APPENDIX E: MITIGATION MEASURES TABLE

Aspect	Management and / or Monitoring Measure
General	• IDPL will produce an Environmental Management Plan (EMP) prior to operations commencing, with a Construction Environmental Management Plan (CEMP) to manage the construction phase. The EMP and CEMP will provide detail on the implementation of the environmental management and monitoring measures presented throughout this EIS and consolidated within this table, and as required by conditions of consent and licences • IDPL will provide an Annual Review of the quarry's environmental performance in line with the requirements of the EMP to the relevant agencies. Annual reviews will be made publicly available via the quarry website • Staff, contractor and visitor inductions will include where relevant an overview of management measures and responsibilities and will include: o EMP requirements o Environmental sensitivities o Hazard and risk management o Designated site access o Waste management, spill response and management o Heritage management and heritage finds protocol o Weed and pathogen control o Bushfire prevention o Emergency response o Incident reporting (environmental and safety) o Driver code of conduct.
Social (Community Relations)	• Establishment of a Community Consultative Committee (CCC) to facilitate meetings with representatives of the local community • Document CCC meeting agendas, issues raised, action items and close-out • A dedicated information contact phone number will be established prior to the commencement of construction and maintained throughout the life of the project • Feedback, enquiries and complaints received will be recorded in a consultation register that will be established prior to the commencement of construction and maintained throughout the life of the project • Complaints recorded in the consultation register will include details of complainant, IDPL response and commitments to follow-up by whom and when will be detailed • Consultation with immediate neighbours via an annual site open day • Community information newsletters providing awareness of: o Project progress o Operating hours, contact information and details of how to provide feedback o Ways in which further information can be sought o Details of breaches of any development approval and licence conditions and IDPL response and corrective actions. • Website to include: o Contact numbers o Copies of community newsletters, details of annual open days o Copies of minutes from Community Consultative Committee o Copies of approvals, copies of licences.

Aspect	Management and / or Monitoring Measure	

Aboriginal Heritage	• As a State Significant Development (SSD), DCQ will implement an Aboriginal Cultural Heritage Management Plan (ACHMP) which will act in place of an AHIP for the life of the project. This is per Section 4.41 of the EP&A Act (SSD)
	• Artefacts uncovered during subsurface testing will be relocated and reburied in locations determined through consultation with the DCQ RAPs
	• RAPs will be given the opportunity to be present for the relocation of artefacts uncovered during subsurface testing
	• Graders will be utilised during the construction of the proposed detention basins, allowing for shallow scraping of topsoil (to depth 300 mm) to lower the possibility of damaging further artefacts that may be present within the proposed detention basin footprints
	• RAPs will be offered the opportunity to be present during excavation for the installation of detention basins to allow for identification and collection of any artefacts (or potential artefacts) that are uncovered during excavation works
	• All artefacts uncovered during subsurface testing, construction, operation and rehabilitation of the DCQ will be reburied onsite in a location that will not be impacted by the DCQ
	• Once artefacts have been retrieved and reburied AHIMS will be updated with an impact recording and new location details
	• In the event of discovery of a previously unknown object in the course of construction works associated with the development the following procedure to be followed:
	  ○ Ground disturbance works in vicinity of the object will cease
	  ○ The works area will be secured to prevent additional works or intrusion
	  ○ The DCQ RAPs and an archaeologist will be notified of the discovery. The artefact will be collected (under the AHIP) and removed to a long term storage location (preferably onsite)
	  ○ If the archaeologist considers the object/feature to be significant (e.g. a hearth), Heritage NSW will be notified and a methodology for salvage will be developed in consultation with Heritage NSW and the RAPs.
	• In the event that any potential human skeletal remains are uncovered during works, all work in the immediate area of the remains will halt immediately. The incident will be immediately reported to the NSW Police, Heritage NSW and the RAPs
	• No action will be undertaken until the NSW Police provide written notification to the Proponent. If the skeletal remains are identified as Aboriginal, the Proponent will contact DPC and the DCQ RAPs to determine suitable salvage methodologies. No works will continue until Heritage NSW provides written notification to the proponent
	• Contractors undertaking earthworks associated with the DCQ will be provided with an Aboriginal Cultural Heritage Awareness Induction document, to be undertaken in conjunction with site induction procedures. The document will outline protocols for discovery of previously identified Aboriginal objects and information to aid in the identification of Aboriginal objects.	

Air quality	General	• Activities to be assessed during adverse weather conditions and modified as required (e.g. cease activity where reasonable levels of dust cannot be maintained using the available means) • Weather forecast to be checked prior to undertaking material handling or processing • Engines of on-site vehicles and plant to be switched off when not in use • Vehicles and plant are to be fitted with pollution reduction devices where practicable • Vehicles are to be maintained and serviced according to manufacturer's specifications • Visual monitoring of activities is to be undertaken to identify dust generation.

