

Doral

YOONGARILLUP Mineral Sands Project

Public Environmental Review

Response to Public Submissions



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EXECUTIVE SUMMARY

Doral Mineral Sands Pty Ltd (Doral) proposes to extract ore from the strand of heavy mineral deposit, known as the Yoongarillup Mineral Sands Deposit located within Mining Tenements M70/458 and M70/459. Approximately 4,000,000t is proposed to be extracted from the deposit to produce 256,000t of heavy mineral concentrate (HMC). HMC product to be generated from mining the deposit includes zircon, ilmenite and rutile. The proposal will have three phases, construction (four months), mining (three years) and mine closure/rehabilitation (up to five years).

The Proposal is located on the lower/mid slopes of the Whicher Scarp, adjacent to the Whicher National Park. The Proposal has a total ground disturbance area of 95.71ha within a Development Envelope of 151.97ha. A total of 86.81ha of the disturbance area is located on previously cleared land currently used for farming activities. 8.90ha of the disturbance area is located in an area on the northern edge of State Forest No. 33. This area of State Forest No. 33 has previously undergone partial clearing and has since revegetated. 8.68ha of the 8.90ha proposed to be cleared within State Forest No. 33 remains vegetated and in very good to excellent condition, 0.22ha of the 8.90ha has previously been disturbed and is in a completely degraded condition. Clearing of native vegetation for the Proposal represents 0.09% (ie. 8.68 of 9,200 ha) of the remaining area of the Whicher Scarp soil-landscape system.



FIGURE ES- 1 LOCALITY PLAN

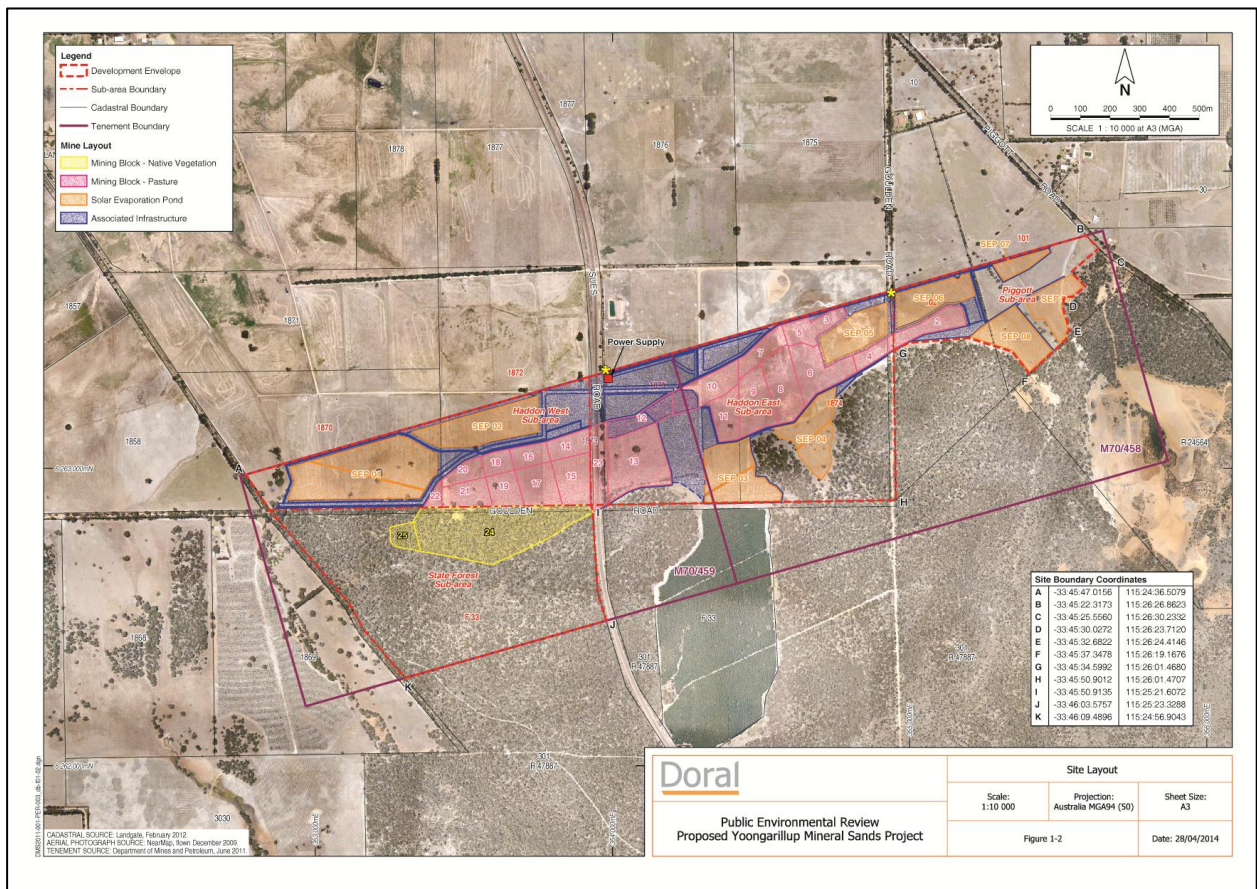


FIGURE ES- 2 SITE LAYOUT

Doral acknowledges that this proposal faces a number of challenges. The main challenges for this proposal include the clearing and subsequent rehabilitation of just under 9 hectares of native vegetation and the operation of the minesite within close proximity to a number of residences. Through technical studies and investigations, and consultation with the community, Doral has gained a thorough understanding of the challenges that the proposal presents. Where possible, Doral has sought to avoid or minimise the impacts of these environmental and social challenges. Doral propose to address the remaining impacts through the implementation of a comprehensive Environmental Management System, incorporating management plans and operating procedures for all facets of the operation. Through these strategies, Doral believes the environmental challenges faced by this proposal can be addressed.

Project Benefits

Doral is a global supplier of the products of mineral sands mining (ilmenite, rutile and zircon). The proposal will enable Doral to continue its mining operations and is crucial to continued delivery to the global market. Products derived from mineral sands mining are used primarily to make pure white, highly light refractive and ultra-violet light absorbing titanium dioxide pigment for use in protective house and car paints; paper; plastics; ink; rubber; textiles; cosmetics; sun screens; leather and ceramics. Because of its non-toxic and biologically inert nature, titanium dioxide can be safely used in foodstuffs and pharmaceuticals. Titanium metals are super strong, lightweight and corrosion resistant. They are used in the construction of aircraft, spacecraft, motor vehicles and for medical implants. Titanium is increasingly being used in the manufacture of advanced engineering applications.

The proposal will provide direct employment opportunities for 32 people (summer) and 25 people (winter), many of whom will reside in the City of Busselton, the remainder residing in the greater South West. Additional employment opportunities will be made available through the engagement of local sub-contractors and service providers throughout the life of the operation. Flow-on benefits will also be realised within the local economy through the purchase of goods and services locally, not only by Doral directly, but indirectly through its employees and sub-contractors living in the region. The proposal will directly contribute to the state economy through the payment of royalties on minerals extracted.

At its existing operation, Doral has become an integral part of the communities of Burekup and Dardanup. Doral has regularly provided financial assistance through grants and sponsorship to local community groups, community events and schools. Doral has built strong relationships with its neighbours and works closely with them to ensure that the social impacts of its mining activities are minimised as far as is practicable. Doral propose to take a similar approach at the Yoongarillup operation, working with neighbours to develop strong relationships and working with the wider community to ensure the proposal delivers an overall benefit to the community.

Summary

A summary of the proposal and its interface with Preliminary Key Environmental Factors is provided in Table ES- 1 below. The table summarises the environmental aspects of the proposal, provides an overview of the environmental impacts resulting from the proposal and describes the mitigation and management commitments Doral will implement to ensure that the proposal will be environmentally acceptable.

The role of the EPA in assessing a proposal is to decide the balance between environment and development on the basis of a range of advice covering political, environmental, economic, social and cultural issues. Doral believe that, through their Environmental Management System, which includes a comprehensive rehabilitation program and environmental offset strategy, this proposal will provide an overall benefit to the State of Western Australia and as such, should be considered for approval by the EPA.

TABLE ES- 1 ASSESSMENT TABLE – PRELIMINARY KEY ENVIRONMENTAL FACTORS

Preliminary Key Environmental Factor / EPA Objective	Environmental Aspect	Potentially Significant Impact (Without Mitigation)	Public Review Submissions	Management Actions (Mitigation)	Regulation
<p>Flora and Vegetation</p> <p>To maintain representation, diversity, viability and ecological function at the species, population and community level.</p>	<p>Ground disturbance – clearing of 8.68 ha of native vegetation within State Forest No. 33</p> <p>Groundwater dewatering</p> <p>Rehabilitation of cleared areas</p>	<p><u>Context</u></p> <ul style="list-style-type: none"> - Very good to excellent quality intact native vegetation of high biodiversity value (Whicher Scarp soil-landscape system) within State Forest No. 33. - Located between cleared agricultural lands and the Whicher National Park. <p><u>Key Surveys / Reports</u></p> <ul style="list-style-type: none"> - EP Bulletin 6 – Natural Values of Whicher Scarp (EPA, 2009) - A Floristic Survey of the Whicher Scarp (Keighery et al., 2008) - Level 2 Flora and Vegetation Survey at Yoongarillup (EcoEdge, 2014) - Review and Impact Assessment of Potential Water Drawdowns on Groundwater Dependent Ecosystems at Yoongarillup (EcoEdge, 2015) <p><u>Survey Findings</u></p> <p><u>Flora</u></p> <p>Recorded within the State Forest sub-area:</p> <ul style="list-style-type: none"> - Two threatened flora species <ul style="list-style-type: none"> ▪ Daviesia elongata subsp. elongata ▪ Verticordia densiflora var. pendunculata - Two priority flora species <ul style="list-style-type: none"> ▪ Conospermum paniculatum (P3) ▪ Acacia semitrullata (P4) - Six regionally significant flora species <p><u>Vegetation</u></p> <ul style="list-style-type: none"> - Very good to excellent quality intact native vegetation - High biodiversity value - Contains Priority 1 Ecological Community WHSFCT C1 - Potential Groundwater Dependent Ecosystem occurs on southern boundary of Development Envelope, 200m from edge of proposed clearing <p><u>Impacts</u></p> <ul style="list-style-type: none"> - Direct loss of vegetation from clearing within State Forest No. 33. 0.09% (8.68 of 9200ha) of remaining Whicher Scarp soil-landscape system to be cleared - Direct loss of 6 of known 1016 individual plants of Daviesia elongata subs. elongata - Potential indirect loss of vegetation through edge effects (degradation of vegetation through increase of interface between State Forest No. 33 and adjacent cleared areas) - Potential indirect loss of vegetation resulting from changes to hydrological regimes (groundwater drawdown) - Potential indirect (and potentially ongoing) loss / degradation of vegetation should dieback or weeds be introduced into previously uninfested areas - If rehabilitation is unsuccessful there will be a permanent loss / degradation of vegetation and fauna habitat. 	<p><u>Whicher Scarp Soil Landscape System</u></p> <p>That the significance of the impact of the proposal on the Whicher Scarp forest ecosystem is considered in the assessment in line with the conservation values documented in EPA Bulletin No.6, The Natural Values of the Whicher Scarp.</p> <p><u>Priority Ecological Community – FCT C1</u></p> <p><i>DPaW recommendation No. 2</i></p> <p>That the significance of the impact on WHSFCT C1 be considered in the assessment. The proposal will result in significant residual impacts on this floristic community type.</p> <p><u>Declared Rare Flora</u></p> <p><i>DPaW recommendation No. 4</i></p> <p>That the significance of the impact of the proposal on the DRF Daviesia elongata subsp. elongata be suitably addressed in the assessment of the proposal</p> <p><u>Dieback</u></p> <p><i>DPaW recommendation No. 1</i></p> <p>That the following conditions be applied to any environmental approval for this proposal:</p> <ul style="list-style-type: none"> - The proponent shall ensure that dieback disease is not spread beyond its current extent as a direct or indirect result of the proposal into the protectable areas within State forest - Prior to project implementation, a Dieback Management Plan is finalised in consultation with DPaW to the satisfaction of the DPaW CEO and made publically available - Implement the Dieback Management Plan during the construction and operation of the proposal <p><u>Weeds</u></p> <p><i>DPaW recommendation No. 5</i></p> <p>That the proponent ensures that no new weed taxa are introduced to or spread beyond the current extent within the disturbed and adjacent areas of State forest, as a direct or indirect result of the proposal.</p> <p><u>Hydrology</u></p> <p><i>DPaW recommendation No. 6</i></p> <p>That the proponent provides management options for maintaining pre-mining hydrological regimes</p> <p>DoW and DER commented that the proposal may result in the degradation and loss of native vegetation as a result of groundwater drawdown within the State Forest sub-area</p> <p><u>Visual Amenity</u></p> <p>DPaW provided comment that the proposed clearing of native vegetation would impact the visual amenity of the local area.</p> <p><u>Rehabilitation / Offsets</u></p> <p><i>DPaW Recommendation No. 7</i></p> <p>That the final offset for the proposal, if found environmentally acceptable, reflects the reality that the rehabilitation of State forest is unlikely to achieve high quality native vegetation outcomes for WHSFCT C1 or conservation flora and fauna, and will likely result in a highly modified and compromised native vegetation outcome with significant residual impact on conservation values of the affected State forest area.</p>	<p><u>Avoid</u></p> <p>The proponent advises that 1/3 of the mineral resource for the proposal is located within the State Forest sub-area. The proposal cannot avoid the clearing of 8.68ha of native vegetation within State Forest sub-area</p> <p><u>Minimise</u></p> <p>Area to be cleared within State Forest No. 33 reduced from 20ha (original referral) to 8.68ha</p> <p><u>Mitigate / Management</u></p> <p><i>Environmental Management System</i></p> <p>Develop and implement the following Management Plans and associated operating procedures:</p> <ul style="list-style-type: none"> - Flora and Vegetation Management Plan - Topsoil Management Plan - Groundwater Operating Strategy and Management Plan - Groundwater Dependent Ecosystem Management Plan - Surface Water Management Plan - Revegetation and Rehabilitation Management Plan - Dieback Hygiene Management Plan - Weed Hygiene Management Plan - Fire Management Plan <p>Plans and operating procedures to be developed in consultation with DPaW and DoW.</p> <p><i>Groundwater drawdown impacting vegetation</i></p> <p>Groundwater Operating Strategy and Management Plan and Groundwater Dependent Ecosystem Management Plan to incorporate baseline surveys, monitoring program, trigger points and contingency actions to be implemented should trigger point be reached. Plans (including contingency actions) to be developed in consultation with DoW and DPaW. Contingency actions may include irrigation of affected areas, establishment of infiltration trenches or groundwater re-injection. Scheduling of mining operations will take into consideration minimising the duration of groundwater dewatering activities adjacent to the State Forest sub-area.</p> <p><i>Rehabilitation Program</i></p> <p>Rehabilitate cleared area within State Forest No. 33 to create a stable, free draining, post mining landform, revegetated with self-sustaining native vegetation using local provenance species.</p> <p><i>Provision of Environmental Offsets</i></p> <p>Provision of environmental offsets to address significant residual impact on:</p> <ul style="list-style-type: none"> - PEC FCT C1 - Black Cockatoo Habitat (refer Environmental Factor: Terrestrial Fauna) 	<p><u>State</u></p> <p>Environment Protection Act (EP Act) Part V (authorised clearing) and Environmental Protection (Clearing of Native Vegetation) Regulations 2004</p> <p>WC Act and Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</p> <p>Conservation and Land Management Act 1984</p> <p>Rights in Water and Irrigation Act 1914</p> <p>WA Environmental Offsets Policy 2011</p> <p>WA Environmental Offsets Guidelines 2014</p> <p><u>Commonwealth</u></p> <p>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</p>

Preliminary Key Environmental Factor / EPA Objective	Environmental Aspect	Potentially Significant Impact (Without Mitigation)	Public Review Submissions	Management Actions (Mitigation)	Regulation
<p>Landforms</p> <p>To maintain the variety, integrity, ecological functions and environmental values of landforms and soils.</p>	<p>Mine Pit Excavation</p>	<p><u>Context</u></p> <ul style="list-style-type: none"> - The proposal is located within the Whicher Scarp, a distinct and naturally restricted landform. <p><u>Key Surveys / Reports</u></p> <ul style="list-style-type: none"> - EP Bulletin 6 – Natural Values of Whicher Scarp (EPA, 2009) - A Floristic Survey of the Whicher Scarp (Keighery et al., 2008) - Level 2 Flora and Vegetation Survey at Yoongarillup (EcoEdge, 2014) <p><u>Survey Findings</u></p> <ul style="list-style-type: none"> - The Whicher Scarp is a very restricted landform, comprising only 0.7% (approx. 21,000 ha) of the Southern Jarrah Forest Biogeographic Sub-region. - 46% (approx. 9,200 ha) of the Whicher Scarp remains naturally vegetated. - Over 50% of the remaining naturally vegetated lands are public lands located in nine Whicher Scarp Reference Areas. - Only 3.4% of the Whicher Scarp soil-landscape system is protected in formal reserves. <p><u>Impacts</u></p> <ul style="list-style-type: none"> - Direct loss from clearing 0.09% (8.68ha of 9,200ha) of remnant native vegetation within the Whicher Scarp Soil Landscape System - 	<p>DPaW requested the EPA consider:</p> <ul style="list-style-type: none"> - the significance of the impact of the proposal on the Whicher Scarp forest ecosystem in line with the conservation values documented in EPA Bulletin No. 6 – The Natural Values of the Whicher Scarp. <p>DPaW commented that:</p> <ul style="list-style-type: none"> - the proposal will result in further impacts on the Whicher Scarp forest ecosystem, which has been reduced from its pre-1750 extent by 58% as a result of the cumulative effects of clearing, grazing and other disturbances including mining. - there is a relatively low probability of the proponent being able to satisfactorily restore the full range of affected State forest values in the medium to long term. - There is a relatively high probability of rehabilitation areas in this environment being adversely affected by weeds and dieback - If the proposal is considered environmentally acceptable, a suitable offset should be considered to address the significant residual impacts on biodiversity and other State forest values, noting that it is likely to be difficult to fully achieve 'like for like' outcomes through averted loss or rehabilitation offsets. <p>Busselton Dunsborough Environment Centre commented that it has significant concerns regarding the proposal to mine a section of Whicher State Forest.</p> <p>The Wildflower Society of WA comments that assessing the proposal as acceptable would be inconsistent with the intent of EP Bulletin No. 6 – The Natural Values of the Whicher Scarp.</p>	<p><u>Avoid</u></p> <p>The proponent advises that 1/3 of the mineral resource for the proposal is located within the State Forest sub-area. The proposal cannot avoid excavation within the Whicher Scarp soil landscape system.</p> <p><u>Minimise</u></p> <p>Area to be mined within State Forest No. 33 reduced from 20ha (original referral) to 8.68ha</p> <p><u>Mitigate / Management</u></p> <p>Management plans detailing the rehabilitation of landforms, materials management, dieback and weed control and revegetation will be developed and implemented as described in the discussion on Environmental Factor - Flora and Vegetation.</p> <p><u>Rehabilitation Program</u></p> <ul style="list-style-type: none"> - Mining voids within the State Forest sub-area will be progressively backfilled with tailings, overburden, subsoil and topsoil to provide a reconstructed soil profile - The reconstructed soil profile will be free draining - The topography of the reconstructed soil profile will be returned similar to pre-mining levels - Cleared areas within the State forest sub-area will be revegetated with local provenance species once soil profiles have been reconstructed 	<p>Regulation of the impacts on the environmental factor landforms can be addressed through the regulation of environmental factor flora and vegetation.</p>

