 Asset Management Plan for Mt Owen Railway and Bettys Creek Bridges, including existing rail monitoring and management program (LW 7-15).	Evert Smit	3	Property Damage	2	D	5	3	Property Damage	Prepare Mt Owen Railway Asset Management Plan for LW 17-20 (consider existing AMP), include extended monitoring and revision of management practices and action plans based on approved LW 15-16 AMP.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Rail line and associated infrastructure (MTO)	Grade outside of operating specs of trains	Damage to railway/ delay to trains/ remediation costs (track)	Mine subsidence	Evert Smit	Ground subsidence monitoring to date. Subsidence predictions. Speed limit for trains. Predicted subsidence effects on gradeability of trains - Rail operators and rail engineer (APidgeon).	Evert Smit	3	Property Damage	2	D	5	2	Financial	Prepare Mt Owen Railway Asset Management Plan for LW 17-20 (consider existing AMP), include extended monitoring and revision of management practices and action plans based on approved LW 15-16 AMP.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Rail line and associated infrastructure (MTO)	Rail loop switch geometry out of specifications for trains	Damage to railway/ delay to trains/ remediation costs (track)	Mine subsidence	Evert Smit	Ground subsidence monitoring to date. Subsidence predictions. Speed limit for trains. Routine rail inspection by rail maintainer during active subsidence.	Evert Smit	3	Property Damage	2	D	5	2	Financial	Prepare Mt Owen Railway Asset Management Plan for LW 17-20 (consider existing AMP), include extended monitoring and revision of management practices and action plans based on approved LW 15-16 AMP. Determine specific actions and monitoring for rail loop points.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Rail line and associated infrastructure (MTO)	Signal line impacted by ground movements	Damage to signal line	Mine subsidence	Evert Smit	Ground subsidence monitoring to date. Subsidence predictions. Routine rail inspection by rail maintainer during active subsidence. Monitoring and impedance test to rail signal line included in Rail AMP.	Evert Smit	3	Property Damage	1	D	2	2	Financial	Prepare Mt Owen Railway Asset Management Plan for LW 17-20 (consider existing AMP), include extended monitoring and revision of management practices and action plans based on approved LW 15-16 AMP.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Rail line and associated infrastructure (MTO)	Mining beneath the railway culverts, cuttings and embankments in the railway loop	Damage to railway infrastructure/ delay to trains/ remediation costs (track)	Mine subsidence	Evert Smit	Built Features Management Plan. Experience in undermining and controls.	Evert Smit	3	Property Damage	2	D	5	3	Financial	Prepare Mt Owen Railway Asset Management Plan for LW 17-20 (consider existing AMP), include extended monitoring and revision of management practices and action plans based on approved LW 15-16 AMP.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Rail line and train loading infrastructure (MTO)	Mining near to the coal loader and conveyor (including train refuelling infrastructure)	Subsidence affecting load cells/ delay to trains/ overloading of coal wagons	Mine subsidence	Evert Smit	Built Features Management Plan. Experience in undermining and controls. Maintained/calibrated by the OEM annually. Mining progressively towards the area and collecting data on approach.	Evert Smit	3	Financial	2	D	5	2	Financial	Consult with OEM on impacts of subsidence on weighing cells. Consider monitoring which may include survey points, GNSS and tilt meters.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Rail line and train loading infrastructure (MTO)	Mining near to the coal loader and conveyor	Damage to infrastructure due to far field horizontal movements/ delay to trains/ remediation costs	Mine subsidence	Evert Smit	Built Features Management Plan Experience in undermining and controls	Evert Smit	3	Financial	2	D	5	3	Financial	Consider monitoring which may include survey points and GNSS.	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	Rail and road bridges (Bettys Creek bridges) (MTO)	Movement of bridges	Damage to bridges/ rail/ road	Mine subsidence	Evert Smit	Knowledge base - Extraction Plan LW 15-16 Asset Management Plan for Mt Owen Railway and Bettys Creek Bridges. Mitigation works completed and cater for predicted subsidence.	Evert Smit	3	Property Damage	2	E	3	2	Financial	Prepare Mt Owen Railway Asset Management Plan for LW 17-20 (consider existing AMP) and review monitoring and management requirements based on increasing distance from LWs.	Chloe Piggford	01-Aug-20	
Integra	Process	Farmland and Facilities	Agricultural land	Surface subsidence effects / cracking	Injury to livestock and wildlife	Mine subsidence	Chloe Piggford	Knowledge base - Extraction Plan LW 15-16 Land Management Plan. Nil agricultural activities within EP area.	Chloe Piggford	3	Property Damage	2	D	5	2	Property Damage	Prepare Land Management Plan for LW 17-20 (consider existing LMP).	Chloe Piggford	01-Aug-20	
Integra	Process	Facilities	Fences & gates	Surface subsidence effects / cracking	Damage to fences and/or gates	Mine subsidence	Chloe Piggford	Knowledge base - Extraction Plan LW 15-16 Land Management Plan. Weekly subsidence inspections.	Chloe Piggford	3	Property Damage	1	D	2	2	Property Damage	Prepare Land Management Plan for LW 17-20 (consider existing LMP).	Chloe Piggford	01-Aug-20	
Integra	Process	Infrastructure	MTO dirty water management systems dams	Surface subsidence effects / cracking	Loss of water storage/ remediation cost	Mine subsidence	Chloe Piggford	Knowledge base - Extraction Plan LW 15-16 Land Management Plan. Weekly subsidence inspections.	Chloe Piggford	3	Property Damage	2	D	5	3	Property Damage	Prepare Land Management Plan for LW 17-20 (consider existing LMP).	Chloe Piggford	01-Aug-20	
38		38		38		38		Subtotal CountA (ignoring hidden values)		38				38		38				