Aspect	Management and / or Monitoring Measure	
	Exposed areas/stockpiles	• The extent of exposed surfaces and stockpiles is to be kept to a minimum • Exposed areas and stockpiles are either to be covered or are to be dampened with water as far as is practicable if dust emissions are visible, or there is potential for dust emissions outside operating hours • Minimise dust generation by undertaking rehabilitation earthworks when topsoil and subsoil stockpiles are moist and/or wind speed is below 10 m/s.
	Material handling	• Reduce drop heights from loading and handling equipment where practical • Dampen material when excessively dusty during handling • Dust suppression on crushing and screening; water sprays as required to control fugitive dust emissions.
	Hauling activities	• Haul roads should be watered using water carts such that the road surface has sufficient moisture to minimise on-road dust generation but not so much as to cause mud/dirt track out to occur • Regularly inspect haul roads and maintain surfaces to remove potholes or depressions • Driveways and hardstand areas to be swept/cleaned regularly as required etc • Vehicle traffic is to be restricted to designated routes • Speed limits are to be enforced • Vehicle loads are to be covered when travelling off-site.
Biodiversity	Clearing of native vegetation	• Avoid and minimise clearing impacts to native vegetation where practicable • Clearly delineate the boundaries of the Development Site to ensure no accidental incursions within retained vegetation • Ensure vehicle and equipment parking areas and stockpile areas are identified and sited to avoid areas containing ecological value wherever practicable • Appropriate signage such as 'No Go Zone' or 'Environmental Protection Area' should be installed • Identify and communicate the location of any 'No Go Zones' in site inductions • Further mitigation measures to reduce the potential for impacts to Koalas are presented in the KPoM (Appendix 10 of Appendix L).

	Removal of hollow-bearing trees / habitat trees, resulting in fauna injury and mortality.	• Limit removal of trees to that required within the Development Site
		• Hollows removed will be replaced with nestboxes in retained vegetation within the IDPL landholding at a ratio of 1:1.
		• A pre-clearing protocol will be implemented during clearing works, as follows:
		  ○ Pre-clearance surveys will be undertaken to determine if any inhabiting fauna are present
		  ○ A suitably qualified and trained fauna handler will be present during hollow-bearing tree clearing to rescue and relocate displaced fauna.

Aspect	Management and / or Monitoring Measure	

	Impacts to surface and groundwater quality and quantity due to sediment run-off and/or contaminant runoff into adjacent watercourses	• Source controls such as sediment fences, mulching and jute matting will be utilised where appropriate
		• Site-based vehicles will carry spill kits
		• A Soil and Water Management Plan will be required prior to disturbance activities that includes:
		  ○ An Erosion and Sediment Control Plan for each stage of development
		  ○ A Groundwater Management Plan
		  ○ A Surface Water Management Plan.
		• Limit the use of pesticides in the Development Site where possible to avoid the risk of contamination of nearby watercourses/wetland areas.

	Vehicle collision with fauna	• Speed limits within the Development Site will be limited to 40 km/hr • This speed limit should be communicated in site inductions and through onsite signage • Staff and contractor awareness of increased animal activity during dawn and dusk should be communicated in site inductions and through appropriate onsite signage • Mitigation measures to reduce the potential for vehicle strikes to Koalas are presented in the KPoM (Appendix 10 of Appendix L).
	Transfer of weeds and pathogens to and from site.	Fungal pathogens, including *Phytophora cinnamomi* and Myrtle Rust (*Puccinia psidii*), and invasive weeds can have devastating impacts on native plant communities and inhabiting fauna if not managed. Key measures are recommended to include: • Earth moving equipment and off road vehicles will be required to enter the site clean, free of loose dirt and vegetation matter • Weed infestations within the construction footprint are to be identified and mapped prior to construction • Ensure soil and seed material is not transferred between weedy and weed free areas onsite • A Plan of Management for the control of noxious weeds is to be included in the Biodiversity Management Plan. This is to include weed control works to be conducted throughout the construction phase of the Project, and follow-up weed control within the Development Site post construction.
	Noise, vibration, waste and air pollution impacts to adjacent sensitive habitat areas.	• Increased human activity (from workers and traffic levels) directly adjacent to sensitive habitat areas may cause disturbance to flora and fauna species in adjoining habitat. Impacts from operational activities, such as disturbance to an animal's normal behaviour patterns due to noise, vibration, and dust may cause areas of previously suitable habitat to become sub-optimal and may cause fauna species to vacate areas of previously suitable habitat. Management Plans for the Quarry will consider measures to mitigate impacts on flora and fauna from noise, vibration, waste, and air pollution such as: ○ Traffic Management Plan that will include measures to improve driver behaviour, that will be communicated through inductions and a Drivers