Preliminary Key Environmental Factor / EPA Objective	Environmental Aspect	Potentially Significant Impact (Without Mitigation)	Public Review Submissions	Management Actions (Mitigation)	Regulation
Terrestrial Environmental Quality To maintain the quality of land and soils so that the environment values, both ecological and social, are protected.	Ground disturbance – clearing of native vegetation within State Forest No. 33 Earthmoving and mining operations Mine Pit Excavation Groundwater dewatering	DIEBACK			
		<p><u>Context</u> Phytophthora dieback is caused by the plant pathogen, Phytophthora cinnamomi, which kills susceptible plants, such as banksias, jarrah and grass trees, by attacking their root systems. The fungus is spread through the movement of soil and mud, especially by vehicles and footwear. It also moves in free water and via root-to root contact between plants.</p> <p><u>Key Surveys / Reports</u> Dieback Survey (Moore Mapping 2014)</p> <p><u>Survey Findings</u> - A dieback infestation was identified west of Sues Road, within the State Forest sub-area. 0.2ha of the infested dieback area is located within the area proposed to be cleared. - The proponent has previously operated in areas containing dieback. Dieback Management procedures are documented and included in the proponent's existing Environmental Management System.</p> <p><u>Impacts</u> - The proposal may result in the spread of dieback outside its current known extent - Indirect (and potentially ongoing) loss / degradation of vegetation should dieback be introduced into previously uninfested areas.</p>	<p><i>DPaW recommendation No. 1</i> That the following conditions be applied to any environmental approval for this proposal:</p> <ul style="list-style-type: none"> - The proponent shall ensure that dieback disease is not spread beyond its current extent as a direct or indirect result of the proposal into the protectable areas within State forest - Prior to project implementation, a Dieback Management Plan is finalised in consultation with DPaW to the satisfaction of the DPaW CEO and made publically available - Implement the Dieback Management Plan during the construction and operation of the proposal <p>The Busselton Dunsborough Environment Centre and one local landholder also had concerns that the proposal would result in the spread of dieback into areas previously mapped uninfested.</p>	<p><u>Avoid</u> The proponent has advised that 1/3 of the mineral resource for the proposal is located within the State Forest sub-area. The proposal cannot avoid the clearing of 8.68ha of native vegetation within State Forest sub-area.</p> <p><u>Minimise</u> Establish specific access points to State Forest sub-area to minimise points of interface between dieback uninterpretable and dieback uninfested areas.</p> <p><u>Mitigate / Management</u> Development and implementation of a Dieback Hygiene Management Plan to the satisfaction of DPaW that includes, as a minimum, details relating to:</p> <ul style="list-style-type: none"> - Access to State Forest sub-area - Management of drainage within State Forest sub-area - Management and Storage of Topsoil from State Forest sub-area - Dieback Hygiene procedures and protocols 	Conservation and Land Management Act 1984
ACID SULPHATE SOILS					
		<p><u>Context</u> - Acid sulphate soils (ASS) occur naturally in Western Australia and are harmless when left in a waterlogged, undisturbed environment. - However, when exposed to air, through drainage or excavation, the iron sulphides in the soils react with oxygen and water to produce iron compounds and sulphuric acid. - This acid can release other substances, including heavy metals, from the soil and into the surrounding environment and waterways.</p> <p><u>Key Surveys / Reports</u> - Acid Sulphate Soil Report (Soil Water Consultants 2012) - Groundwater Modelling Report (Parsons Brinkerhoff 2014)</p> <p><u>Survey Findings</u> - Potential Acid Sulphate Soils (PASS) have been identified within the project area, however, they are located outside the areas to be excavated during mining operations. - PASS have been identified below the pit floor in mining pits 5, 7 and 10. Groundwater drawdown within these areas during mining operations may result in the oxidation of these materials. ...continued over page</p>	<p>Concerns were raised by the Department of Water (DoW) and Department of Environmental Regulation (DER) relating to the potential for the proposal to interface with Acid Sulphate Soils. Similar concerns were raised by one of the public respondents.</p> <p>Concerns related to the potential for groundwater drawdown resulting from mining operations dewatering areas of potential acid sulphate soils.</p> <p>The DoW stated that the main groundwater resource condition impacts are the potential oxidation of sulphidic material, associated sulphate plume and the formation of acidic conditions. This is required to be monitored and the rehabilitation progressed to remediate any plume from expanding down hydraulic gradient and impacting on other groundwater users and GDE's.</p>	<p><u>Avoid</u> Excavations from the proposal do not directly interface with PASS materials.</p> <p><u>Minimise</u> Mine planning to incorporate ASS risk assessment to identify areas where groundwater drawdown may dewater areas of PASS located below the pit floor.</p> <p><u>Mitigate / Management</u> Development and implementation of an Acid Sulphate Soils Management Plan to the satisfaction of DER.</p>	<ul style="list-style-type: none"> - Environmental Protection Act 1986 (EP Act) - Rights in Water and Irrigation Act 1914

Preliminary Key Environmental Factor / EPA Objective	Environmental Aspect	Potentially Significant Impact (Without Mitigation)	Public Review Submissions	Management Actions (Mitigation)	Regulation
Terrestrial Environmental Quality (cont.)		<p>- The proponent is familiar with the management of PASS soils as PASS is present at its current Dardanup operation. Current management of PASS at the proponent's existing operation is undertaken through an Acid Sulphate Soil Management Plan approved by the DER.</p> <p><u>Impacts</u> ASS can lead to localised impacts on water quality, soil condition and vegetation growth</p>			
		RADIOLOGICAL PROCESSES			
		<p><u>Context</u> All mineral sands are considered to be Naturally-Occurring Radioactive Materials (NORM), due to the presence of thorium and uranium in mineral grains. The Mineral Sands industry within the southwest of WA has well established methods of operation, regulation, monitoring and research in the management of NORM with no resulting adverse radiological effects. Radiological processes were not assessed as an environmental factor in the Environmental Scoping Document.</p> <p><u>Survey Findings</u> - No mineral transported by the proponent is required to be placarded for radioactive transport. - Part 16 of the Mines Safety and Inspection Act 1994 requires all mineral sands mining operations to submit a Radiation Management Plan, including a Radiation Waste Management Plan, to the DMP for approval by the State Mining Engineer prior to any action taking place.</p> <p><u>Impacts</u> The risk of contamination of land and soils from NORM is not significant.</p>	<p>Comments from the Department of Environmental Regulation (DER) stated the PER had not assessed radiological impacts from the proposal.</p> <p>The DER sought additional information from the proponent to ensure public health and the environment were protected from radiological impacts during commissioning, operation and post-closure.</p>	<p><u>Avoid</u> The proposal cannot avoid interfacing with Naturally Occurring Radioactive Materials.</p> <p><u>Minimise</u> Wherever practicable, all radioactive waste generated on a mine or mineral processing site should be managed and disposed of according to the provisions of the Code of Practice & Safety Guide – Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing. (ARPNSA,2005)</p> <p><u>Mitigate / Management</u> Development and implementation of a Radiation Management Plan and Radioactive Waste Management Plan to the satisfaction of the DMP.</p>	<p>- Mines Safety and Inspection Act 1994 - Mines Safety and Inspection Regulations 1995 - Radiation Safety Act 1975</p> <p>The management of radiation and radiological processes within mining operations is the responsibility of the Department of Mines and Petroleum.</p>

Preliminary Key Environmental Factor / EPA Objective	Environmental Aspect	Potentially Significant Impact (Without Mitigation)	Public Review Submissions	Management Actions (Mitigation)	Regulation
<p>Terrestrial Fauna</p> <p>To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.</p>	<p>Ground disturbance – clearing of 8.68 ha of native vegetation containing fauna habitat within State Forest No. 33</p> <p>Earthmoving and mining operation activities</p> <p>Noise and vibration from earthmoving and mining operation activities</p> <p>Light emissions from mining operations and activities</p>	<p><u>Context</u></p> <ul style="list-style-type: none"> - Very good to excellent quality intact native vegetation of high biodiversity value (Whicher Scarp soil-landscape system) within State Forest No. 33. - Located between cleared agricultural lands and the Whicher National Park. <p><u>Key Surveys / Reports</u></p> <p>The following surveys were undertaken by the proponent.</p> <ul style="list-style-type: none"> - Level 1 fauna assessment - Level 2 seasonal Fauna Survey - Chuditch Trapping Program - Western Ringtail Possum Targeted Survey - Black Cockatoo Habitat Survey - Terrestrial Invertebrate Survey for SRE taxa (Phoenix Environmental Services 2012) <p>Unless stated otherwise, surveys were undertaken by Zoologist, Greg Harewood (2011 – 2014)</p> <p><u>Survey Findings</u></p> <p>7 conservation significant fauna species were recorded within the Development Envelope.</p> <ul style="list-style-type: none"> - Forest Red-tailed Black-Cockatoo - Carnaby's Black Cockatoo - Baudin's Black Cockatoo - Rainbow Bee-eater - Cattle Egret - Great Egret - Western Brush Wallaby - Quenda - Coastal Plains Ctenotus <p>3 species of local significance were recorded within the Development Envelope.</p> <p>Speckled Stone Gecko Black-backed Hooded Snake Forest toadlet</p> <p>3 rare assemblages were identified within the Development Envelope.</p> <ul style="list-style-type: none"> - West Coast Four-toed Lerista / South-western Four-toed Lerista - West Coast Pale-flecked Morethia / Shrubland Pale-flecked Morethia - Chain-striped Heath Ctenotus / Odd-striped Ctenotus / Coastal Plains Ctenotus <p><u>Impacts</u></p> <ul style="list-style-type: none"> - Direct loss of fauna habitat from the clearing of 8.68ha of State Forest No. 33, including: <ul style="list-style-type: none"> - Significant residual impact on Black Cockatoo habitat as a result of the clearing of 110 habitat trees, 10 of which contain potential nesting hollows - Indirect (and potentially ongoing) loss / degradation of fauna habitat should dieback or weeds be introduced into previously uninfested areas. <p>There is potential for a significant residual impact on fauna if rehabilitation is unsuccessful and/or weeds and/or dieback are introduced.</p>	<p>Comments provided by DPaW relating to dieback, weeds and the success of rehabilitating cleared areas are outlined in the Flora and Vegetation section.</p> <p>The Busselton Dunsborough Environment Centre raised concern that the proposed clearing would impact on a suite of threatened fauna.</p> <p>A number of local landowners made comment that the proposal would impact native fauna residing in the area proposed to be cleared.</p> <p>A number of local landowners were concerned that the proposed clearing would have an impact on the recovery of black cockatoo populations.</p> <p>A number of local landowners were concerned that the reduction in black cockatoo habitat may result in an increased foraging by black cockatoos within their horticultural crops.</p> <p>A number of local landowners made comment that the proposed clearing may result in the displacement of kangaroos and emus onto their agricultural properties.</p>	<p><u>Avoid</u></p> <p>The proponent has advised that 1/3 of the mineral resource for the proposal is located within the State Forest sub-area. The proposal cannot avoid the clearing of 8.68ha of native vegetation within State Forest sub-area.</p> <p><u>Minimise</u></p> <p>Area proposed to be cleared within State Forest No. 33 has been reduced from 20ha (original referral) to 8.68ha</p> <p><u>Mitigate / Management</u></p> <ul style="list-style-type: none"> - Development and implementation of the following: <ul style="list-style-type: none"> - Pre-Clearing Fauna Surveys prior to any ground disturbance - Fauna Management Plan - Revegetation and Rehabilitation Management Plan - Dieback Hygiene Management Plan - Weed Hygiene Management Plan - Fire Management Plan - Noise Management Plan <p>Plans to be developed in consultation with DPaW.</p> <ul style="list-style-type: none"> - In consultation with DPaW, the proponent will establish a population control program for the management of pest species (foxes, rabbits, kangaroos) impacting rehabilitation programs within the project area. - Rehabilitate cleared area of State Forest No. 33 to create a stable, free draining, post mining landform, revegetated with self-sustaining native vegetation using local provenance species. - Environmental offsets will be provided to address significant residual impact on Black Cockatoo Habitat. 	<p><u>State</u></p> <p>Environment Protection Act (EP Act) Part V (authorised clearing) and Environmental Protection (Clearing of Native Vegetation) Regulations 2004</p> <p>WC Act and Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</p> <p>Conservation and Land Management Act 1984</p> <p>WA Environmental Offsets Policy 2011</p> <p>WA Environmental Offsets Guidelines 2014</p> <p><u>Commonwealth</u></p> <p>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</p>

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<p>Hydrological Processes</p> <p>To maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.</p>	<p>Groundwater abstraction from Yarragadee aquifer (1.6 GL/year)</p> <p>Minesite dewatering resulting in groundwater drawdown of superficial aquifer</p> <p>Discharge of water from site during emergency situations</p>	<p><u>Context</u></p> <ul style="list-style-type: none"> - The proposal is located in the catchment area of the Vasse River Basin which forms part of the Busselton-Capel Groundwater Area. The catchment is dominated by agricultural land; consequently approximately 80% of the catchment has been cleared. - Landholders adjacent to the proposal utilise groundwater drawn predominantly from the Superficial and Leederville aquifers for domestic and rural purposes. <p><u>Key Surveys / Reports</u></p> <ul style="list-style-type: none"> - Hydrological Reports (Parsons Brinkerhoff, 2014, 2015) <ul style="list-style-type: none"> - Groundwater modelling report - Surface Water report - Site Water Balance - Review and Impact Assessment of Potential Water Drawdowns on Groundwater Dependent Ecosystems at Yoongarillup (EcoEdge, 2015) <p><u>Survey Findings</u></p> <ul style="list-style-type: none"> - No impacts are expected to other users of the Yarragadee aquifer - No local waterways are located in the Development Envelope. - No impacts to the Vasse River, Sabina River or Vasse-Wonnerup Estuary are expected as a result of the proposal. - Groundwater drawdown (<1m) is predicted within the State Forest sub-area - A potential groundwater dependent ecosystem is located within the Development Envelope, 200 metres from the edge of mine pit and 70m from the predicted 0.1m drawdown contour - No impacts from drawdown of the water table as a result of mine pit dewatering are expected for aquifer users with bores located outside the Development Envelope. <p><u>Impacts</u></p> <ul style="list-style-type: none"> - Changes to groundwater regimes from dewatering operations may affect: <ul style="list-style-type: none"> - Native vegetation within the State Forest sub-area and Whicher National Park - Potential acid sulphate soil material located below the mine pit floor at a number of locations with the project area - Discharge of water in emergency situations may have a localised adverse effect on the receiving environment 	<p><u>General</u></p> <ul style="list-style-type: none"> - The DoW, DER and one public submission queried the validity of the hydrological modelling undertaken by the proponent. - The DoW and DER have stated that the proponent will need to establish additional monitoring bores around the perimeter of, and south of, the mine pit to enable improved groundwater data collection. This will allow for improved monitoring of groundwater levels during operations and will provide reference data that will assist in the validation of the groundwater model. <p><u>Minesite Dewatering</u></p> <ul style="list-style-type: none"> - The DoW made comment that the proponent has yet to apply for a Section 5C dewatering licence. - A number of local landholders made comment that they are concerned that the proposal will result in the lowering of groundwater levels, resulting in an impact on their domestic and agricultural water supply availability and quality. - The DoW, DER and one public submission made comment that dewatering activities may result in the oxidation of potential acid sulphate soil material. <p><u>Impact of Groundwater Drawdown on Vegetation</u></p> <ul style="list-style-type: none"> - The DoW, DER and DPaW raised concern that changes to groundwater regimes may impact on native vegetation within the State Forest sub-area, outside of the area proposed to be cleared. Similar concerns were raised by the Busselton Dunsborough Environment Centre. - The Forest and Products Commission raised concerns that the proposal had the potential to change groundwater regimes within its pine plantation, resulting in possible detrimental effects on the health of the trees within the pine plantation. <p><u>Vasse-Wonnerup Ramsar System Wetland</u></p> <ul style="list-style-type: none"> - The DER and one public submission made comment that the proposal had the potential to impact on the Vasse-Wonnerup Ramsar System Wetland. - The DoW stated that the proponent's conclusion that impacts on the Vasse-Wonnerup Ramsar System Wetland are unlikely, given that the wetlands are 14 kilometres away, is supported by the information presented in terms of likely extent of aquifer drawdown. 	<p><u>Avoid</u></p> <p>The proposal cannot avoid interfacing with local hydrological processes.</p> <p><u>Minimise</u></p> <p>The proponent will operate the proposal to minimise impacts on the existing hydrological regime by:</p> <ul style="list-style-type: none"> - ensuring water resources are recycled within the site as far as is practicable; - ensuring the duration of dewatering activities is kept to the shortest timeframe as is practicable to facilitate mining operations (ie. undertake progressive backfill to close-off aquifer interfaces as quickly as possible) <p><u>Mitigate / Management</u></p> <ul style="list-style-type: none"> - The proponent will ensure all required licences and approvals are obtained from the DoW prior to any dewatering or groundwater abstraction activities taking place. - The proponent will install additional groundwater monitoring bores to enable further refinement of the groundwater model and to monitor groundwater levels within the State Forest sub-area. The location and number of additional monitoring bores shall be determined by the proponent in consultation with DoW, DER and DPaW. - The proponent will commit to supplementing local landholders water supply should their groundwater supply be affected by the proposal. - The proponent will develop and implement the following management plans: <ul style="list-style-type: none"> - Groundwater Operating Strategy and Management Plan - Groundwater Dependent Ecosystems Management Plan - Surface Water Management Plan, incorporating the management of emergency discharges of water from the site - Acid Sulphate Soils Management Plan <p>Further discussion on the management of Acid Sulphate Soils is provided under Environmental Factor: Terrestrial Environmental Quality.</p> <p>Further discussion on the management of Groundwater Dependent Ecosystems is provided under Environmental Factor: Flora and Vegetation.</p>	<ul style="list-style-type: none"> - Rights in Water and Irrigation Act 1914 - Environmental Protection Act 1986 (EP Act) <p>The Department of Water is responsible for managing the state's water resources. By issuing licences and permits under the Rights in Water and Irrigation Act 1914 (RIWI), the Department protects the state's water resources and promotes the sustainable and efficient use of water.</p> <p>The Department of Environmental Regulation has responsibility under Part V of the Environmental Protection Act 1986 (EP Act) for the issuing of works approvals and the licensing and registration of prescribed premises. Issues relating to release of water from the proposal and oxidation of potential acid sulphate soils can be regulated through the Works Approval and licensing process.</p>

Preliminary Key Environmental Factor / EPA Objective	Environmental Aspect	Potentially Significant Impact (Without Mitigation)	Public Review Submissions	Management Actions (Mitigation)	Regulation
<p>Amenity</p> <p>To ensure that impacts to amenity are reduced as low as reasonably practicable.</p> <p>Noise</p> <p>To protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring the noise levels meet statutory requirements and acceptable standards.</p> <p>Dust</p> <p>To ensure that dust emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.</p> <p>Visual</p> <p>To ensure that aesthetic values are considered and measures adopted to reduce visual impact on the landscape to as low as reasonably practicable</p>	<p>Noise and vibration from earthmoving and mining operation activities</p> <p>Dust generation from earthmoving and mining operation activities.</p> <p>Ground Disturbance resulting in a change to the existing vista</p> <p>Light emissions from mining operations and activities</p>	<p><u>Context</u></p> <ul style="list-style-type: none"> - The proposal is located on land zoned Agricultural (cleared paddock areas) and Recreation (State Forest sub-area). - The community of Yoongarillup consists of broad acre farms (dairy, horticulture) interlaced with small / medium sized lifestyle blocks - A number of residences are located in close proximity to the proposal. <p><u>Key Surveys / Reports</u></p> <ul style="list-style-type: none"> - Noise Assessment (SVT Engineering Consultants, 2014 and 2015) - An assessment of potential dust impacts was undertaken by environmental consultants, Aurora Environmental and incorporated into the Public Environmental Review document. - Visual Impact Assessment (Woodlands, 2015) <p><u>Survey Findings</u></p> <p>General</p> <p>The proponent works in close proximity to residences at its current operation.</p> <p>Noise</p> <ul style="list-style-type: none"> - The proposal will generate noise during construction and mining activities for the life of the mine. - A number of noise sensitive receptors are located in close proximity to the proposal - Noise mitigation measures can be established to control noise generated by the proposal to levels below noise regulations at all noise sensitive locations. - No noise exceedances above maximum permitted levels under the EP (Noise) Regulations 1997 are predicted/ <p>Dust</p> <ul style="list-style-type: none"> - There is potential for 4 residences to be impacted by dust during mining of pits - The risk of significant off-site impacts has been assessed as low due to proven performance of dust management strategies at existing operation <p>Visual Amenity</p> <ul style="list-style-type: none"> - The proposal will be visible from some of the surrounding properties and segments of Sues Road. - The proposal may result in obtrusive light spill resulting from general luminance diffusion, reflection from existing surfaces or through atmospheric scattering. <p><u>Impacts</u></p> <p>Noise</p> <ul style="list-style-type: none"> - Excessive noise can significantly impact on local communities, particularly where it disturbs sleep at night. - Ongoing noise disturbance can impact on human health <p>Dust</p> <ul style="list-style-type: none"> - Deposition of dust may occur inside local residences - Deposition of dust on fabrics (ie. drying washing on line) - Deposition of dust on house roofs, and the potential for that dust to be transported to water tanks during rain. <p>Visual Amenity</p> <ul style="list-style-type: none"> - The proposal is likely to have some short-term visual impacts on the scenic values of the State Forest sub-area located west of Sues Road. 	<p>Noise</p> <p>DER provided comment that</p> <ul style="list-style-type: none"> - Proponent should justify the overall benefits of the construction of the proposed noise bunds - Seek amenity agreements with residences where predicted noise levels exceed noise regulations <p>Local landholders commented:</p> <ul style="list-style-type: none"> - existing background noise levels are low, being a rural agricultural area - noise from the proposal will impact on the amenity of local residences - the proponent should construct a 7.5m high earthen bund along the northern perimeter of the proposal (east of Sues Road) <p>Dust</p> <p>Local landholders made comment that they were concerned about:</p> <ul style="list-style-type: none"> - the impact of dust on residents who suffer from asthma and other health concerns. - impact on the quality of water captured in rainwater tanks from roof collection systems used as a domestic water supply - risk of inhalation of radioactive material - the impact on local grass and horticultural crops - the level of dust modelling / assessment undertaken <p>Visual Impacts</p> <ul style="list-style-type: none"> - DPaW made comment that the proposed mine will significantly impact the scenic values of this section of the Whicher Scarp. The clearing, mine void and years of regenerating rehabilitation on an elevated scarp adjacent to cleared paddocks and a major transport corridor will be clearly visible for a considerable distance, negatively impacting the scenic value of the scarp landform and the adjoining National Park when viewed from the north. - A number of local landholders commented that the proposal will be visible from their properties, affecting their visual amenity. - A number of local landholders commented that lighting from the proposal will: <ul style="list-style-type: none"> - be visible from their properties - will disrupt the "night sky" - may disrupt their sleeping patterns - may disrupt the sleeping patterns of native fauna - may disrupt sleeping patterns of agricultural and domesticated animals 	<p><u>Avoid</u></p> <p>Factors (noise, dust, visual amenity) that impact on the amenity of the areas surrounding the proposal cannot be avoided.</p> <p><u>Minimise</u></p> <p>Noise</p> <p>The proponent will:</p> <ul style="list-style-type: none"> - utilise the quietest reasonably available equipment for its operations - investigate and implement methods to reduce noise emissions in accordance with best practice <p>Dust</p> <p>The proponent will:</p> <ul style="list-style-type: none"> - scheduled ground disturbance activities to take advantage of favourable weather conditions, where possible - ensure the size of open, disturbed areas is maintained to manageable levels <p>Visual</p> <p>The proponent will:</p> <ul style="list-style-type: none"> - Locate the in-pit hopper and screen plant below the natural surface level minimising nuisance light overspill from active mining areas. - Utilise mobile lighting towers so active mining areas are only illuminated on an as needs basis - Generally limit night time earthmoving equipment operations to a front end loader feeding the in-pit feed hopper - Undertake rehabilitation works to restore the pre-mining vista as soon as is practicable after mining operations have been completed <p><u>Mitigate / Management</u></p> <p>Noise</p> <ul style="list-style-type: none"> - During construction, works will be carried out in accordance with AS 2436: 2010 Guide to Noise and Vibration Control on Construction, Maintenance and Demolition sites - The proponent will adopt methods of noise mitigation, including, but not be limited to: <ul style="list-style-type: none"> - constructing noise bunds recommended in the noise modelling study - constructing a 3m high bund along the northern and eastern perimeters of the operation, east of Sues Road, to further reduce noise emissions - seeking amenity agreements with adjacent landholders - relocating or temporarily shutting down noise generating equipment and/or plant to ensure compliance with the noise regulations during persistent, unfavourable wind conditions - the proponent will develop and implement a Noise Management Plan to the satisfaction of the DER. <p>...continued over page</p>	<p>Environmental Protection Act 1986 (EP Act)</p> <p>Environmental Protection (Noise) Regulations 1997</p> <p>The Department of Environmental Regulation has responsibility under Part V of the Environmental Protection Act 1986 (EP Act) for the issuing of works approvals and the licensing and registration of prescribed premises.</p> <p>The control and management of noise and dust are regulated through the works approval and licensing and registration of prescribed premises.</p>