Aspect	Management and / or Monitoring Measure	
		Code of Conduct applicable to all haulage contractors. Key measures to be included are: ▪ Speed limits within the Development Site will be limited to 40 km/hr ▪ Speed limit signage ▪ Staff and contractor awareness of increased animal activity during dawn and dusk should be communicated in site inductions and through appropriate onsite signage. • Enforce 'carry-in, carry-out' policy regarding rubbish and waste materials generated on site to avoid waste materials entering adjacent vegetation. • Restriction of public access and associated impacts from domestic pets, waste dumping and damage to adjoining vegetation must be enforced pre, during and post construction • Fence sensitive areas to delineate 'no go' zones • Noise and vibration minimization practices should be included in the Noise and Vibration Management Plan for the quarry • Dust control measures will be implemented through the Quarry's Air Quality Management Plan, this should include covering loads where required; amending operations under excessive wind conditions including ceasing operations if required; use of water carts and static sprays as required to control dust; rehabilitation or stabilisation of exposed surfaces; and, other dust minimisation measures as become evident during works.
	'On site' offset areas	• Weed control programs to maintain or reduce the existing weeds within the onsite offset area. • Repair and erection of fencing as needed to ensure the exclusion of livestock from the offset area.
	Biodiversity Offset Strategy	• Satisfaction of the Biodiversity Offset Strategy detailed within Section 7.1.14.
Economics	• To maximise local benefits derived from the Project, the proponent and contractors engaged by the proponent will be encouraged to source labour locally where possible and practical, and provide training opportunities where practical • To maximise local benefits derived from the Project, the proponent and contractors engaged by the proponent will provide sufficient opportunities and access to information for local businesses to understand the Project's supply contract arrangements and requirements, and improve their ability to secure supply contracts.	
Erosion and Sediment Control	• A CEMP including erosion and sedimentation controls will be prepared and implemented for all construction activities proposed • Erosion and sediment control plans (ESCP) to be prepared and implemented with all internal road construction activities • Install and maintain erosion and sediment controls on-site as required in accordance with the Code of Practice for Managing Urban Stormwater – Soils and Construction (Landcom, 2004) • Erosion and sediment controls will be monitored monthly to ensure performance is maintained.	

Aspect	Management and / or Monitoring Measure	
Hazards	Flood Management	• Adoption of surface water mitigation measures stated in (see 'surface water' within this table) • A Soil and Water Management Plan (SWMP) will be prepared for the proposed DCQ to support the CEMP. The SWMP will be implemented throughout the duration of construction.

	Hydrocarbon Management	• A Pollution Incident Response Plan (PIRMP) will be prepared prior to construction. The PIRMP will be prepared in accordance with NSW EPA Guidelines
		• A chemical inventory, updated daily, will be clearly displayed onsite including all Safety Data Sheets (SDS), which must be no older than 5 years
		• All vehicles and machinery should be turned off when not in use
		• If obvious signs of contamination such as discoloured or odorous soils are encountered during site set-up and extraction, work will stop in the vicinity of the area and, if safe to do so, samples will be taken for analysis
		• Daily equipment pre-start inspections will be undertaken by site personnel. These are designed to identify faulty equipment and potential oil leakages
		• A fully bunded and undercover hardstand for fuel, hydrocarbon and chemical storage will be constructed within the office and weighbridge area, located more than 40 m from any drainage lines
		• Personnel to be trained in spill containment and response procedures
		• Spill response kits will be kept and maintained onsite
		• The processing plant area installed on site will include:
		  ○ A bunded parking area for the overnight parking of site machinery.
		  ○ If power via electrical mains supply is unavailable, diesel generators will be required. If used, diesel generators will:
		  ▪ Be located within a bunded area.
		  ▪ Include an internal double skinned and self bunded diesel storage tank.
		  ▪ Be refuelled as required within the bunded refill area.
		  ▪ Be returned to the Office and Weighbridge area on conclusion of operations each Saturday. This is proposed in the context of reducing the risk of vandalism over the weekend, and limiting risks (e.g. electrical and diesel) associated with the daily transport of the generator to and from processing plant area.
		• Mobile equipment installed on site will:
		  ○ Be refuelled at a lined and bunded refuelling area
		  ○ Include spill control kits
		  ○ Operators trained in the use and maintenance of spill control kits
		  ○ Return of all mobile equipment at end of each day to the Office and Weighbridge area.
		• Refuelling of equipment will be undertaken over a bunded concrete pad by a registered contractor. No fuel or diesel will be stored on site contained in plant and equipment
		• Oils and grease will be stored in a bunded area located more than 40 m from drainage lines
		• Any hydrocarbon spills on site will include the following response:
		  ○ Immediate deployment of spill control kits
		  ○ Notifications of relevant stakeholders (e.g. EPA and Mid Coast Council) consistent with the

Aspect	Management and / or Monitoring Measure	
		Pollution Incident Response Management Plan (PIRMP) for any spills estimated to be greater than 30 L ○ Recovery of all contaminated material regardless of size for collection and offsite disposal at a licenced waste facility.

Aspect	Management and / or Monitoring Measure	
	Hazardous Waste	• No onsite disposal of waste will occur • Scrap metal will be deposited into a dedicated receptacle for periodic collection and recycling • Diesel fuel will be stored within self-bunded above ground tank and all refuelling will be undertaken on a bunded and covered hardstand area • During excavation any foreign materials encountered will signal an immediate stop work in the proximate area until the nature of the object/s can be determined. In the case of uncovered potential asbestos sheeting or pipe laboratory testing may be required to determine if asbestos fibres are present in the surrounding soil • All wastes generated by the DCQ will be managed by the way of Council collection services or via appropriately licensed waste contractors • All waste oil will be collected and stored in containers within a covered and bunded area, and will be removed from the site by an appropriately licensed contractor with all relevant waste tracking documentation completed • All oil filters will be separately stored in containers with a covered bunded area, and will be removed from the site by an appropriately licensed contractor with all relevant waste tracking documentation completed • Sediment / soil will be periodically removed from the various silt control structures and used in progressive rehabilitation of the site • All office paper and general waste originating from the office and amenities building from routine equipment and vehicle maintenance consumables will be placed in appropriate containers for collection by council or a licensed contractor for disposal/ recycling at an appropriate waste management facility • Good housekeeping practices and routine inspection/maintenance will be undertaken of all non-public roads, site infrastructure and silt fencing. Damaged infrastructure including sediment control structures will be replaced as required • Wastewater from the amenities and workshop will be collected in a pump-out system and transported off-site by a licensed contractor • All waste tyres will be removed by the supplier of replacement tyres • Install sediment controls downslope of the disturbance area (in accordance with guidelines such as Landcom (2004) • Any potential asbestos containing materials will be disposed of to a licenced facility using appropriate handling and disposal techniques • Hazardous substances will be stored with valves / outlets facing away from the predominant bushfire threat, site office and workshop area (where applicable). Connection to gas cylinders will be metal. Any hazardous material storage will occur more than will be stored more than 10m from any bushfire hazard and more than 10m from the proposed workshop and site office. Hazardous materials will be stored in accordance with *AS 2187.1-1998 Explosives-Storage, transport and use – storage*.