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Amenity (cont.)				<p><i>Noise (cont.)</i> The Noise Management Plan shall outline:</p> <ul style="list-style-type: none"> - noise mitigation measures to be implemented on the site; - plant and equipment monitoring regimes; - programs for the periodic and, where required, real-time monitoring of noise at sensitive noise receptors; <p><i>Dust</i> The proponent will develop a Dust Management Plan to the approval of the DER, incorporating:</p> <ul style="list-style-type: none"> - Details of education/ information programs for staff/ contractors about controlling dust - Dust control techniques and management practices (including, but not limited to water carts and sealing exposed areas with clay fines) - Dust monitoring program and procedures <p><i>Visual Amenity</i> The proponent will:</p> <ul style="list-style-type: none"> - Consult with landholders to discuss visual screening options presented in the Visual Impact Assessment - constructing a 3m high bund along the northern and eastern perimeters of the operation (east of Sues Road) to provide a visual screen between the mine operations and local landholders - Comply with Australian Standard AS 4282-1997 Control of Obtrusive Effects of Outdoor Lighting - Develop a Visual Amenity Management Plan. The Visual Amenity Management Plan will document housekeeping requirements to maintain a "tidy" site, implementation and location of visual screening (where required), procedures for the establishment of lighting <p><i>General</i> The proponent will develop and implement a Stakeholder Communication Management Plan to ensure effective dialogue and communication is implemented between the proponent and local residents. The plan shall document the capture, documentation and remediation (where applicable) of feedback and concerns/complaints received from local residences relating to the impact of mining operations on their amenity.</p>	

Preliminary Key Environmental Factor / EPA Objective	Environmental Aspect	Potentially Significant Impact (Without Mitigation)	Public Review Submissions	Management Actions (Mitigation)	Regulation
<p>Integrating Factor Rehabilitation and Closure</p> <p>To ensure that premises are closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed outcomes and land uses, and without unacceptable liability to the State.</p>	<p>Ground disturbance – clearing of 8.68 ha of native vegetation within State Forest No. 33</p> <p>Ground disturbance of 86.8ha within previously cleared agricultural land</p> <p>Rehabilitation of cleared areas within State Forest No. 33</p> <p>Rehabilitation of disturbed areas within agricultural paddocks.</p> <p>Reinstatement of road reserves and associated infrastructure.</p>	<p><u>Context</u></p> <p>The proposal will disturb a total of 95.71ha.</p> <ul style="list-style-type: none"> - 86.81 ha within cleared farmland and road reserve - 8.90 within State Forest No. 33, of which 0.22ha has been previously cleared. This area contains PEC WHSFCT C1. <p>Three post-mining land uses have been identified, based on pre-mining land use, including:</p> <ul style="list-style-type: none"> - Rehabilitated Native Vegetation - Agriculture - Road / Road Reserve <p><u>Key Surveys / Reports</u></p> <ul style="list-style-type: none"> - Desktop Study on Successful Rehabilitation Procedures (Aurora Environmental 2014) - Rehabilitation at the proposed Lot 102 Goulden Road offset area and within SF33 - Preliminary Technical Note (EcoEdge 2015) - Guidelines for Preparing Mine Closure Plans (DMP, EPA 2011) <p><u>Survey Findings</u></p> <ul style="list-style-type: none"> - The proponent has successfully undertaken rehabilitation of large areas of agricultural land at its current operation at its current Dardanup operation. - The proponent has successfully implemented small scale native vegetation rehabilitation at its current Dardanup operation. - The proponent has not previously undertaken large scale rehabilitation of native vegetation. - The proponent has consulted with native revegetation specialists from larger mineral sands operations experienced in large scale rehabilitation of native vegetation to investigate best-practice methodologies. - The proponent has engaged and will continue to engage suitably qualified environmental consultants to assist in the development of rehabilitation programs. - Issues considered of critical importance for rehabilitation of surface mining in the southwest of WA include: <ul style="list-style-type: none"> - Characterization of existing and reconstruction of soil profiles <ul style="list-style-type: none"> - Including Topsoil Management - Species selection and seed management - Plant establishment - Controlling threats to rehabilitation success (weeds, dieback, feral/grazing animals) <p><u>Impact</u></p> <ul style="list-style-type: none"> - There is potential for a significant residual impact if rehabilitation is unsuccessful and there is a loss / degradation of vegetation and fauna habitat. - Consequences of failure to rehabilitate natural ecosystems to appropriate standards can include: <ul style="list-style-type: none"> - Reduction in the quality and quantity of habitats for plants, animals, fungi and microbes resulting in net loss of biodiversity. - Reductions in essential ecosystem functions such as carbon sequestration, water table stabilisation, etc. - Impacts on adjacent natural vegetation due to weed invasion, changes to hydrology, loss of connectivity, etc. - Environmental hazards and management costs that must be borne by society. - Reductions in the economic values of sites (forestry, grazing, tourism, etc.). - Loss of visual amenity and heritage values. - Failure to meet environmental conditions/commitments requiring additional remediation work. - Loss of image and reputation for proponents 	<p><u>Mine Closure</u></p> <p>DPaW recommendation No. 8</p> <p>That the Mine Closure Plan for the proposal be developed in close consultation with Parks and Wildlife for approval of the CEO of the OEPA.</p> <p><u>Rehabilitation</u></p> <p>DPaW comment:</p> <p>Rehabilitation of State forest is unlikely to achieve high quality native vegetation outcomes for WHSFCT C1 or conservation significant flora and fauna, and will likely result in a highly modified and compromised native vegetation outcome with a significant residual impact on the conservation values of the affected State forest area.</p>	<p><u>Avoid</u></p> <p>The proposal cannot avoid clearing 8.68ha within State Forest No. 33.</p> <p><u>Minimise</u></p> <ul style="list-style-type: none"> - Area proposed to be cleared within State Forest No. 33 has been reduced from 20ha (original referral) to 8.68ha - Temporary duration of the proposal. The proposed mining schedule has been developed to minimise the disturbance time associated with mining within the State Forest sub-area. Rehabilitation and revegetation works will commence as soon as practicable following extraction of the ore through progressive backfilling of the mine void and replacement of overburden, subsoil and topsoil. Mining within the State Forest sub-area is scheduled to start in the second half of the first year of operations, with an estimated duration of mining within the State Forest sub-area being 13 months. <p><u>Mitigate / Management</u></p> <p>The proponent has committed to the development and implementation of:</p> <ul style="list-style-type: none"> - Mine Closure Plan - Flora and Vegetation Management Plan - Rehabilitation and Revegetation Management Plan - Topsoil Management Plan - Dieback Hygiene Management Plan - Weed Hygiene Management Plan - Fire Management Plan <p>The Rehabilitation and Revegetation Management Plan will specifically address the following factors considered to be critical for successful rehabilitation after near surface mining:</p> <ul style="list-style-type: none"> - Characterization and reconstruction of soil profiles including: <ul style="list-style-type: none"> - Pre-mining characterization of natural soil profiles and landforms; - Removal and management of vegetation and topsoil; - Soil profile reconstruction to support post mining land use objectives. - Species selection and seed management including: <ul style="list-style-type: none"> - Plant species selection; - Seed collection, storage and treatment. - Plant establishment including: <ul style="list-style-type: none"> - Plant establishment techniques; - Controlling threats to rehabilitation success; - Completion criteria and monitoring. 	<p>Mining Act 1975</p> <p>EPA Act 1986</p> <p>Where the EPA assesses mine closure planning as part of the EIA process (provided under section 40 of the Act), the EPA's primary objective is to ensure that the mine is capable of being closed in an ecological sustainable manner.</p> <p>The approval processes for Mine Closure Plans often require advice or endorsement from other environmental regulators including the Department of Environment Regulation (administering Part V of the EP Act and the Contaminated Sites Act 2003), the Department of Parks and Wildlife (administering the Wildlife Conservation Act 1950 and the Conservation and Land Management Act 1984,) and the Department of Water (administering the Rights in Water and Irrigation Act 1914).</p>

Preliminary Key Environmental Factor / EPA Objective	Environmental Aspect	Potentially Significant Impact (Without Mitigation)	Public Review Submissions	Management Actions (Mitigation)	Regulation
<p>Integrating Factor Offsets</p> <p>To counterbalance any significant residual environmental impacts or uncertainty through the application of offsets.</p>	<p>Ground disturbance – clearing of 8.22 ha of Priority Ecological Community WHSFCT C1 within State Forest No. 33</p> <p>Ground disturbance – clearing of 8.68 ha of native vegetation supporting Black Cockatoo habitat within State Forest No. 33</p>	<p><u>Context</u> Environmental offsets are actions that provide environmental benefits which counterbalance the significant residual environmental impacts or risks of a project or activity. Unlike mitigation actions which occur on-site as part of the project and reduce the direct impact of that project, offsets are undertaken outside of the project area and counterbalance significant residual impacts.</p> <p><u>Key Surveys / Reports</u></p> <ul style="list-style-type: none"> - Yoongarillup Mineral Sands Project – Public Environmental Review (2014) - Yoongarillup Mineral Sands Project –Offset Strategy (June 2015) - Technical Note - Rehabilitation at the proposed Lot 102 Goulden Road offset area and within SF33 - (EcoEdge 2015) - Report on a Floristic Community Assessment of a Proposed Offset Area at Yoongarillup (EcoEdge 2013) - Vegetation Condition in a Proposed Mining Offset Area on Lot 102 Goulden Road, Yoongarillup <p><u>Survey Findings</u> The proponent has identified the proposal will result in the following significant residual impacts:</p> <ul style="list-style-type: none"> - Clearing of 8.68ha of native vegetation within the Whicher Scarp soil landscape system, including clearing of 8.22ha of Priority 1 Ecological Community FCT C1 - Clearing of 8.68ha of Black Cockatoo habitat located within State Forest No. 33 <p>The proposed offset site is located within the Whicher Scarp soil landscape system and is adjacent to the development envelope. It contains:</p> <ul style="list-style-type: none"> - Black Cockatoo Habitat - Approximately 4 ha of remnant vegetation similar to Floristic Community Type WHSFCT C1 - Approximately 5.8 ha of remnant vegetation (including the 4ha of WHSFCT C1) classified as being in ‘Good’, ‘Good to Very good’ or ‘Very good’ condition <p>It is anticipated that natural regeneration of native vegetation within the proposed offset site will occur once appropriate management actions are undertaken (ie. fencing, weed control, pest species control). This will create the necessary favourable conditions required to improve the condition of native vegetation within these areas.</p> <p><u>Impacts</u></p> <ul style="list-style-type: none"> - The condition of native vegetation (including 4ha of WHSFCT C1) within the proposed offset area will degrade further as a result of ongoing grazing pressures from pest species (native and introduced) - There is potential for ongoing significant residual environmental impacts to flora and fauna if rehabilitation is unsuccessful, dieback or weeds are introduced and/or feral animal management is not successful. - If significant residual environmental impacts remain after reasonable rehabilitation and management measures are undertaken, the reserve Manager (Department of Parks and Wildlife) may be left with a future liability for reserve management. 	<p>The Department of Parks and Wildlife state that if the proposal is considered environmentally acceptable, a suitable offset should be considered to address the significant residual impacts on biodiversity and other State forest values, noting that it is likely to be difficult to fully achieve 'like for like' outcomes through averted loss or rehabilitation offsets.</p> <p><i>DPaW recommendation No. 7</i> That the final offset for the proposal, if found environmentally acceptable, reflects the reality that the rehabilitation of State forest is unlikely to achieve high quality native vegetation outcomes for WHSFCT C1 or conservation significant flora and fauna, and will likely result in a highly modified and compromised native vegetation outcome with a significant residual impact on the conservation values of affected State forest area.</p> <p>The Busselton Dunsborough Environment Centre considers that the proponent is unlikely to identify an offset that addresses the loss of FCT C1. The Wildflower Society of WA state the area to be cleared cannot be offset as there is no comparable area of native vegetation.</p> <p>One respondent from the public stated that an assessment of the environmental acceptability of the proposal should not be made in the absence of a secured offset that has been surveyed, documents and made available for public review.</p>	<p>The proponent has provided the OEPA an Offset Strategy that addresses the requirement of the WA Government Offsets Policy (2011) and the offset requirements outlined in the EPBC Act that addresses the significant residual impacts predicted to occur as a result of the proposal.</p> <p><u>Management</u></p> <ul style="list-style-type: none"> - Land acquisition of proposed offset site - Delivery of a rehabilitation program to improve the condition of native vegetation within the proposed offset area, including: <ul style="list-style-type: none"> - Establishment of exclusion fencing to prevent grazing on native vegetation and degradation of soils from pest species (native and introduced) - Revegetation program within degraded areas of the site to reintroduce understorey species. - Weed control - Revegetation of cleared paddock areas within proposed offset site with native vegetation to provide additional black cockatoo habitat. <p>The proponent has committed to the development and implementation of:</p> <ul style="list-style-type: none"> - Rehabilitation and Revegetation Management Plan - Offset Management Plan - Dieback Hygiene Management Plan - Weed Hygiene Management Plan 	<p><u>State</u> Environment Protection Act (EP Act) Part V (authorised clearing) and Environmental Protection (Clearing of Native Vegetation) Regulations 2004</p> <p>WC Act and Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</p> <p>Conservation and Land Management Act 1984</p> <p>WA Environmental Offsets Policy 2011</p> <p>WA Environmental Offsets Guidelines 2014</p> <p><u>Commonwealth</u> Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</p>

1 INTRODUCTION

1.1 BACKGROUND

The Yoongarillup Mineral Sands Project - Public Environmental Review (PER) was released for a four week public comment on 20th October 2014. The document was advertised in the following publications:

- The West Australian (Monday, 20th October 2014)
- Busselton-Dunsborough Times (Friday, 17th October 2014)

The public comment period closed on the 20th November 2014.

In total, 25 submissions were received by the Office of the EPA from 8 organisations and 17 individuals.

1.2 PURPOSE OF THIS DOCUMENT

Section 9.2 of the Environmental Impact Assessment (Part IV Division 1) Administrative Procedures (2002) requires that the proponent provides a written response to issues raised during the public review. The proponent must prepare a summary of the pertinent issues raised in submissions, responding to them in writing, along with providing a response to any other issues the OEPA may consider need to be addressed.

This document provides an opportunity for Doral to:

- Address any errors and/or omissions identified by respondents in the Public Environmental Review document
- Review the EPA's environmental objectives in response to submissions received;
- Present additional information and/or technical reports used in the preparation of responses to submissions;
- Modify aspects of the proposal in response to submissions received;

Amend environmental commitments and/or include additional environmental commitments in response to submissions received.

1.3 RESPONSE METHODOLOGY

Doral are required to prepare a response to submissions document that meets the requirements for an adequate document as outlined in Section 4.4 of the EPA document *"Environmental Assessment Guideline No. 6 – Timelines for Environmental Impact Assessment of Proposals – March 2013"*. To achieve this, Doral has employed the following methodology to review and prepare a response to the public submissions received for this proposal.

Issues arising from the public review submissions have been tabulated and categorised against the preliminary key environmental factors outlined in the Environmental Scoping Document (ESD). This has allowed for grouping of common areas of concern/comment. A number of comments received did not fall within the scope of a specific environmental factor, in such cases, they were categorised into one of the following topics.

General Comments Not Associated with Environmental Factor	Details
PER Documentation	<ul style="list-style-type: none"> • Typographical errors contained with the PER document • Omissions from the PER document not relating to an Environmental Factor
The Proposal	<ul style="list-style-type: none"> • Justification for project • Project timing • Location of infrastructure • Objection to mining operation • Environmental Management System
Commercial Impacts	<ul style="list-style-type: none"> • Potential loss of income as a result of mining operations • Devaluation of property as a result of mining operations • Conditions for Land Access
Environmental Management Systems	<ul style="list-style-type: none"> • Fire management • Access to site

Table 1-1 Response Categories not associated with Environmental Factors

1.3.1 Preliminary Key Environmental Factors

In reviewing the 25 responses received from the public review, Doral has identified a number of topics which align with the EPA's framework for environmental factors and objectives.

In January 2013, the EPA issued an Environmental Scoping Document (ESD) for the proposal. The ESD listed the preliminary key environmental factors to be addressed by Doral in the Public Environmental Review (PER). The preliminary key environmental factors identified in the ESD and subsequently addressed in the PER are presented in Table 1-2.

Theme	Environmental Factor	Environmental Objective
Land	Flora and Vegetation	To maintain representation, diversity, viability and ecological function at the species, population and community level.
Land	Terrestrial Fauna	To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.
Water	Hydrological Processes	To maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.
Integrating Factors	Offsets	To counterbalance any significant residual environmental impacts or uncertainty through the application of offsets.
	Rehabilitation and Closure	<p>To ensure that premises are closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed outcomes and land uses, and without unacceptable liability to the State.</p> <p>EP Guidance Note 6: Rehabilitation of Terrestrial Ecosystems Minimise environmental impacts resulting from permanent change to ecosystems, including the return of rehabilitated areas to self-sustaining and functional ecosystems comprised of local provenance species</p>

Table 1-2 Preliminary Key Environmental Factors identified in ESD

The Environmental Scoping Document (ESD) also required Doral to address a number of “Other Environmental Matters” as listed below:

- Water Resources;
- Vasse-Wonnerup System Ramsar wetland;
- Discussion of potential groundwater impacts (including any impacts from Acid Sulphate Soils);
- Dieback mapping and management;
- Dust; and
- Noise.

Upon review of the submissions received from the public review, Doral has identified trends in the topics presented in the submissions. Reviewing the submissions received against the EPA document, Environmental Assessment Guideline No. 8 - Environmental factors and objectives, Doral has identified a number of additional key environmental factors that are applicable to the proposal. Table 1-3 outlines the additional preliminary key environmental factors that Doral will address in this Response to Submissions.