Aspect	Management and / or Monitoring Measure	

	Blasting	• A Blast Management Plan will be prepared and implemented prior to the commencement of DCQ operation:
		  ○ Consultation during preparation of the Blast Management Plan will include discussions with Mid-Coast Council towards the feasibility of temporary short term closure of Deep Creek Road during blasting events for public safety.
		• Blasting will generally only be permitted during the hours of 9 am to 5 pm Monday to Saturday, and will not take place on Sundays and Public Holidays
		• Blasting will take place no more than once per day
		• Blasting will include the provision of spotters, both to provide a visual cue to where blasting will occur and to stop blasting from occurring in the event the event may result in injury to personnel and / or members of the public or site infrastructure / machinery
		• The Blast Management Plan will include the following items, at minimum:
		  ○ Summary of statutory requirements
		  ○ Outline of blasting frequency and hours
		  ○ Outline of sensitive receivers in the vicinity of the DCQ
		  ○ Baseline noise data and outline of expecting blast noise levels
		  ○ Procedure for blast notifications
		  ○ Blast management and control measures, including measures to ensure both public and personnel safety during blasting (Blast Exclusion Zone)
		  ○ Procedure for monitoring of meteorological conditions, airblast pressure, ground vibration, flyrock (airbourne rocks) and noise during blasting
		  ○ Procedure for management of receiver complaints
		  ○ Procedure for the updating of Blast Management Plan every 5 years, unless required as a result of consultation, utilising monitoring data to inform the scheduled update
		  ○ Mitigation measures outlined under the Voluntary Land Acquisition and Mitigation Policy will be applied as required (no requirements have been identified during impact assessment).

Aspect	Management and / or Monitoring Measure	

	Road Safety	• A Traffic Management Plan (TMP) will be prepared and implemented prior to the commencement of construction of the DCQ
		• Once the final merge geometry and headwall locations are determined for the road widening works in the vicinity of the two cell pipe culvert underneath The Bucketts Way, both headwalls will be assessed to determine whether safety barrier protection is required
		• Consultation with Transport for NSW will include the following from the RSA (see Attachment E of Appendix K):
		  ○ Installation of signage along The Bucketts Way and the Pacific Highway in the vicinity of the Pacific Highway / The Bucketts Way and The Bucketts Way / DCQ intersections to advise road users of the upcoming intersections, providing notice of potential upcoming deceleration / acceleration requirements
		  ○ Consultation towards the feasibility of installing a northbound acceleration lane on The Bucketts Way / Pacific Highway intersection. As The Bucketts Way provides a prominent thoroughfare to the Pacific Highway from suburbs such as Booral, Stroud and Clarence Town, the provision of an acceleration lane would benefit all businesses and operations utilising heavy vehicles in this region and, as such, the funding for this intersection upgrade is considered outside the scope of the DCQ approval and is thus not the responsibility of IDPL
		  ○ Installation of a hold line for the southbound highway right turn lane into The Bucketts Way (outside the responsibility of IDPL as per the above)
		  ○ TfNSW amendment of width marker signs and installation of delineation devices for Limeburners Creek Bridge for general road safety.

Aspect	Management and / or Monitoring Measure	

	Bushfire	• A Bush Fire Management Plan (BFMP) will be prepared prior to the commencement of construction, including the following information at minimum:
		  ○ APZ locations and management details
		  ○ Landscaping requirements, where proposed
		  ○ Access provisions such as locations, passing bays and alternate emergency access
		  ○ Water supplies and bush fire suppression systems (including drenching systems, static water supply, natural water sources etc.) where utilised
		  ○ Schedule of the BAL requirements and building footprints as well as any specific construction details
		  ○ Details regarding the Bush Fire Emergency Management and Evacuation Plan
		  ○ Any other essential bush fire safety requirements.
		• Contractors or employees that smoke must do so in a safe manner having full regard to the safe disposal of cigarette butts to ensure bushfire ignition does not occur. Smoking should be confined to the designated smoking area on site
		• Review bushfire danger ratings and when total fire bans are in place prior to undertaking clearing activities or other hot works onsite. Postpone activity where feasible or increase preparedness through having a fire tanker on standby
		• All mobile machinery and fixed plant to include on-board fire extinguishers
		• Maintain a sufficient asset protection zone (APZ) around the office and workshop area
		• All dangerous goods will be stored in accordance with AS1940, AS1596 and the Dangerous Goods Code
		• All DCQ roads / tracks will maintain a 4 m vertical clearance to allow unobstructed access by fire tankers
		• No parking on the DCQ access road is to occur
		• APZs at the DCQ are to be maintained to standards outlined under Appendix 4 of the NSW RFS document *Planning for Bush Fire Protection 2019*
		• The water tank(s) will be fitted with a 65mm Storz outlet with ball valve to allow for use by firefighting personnel if required
		• Where utilised, bottled gas supplies with be installed and maintained in accordance with AS/NZS 1596:2014, with valves / outlets facing away from the predominant bushfire threat, site office and workshop area (where applicable). Connection to gas cylinders will be metal. Any gas cylinders will be stored more than 10m from any bushfire hazard
		• The proposed DCQ access road verges will be designated ‘no stopping’ zones to maintain a clear thoroughfare
		• In the event of an emergency, Deep Creek Rd (public road) will provide a secondary emergency egress from the DCQ for site personnel
		• A minimum 4m vertical clearance will be maintained on DCQ internal roads to allow for tanker access in the event of an emergency.

Aspect	Management and / or Monitoring Measure	
	Site Safety	• Prior to the commencement of construction, a Work Health and Safety Management Plan (WHS Management Plan) will be prepared • Controls listed under the WHS Management Plan will be included as part of a site induction, with all personnel to be presented and sign onto the induction form prior to the commencement of work at the DCQ • All contractors will be required to partake in a daily toolbox talk by the Construction Manager (or delegate) during construction of the DCQ • All contractors will then be required to undertake toolbox talks for their individual works prior to commencement each day. Hard copies of toolbox talks will be made available to the DCQ Construction Manager and / or Project Manager upon request • All personnel will be required to wear appropriate PPE when onsite, as deemed appropriate by their field of work and the DCQ OHS Management Plan.
	Public Safety	• Application of controls for road management and blasting as listed above • All personnel inducted to the DCQ will be informed of the appropriate communication channels in the event a member of the public is observed onsite • The entirety of the DCQ will be security fenced to prevent accidental access by members of the public • Vehicles and machinery onsite will be fitted with security flashing beacons, to be operating when vehicles / machinery are in use • Vehicles and machinery are to be fitted with reverse alarms (preferentially broadband alarm) and reverse cameras • All works at the DCQ are to be stopped immediately once management personnel have been informed of unauthorised entry. Works will not recommence until the unauthorised intruder has been located and removed from site or taken to the site office • All visitors to the DCQ will be required to sign in upon entry, where they will be presented with a visitor card and high visibility vest (if required). Visitors will return card (and vest if used) when signing out and leaving the DCQ • The DCQ site entry will include a security gate, to be closed outside of construction and or operation hours • Security cameras will be fitted throughout the DCQ both to observe and record intruders, and to provide a visual cue of site security that may discourage unauthorised access.
Historic Heritage	• The report has concluded that the area contains no items of heritage significance and that there are no issues that would constrain the approval of the quarry or require specific management measures.	

Aspect	Management and / or Monitoring Measure

Land Use	• Erosion and sediment control structures will be implemented to prevent run-off and erosion from topsoil
	• Stockpiling of topsoils and subsoils for extended periods of time will lead to degradation of these soils as a rehabilitation resource, but this impact can be contained with suitable management actions including:
	  ○ Topsoil stockpiling should be limited to as short a time as possible, subject to operational requirements
	  ○ stockpiles should be constructed as flat and wide as the available space allows (to prevent anerobic conditions deep within the stockpile)
	  ○ The stockpile should also be seeded to reduce erosion and runoff
	  ○ All stockpiles are to be bunded with a soil bund to contain runoff and erosion until vegetation becomes established
	  ○ When the stockpile is due to be utilised, established vegetation is to be mulched and incorporated into the respread soil.

Noise and Blasting	A Noise Management Plan (NMP) will be developed for the quarry prior to the commencement of construction, and at a minimum the NMP would include:
	• A noise monitoring program, including:
	  ○ Noise monitoring on commencement of construction and on a quarterly basis for at least the first year of operation to determine compliance with the noise criteria and to inform any further noise mitigation works, should the need arise. Monitoring locations would include R6 and/or R19 and R25 (see Figure 2).
	• Management controls to minimise noise impacts, including:
	  ○ Relevant best practice noise management practices.
	  ○ Ensuring plant and equipment used onsite are generally consistent with the sound power levels used in this noise modelling assessment.
	  ○ The location of plant and equipment relative to bunding and screens is generally consistent with this noise modelling assessment.
	• Response protocols in the event of a monitored exceedance or noise complaint and implementation of reasonable feasible mitigation measures where criteria is exceeded.
	• A Blast Management Plan should be developed prior to undertaking blasting onsite, the Blast Management Plan should include vibration monitoring protocols for each blast and response protocols in the event of any exceedance of blast vibration criteria.