Theme	Environmental Factor	Environmental Objective
Land	Landform	To maintain the variety, integrity, ecological functions and environmental values of landforms and soils.
Land	Terrestrial Environmental Quality	To maintain the quality of land and soils so that the environment values, both ecological and social, are protected.
People	Amenity	To ensure that impacts to amenity are reduced as low as reasonably practicable

Table 1-3 Additional Preliminary Key Environmental Factors

For each key environmental factor, a detailed response of the submissions received has been prepared. Reference to this detailed response is provided in Table 1-4.

The information provided in the detailed response may include, but not be limited to:

- Clarification of data presented in the Public Environmental Review (PER) – Revision 0;
- Correction of data/information presented in the PER document;
- The provision of supplementary information not included in the PER document to addresses issues raised;
- Commentary from Doral Mineral Sands on the matters raised in the public submissions.
- Amended or additional management commitments;

TABLE 1-4 SUMMARY OF RESPONSE THEMES/TOPICS

Theme	Environmental Factor / Topic	Environmental Objective	Specific Topic	Section	
Land	Flora and Vegetation	To maintain representation, diversity, viability and ecological function at the species, population and community level.	Clearing of Native Vegetation	Refer Section 2	
			Impacts on PEC FCT C1		
			Impacts on Conservation Significant Flora		
			Indirect Impacts of Mining Operations		
Landforms	To maintain the variety, integrity, ecological functions and environmental values of landforms and soils.	To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.	Management of Weeds	Refer Section 3	
			Clearing of Native Vegetation within Whicher Scarp Soil Landscape System		
			Terrestrial Environmental Quality		
Terrestrial Fauna	To maintain the quality of land and soils so that the environment values, both ecological and social, are protected.	To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.	Dieback	Refer Section 4	
			Acid Sulphate Soils		
			Radiological Processes		
Water	Hydrological Processes	To maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.	Conservation of Native Fauna	Refer Section 5	
			Pest / Nuisance Fauna		
			Rights in Water Irrigation Act 1914		Refer Section 6
			Site Water Balance		
			Groundwater Modelling		
			Water Monitoring		
			Other Groundwater Users		
			Discharge of Water from Site		
Groundwater Dependent Ecosystems					
Vasse Wonnerup Ramsar System Wetland					

Theme	Environmental Factor / Topic	Environmental Objective	Specific Topic	Section
People	Amenity	To ensure that impacts to amenity are reduced as low as reasonably practicable.	Dust	Refer Section 7
			Noise	
			Visual Amenity	
Integrating Factors	Rehabilitation	To ensure that premises are closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed outcomes and land uses, and without unacceptable liability to the State.	Mine Closure Rehabilitation of Native Vegetation	Refer Section 8
	Offsets	To counterbalance any significant residual environmental impacts or uncertainty through the application of offsets.	Offset Strategy	Refer Section 9
General	Comments/Concerns not associated with Environmental Factor		PER Documentation	Refer Section 10
			The Proposal	
			Transport Route	
			Commercial Impacts	
			Environmental Management Systems	

2 ENVIRONMENTAL FACTOR: FLORA AND VEGETATION

2.1 OVERVIEW

Comments received from the public review focus on the following areas:

- Clearing of Native Vegetation within the Whicher Scarp Soil Landscape System;
- Impacts on Priority 1 Ecological Community WHSFCT C1;
- Impacts on Conservation Significant Flora;
- Management of Dieback;
- Management of Weeds;
- Indirect Effects of Mining Operations; and
- Likelihood of Rehabilitation Success.

Commentary on the above areas is provided below. Individual responses to each comment received from the public review relating to Flora and Vegetation are provided in Section 2.11.

2.2 REVIEW OF DATA PRESENTED IN PUBLIC ENVIRONMENTAL REVIEW

The proposal seeks to clear a total of 8.90ha of State Forest No. 33, resulting in the clearing of 8.68ha of native vegetation and 0.22ha of previously cleared sandpit. The area proposed to be cleared is located within the Whicher Scarp soil landscape system.

Priority 1 Ecological Community WHSFCT C1 is found within the Development Envelope. 8.22ha of PEC WHSFCT C1 is located within the area proposed to be cleared. Also located within the area proposed to be cleared are 6 individual plants of *Daviesia elongata* subsp. *elongata*, a threatened flora species. 16 plants of priority flora species *Conospermum paniculatum* (P3) and 2 plants of priority flora species *Acacia semitrullata* (P4) will also be cleared as a result of this proposal.

Doral propose to progressively backfill areas mined within the State Forest sub-area, minimising the duration of changes to hydrological regimes and enabling rehabilitation works to commence as soon as is practicable after backfilling operations have been completed.

Doral acknowledge that:

- Clearing of 8.68ha of native vegetation within the Whicher Scarp Soil Landscape System; and
- Clearing of 8.22ha (within the 8.68ha) of PEC WHSFCT C1;

will result in a significant residual impact on the environment, for which environmental offsets are proposed. Further discussion on the proposed environmental offsets is provided in Section 9.

2.3 SUPPLEMENTARY INFORMATION NOT INCLUDED IN THE PER DOCUMENT

To assist in addressing the submissions received during the public review, Doral engaged environmental consultants/botanists EcoEdge to prepare the following reports:

- Groundwater Dependent Ecosystem Review and Impact Assessment for the Proposed Yoongarillup Mineral Sands Project (Appendix 1-A);
- Preliminary Technical Note: Groundwater and Plant Health Monitoring at the Proposed Yoongarillup Mineral Sands Project (Appendix 1-B).

2.4 DISCUSSION / COMMENTARY: CLEARING OF NATIVE VEGETATION WITHIN THE WHICHER SCARP SOIL LANDSCAPE SYSTEM

The PER recognises that the combined remaining naturally vegetated areas of the Whicher Scarp, when considered together, meet the EPA's six criteria for regionally significant areas. The Whicher Scarp forest ecosystem is regarded internationally as an area of very high conservation significance, particularly for flora, that is one of 34 globally recognised biodiversity hotspots (Environmental Protection Authority (EPA), 2009). Only 42% of the pre-European extent remains, of which just 4.3% (1.8% of the pre-European extent) is protected within formal reserves (Conservation Commission of Western Australia (CCWA), 2013).

The clearing of 0.09% (8.68 of 9,200ha) of native vegetation as part of this proposal will not result in a significant change to the pre-European extent. Calculating the percentage of remaining native vegetation within the Whicher Scarp soil landscape system after the clearing of 8.68ha still maintains a value of 42% of the pre-European extent.

DPaW have stated in their submission that only 1.9% of the Whicher Scarp soil landscape system (9,960ha) is currently included in formal reserves, with a further 10.5% proposed under the 2014-2023 Forest Management Plan.

In their public submission, the Wildflower Society of WA states that the acceptance of this proposal by the EPA would not be consistent with EP Bulletin No.6 – The Natural Values of the Whicher Scarp. Doral acknowledges the EP Bulletin No.6 outlines the environmental significance of the Whicher Scarp soil landscape system. The bulletin further goes on to discuss how proposals located within the Whicher Scarp are to be assessed. The bulletin states:

The EPA will... "continue to consider proposed developments for this area on an individual basis, however, the EPA recognises the significance of the natural values of the Whicher Scarp across a range of biodiversity characteristics at the genetic, species and community levels, and the small overall extent of the Whicher Scarp environments. Where the EPA considers a proposal is likely to pose significant risk to the outstanding natural values of the Whicher Scarp, it will be formally assessed.."

In setting the level of assessment as requiring a Public Environmental Review, Doral believe the EPA has acknowledged the potential significant impacts this proposal may have on the Whicher Scarp soil landscape system.

The PER states that Doral considers the small size of the area proposed to be cleared does not significantly impact the overall extent of the Whicher Scarp soil landscape system. Doral does, however, recognise that there is a high degree of biodiversity found within the Whicher Scarp soil landscape system. As such, Doral considers the clearing of native vegetation within the Whicher Scarp soil landscape system will result in a significant residual impact on the environment, for which environmental offsets have been proposed to address this residual impact.

2.4.1 The broader (regional) scale ecological significance of the vegetation affected by the Proposal, or the cumulative impacts of the proposal on Whicher Scarp vegetation

The Whicher Scarp forest ecosystem is regarded internationally as an area of very high conservation significance, particularly for flora, that is one of 34 globally recognised biodiversity hotspots (Environmental Protection Authority (EPA), 2009). Only 42% of the pre-European extent remains, of which just 4.3% (1.8% of the pre-European extent) is protected within formal reserves (Conservation Commission of Western Australia (CCWA), 2013).

A floristic study of the Whicher Scarp forest ecosystem (Keighery et al., 2008) identified eight floristic groups, and at a lower level, 20 floristic community types (FCTs), of which seven have been categorised as level 1 priority ecological communities (PECs) and one, the Busselton Ironstones, comprises a threatened ecological community (TEC).

One of these PECs; Whicher Scarp Floristic Community Type (WHSFCT) C1, otherwise known as the Central Whicher Scarp Jarrah Woodland, occurs within and adjacent to the Yoongarillup Mineral Sands Project Area. WHSFCT C1 is a component of the Whicher Scarp woodlands of coloured sands and laterites Floristic Group C, identified by Keighery et al. (2008). Of the six floristic community types comprising this floristic group (FCTs C1 – C6), WHSFCT C1 was one of three relatively restricted floristic community types that were considered in need of particular attention in consideration of the natural values of Whicher Scarp vegetation.

Eleven floristic quadrats were installed in WHSFCT C1 in the Whicher Scarp Survey (Keighery et al., 2008). Of these, the majority (8) were situated on various soil phases of the Whicher Scarp soil-landscape system (Tille and Lantzke, 1990). Of the remaining three quadrats, one each was situated on the Goodwood Valleys, Treeton Hills and Abba soil-landscape systems. Within the Project Area, WHSFCT C1 occurs on the Yelverton flats phase (214WsYL1) of the Whicher Scarp system.

Within the Project Area, vegetation types and surface soils form a catena extending from the northern boundary at 50 m ASL upslope to the northern boundary at approximately 75 m ASL. This is most clearly seen in the pattern of surface soils distribution (EcoEdge, 2014). The southern limit of the occurrence of vegetation unit A (EcoEdge, 2014), which is equivalent to WHSFCT C1, is demarcated in places by a low slope of exposed laterite and gravel, above which gravels and grey sandy loams occur rather than the yellow-brown sandy loams which underlie most of the WHSFCT C1 vegetation. The southern limit of the proposed mining pit coincides quite closely with the southern limit of the yellow-brown (“orange”) sandy loams (and of WHSFCT C1).

The occurrence of WHSFCT C1 within the Project Area contains the largest known area of this community situated on deep (more than 1.5 m) yellow-brown (“orange”) sandy loam or sand (R. Smith, pers. observ.). A number of the other known occurrences are situated on shallower grey-brown loamy sands.

As mentioned above, a large proportion of the Whicher Scarp forest ecosystem has been cleared, primarily for agriculture, but also for mining, basic raw materials extraction and the establishment of pine plantations (Keighery et al., 2008; DEC, 2010). Consequently, the original catena or sequence of soil and associated vegetation that originally extended from the alluvial soils of the Swan Coastal Plain to the lateritic soils of the Blackwood Plateau has disappeared along much of the Whicher Scarp, and it survives more-or-less intact in only a few places.

Vegetation types such as WHSFCT C1, which are now restricted, partly perhaps because their preferred habitat was originally of small extent but also because of past clearing activities, are an integral part of that catena.

The mining proposal for the Yoongarillup Project Area would lead to a reduction of the total known area of WHSFCT C1 from 66.1 ha to 58.1 ha, or by 12.1% (see Section 2.5 for more information). Currently, the known area of WHSFCT C1 comprises approximately 0.67% of the remaining area of the Whicher Scarp forest ecosystem, which would be reduced to 0.59% under the current mining proposal. There are limitations on the analysis of the total area of reduction in the proportion of WHSFCT C1 of the total Whicher Scarp forest ecosystem due to the fact that the ecosystem floristic community types (FCTs) have only been partially mapped and there are probably several that have not been defined because of the patchy distribution of the original Whicher Scarp survey quadrats.

It is the belief of Doral that, put into a regional context, the extent of clearing proposed by Doral does not significantly impact the Whicher Scarp Soil Landscape System, however, within a local context, some significant residual impacts will occur as a result of the proposal, for which environmental offsets are proposed.

2.5 DISCUSSION / COMMENTARY: IMPACTS ON PRIORITY 1 ECOLOGICAL COMMUNITY - WHSFCT C1

The Department of Parks and Wildlife is of the view that, based on available survey information, the PER understates the proportion of impact on the Whicher Scarp Floristic Community Type (FCT) C1, a Priority 1 PEC. That the PER provides an estimate of the regional extent of FCT C1 without verifiable information based on on-ground soil or vegetation survey data. DPaW provide a recommendation that the significance of the impact on the Priority 1 Priority Ecological Community (PEC) Whicher Scarp Floristic Community Type (WHSFCT) C1, also known as the Central Whicher Scarp Jarrah Woodland PEC, be considered in this assessment. Similar responses were received from the Busselton Dunsborough Environment Centre and the Wildflower Society of WA.

Doral has been advised by environmental consultants EcoEdge that a total of 17.1 ha of WHSFCT C1 has been identified within and adjacent to the Project Area, of which 16.4 ha is within the Project Area, including the area mapped by EcoEdge (2014) and a small amount (0.7 ha) within the road reserves on the northern and western boundaries not covered by that survey. Approximately 8 ha of WHSFCT C1 lies within the proposed pit area and would be cleared as part of the mining proposal. Therefore according to the current mining proposal, just under half (49 %) of WHSFCT C1 within the Project Area would be cleared.

The mining proposal for the Yoongarillup Project Area would lead to a reduction of the total known area of WHSFCT C1 from 66.1 ha to 58.1 ha, or by 12.1%. Currently, the known area of WHSFCT C1 comprises approximately 0.67% of the remaining area of the Whicher Scarp forest ecosystem, which would be reduced to 0.59% under the current mining proposal. There are limitations on the analysis of the total area of reduction in the proportion of WHSFCT C1 of the total Whicher Scarp forest ecosystem due to the fact that the ecosystem floristic community types (FCTs) have only been partially mapped and there are probably several that have not been defined because of the patchy distribution of the original Whicher Scarp survey quadrats.

DPaW comment that indirect impacts on WHSFCT C1 may occur due to fragmentation and edge effects, with the potential for up to 24% of the currently known extent of WHSFCT C1 to be impacted by the proposal. EcoEdge have advised Doral that 'edge effects' may result from the clearing of the 8.68ha. Doral estimate that a 5.1ha area of FCT C1 located on the western side of the Project area, over 80m west of the area to be cleared and outside the 0.5m groundwater drawdown contour should not be exposed to any edge effects from the proposal. Doral acknowledges that edge-effects may occur in 3.8ha of FCT C1 located outside the clearing area. This would result in an indirect impact on a further 5% of the known mapped FCT C1, resulting in the proposal having the potential to impact on over 17% of the known mapped areas of FCT C1.

This estimate of the known mapped extent of FCT C1, however, is likely to be conservative given that it is possible that more surveys of the Whicher Scarp, particularly on coloured sands, are likely to identify more FCT C1 vegetation (EcoEdge 2015). EcoEdge have identified 28 ha of potential new occurrences of FCT C1. Figure 2-1 provides a locality plan for Figure 2-2 and Figure 2-3. Figure 2-2 and Figure 2-3 provide details on where potential FCT C1 may be identified should further floristic studies be undertaken.



FIGURE 2-1 LOCALITY PLAN FOR POTENTIAL ADDITIONAL AREAS OF PEC FCT C1

To minimise the potential for indirect impacts resulting in a loss of vegetation, Doral propose a groundwater and plant health monitoring program. “Trigger points” for intervention and the deployment of contingency measures should a deterioration in plant health be observed will be incorporated into the Flora and Vegetation Management Plan and the Conservation Significant Flora Management Plan.

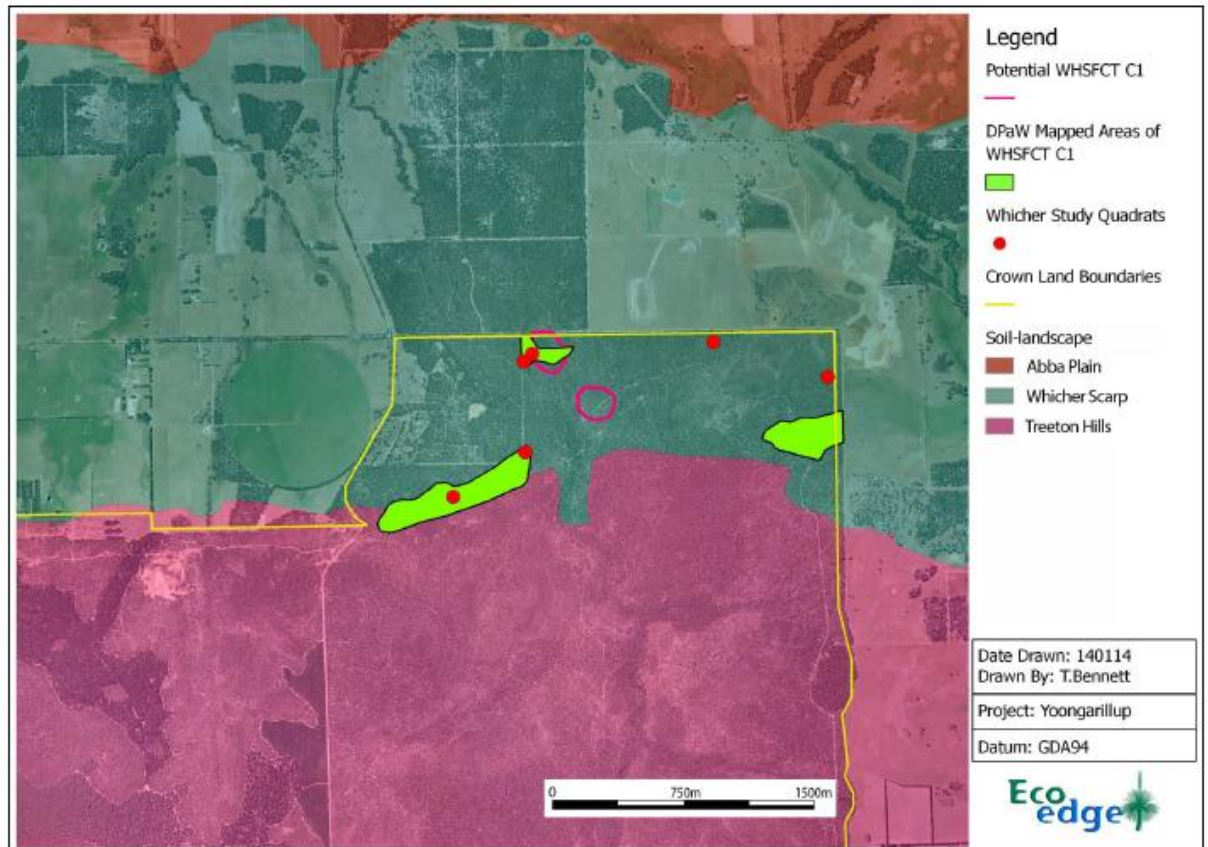


FIGURE 2-2 – TREETON BLOCK AREA SHOWING A POTENTIAL NEW AREA OF WHSFCT C1

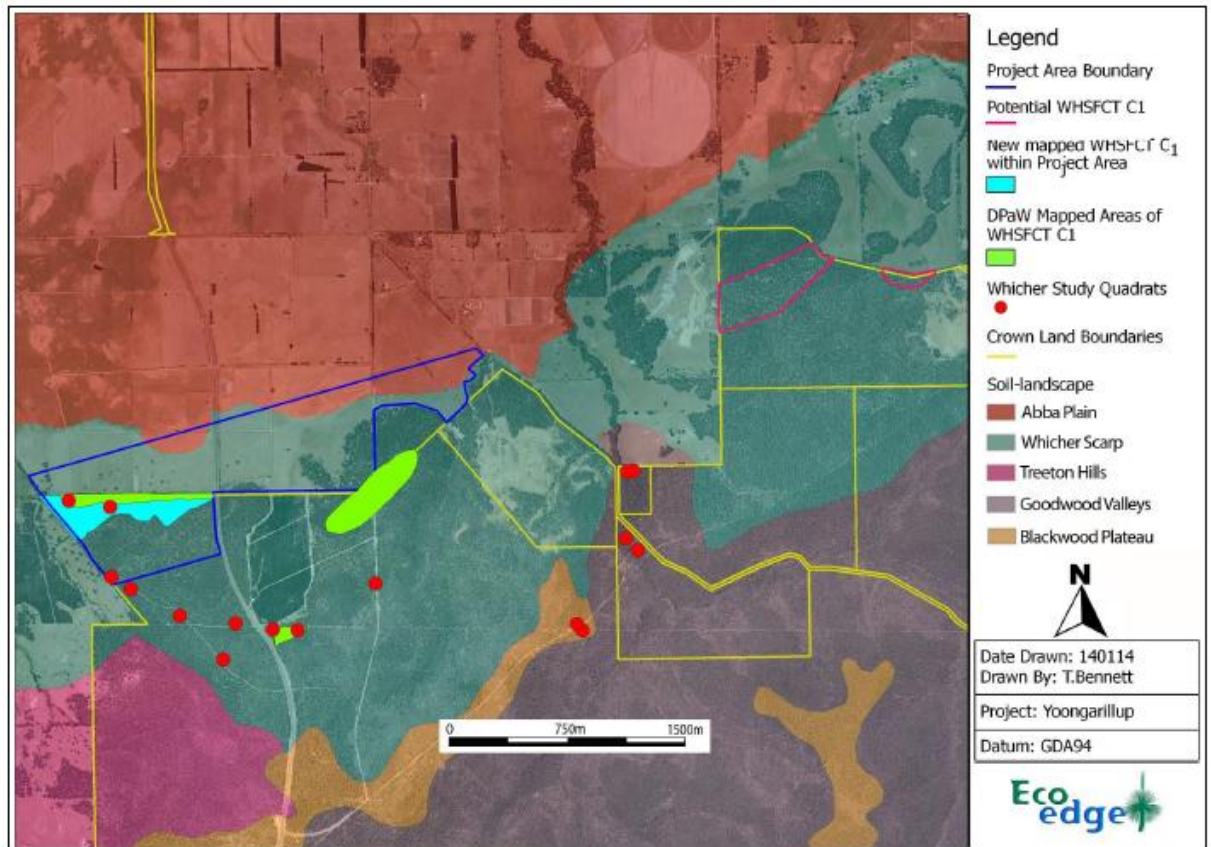


FIGURE 2-3 - POTENTIAL NEW OCCURRENCE OF WHSFCT C1 IN STATE FOREST - EAST OF THE PROJECT AREA

2.5.1 Areas of Contiguous Floristic Communities remaining within the Project Area

Cross sections of the Whicher Scarp illustrating the sequence of soils and associated vegetation are provided on pp. 116-119 of Keighery et al. (2008). Downslope of these Whicher Scarp communities the vegetation merges with that of the Swan Coastal Plain, and upslope they blend into those of the Blackwood Plateau. As noted above, this original sequence from Swan Coastal Plain to Blackwood Plateau only survives in a few places.