Aspect	Management and / or Monitoring Measure

Rehabilitation	• The BDAR recorded four native plant community types (PCTs). Where revegetation is slated to return to native woodland, species assemblages will be sourced from these communities
	• Generally, the process of revegetation is as follows:
	  ○ Immediately prior to topsoil spreading, the area will either:
	  ▪ be ripped to provide a friable subsoil layer to allow for water and root penetration
	  ▪ or sufficient growth media in the form of subsoil or topsoil will be applied to allow for water accumulation and root development.
	  ○ Topsoil will be re-spread by machine over the areas to a depth of between 100 mm and 200 mm subject to availability, areas such as the quarry benches would benefit from application of deeper quantities.
	  ○ Once topsoil has been respread, seed will be broadcast using the equipment/machinery adequate for the area, i.e., batters and the quarry floor (once extraction has ceased) may be able to be seeded using tractor mounted equipment, or where areas are small or difficult to access, seed will require manual seeding either by hand or by “belly-seeders”
	  ○ Seed for the revegetation will be purchased from commercial seed suppliers where available, but for greater diversity a few species will be required to be collected from site prior to clearing
	  ○ Seed application is the preferred method of revegetation establishment, but tubestock supplied by a recognised native plant nursery can be used if conditions are appropriate (e.g., revegetation of creek lines, visual amenity screens and shade tree patches on the quarry floor)
	  ○ The quarry floor is anticipated to consist of hard rock with a shallow topsoil layer. The hard rock floor should be ripped or fractured (as above) to provide a friable subsoil layer to improve root penetration and drainage that will improve establishment of grassland and woody vegetation. Where shade trees are to be established in patches, the subsoil will require extra work to allow for the establishment of deeper root systems for stability. This will be accomplished by ripping / fracturing the quarry floor to a depth of 1 m
	• The following monitoring methods are to be used depending upon vegetation type and size of area that has been rehabilitated. Rehabilitation flora monitoring will be conducted annually:
	  ○ Where the area to be rehabilitated is of sufficient contiguous area (>1 ha), monitoring will be conducted by the establishment of permanent 20m x 20m flora quadrats. It is anticipated that only the quarry floor and product stockpile areas consisting of grassland or pasture rehabilitation areas will require this methodology. The number of quadrats to be established based on the Biodiversity Assessment Methodology (BAM) are for areas of >2 – 5 ha two quadrats, while areas of >5 - 20 ha require three quadrats. Therefore, the product stockpile area will have two quadrats and the quarry floor will have three quadrats. Data collected within the quadrat will include the following:
	  ▪ Species composition (including weed species)
	  ▪ Total Vegetation cover (% coverage) as a general observation
	  ▪ Five 1m x 1m plots will be measured at random to determine detailed cover and litter build up
	  ▪ Bare soil (if present).

Aspect	Management and / or Monitoring Measure
Rehabilitation	○ Shade tree patches will consist of stands of native tree species over native grasses or exotic pasture. These will be monitored by observation. The same patches will be monitored to provide consistency with a data set collected as follows: ▪ Tree number and species (should be known from rehabilitation data) ▪ Height of trees – to determine growth ▪ General health of trees ▪ Ground cover under the canopy - determined as a general observation ▪ Weed presence and species. ○ If the number of trees (deemed as canopy species at maturity) on the patch exceeds five individuals, then a minimum of five trees will be consistently monitored to provide representative examples of the tree patch. These trees are to be marked with tape, paint or a peg to ensure that the same trees are measured each monitoring event ○ In addition, the quarry floor and product stockpile areas will have a walkover-style inspection conducted to identify weed areas, erosion, revegetation failure, fence condition, evidence of feral animal activity and any other feature or criterion requiring action to ensure successful rehabilitation. • Areas of linear or patch rehabilitation will be monitored by the establishment of transects that run along the length of the feature. The transects will be a maximum of 25m in length. If batters or linear features are of insufficient length to fit this transect, then visual observations only will be made. Data collected for transects will be: ○ Number of trees and within 1m either side of the transect ○ Average height of each stratum i.e. canopy species, midstorey species and shrub species (if present) ○ Cover to be measured using five 1m x 1m plots positioned at five-meter intervals, alternating either side of the transect to determine detailed cover and litter build up. • The extraction area benches will be rehabilitated to native vegetation as they will be unsuitable for agriculture. If access cannot be achieved, then visual inspection of the benches will be sufficient to determine if native vegetation has become established • Stockpiling of topsoils and subsoils for extended periods of time will lead to degradation of these soils as a rehabilitation resource, but this impact can be contained with suitable management actions including: ○ Topsoil stockpiling should be limited to as short a time as possible, subject to operational requirements ○ stockpiles should be constructed as flat and wide as the available space allows (to prevent anerobic conditions deep within the stockpile) ○ The stockpile should also be seeded to reduce erosion and runoff ○ All stockpiles are to be bunded with a soil bund to contain runoff and erosion until vegetation becomes established ○ When the stockpile is due to be utilised, established vegetation is to be mulched and incorporated into the respread soil.