The whole Project Area is mapped as the Yelverton flats phase of the Whicher Scarp soil-landscape system, however the surface soils vary in a sequence up the slope as shown in Figure 2-4 and there is a similar, although less pronounced sequence of vegetation units (Figure 2-5). The Pinjarra Plain soil-landscape system of the Swan Coastal Plain lies 250-300 m north of the Project Area, though there is a small area of red-brown loam, and associated vegetation along a shallow gully on the northern boundary that has affinities with vegetation typical of similar soil of the Abba (Pinjarra Plain) soil-landscape system (R. Smith, pers. observ.).

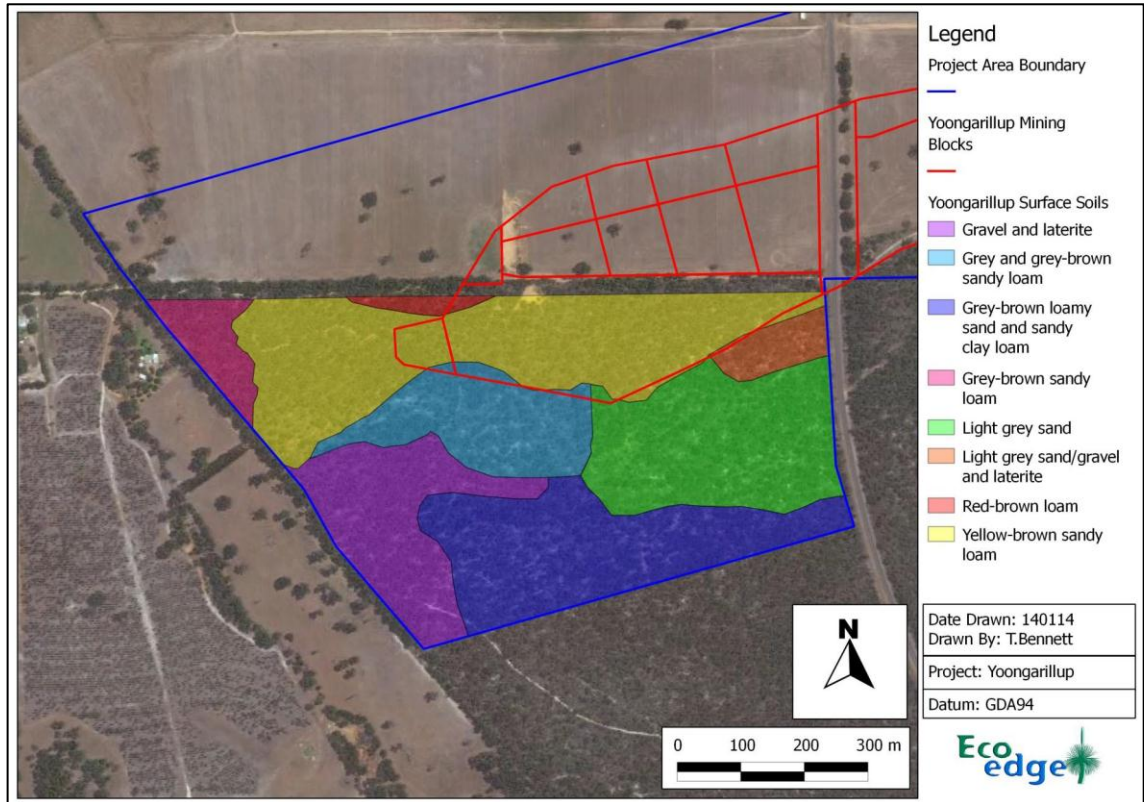


FIGURE 2-4 - SURFACE SOIL UNITS WITHIN THE PROJECT AREA COMPARED WITH THE PROPOSED PIT AREA

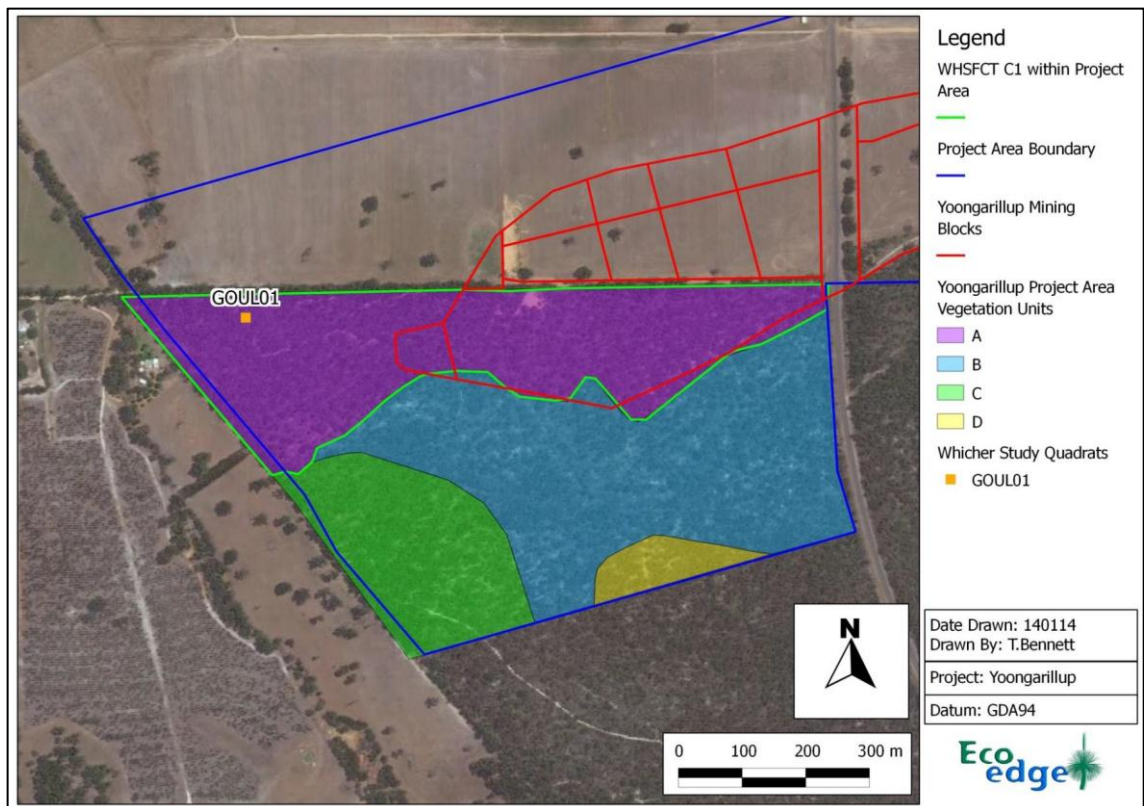


FIGURE 2-5 - VEGETATION UNITS AND THE BOUNDARY OF WHSFCT C1 WITHIN THE PROJECT AREA/PIT AREA

The mining proposed for the Project Area will impact on just over half (53.7%) of the area of WHSFCT C1 (vegetation unit A, EcoEdge 2014a) within the Project Area (Figure 2-4). Almost all of the eastern part of the occurrence would be removed by mining. This would effectively remove part of the sequence of contiguous floristic communities (from vegetation unit A, to unit B to unit D) in this part of the Project Area (Figure 2-4). However, the original vegetation sequence will remain in the western part of the Project Area. In a similar way, the soil sequence would be disrupted by the proposed mining in the eastern part of the Project Area but a similar sequence would be intact in the western part (Figure 2-5).

2.6 DISCUSSION / COMMENT: IMPACTS ON CONSERVATION SIGNIFICANT FLORA

A number of submissions were received stating that significant flora species will be impacted by the proposal. Table 6-21 of the PER outlines the number of plants of conservation significance to be cleared as a result of this proposal. Specifically, 6 individual plants of threatened species *Daviesia elongata* subsp. *elongata* will be cleared as a result of the proposal.

In their submission to the public review of this proposal, the Department of Parks and Wildlife recommend that:

*“the impact on the declared rare flora *Daviesia elongata* subsp. *elongata* be considered as significant and be suitably addressed by the EPA in the assessment of the proposal.”*

Furthermore, they recommended that:

“the proponent undertakes suitable actions to mitigate the impacts on conservation significant flora species affected by the proposal, including flora occurring within genetically or morphologically distinct remote outlier populations, through the development and implementation of a conservation significant flora management plan”

Doral acknowledge that conservation significant flora occur within the Development Envelope. In response to comments provided by the Department of Parks and Wildlife, Doral will commit to the development and implementation of a Conservation Significant Flora Management Plan for the proposal.

2.7 DISCUSSION / COMMENTARY: INDIRECT IMPACTS OF MINING OPERATIONS

A number of responses were received that raised concern about indirect impacts on the native vegetation within the State Forest and the Whicher National Park. Specifically, the impact from groundwater drawdown within the State Forest sub-area and the Whicher National Park on native vegetation, including Priority 1 Ecological Community WHSFCT C1.

Two comments were also received seeking information on the potential impact of the proposal on timber plantations located adjacent to, or near to the mining operation.

In response to the comments received, Doral engaged environmental consultants EcoEdge to conduct a review and impact assessment of modelled water drawdowns on Groundwater Dependent Ecosystems (GDEs) (Appendix 1-A) and other conservation values potentially

adversely affected by the predicted cone of drawdown on groundwater resulting from the implementation of the proposal.

2.7.1 Groundwater Drawdown – Impact on Plant Communities

Vegetation and Flora surveys within the Project Area (Mattiske Consulting, 2012; EcoEdge, 2014) did not identify any areas of wetland vegetation. However, an area of sandy clay loam with dampland species, such as *Banksia littoralis*, *Kunzea rostrata*, *Mirbelia dilatata* and *Taxandria linearifolia* near the southern boundary of the Project Area was identified by EcoEdge (2014). This potential GDE is shown in Figure 2-7, along with the locations of all 'dampland' taxa recorded by Mattiske (2012) and EcoEdge (2014). The potential GDE is mapped with reference to locations of 'dampland' taxa and surface soils. It extends through parts of three vegetation units (B, C and D) as mapped by EcoEdge (2014).

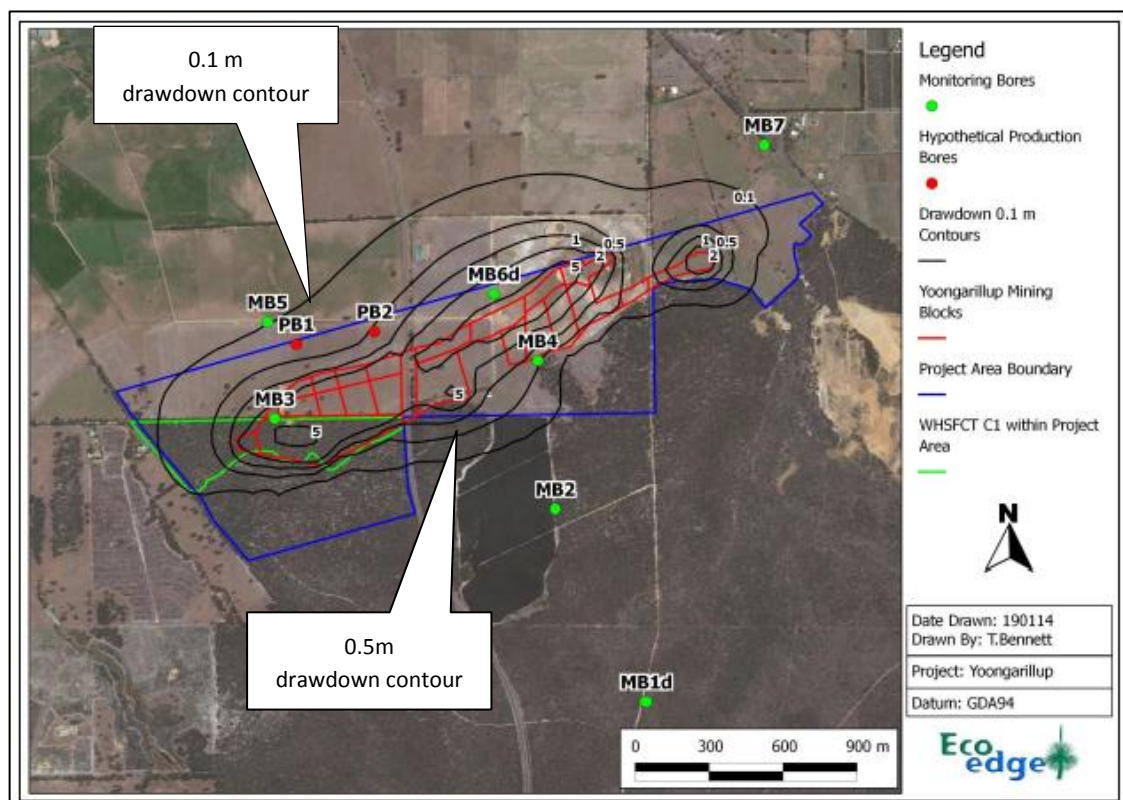


FIGURE 2-6 - POTENTIAL INDUCED DRAWDOWNS AT 0.1 METRE CONTOURS (PARSON BRINCKERHOFF, 2015)

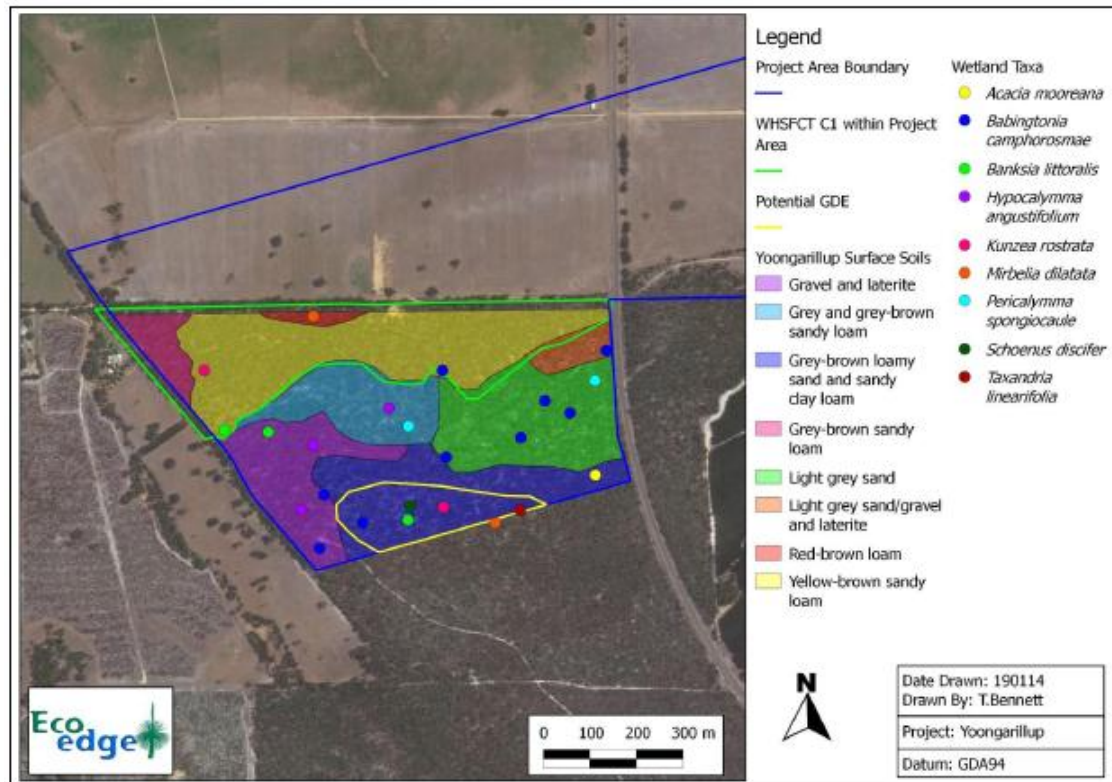


FIGURE 2-7 - LOCATION OF A POTENTIAL GDE AND DAMPLAND SPECIES WITHIN THE YOONGARILLUP PROJECT AREA IN RELATION TO SURFACE SOILS

As can be seen from Figure 2-7, dampland species are scattered over much of the Project Area, however there are few situated within vegetation unit A (which is considered to be equivalent to be the priority plant community WHSFCT C1) as mapped by EcoEdge (2014). This absence of dampland species within vegetation unit A is probably because the surface soils in this community are mainly sands or loamy sands several metres deep.

Several taxa located within the potential GDE near the southern boundary of the Project Area (but generally not located outside of it) are particular evidence of a perched aquifer – these being *Banksia littoralis*, *Schoenus discifer* and *Taxandria linearifolia*.

The potential GDE within the Project Area is more than 200 m from the proposed Mine Pit and over 70 m from the predicted 0.1 m drawdown zone. Therefore there is not likely to be any indirect effect on this community caused by dewatering activity. Although it is not anticipated that the proposal will impact the potential GDE, Doral has committed to the development and implementation of a Groundwater Dependent Ecosystem Management Plan to ensure the potential GDE is protected.

2.7.2 Groundwater Drawdown – Impact on Conservation Significant Flora

Section 6.2.8 of the PER documented the presence of 2 threatened species and 4 regional conservation significant flora species within the Project Area. EcoEdge (2015) state there is no specific information about any of the rare or conservation significant species within the Project Area with regard to their tolerance to groundwater drawdown. None of these species are

known to be dependent on partial, episodic or continual access to groundwater aquifers. No information is available regarding the rooting patterns or maximum depths of the rare or conservation dependent plants in the Project Area, although their maximum rooting depths are likely to be in the range of 0.5 m to 2.0 m. It is likely that the deeper rooted species occasionally access the Superficial Aquifer, but they are unlikely to be dependent on it for their continued survival.

Except for plants within close proximity to the Mine Pit it is unlikely that there will be any long-term effect of groundwater drawdown in the range of 0.1 m to 0.5 m. Plants in close proximity (< 5 – 10 m) to the Mine Pit are at risk of direct and indirect impacts, including possible effects of opening up of the canopy by direct disturbance and increased exposure to wind and sunlight.

For plants not within close proximity to the Mine Pit, there is unlikely to be any long-term effects of a drawdown in the Superficial Aquifer of up to 0.5 m, particularly if the drawdown is temporary (as is likely) and occurs over winter.