Aspect	Management and / or Monitoring Measure

Social	• Pre Construction
	  ○ Proactive communication and engagement with neighbours, the community and Council around the Project prior to site establishment. Measures could include newsletter and construction updates on the scope of the project, likely high impact activities (noise, vibration, traffic and changes to the landscape), and contact details for inquiries and complaints
	  ○ Meetings/presentations with neighbouring properties and community groups prior to construction should also be considered
	  ○ Develop an inquiry and complaint process for the construction period
	  ○ Engage with the local community and neighbours to develop a working relationship to disseminate information during and after construction.
	• Construction
	  ○ A Construction Management Plan (CMP) should be prepared that incorporates the findings of the various project technical studies in relation to communication and notifications. The CMP should detail proposed management and mitigation measures for the identified impacts including:
	  ▪ Amenity impacts including noise monitoring, buffers for visual impacts
	  ▪ Traffic management
	  ▪ Site safety and management
	  ▪ Health impacts – noise, dust, and emissions
	  ▪ Heritage management including unexpected finds procedure
	  ▪ Complaints management process
	  ▪ Ongoing communications with the community around the project to keep residents updated on construction scheduling. This may include signage, notifications, and other appropriate communication channels.
	  ▪ Investigate opportunities to use local contractors, suppliers, and service providers.
	• Operations
	  ○ Develop Community Engagement Plan (CEP) identifying proactive and ongoing engagement and communication strategy to build positive relationships with surrounding stakeholders
	  ○ Establish consultative committee or reference group
	  ○ Ongoing communication with neighbouring community including creating a project website with regular updates and blasting notifications
	  ○ Landscape works along the access road installed early in the project, potentially using mature vegetation
	  ○ Monitor particulate and emissions levels
	  ○ Proactively manage issues, with nearby residents to avoid escalation to complaints
	  ○ Investigate opportunities for inviting community members to participate on consultative committee or reference group
	  ○ Ongoing engagement with the community, hosting events and open days
	  ○ Inquiries and complaints management process.

Traffic and Transport	• Traffic control plans prepared by an accredited person are to be approved by the RMS prior to implementation by an accredited person for the construction of the quarry intersection • The quarry intersection and associated acceleration and deceleration lanes will have signage installed, which will be agreed in consultation with RMS • A signed 40km/hr speed limit along internal quarry roads, including Deep Creek Road • IDPL will implement a Driver Code of Conduct signed onto by all drivers during their site induction • Haul trucks will be weighed on entry to the site via a weigh bridge at the site office complex and again on leaving the site where product weight and tickets will be generated and recorded for each load. • IDPL may make a fair and reasonable contribution to road authorities regarding future works on the Pacific Highway / The Bucketts Way intersection commensurate with the relative impact of the traffic generated by the quarry.

Aspect	Management and / or Monitoring Measure	
Visual	• Trees and shrubs can be planted along the proposed access road near The Bucketts Way to screen views of the proposed road where it can be seen from nearby residences • Bushland around the quarry site should be maintained to keep the existing visual screen intact • Materials, textures and colour selection should relate to the palette of the surrounding environment to minimise visibility and potential for visual impact • Reflective surfaces and bright, contrasting colours should be avoided.	

Water Management	Surface Water	• Water management controls will be revised and updated on determination of the project to ensure management measures proposed adequately reflect the requirements of the Conditions of Consent:
		  ○ The revised controls will be prepared in consultation with the NSW EPA and NSW Water for approval by NSW DPIE
		• The proposed WMS would form the basis of a site Water Management Plan (WMP), that will be developed post approval and outline how the WMS is to be operated to meet EPL conditions, and any other relevant conditions of consent, within the requirements of the POEO Act, taking account of both historical and current water qualities in the surrounding watercourses, and current and future downstream water users
		• The WMP will allow for the ongoing assessment of risk as quarry operations progress, and the implementation of improvements and changes to the WMS where required
		• The Water Management System will include:
		  ○ Scour protection measures for the proposed watercourse crossing points associated with the proposed access route
		  ○ Sediment dams designed with stable spillways for overflows in wet weather
		  ○ Discharge points located within tributaries of Deep Creek with suitable scour protection controls and pumping procedures
		  ○ Management for discharge of sediment dams to ensure water quality measures are implemented.
		All water management infrastructure, and scour protection measures are to be designed, constructed, maintained, removed, and rehabilitated to:
		• Fulfil the statutory conditions of the project approval
		• Meet industry standards and best practice, specifically:
		  ○ Landcom 2004. Managing Urban Stormwater – Soils and Construction, Volume 1, 4th Edition
		  ○ Department of Environment and Climate Change (DECC) 2008. Managing Urban Stormwater – Soils and Construction, Volume 2E – Mines and Quarries.