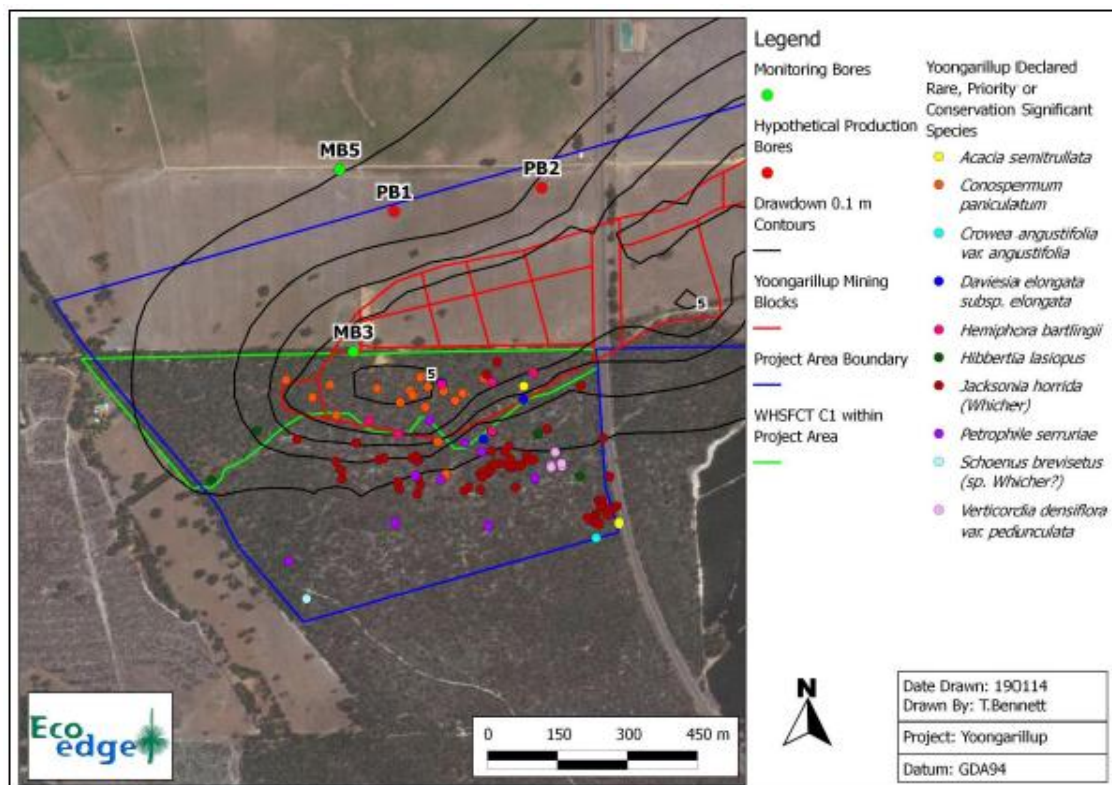


FIGURE 2-8 - LOCATION OF DECLARED RARE, PRIORITY OR CONSERVATION SIGNIFICANT SPECIES IN RELATION TO DRAWDOWN MODELLING AND THE PROPOSED PIT LOCATION

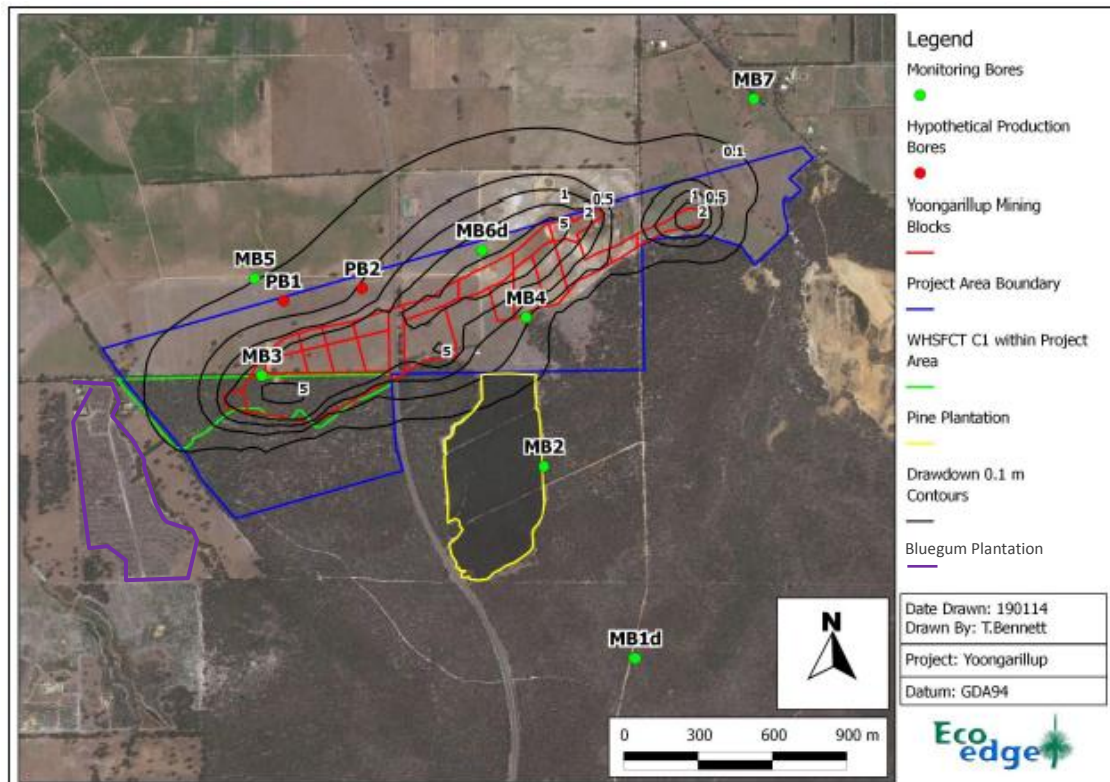


FIGURE 2-9 – LOCATION OF TIMBER PLANTATIONS IN PROXIMITY TO PROJECT AREA

2.7.3 Groundwater Drawdown – Timber Plantations

Two timber plantations are located in proximity to the proposal as shown in Figure 2-9.

2.7.3.1 Pine Plantation (Forest Products Commission)

A small portion of the pine plantation lies within the zone of 0.1 m predicted drawdown. A monitoring bore (MB2) has been sited on the eastern side of the plantation, drilled to 18.05m depth. This bore was constructed to test portions of the Superficial Aquifer, but the slotted casing is located in a low porosity unit (Mowen Member). Nearby historic drilling by Iluka Resources suggests the base of the superficial aquifer is at most 5-10m below surface. This bore typically runs dry over the dry season and it has been recommended that the bore be replaced by a shallower bore closer to the proposed mining area (Doral, 2015).

Pinus pinaster plantations on the Gnangara Mound north of Perth apparently do not utilise groundwater when it appears they have access to it and growth of the species is mostly associated with rainfall trends (Bourke, 2004). *P. radiata* in eastern Australia has been shown to use some groundwater at locations where the watertable was within 6 m of the ground surface and where there were no distinct root-impeding layers (Benyon, et al. 2006).

In summary, sited as it is on moderately deep sand, it is unlikely that the pine plantation at Yoongarillup sources much of its water from groundwater. It is unlikely that a fall in the groundwater table in the region of 0.1 m will have any effect on growth in the plantation.

2.7.3.2 *Bluegum Plantation (Privately Held)*

The bluegum plantation located to the southwest of the proposal is located approximately 100 metres outside the 0.1m drawdown contour. Changes to the hydrological regime within the bluegum plantation are not anticipated.

2.7.4 **Edge Effects**

Doral acknowledge that there is a risk of edge effects impacting native vegetation within State Forest sub-area outside the clearing line. The report, Groundwater and Plant Health Monitoring at the Proposed Yoongarillup Mineral Sands Project (EcoEdge 2015) (Appendix 1-B), states:

“The proposed mining would increase the length of “edge” in State Forest 33 within the Yoongarillup Mineral Sands Project Area from around 570 m to 910 m (i.e. by 62%). The current forest edge has been stable for many years and while there has been some invasion by annual agricultural weeds, vegetation condition was rated as “Excellent” condition (EcoEdge, 2014). Opening up a new edge will cause the vegetation and other biotic assemblages interior to this new edge to be subject to changes in microclimatic conditions. Among the almost immediate changes that could be expected are increased average wind speed, increased insolation and decreased moisture levels in the surface soil. Other changes, including biotic changes would develop over a period of months and years”

It is likely that soil moisture levels will be one of the first abiotic variables to change following clearing of the mine pit area. Increased light levels and wind speed within the area adjacent to the mine pit, as well as groundwater drawdown, are likely to lead to a fall in soil moisture levels. However, the direction and magnitude of changes in soil moisture will depend on the time of clearing of the pit area, the aspect of the vegetation along the pit edge, and the length of time before canopy is re-established within the pit area following the cessation of mining.

The report, Groundwater and Plant Health Monitoring at the Proposed Yoongarillup Mineral Sands (EcoEdge 2015) recommends that plant health measurements using direct and/or indirect methods be carried out on at least six species found within 50m of the proposed mine pit. The report recommends that both relatively deep-rooted and shallow-rooted taxa be observed.

Doral propose to establish a number of monitoring zones within the State Forest sub-area to enable the monitoring and reporting of plant health. Monitoring programs will be developed for each zone in consultation with DPaW. Monitoring programs will be incorporated into the Flora and Vegetation Management Plan, Groundwater Operating Strategy and Groundwater Dependent Ecosystem Management Plan. A risk assessment for each zone will be undertaken to determine the monitoring regime/frequency for each zone and the trigger point criteria required to initiate the implementation of contingency actions.

Monitoring Zone:	Description of Zone Boundaries Map of Proposed Zones provided in Appendix 2
1	Edge Effects – within 50 m of cleared area and areas, including all areas within the 1.0m groundwater drawdown contour
2	Areas between the 0.5m and 0.1m groundwater drawdown contours
3	Boundary of Potential Groundwater Dependent Ecosystem (EcoEdge 2015)
4	Areas outside the 0.1m groundwater drawdown contour, within the State Forest Sub-Area, excluding areas contained within Zone 3.

TABLE 2-1 – PROPOSED PLANT HEALTH MONITORING ZONES (A4 MAP PROVIDED AS APPENDIX 2)

2.8 DISCUSSION / COMMENTARY: DIEBACK MANAGEMENT

Comments received relating to dieback are discussed further in Section 4.2

2.9 DISCUSSION / COMMENTARY: SPREAD OF WEEDS

Doral met on-site with DPaW in November 2014. A concern raised by DPaW at this meeting, and again in their submission to the public review highlighted the need to ensure topsoil is from the State Forest sub-area is managed in such a way as to minimise the risk of weeds infesting the topsoil material. Specific concern was raised with regard to the methodology outlined in Section 3.7.2 of the PER, where Doral had proposed to stockpile topsoil material from the State Forest sub-area in the cleared areas of paddock to the north of Goulden Road.

Doral has reviewed its topsoil management methodology in light of the concerns raised by DPaW and have altered the mining methodology and schedule to allow for the topsoil material within the State Forest sub-area to be stockpiled within the State Forest sub-area. This revised methodology ensures that the topsoil's exposure to paddock weeds is minimised.

Doral has committed to the development and implementation of a Topsoil Management Plan. This plan will be developed in consultation with DPaW.

2.10 SUMMARY OF MANAGEMENT COMMITMENTS

Doral has designed the proposal to avoid and minimise impacts on Flora and Vegetation where possible, however, Doral acknowledge that the proposal will still result in a number of impacts to Flora and Vegetation.

Doral has committed to the development and implementation of a comprehensive Environmental Management System (EMS) for this proposal. Specific management plans and procedures included in the EMS relating to minimising impact on Flora and Vegetation include:

- Flora and Vegetation Management Plan
- Conservation Significant Flora Management Plan
- Topsoil Management Plan

- Revegetation and Rehabilitation Management Plan
- Dieback Hygiene Management Plan
- Weed Hygiene Management Plan
- Groundwater Operating Strategy and Management Plan
- Groundwater Dependent Ecosystem Management Plan
- Surface Water Management Plan
- Dust Management Plan
- Fire Management Plan

The above plans and operating procedures will be developed in consultation with DPaW, DoW and other relevant stakeholders as required.

Through the implementation of the Environmental Management System, Doral believe the EPA's environmental objective for Flora and Vegetation, to maintain representation, diversity, viability and ecological function at the species, population and community level, will be realised.

2.11 PUBLIC REVIEW – RESPONSES RECEIVED – FLORA AND VEGETATION

ID	Received From	Comment	Doral's Response
FLORA and VEGETATION			
Native Vegetation Clearing within the Whicher Scarp soil landscape system			
1.	Department of Parks and Wildlife	The PER does not explain whether a 20 m buffer is required to be cleared of native vegetation around the perimeter of the mine voids for safety purposes, resulting in impacts beyond the 8.9ha of clearing identified in the PER.	Doral has endeavoured to minimise the amount of clearing required within the State Forest sub-area, as such, only a 5m buffer between the edge of the mine pit and the proposed clearing line for the State Forest sub-area is proposed. This buffer provides sufficient space for the installation of an exclusion bund at the top of the mine pit. The proposed clearing of 8.68 ha within the State Forest sub-area includes the 5 metre buffer.
2.	Department of Parks and Wildlife	Impacts on State forest and Whicher Scarp vegetation from the realignment of Sues Road that would be required if the proposal is approved have not been provided with the PER. Given Sues Rd is used for heavy haulage, is relatively steep at this section, and has 110 km/hr speed limit, a considerable area of vegetation clearing may be required to provide for a safe realignment and to maintain roadside drainage.	The concept alignment developed by Doral for the realignment of Sues Road does not propose any additional clearing to State Forest No. 33 above the 8.90ha quoted in the PER. Doral will continue to liaise with Main Roads WA to discuss options to extract mineral from within the road reserve in a way that does not compromise road safety and does not result in any additional clearing to State Forest No. 33.
3.	Wildflower Society of WA	It is not acceptable for the PER to downgrade the values of vegetation in very good to excellent condition as having a lesser value as part of it has been disturbed in some way. The disturbance was most likely the 'rolling' of the over storey and not 'clearing'.	Doral provided comment relating to the previous clearing of native vegetation within State Forest No. 33 to highlight the resilience of native vegetation to re-establish after disturbance. Doral acknowledges that the area of native vegetation proposed to be cleared is in very good to excellent condition.
4.	Busselton Dunsborough Environment Centre	Overall BDEC considers the cumulative effects of allowing this mining proposal to proceed present too high a risk to the recognised values of the Whicher Scarp and therefore further fragmentation of this landscape through damaging mining should not be permitted. It will only be short term gain for a few with long term loss for the ecosystem and ultimately us all.	Refer discussion in Section 2.4.1.

ID	Received From	Comment	Doral's Response
FLORA and VEGETATION			
5.	Busselton Dunsborough Environment Centre	<p>The BDEC has significant concerns regarding this proposal, primarily the intent to mine a section of Whicher state forest.</p> <p>The BDEC is concerned about the impact of the project on the Whicher Scarp, including:</p> <ul style="list-style-type: none"> - impacts on flora and vegetation; - impacts on fauna and fauna habitat; - rehabilitation; - offsets; - application of principles under the EP Act and consistency with EPA policies and guidelines" 	Doral has, where possible, avoided and minimised the amount of clearing within State Forest No. 33, reducing the area proposed to be cleared from 20ha to 8.68ha. Doral commit to developing and implementing a number of management measures, including a comprehensive rehabilitation program, to minimise the residual impacts of the proposal on the State Forest sub-area.
6.	Busselton Dunsborough Environment Centre	The state forest site of this current proposal has been identified in the Draft System 1 Report(74) as being of High Conservation Value. It includes some of the Whicher Forest block and Whicher Reference Area adjacent to the Whicher National Park.	<p>The Forest Management Plan 2013-2024 is the current management plan for the management of State Forests within the South-West of WA and was developed by DPaW and the Conservation Commission of WA. The plan underwent a comprehensive public review coordinated by the EPA. Doral acknowledge that the current Forest Management Plan 2013-2024 does not include the area of State Forest located within tenement M07/0459.</p> <p>Doral was not involved in the decision making process for what areas were/were not included in the areas to be included in the National Park, so is not in a position to comment further on this matter.</p>
7.	Busselton Dunsborough Environment Centre	This area was previously to be included in the National Park but was finally excluded in the 2014-23 Forest Management Plan because of the existing mining lease.	
8.	Department of Parks and Wildlife	The proposal will result in further impacts on the Whicher Scarp forest ecosystem, which has been reduced from its pre-1750 extent by 58% as a result of the cumulative effects of clearing, grazing and other disturbances, including mining. The ecosystem now occupies a remaining extent of 9,960 hectares with only 1.9% of this remaining area currently being included in formal conservation reserves. The Forest Management Plan 2014-2023 proposes that an additional 10.5% be included in formal reserves, subject to agreement by a range of stakeholders.	<p>The proposed clearing of 8.68ha within the State Forest sub-area equates to a reduction in the pre-1750 extent by only 0.09%. This results in a very small change to the pre-1750 extent, with the extent of clearing of native vegetation within the Whicher Scarp staying at 58% of the pre-1750 area (ie. 42 % of pre-1750 extent remains).</p> <p>Upon completion of mining operations, and as soon as is practicable to do so after rehabilitation works have been completed and completion criteria met, Doral will seek to surrender tenements M07/0458 and M07/0459. After the completion of mining operations, Doral would support the inclusion of the northern portions of State Forest No.33 into the Whicher National Park.</p>

ID	Received From	Comment	Doral's Response
FLORA and VEGETATION			
9.	Department of Parks and Wildlife	Recognising the current level of cumulative impacts on the Whicher Scarp forest ecosystem and the EPA's previous interest in this area, it may be appropriate for the EPA's assessment to give further consideration to the appropriate level of formal protection of this ecosystem in reserves, and to a possible Government position on the current formal reserve proposals, as outlined in the Forest Management Plan 2014-2023.	This comment cannot be addressed by the proponent as the statement is directed to the EPA.
10.	Wildflower Society of WA	The PER fails to address the substantive number of recommendations for the inclusion of all the Swan Coastal Plain facing slopes of the Whicher Scarp adjacent to the Whicher National Park. Such recommendations are found in: Keighery et al. (2008); and the report of an inter-departmental expert panel on Conservation of the Whicher Scarp (Hagan et al 2010, located in the Conservation Science Library acc no 070397).	Doral cannot comment on the decision-making process that was implemented to determine the additional parcels of Whicher Scarp to be incorporated into the Whicher National Park. Where it does not adversely affect Doral's mineral tenement holdings, Doral supports the formal protection of additional areas of Whicher Scarp soil landscape system.
11.	Wildflower Society of WA	There are many areas of Whicher Scarp vegetation in need of better protection but none are floristically equivalent to this area. The Whicher Scarp is not currently adequately protected or reserved. All proposals to this date for adequate reservation as National Park have been reduced through the intervention of the Department of Mineral and Petroleum. Approval of this proposal will further diminish the standing of well researched and document recommendations for the protection of the state's irreplaceable natural heritage.	
12.	Busselton Dunsborough Environment Centre	In Point 6.2.2 in the PER document it states there is only 3.4% of Whicher Scarp soil landscape system protected in formal reserves which highlights the vulnerability of this unique system.	