	Groundwater	

		• Monitoring of the current groundwater network will be performed to evaluate drawdown in the groundwater level associated with quarry operation. This will continue with a period of post-closure monitoring
		• As wells within the quarry are likely to be destroyed during quarry operations it is recommended that additional existing wells are added to the monitoring network and new wells are added to compensate for loss of wells within the quarry. These wells should be constructed as purpose-built monitoring wells. In particular wells should provide information on groundwater quality between the quarry and Deep Creek
		• A dedicated monitoring well should be installed down gradient of the petroleum storage area, to monitor for hydrocarbon contamination of groundwater
		• Water levels and water quality should be measured during the first year of operations on a monthly basis, followed by quarterly monitoring
		• Data loggers will be installed in wells at least during the first year of quarry operations to better understand the drawdown cone developing due to quarrying
		• Water quality monitoring should consist of the analytes and frequencies outlined in Table 7-21
		• Water level and water quality data should be analysed following each quarterly sampling round and plotted to evaluate trends in the data that may correlate with rainfall and climatic conditions
		• A rain gauge will be installed on site and rainfall measurements made throughout the life of the quarry operation for comparison with surface and groundwater data. BOM rainfall data may also be used
		• A database will be maintained with manual water level measurements and measurements from data loggers
		• Given the natural background groundwater conditions at the quarry site show exceedances of the ANZECC 2000 95% levels for NSW Upland Rivers for many of the metals and some other parameters the selection of trigger values for future reporting needs to be carefully selected prior to commencing operations
		• A groundwater management plan will be developed for the site post approval. The Groundwater Water Management Plan (GWMP) should contain the following information:
		  ○ Presentation and analysis of water levels in groundwater monitoring wells and analysis of groundwater physical and chemical parameters and changes over time
		  ○ Presentation of rainfall data and the possible correlations with groundwater and surface water measurements
		  ○ Monthly information should be presented in internal reports and in reporting to government agencies.
		• Reporting should include:
		  • A map showing the location of sites in the monitoring network
		  • Rainfall data and annual variations
		  • Graphs showing changes in groundwater level over time (hydrographs), comparing results between monitoring wells and with rainfall data

Aspect	Management and / or Monitoring Measure	
		• Tables and graphs showing changes in groundwater chemistry, identifying any trends and comparison with ANZECC values and other values which may be relevant trigger values • Measurement and recording of inflows into the quarry and evaluation against predictions • Conclusions from monitoring and any suggested modifications to the monitoring network • Reporting will be via the AEMR.

Waste Management	• All works would be conducted in accordance with the waste management hierarchy established by the WARR Act. The waste management measure would include:
	  ○ No permanent onsite disposal of waste will occur. All wastes generated by the DCQ will be managed by the way of Council collection services or via appropriately licensed waste contractors
	  ○ Scrap metal will be deposited into a dedicated receptacle for collection and recycling
	  ○ Diesel fuel will be stored within self-bunded above ground tank and all refuelling will be undertaken on a bunded and covered hardstand area
	  ○ During excavation any foreign materials encountered will signal an immediate stop work in the proximate area until the nature of the object/s can be determined. In the case of uncovered potential asbestos sheeting or pipe laboratory testing may be required to determine if asbestos fibres are present in the surrounding soil
	  ○ All waste oil will be collected and stored in containers within a covered and bunded area, and will be removed from the site by an appropriately licensed contractor with all relevant waste tracking documentation completed
	  ○ All oil filters will be separately stored in containers with a covered bunded area, and will be removed from the site by an appropriately licensed contractor with all relevant waste tracking documentation completed
	  ○ Sediment / soil will be periodically removed from the various silt control structures and used in progressive rehabilitation of the site
	  ○ All office paper and general waste from routine equipment and vehicle maintenance consumables will be placed in appropriate containers for collection by council or a licensed contractor for disposal/ recycling at an appropriate waste management facility
	  ○ Good housekeeping practices and routine inspection/maintenance will be undertaken of all non-public roads, site infrastructure and silt fencing. Damaged infrastructure including sediment control structures will be replaced as required
	  ○ Wastewater from the amenities and workshop will be collected in a pump-out system and transported off-site by a licensed contractor
	  ○ All waste tyres will be removed by the supplier of replacement tyres
	  ○ Install sediment controls downslope of the disturbance area (in accordance with guidelines such as Landcom (2004)
	  ○ Any potential asbestos containing materials will be disposed of to a licenced facility using appropriate handling and disposal techniques.
	• Hazardous substances will be stored with valves / outlets facing away from the predominant bushfire threat, site office and workshop area (where applicable). Connection to gas cylinders will be metal. Any hazardous material will be stored more than 10m from any bushfire hazard and more than 10m from the proposed workshop and site office. Hazardous materials will be stored in accordance with AS 2187.1-1998 Explosives-Storage, transport and use – storage
	• The Development has been positioned to minimise direct impacts on drainage channels such as Deep Creek to the north; however, there is some potential for indirect impacts to water quality downstream through sedimentation. Implementation of appropriate erosion and sedimentation control measures as part of the quarry will be required to minimise the potential for these impacts
	• Protection of the Environment Operations Act 1997. The EPL will require two discharge locations: one for each of the two sediment dams. Discharges are expected to be limited to storm events with rainfall depths in excess of about 91.5 mm (based on the design rainfall depth of the sediment dams of 91.5 mm over 5 days). Water balance modelling indicates that discharges of up to about 100 ML per annum are likely (for median climate conditions
	• Water Management Act 2000. Water access licences, in addition to site harvestable right of about 33 L, will be required to cover the water take from the dam to the south of the quarry. Water balance modelling indicates that by retaining and reusing surface water generated on site (primarily within the quarry footprint), external supply from the dam are expected to be small (up to 1 ML per year).
	• Groundwater seepages into the pit will need to be licensed under the Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016 (New

Aspect	Management and / or Monitoring Measure
	England Fold Belt Coast Groundwater Source). It is understood that the final landform will be free-draining and will therefore not represent a loss of groundwater to evaporation.