ID	Received From	Comment	Doral's Response
FLORA and VEGETATION			
13.	Wildflower Society of WA	<p>The Wildflower Society of WA considers that the above proposal has a number of unacceptable environmental impacts and should be rejected. Accepting the proposal would be inconsistent with the intent of Environment Protection Bulletin No 6 The natural values of the Whicher Scarp</p> <p>The EPA's own document (EPB No 6) recognizes past incremental loss and the considerable threat posed by the substantive all-encompassing current or pending mineral tenements</p>	<p>EP Bulletin No.6 also states that:</p> <p><i>"The EPA will, as required under the Environmental Protection Act 1986, continue to consider proposed developments for this area on an individual basis"</i></p>
14.	Busselton Dunsborough Environment Centre	<p>Consistency with EPA policies and guidelines is vital: (EP Bulletin No. 6 - The Natural Values of the Whicher Scarp).</p> <p>EPA Position Statement No. 9 - Environmental Offsets (pp14-17) states where adverse impacts to native vegetation are seriously at variance to the principles to protect native vegetation... where:</p> <p>a) it comprises a high level of biological diversity</p> <p>b) comprises the whole or part of a significant habitat for fauna indigenous to Western Australia</p> <p>h) The clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area</p>	<p>EP Bulletin No.6 also states that:</p> <p><i>"The EPA will, as required under the Environmental Protection Act 1986, continue to consider proposed developments for this area on an individual basis"</i></p> <p>EPA Position Statement No. 9 has now been superseded by WA Environmental Offsets Policy and Guidelines and Environmental Protection Bulletin No. 1. These documents state that environmental offsets are actions that provide environmental benefits which counterbalance the significant residual environmental impacts or risks of a proposal. These documents outline a mitigation hierarchy of Avoid, Minimise, Rehabilitate, and Offset. Doral has employed this mitigation hierarchy in the development of this proposal.</p>
15.	Wildflower Society of WA	<p>If this proposal is approved it allows the removal of around 9ha of an intact portion of the Whicher Scarp (WS) regionally and nationally significant native vegetation located on the further limited area of the WS Swan Coastal Plain facing slopes;</p>	<p>Discussion on the regional significance of the area proposed to be cleared is provided in Section 2.4.1.</p>
16.	Wildflower Society of WA	<p>The PER fails to consider that the Whicher Scarp forest ecosystem is under such substantive threat from current or pending mineral tenements and it should be recognised as a Vulnerable Forest Ecosystem after the Commonwealth of Australia (1997-Nationally Agreed Criteria for the Establishment of a CAR Reserve System for Forests in Australia). All areas of Vulnerable Forest Ecosystems are recommended for protection.</p>	<p>The PER acknowledges EP Bulletin No. 6 – The Natural Values of the Whicher Scarp. EP Bulletin No. 6 states the remaining area of native vegetation within the Whicher Scarp soil landscape system meet the six criteria for regionally significant natural areas, however, it does not reference the Whicher Scarp soil landscape as a vulnerable forest ecosystem.</p>

ID	Received From	Comment	Doral's Response
FLORA and VEGETATION			
17.	Individual Submission	The clearing of native vegetation in the part of the proposal that extends into State Forest on the Whicher Escarpment should not be permitted as the area is too important environmentally.	Doral has, where possible, avoided and minimised the amount of clearing within State Forest No. 33, reducing the area proposed to be cleared from 20ha to 8.68ha. Doral commit to developing and implementing a number of management measures, including a comprehensive rehabilitation program, to minimise the residual impacts of the proposal on the State Forest sub-area.
18.	Individual Submission	The submitter contends that the importance of the forest cannot be over emphasised as it is vibrant and healthy and teeming with endangered fauna and flora.	
19.	Individual Submission	The submitter contends that the proposal would impact on the fauna and flora values.	
20.	Wildflower Society of WA	The PER should have addressed the total area of Whicher Scarp Swan Coastal Plain facing slopes and what proportion of this area was being impacted.	Doral does not have access to mapping data for the total area of Whicher Scarp / Swan Coastal Plain facing slopes, however, a preliminary assessment as to the proportion of these slopes that the Yoongarillup proposal represents approximately 600 m of 45 km of remaining length of Whicher Scarp/Swan Coast Plain facing slopes, equating to approximately 1 % of the slopes of the Whicher Scarp that face the Swan Coastal Plain.
21.	Individual Submission	It is the submitters view that it would be criminal to push over 20 hectares of State Forest containing rare and endangered flora and fauna. The submitter contends that that the project should not proceed and the 20 hectares proposed to be mined should be included in the Whicher Scarp National Park for future generations to enjoy	The PER states that Doral has reduced its original proposal to clear 20ha of native vegetation with State Forest No. 33 down to an area of 8.90ha, of which 0.22ha has been previously cleared. Prior to clearing, Doral will obtain all regulatory approvals necessary to facilitate clearing under the laws and regulations of the State of WA and the Commonwealth of Australia.
Impacts on Priority 1 Ecological Community WHSFCT C1			
22.	Wildflower Society of WA	The project should be modified and the approximately 9ha of the FCT C1 and the remaining area of the State Forest sub area be recommended for inclusion in the Whicher National Park	Doral is not in a position to alter the proposal to avoid the 8.68ha of native vegetation. Approximately 1/3 of the mineral resource for this proposal is located within the State Forest sub-area, a large proportion of which (8.22ha) is located within the area that contains FCT C1. A 5ha block of FCT C1, located in the north-west corner of State Forest No. 33 will remain undisturbed by the proposal. Upon completion of mining operations, and as soon as is practicable to do so after rehabilitation works have been completed and completion criteria met, Doral will seek to surrender tenements M07/0458 and M07/0459. After the completion of mining operations, Doral would support the inclusion of the northern portions of State Forest No. 33 into the Whicher National Park.

ID	Received From	Comment	Doral's Response
FLORA and VEGETATION			
23.	Busselton Dunsborough Environment Centre	The State Forest sub-area vegetation is rated "very-good" or "excellent" and contains the Priority 1 Ecological Community Central Whicher Scarp Jarrah Woodland, of which 49% will be lost due to clearing.	Doral has acknowledged in Section 6 of the PER that the vegetation proposed to be cleared is in very-good to excellent condition. 49% of the PEC FCT C1 located within the development area will be cleared. Further discussion on the impact of the total known areas of PEC FCT C1 is provided in Section 2.5.
24.	Department of Parks and Wildlife	There will be significant residual impacts on the occurrence, within the State Forest, of Whicher Scarp Floristic Community Type (WHSFCT) C1 Priority 1 Priority Ecological Community (PEC) (also known as the Central Whicher Scarp Jarrah Woodland PEC), which supports a significant number of threatened, priority and conservation significant flora and fauna, as document in the PER.	Doral acknowledge that the clearing of 8.22ha of WHSFCT C1 may result in a significant impact to this PEC. Further discussion on this topic is presented in Section 2.5.
25.	Department of Parks and Wildlife	Recommendation 2: That the significance of the impact on the Priority 1 Priority Ecological Community (PEC) Whicher Scarp Floristic Community Type (WHSFCT) C1, also known as the Central Whicher Scarp Jarrah Woodland PEC, be considered in this assessment.	Doral acknowledge that the clearing of 8.22ha of WHSFCT C1 may result in a significant impact to this PEC. Further discussion on this matter is presented in Section 2.5. Section 9 of this Response to Submissions discusses measures to be implemented to counterbalance the impact on FCT C1 resulting from the proposal.
26.	Wildflower Society of WA	The work done for the PER confirms the substantive values of the approx. 9ha and the adjacent area of the Whicher Scarp but dismisses the impact, as it is so small in area. However it is 11% of the Whicher Scarp FCT C1. Stating that additional areas of this FCT may be mapped should not be of consideration here. This area is not replacement.	
Impacts on Conservation Significant Flora			

ID	Received From	Comment	Doral's Response
FLORA and VEGETATION			
27.	Department of Parks and Wildlife	Recommendation 3: That the significant of the impact of the proposal of the declared rare flora (DRF) <i>Daviesia elongata</i> ssp. <i>elongata</i> be suitably addressed in the assessment of the proposal	Section 2.6 further discusses the impact of the proposal on Conservation Significant Flora. Doral acknowledges DPaW's comments and commits to the development of a Conservation Significant Flora Management Plan as recommended.
28.	Department of Parks and Wildlife	Recommendation 4: That under any environmental approval for the proposal, the proponent undertakes suitable actions to mitigate the impacts on conservation significant flora species affected by the proposal, including flora occurring within genetically or morphologically distinct remote outlier populations, through the development and implementation of a conservation significant flora management plan.	
29.	Busselton Dunsborough Environment Centre	Threatened flora <i>Daviesia elongata</i> subsp. <i>Elongata</i> and threatened/endangered <i>Verticordia densiflora</i> var. <i>pendunculata</i> are present.	This is noted in the PER – Section 6.4.1. Section 2.6 further discusses the impact of the proposal on Conservation Significant Flora.
30.	Busselton Dunsborough Environment Centre	Under threat from this proposal are also Priority species <i>Conospermum paniculatum</i> (P3) and <i>Acacia semitrullata</i> (P54).	
31.	Busselton Dunsborough Environment Centre	Three other regionally significant species were also recorded: <i>Crowea angustifolia</i> var. <i>angustifolia</i> ; <i>Hemiphora bartlingii</i> and <i>Petrophile serruriae</i> .	
32.	Busselton Dunsborough Environment Centre	There is also mention of <i>Hibbertia lasiopus</i> . According to Keighery et al in "The Flora and Vegetation of the Swan Coastal Plain" the <i>Crowea</i> and the <i>Petrophile</i> are both disjunct species in this location.	
33.	Individual Submission	There are endangered native flora in the bush	

ID	Received From	Comment	Doral's Response
FLORA and VEGETATION			
34.	Individual Submission	Clearing proposals will also have a significant impact on Declared Rare Flora (Long Leaved Daviesia) and three other vulnerable plant species (Priority 3 listed). Mining is one of a number of threats to Long Leaved Daviesia, including dieback which is easily spread by mining activity. DEC (now DPaW) has stated that all known populations of this rare plant and its habitat are necessary for the species' long term survival.	Refer Response No. 32.
35.	Individual Submission	We would like to know how and why a mining company can destroy this rare vegetation and critical habitat when other proposals cannot (which is a good thing but totally contradictory).	<p>Doral cannot make comment on the approval process for other proposal/developments. Doral has sought approval in accordance with EPA and DMP requirements.</p> <p>Mineral exploration and mining in Western Australia is administered under the Mining Act 1978. It is through the administration of this Act that mineral explorers can gain appropriate approvals for access to mineral resources on crown land including conservation reserves and other environmentally sensitive lands.</p> <p>It is DMP's responsibility to ensure that the orderly development of Western Australia's mineral resources provides the optimum economic and social benefits to the community. This responsibility includes ensuring that measures are taken to protect the natural and built environments and where necessary to rehabilitate ground disturbed by exploration and mining activities. There are provisions within the Act that seek to protect the environment from impacts as associated with these activities.</p> <p>The role of the EPA in the approval process is to decide the balance between environment and development on the basis of a range of advice covering political, environmental, economic, social and cultural issues.</p>
36.	Individual Submission	The submitter contends that the fact that this high value asset vegetation is home to critically threatened flora and fauna including Daviesia elongata and Verticordia densiflora should be the logical trigger for potentially rejecting the proposal.	<p>Under the EPBC Act, Daviesia elongata subsp. elongata is listed as vulnerable, and Verticordia densiflora var. pedunculata is listed as endangered, not critically threatened as stated by the submitter.</p> <p>The conservation significance of flora contained within the State Forest sub-area is discussed in the PER – Section 6.4.1. Section 2.6 of this document further discusses the impact of the proposal on Conservation Significant Flora.</p>
Management of Weeds			
37.	Department of Parks and Wildlife	There is a relatively high probability of rehabilitation areas in this environment being adversely affected by weeds and dieback.	Doral acknowledge that there is a risk of weed ingress into rehabilitation areas. Doral propose to develop and implement a Weed Hygiene Management Plan as part of this proposal. This plan will relate to all stages of the proposal (Construction, Operations and Rehabilitation).

ID	Received From	Comment	Doral's Response
FLORA and VEGETATION			
38.	Department of Parks and Wildlife	Recommendation 5: That the proponent ensures that no new weed taxa are introduced to or spread beyond current extent within the disturbed and adjacent areas of State forest, as a direct or indirect result of implementation of the proposal.	Doral acknowledge that the proposal has the potential to spread weeds beyond current extents. The Weed Hygiene Management Plan will identify and address the risks that the proposal poses to the control of invasive species into the State Forest sub-area.
39.	Individual Submission	For lots 101 and 102, all weeds such as double gees and wild radish to be sprayed at least twice per year to eradicate the same	Doral acknowledge that the proposal has the potential to spread weeds beyond current extents. The Weed Hygiene Management Plan will identify and address the risks that the proposal poses to the control of invasive species into agricultural areas.
Indirect Impacts from Mining Operations			
40.	Department of Water	Details of any proposed monitoring to manage potential risks to the vegetation adjacent to the mine pit is lacking. The commitment to recalibrate the groundwater model is supported but should be complimented by commitments to establish adequate monitoring bores to assess the progression of groundwater drawdown beyond the pit boundary.	Doral acknowledge that additional monitoring bores are required to assess the impact of the proposal on groundwater levels during operations. As such, an additional 11 monitoring bores are proposed to be installed around the southern perimeter of the proposal to improve groundwater level / quality data collection. The actual location of the proposed bores will be undertaken in consultation with DoW, DPaW and Doral geologists.
41.	Department of Water	Drawdown impacts on the State Forest are expected, and are considered to be unacceptable. Contingency plans must be prepared including the provision of infiltration trenches along the western boundary of the State Forest to maintain the water table within the Leederville aquifer	The development of contingency plans for potential adverse effects from dewatering operations as a result of the proposal will be developed in consultation with DoW and DPaW. Infiltration trenches are one option that may be considered. Contingency plans will be incorporated into the Groundwater Operating Strategy to be developed for this proposal, to the requirements of the DoW. The Groundwater Dependent Ecosystem Management Plan will also incorporate details of proposed contingency plans.
42.	Department of Water	Contingency planning needs to include the provision of infiltration trenches along the western boundary of the State Forest adjacent to the mine development area, to be activated when water level monitoring indicates drawdown is beyond seasonal range - not after any deterioration in vegetation health is evident.	

ID	Received From	Comment	Doral's Response
FLORA and VEGETATION			
43.	Department of Parks and Wildlife	<p>The DoW has some concerns with the validity of this assessment and believes there is a high risk of impacts to vegetation beyond the area to be cleared. The concerns identified are:</p> <ul style="list-style-type: none"> - Drawdown of less than 1m will extend into State Forest 33 and have potential to impact the vegetation. The vegetation will likely be accessing groundwater from the Mowen Member sediments above the Vasse Member. Whilst the modelling conducted indicates there will be some drawdown (down-slope drainage) in the overlying Mowen sediments and there is potential for impacts to vegetation as a result. - Assessment of the above potential impacts is not possible based on the information provided in the PER and supporting hydrogeological reports. Information on the current depths to groundwater in areas adjacent to the mine pit (immediately south) is not provided. This is critical information to allow the assessment of the potential risk to groundwater dependent vegetation outside of areas to be cleared. <p>Predicted drawdowns should be presented in addition to current seasonal fluctuations as changes in the water regime that will result during and post mining. This will allow the proponent to assess the risk to vegetation beyond the mine pit boundary.</p>	<p>Doral engaged Parsons Brinckerhoff to review the Groundwater Modelling in light of the comments received from the public review. Further discussion on groundwater modelling is provided in Section 6 of this Response to Submissions.</p> <p>Parsons Brinckerhoff produced additional mapping of the predicted groundwater drawdown contours, details of which are provided in Appendix 4.</p> <p>Doral also engaged EcoEdge to prepare a Groundwater Dependent Ecosystem Report for the proposal. Further discussion on the impact of groundwater drawdown on native vegetation is provided in 2.7.</p> <p>In consideration of information presented in the Groundwater Dependent Ecosystems report, Doral commit to the development and implementation of a Groundwater Dependent Ecosystems Management Plan and a Groundwater Operating Strategy</p>
44.	Wildflower Society of WA	probable hydrological impact on the surrounding state forest and the Whicher National Park	
45.	Department of Parks and Wildlife	Recommendation 6: That the proponent provides management options for maintaining pre-mining hydrological regimes.	Doral acknowledge the potential for groundwater drawdown to impact on vegetation located outside the area to be directly affected by clearing.

ID	Received From	Comment	Doral's Response
FLORA and VEGETATION			
46.	Busselton Dunsborough Environment Centre	Doral acknowledges that the drawdown from the dewatering of mine pits may affect native vegetation in the state forest sub area and the Whicher National Park. Nevertheless they assert the risk to be minor. The BDEC are extremely sceptical that adaptive management measures can be capable of protecting vegetation retrospectively once obvious signs of deterioration are observed.	Management Measures to address any potential impacts from groundwater drawdown include, but are not limited to: <ul style="list-style-type: none"> • Development and implementation of Management Plans (Groundwater Operating Strategy and Groundwater Dependent Ecosystem Management Plan) • Establishment of an additional 11 monitoring bores around the perimeter of the operation • Soil moisture monitoring within the State Forest sub-area • In consultation with DPaW, establishment of "Trigger Points" for which contingency plans (developed in consultation with DPaW and DoW) will be implemented
47.	Wildflower Society of WA	There should also be an adequate buffer area provided so that the native vegetation is not affected by unacceptable hydrological impacts from any adjacent mining.	The potential Groundwater Dependent Ecosystem identified by EcoEdge (2015) is located 200m from the mine pit and 70m from the 0.1m drawdown contour. Doral believe a sufficient buffer exists between the mine pit and the potential GDE.
48.	Forest Products Commission	Lowering the water table may directly impact the productive capacity of the adjacent pine plantations. The current plantation has 16 years of growth remaining until harvest and there is an intention to establish future rotations. Fluctuations in the water table impact productivity, and there have been situations in other parts of FPC estate where the whole plantation has died because of rapid changes in the water table.	A northern section of the pine plantation is located within the 0.1 – 0.5m. Section 2.7.3.1 further discusses the potential impact of groundwater drawdown on the pine plantation. Doral will continue to liaise with the Forest Products Commission with regard to the proposal and its interface with the pine plantation.
49.	Forest Products Commission	The FPC requires an assurance, based on scientifically robust analysis, that the project will not impact State forest plantations	Refer discussion provided in Section 2.7.3.1.
50.	Individual Submission	The submitter is concerned about their bluegum plantation, located adjacent to the proposal. The submitter contends that the health of those trees will be affected by any reduction in the water table, which will result in financial loss.	Doral has assessed the impact of the proposal on the bluegum plantation as low. The bluegum plantation is located approximately 100m outside the predicted 0.1m groundwater drawdown contour. Doral will continue to liaise with the private owner of this plantation to ensure that any concerns relating to the impact of the proposal on the plantation are addressed.

3 ENVIRONMENTAL FACTOR: LANDFORM

3.1 OVERVIEW

The EPA objective for the Environmental Factor – Landform is:

“To maintain the variety, integrity, ecological functions and environmental values of landforms and soils.”

Section 2.1.8 of the PER describes the two soil landscape systems present within the development envelope, being:

- Whicher Scarp System (214Ws);
- Abba System (213Ab).

Doral acknowledge that the proposed mining operations will temporarily alter the landforms within the Development Envelope. Excavation of mine pits, construction of stockpiles and solar evaporative ponds will change the existing topography of the area, however, the duration of the change will be of short duration.

A number of comments were received during the public review that referenced the Whicher Scarp Soil Landscape System. Doral has incorporated these comments into the Flora and Vegetation discussion (Section 2) as, although they reference the Whicher Scarp Soil Landscape system, it is in the context of the loss of native vegetation and the impacts the proposal will have on vegetation within the Whicher Scarp Soil Landscape System, rather than any change of topography within the site.

Doral has committed to returning the topography within the State Forest sub-area to similar levels found pre-mining. Within the cleared agricultural areas, topography will be returned similar to pre-mining levels unless a change in topography is requested by the landholder (ie. construction of a dam, re-contouring the site). Soil profiles will be reconstructed and pre-mining hydrological regimes will be re-established.

Through the delivery of a comprehensive revegetation and rehabilitation program on the reconstructed soil profile, Doral do not anticipate any long term impacts on the landform and as such, believe the EPA objective for this factor can be addressed.

4 ENVIRONMENTAL FACTOR: TERRESTRIAL ENVIRONMENTAL QUALITY

4.1 OVERVIEW

Comments received from the public review focus on the following areas:

- Dieback
- Acid Sulphate Soils
- Radiological Processes

Commentary on the above areas is provided below. Individual responses to comments received from the public review relating to Terrestrial Environmental Quality are provided in Section 4.5.

4.2 DIEBACK

4.2.1 Review of Data Presented in Public Environmental Review

Section 10.3 of the PER documents the presence of *Phytophthora cinnamomi* disease within the Development Envelope, in two locations. The first location, on the western boundary of the State Forest, is outside the proposed clearing line and will not be disturbed as a result of the proposal. The second area is a small area located to the west of Sues Road, within the State Forest sub-area. Other areas within the State Forest sub-area were mapped as uninfested. Areas within the cleared paddocks were mapped as 'uninterpretable' as there are too few indicator species present to enable an accurate assessment.

4.2.2 Supplementary Information

No supplementary information is presented for this factor.

4.2.3 Discussion / Comment – Management of Dieback

Concern was raised by a number of respondents relating to the potential for the proposal to spread dieback into previously uninfested areas of the State Forest sub-area.

Section 10.3 of the PER documents the investigations, impact assessments and management measures specifically related to preventing the spread of dieback as a result of the implementation of this proposal

Doral acknowledge the recommendation provided by DPaW in their submission to the public review and would be in acceptance of this condition should it be incorporated into any approval for this proposal.

DPaW Recommendation 1:

That the following condition be applied to any environmental approval for this proposal to address dieback disease:

- The proponent shall ensure that dieback disease is not spread beyond its current extent as a direct or indirect result of the implementation of the proposal into the protectable areas within the State forest;
- Prior to project implementation, the proponent shall finalise a Dieback Management Plan in consultation with Parks and Wildlife and to the satisfaction of the CEO and make the plan publicly available;
- During the construction and operation of the proposal, the proponent shall implement the Dieback Management Plan.

In both its current mining operations and its exploration activities, Doral is familiar with working in areas where dieback hygiene measures are required to be implemented.

4.2.4 Summary of Management Commitments

Doral has committed to developing and implementing a Dieback Hygiene Management Plan. Doral will consult with DPaW when developing this plan to ensure that their concerns are addressed and incorporated into the plan.

4.3 ACID SULPHATE SOILS

Three respondents (Department of Water, Department of Environmental Regulation and one public submission) made comment relating to the potential for the proposal to interface with acid sulphate soils.

Doral acknowledge that an additional level of information will be required to be provided to the Department of Environmental Regulation when submitted the Works Approval for the proposal and to the Department of Water when submitting the Section 5C – Application to Take Water for proposed pit dewatering activities.

4.3.1 Review of Data Presented in Public Environmental Review

An Acid Sulphate Soil (ASS) assessment was conducted in 2012. Comparison of the field screening results to the DEC (2012b) assessment criteria showed the test results did not exceed the assessment criteria. As such, it was not considered that there was a significant risk of sulphide oxidation hazard at the site. The PER states, however, that although the ASS hazard has a low risk and does not exceed the DEC (2012b) assessment criteria, a groundwater monitoring and contingency plan will be required to be developed and implemented for the proposal.

4.3.2 Supplementary Information

In reviewing the information provided to the public in relation to this factor, Doral identified an error in the PER documentation, specifically being the latest version of the Acid Sulphate Soil Assessment was not included in the PER documentation (Appendix 5C of PER). This inadvertent error resulted in a draft version, Version B (14 Aug 2012) of the document being provided instead of the final version, Version C (31 Aug 2012). Version C of the Acid Sulphate Soil Assessment is provided as Appendix 3.

Additional information provided in Version C of the report included:

- Cross-Sections showing logs of Sampled Data against the location of the mine pit. An example cross section extracted from the report is shown as Figure 4-1 below;
- Drill log and Screen Level Assessment Results (Appendix A of Version C report);
- Additional conclusion statements and recommendations.

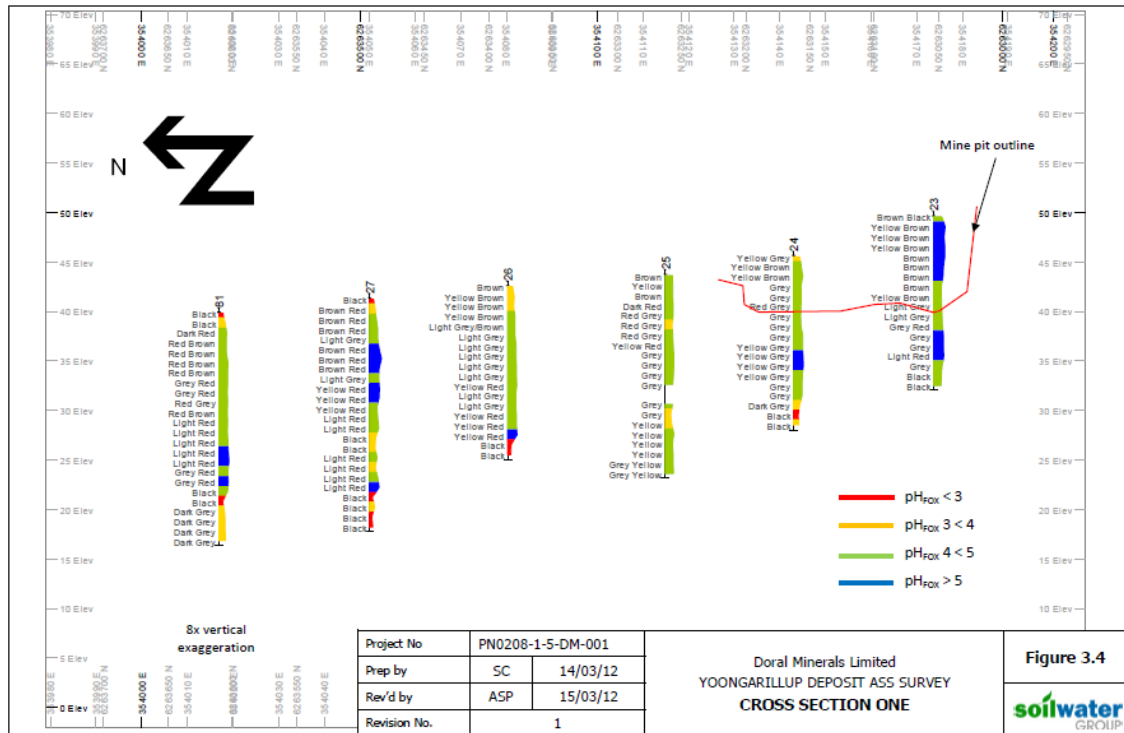


FIGURE 4-1 – CROSS SECTION OF MINE PIT SHOWING SOIL COLOUR CLASSIFICATION AND PH

An A4 version of Figure 4-1 is provided in Appendix 3.

Doral acknowledges that, as a result of the incorrect version of the Acid Sulphate Soil Assessment being included in the PER documentation released for public review, insufficient information was provided to reviewers to undertake a preliminary assessment of the potential for the proposal to impact on Acid Sulphate Soils. Through the provision of the final version of the Acid Sulphate Soil Assessment (Version C), and through the discussion provided below, Doral believe the concerns of respondents can be addressed with respect to the level of detail required to be provided for the Public Environmental Review.

4.3.3 Discussion / Comment –Recommendations from Acid Sulphate Soil Assessment (Final - Version C) Areas of Direct Disturbance (areas to be excavated)

The revised Acid Sulphate Soil Assessment (Version C) includes the following recommendations with respect to areas of direct disturbance (ie. within the excavated areas of the mine pit)

- A review of the drilling data shows that the low pH_{FOX} values (PASS) are found within materials outside of the resource reserve, with the majority occurring to the north of the resource or in a sedimentary layer beneath the resource, and therefore are unlikely to be directly disturbed (i.e. excavated) during mining. The cross sections clearly show the extent of the proposed current pit boundary with the PASS areas well outside the area of direct disturbance.
- The SCR results highlight that the use of soil colour as a management technique for the field identification of PASS is likely to be effective, and it is recommended that the black clay materials below the ore zone within the Yoongarillup deposit be classified as PASS. This information can then be fed into the block model along with the pH_{FOX} data and can then be used to inform both material handling and dewatering management plans.
- Although the risk of direct disturbance of PASS is considered to be low given the position of the identified PASS, management plans for the possibility of disturbance of small, localised areas

should be put in place to mitigate any potential risk. Any PASS material identified during excavation (i.e. dark coloured clay soils, pHFOX < 3.5) should be deposited within a purpose built above ground storage cell and covered with > 5 metres of clay (reddish yellow clay overburden) to ensure oxidation does not occur. At the cessation of mining and dewatering these cells can be placed back within the mine pit below the water table level to ensure reducing conditions are maintained and that no acid generation can occur.

Areas of In-Direct Disturbance (areas affected by dewatering)

The revised Acid Sulphate Soil Assessment (Version C – 31 Aug 2012) states that a detailed hydrological study is needed to predict the effects of mine pit de-watering and the associated drawdown effects this will entail. In 2014, Parsons Brinckerhoff completed the Groundwater Modelling Report for the Yoongarillup proposal, reviewing it in response to submission from the public review in January 2015.

The revised Acid Sulphate Soil Assessment (Version C) recommended the following management measures be implemented:

- Any de-watering plan should seek to minimise the impact on areas that have been identified as containing PASS from the geological block model. With de-watering curves minimised and the use of re-injection bores down gradient of the mine-pit examined.
- Detailed background groundwater monitoring data should be collected for use as references to enable measurement of potential changes in water quality which may occur in response to either direct or indirect PASS disturbance. This background data can also be used in the creation of ‘trigger’ values to identify any impacts on water quality at the earliest possible stage.
- Monitoring bores should be sited to target both areas of known PASS (i.e. targeted screening at the identified depth) and in a wider monitoring role down gradient from the project site. These bores can then be used to monitor both potential changes in groundwater quality and drawdown. Potential mitigation of drawdown within PASS zones can be managed through use of re-injection bores.

Figure 4-2 (below) shows the groundwater drawdown contours (PB-2015) in relation to the identification of PASS material located within 3 m below the depth of the pit floor.

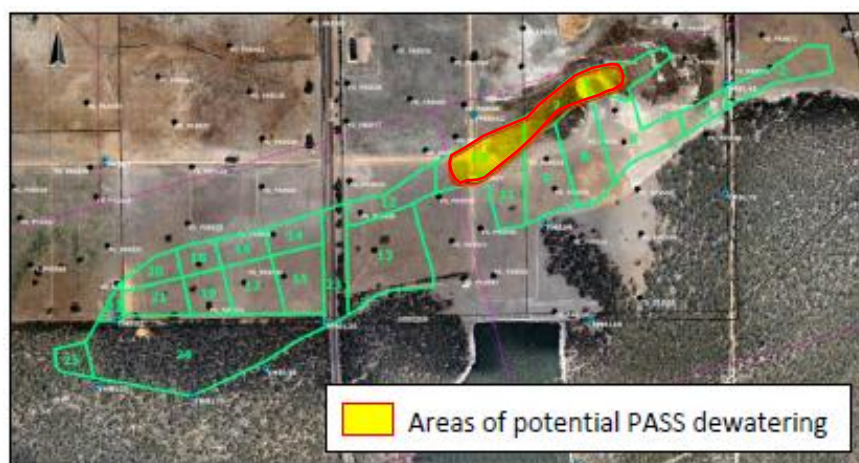


FIGURE 4-2 – PREDICTED GROUNDWATER DRAWDOWN SHOWING AREAS OF PASS WITHIN 3 METRES OF BASE OF PIT FLOOR

4.3.4 Discussion / Comment – Management of Potential Acid Sulphate Soils

The Acid Sulphate Soil Assessment undertaken by Doral identifies that there is a low risk of the proposal interfacing with Acid Sulphate Soils. Potential Acid Sulphate Soils may be indirectly affected as a result of proposed dewatering activities, however, the risk that dewatering activities will oxidise PASS material is also low.

Figure 4-3 below shows a flowchart from the DER publication, Identification and investigation of acid sulphate soils and acidic landscapes. Doral has completed investigations that have identified no Acid Sulphate Soils are present within the Project Area. Potential Acid Sulphate Soils have been identified, and may be indirectly affected by the proposal.

Doral currently operate in areas that experience Acid Sulphate Soils and already implement an Acid Sulphate Soil Management Plan at its Dardanup/Burekup operation. To ensure that the risk of any adverse effects impacting the environment around the Yoongarillup proposal is reduced further, Doral commit to developing an Acid Sulphate Soil Management Plan the Yoongarillup operation, to be submitted to the Department of Environmental Regulation as part of the Works Approval and Licensing process.

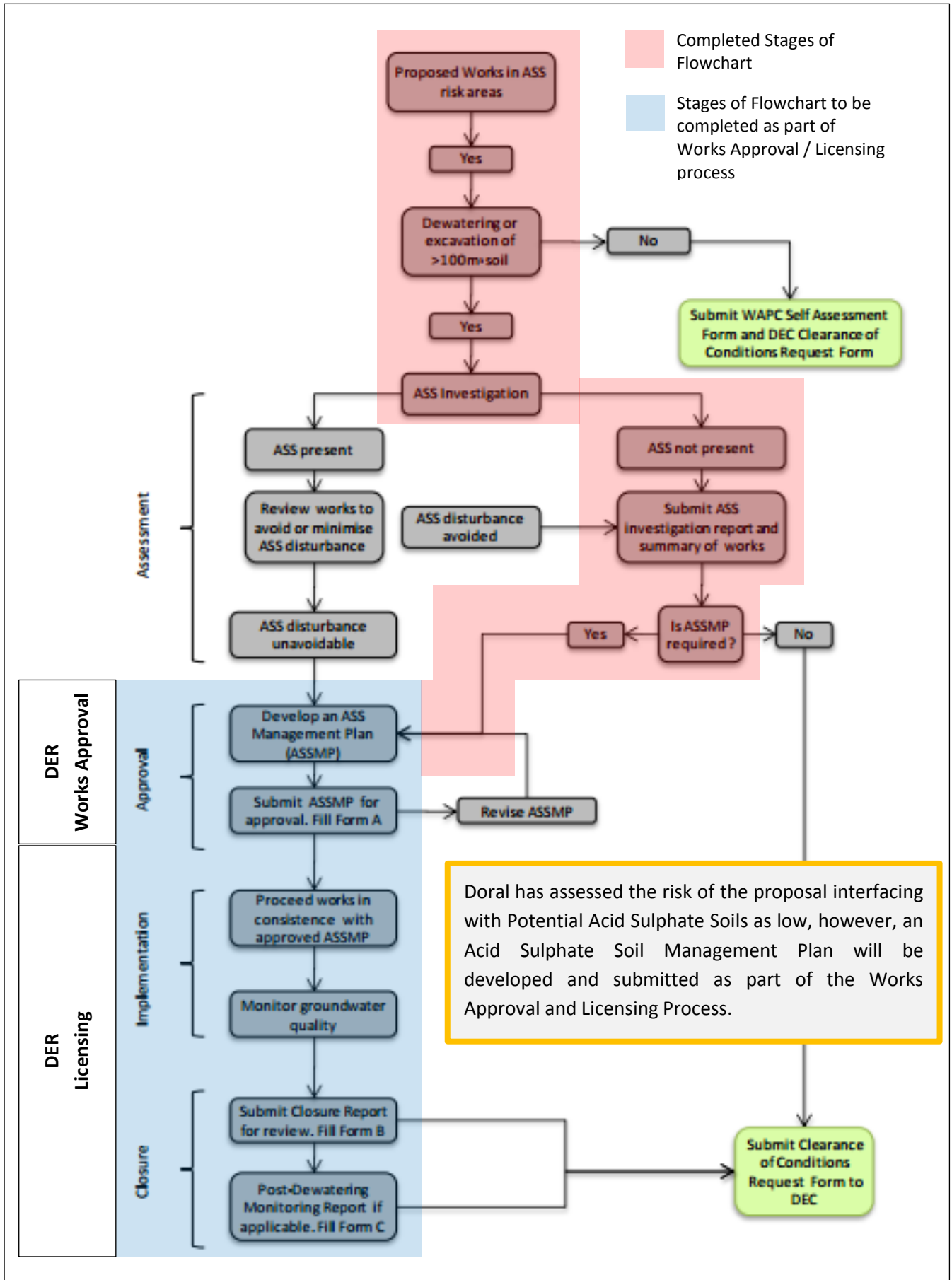


FIGURE 4-3 – DER – ASSESSMENT FLOW CHART FOR PROPOSALS IN ACID SULPHATE SOIL AREAS

4.3.5 Summary of Management Commitments

Doral commit to the development and implementation of an Acid Sulphate Soil Management Plan for this proposal.

4.4 RADIOLOGICAL PROCESSES

The Department of Environment Regulation (DER) was the only respondent that raised concern about the management of radioactive material at the proposed minesite. The DER have stated that the PER may not represent an adequate assessment of the key environmental factors associated with the proposal as the Environmental Scoping Document (ESD) omitted to include radioactive waste disposal as a key environment factor;

The DER has recommended that the OEPA request the proponent to consider the following:

- Item 1 in the DER submission - The revision of the acid sulphate soil assessment (Appendix 5C of the PER) to address concerns related to radioactive waste disposal and the interaction of acid sulphate soils with radioactive materials;
- Item 3 in the DER submission -The revision of the PER to ensure it demonstrates public health and the environment are protected from radiological impacts during commissioning, operation and post-closure:
- That the PER include baseline monitoring of groundwater and surface water quality (including radionuclide and radioactivity levels) (Item 2 - last bullet point and Item 8 in the DER submission)

4.4.1 Review of Data Presented in Public Environmental Review

The PER did not specifically reference the management of radiological processes at the proposed site. Section 4.14 of Appendix 12 – Preliminary Mine Closure Plan did address radiation in the context of mine closure.

The Environmental Scoping Document compiled by the EPA did not outline a requirement for Doral to provide information on radiological processes in the PER.

4.4.2 Supplementary Information

In preparing a response to the submissions received, Doral has referenced the following documents:

- Safety Report No. 68 – International Atomic Energy Agency (IAEA) “Radiation Protection and NORM Residue Management in the Production of Rare Earths from Thorium Containing Minerals” (2011)
- Mines Safety and Inspection Act 1994 - WA State Government
- Mines Safety Inspection Regulations 1995 – WA State Government

4.4.3 Discussion / Comment - Adequacy of Public Environmental Review (PER) documentation

Doral disagrees with the DER comment that the PER may not represent an adequate assessment of the key environmental factors in relation to the disposal of radioactive waste. Doral has addressed all environmental factors, including “Other Matters” identified in the Environmental Scoping Document prepared by the OEPA. The management of radiological materials was not identified as an area required to be addressed through the Public Environmental Review.

Legislation for the protection of workers and the environment at any mine within Western Australia is contained within the Mines Safety and Inspection Regulations 1995 (Part 16 (Part 16)). These regulations are administered by the Department of Mines and Petroleum (DMP). Within Part 16, all mineral sands mining operations are required to submit a Radiation Management Plan, including a Waste Management Plan, to the requirements of the DMP, and approved by the State Mining Engineer.

The Mineral Sands industry has well established methods of operation through a long history of regulation, research and monitoring. As only physical separation processes (gravity and electromagnetic separation) are utilised in extracting the heavy mineral content from the ore, the waste material (which includes a small percentage of monazite), remains a natural product and poses no risk to the environment when returned to the mine void as a backfill material.

The practice of returning waste material from the dry separation process is undertaken in accordance with Mines Safety and Inspection Regulation 16.35(2) where *“Each responsible person at a mine must ensure that, so far as is practicable, radioactive waste is diluted with other material before it is finally disposed of”*.

Section 13.3.5 – Implementation and Operation of the PER document, outlines a number of operating procedures that will be implemented at the proposed minesite. This list includes the provision of a Radiation Monitoring and Management Procedure. Doral currently implement a Radiation Management Plan at its existing Dardanup operation and will be providing a revised and updated version of this document (so as to make it applicable and relevant to the Yoongarillup operations) for inclusion with the mining proposal submission to be made to the DMP.

4.4.4 Discussion / Comment - Acid Sulphate Soil interaction with Radioactive Material

The DER has requested that the acid sulphate soil assessment (Appendix 5C of the PER) be revised to include:

- a) Assessment of radioactive waste disposal within acid sulphate soil sediments;
- b) Leach tests of representative samples at pH 2.9 to simulate pH leaching conditions that would occur if actual acid sulphate soils develop. Leach tests should be undertaken on both the ore and radioactive wastes;
- c) Protocols for identification of potential acid sulphate soils by test pitting sufficiently in advance of the mining footprint to enable potential acid sulphate soils to be identified and appropriate management protocols formulated;
- d) Assessment of impacts of dewatering of potential acid sulphate soil sediments within the cone of depression adjacent to the pit void; and
- e) Previous consultation with DER on acid sulphate soils technical advice did not include the proposal to dispose of radioactive waste derived from off-site processing facilities at the mine site and may not have considered radiological impacts associated with this activity.

In response to e) above, the waste material proposed to be disposed of at the site originates from the minesite itself, not from off-site processing facilities. The HMC is transported from the minesite to the Picton dry processing plant, where the valuable heavy minerals are separated from the waste material (being non-valuable heavy minerals and minor amounts of quartz sand). The waste material (which originated from the minesite) is then returned to the minesite to be placed as backfill in the mine void.

In response to c) and d) above, Section 4.3 of this document covers submissions specifically related to Potential Acid Sulphate Soils and the response from Doral provided in Section 4.3 addresses this item.

In response to a) and b) above, the potential for acid sulphate soils to interact with radioactive material located at the minesite (in-situ undisturbed soils or waste material returned to the mine voids) is extremely low. Part 9.1.1.1 – Page 120 of Safety Report No. 68 – International Atomic Energy Agency (IAEA) “Radiation Protection and NORM Residue Management in the Production of Rare Earths from Thorium Containing Minerals” (2011) states that the minimum temperature required for monazite to react with concentrated sulphuric acid is 200°C. Conditions required for leaching of radionuclides from monazite are extreme and will not be present within the proposal. For the reasons described above, Doral do not believe additional testing and assessment work, as requested by the DER, is required for this proposal.

4.4.5 Discussion / Comment - Protection of Public Health and the Environment from Radiological Impacts

The DER has requested that the PER be amended to address the concerns raised below:

- a) The PER has not assessed radiological impacts from the proposal, for example, from the thorium and uranium content of the waste after blending at the disposal site. This is proposed to have a maximum uranium or thorium content of 140-180 ppm for uranium or thorium (page 4-61 of Appendix 12 of PER), whereas background levels at the minesite in natural soils range from 0.33-2.3 ppm for uranium and 8.7-23 ppm for thorium (page 21 of Appendix 5C of PER). This represents a significant increase above background levels as a result of the proposal.
- b) The transport of radioactive tailings from off-site processing facilities to the mine site should be addressed in the PER.
- c) The radiological characteristics of all waste streams (including sand tailings, clay tailings, off-site processing waste stream/s, oversize etc.) should be defined in the PER. The radiological characteristics of each waste stream must be defined to ensure that the disposal of each waste stream is appropriately assessed and managed.
- d) That the PER include a statement that a restriction on future land and groundwater uses may be placed on the title(s) of land where radioactive waste is disposed or where groundwater has been impacted by the activity of radioactive waste disposal. The restriction is to ensure that future users of these resources are not unacceptably impacted. Restrictions on future land uses are imposed under Contaminated Sites legislation.

In response to a) above, Appendix 12 – Preliminary Mine Closure Plan of the PER, Section 4.14 – Radiation provides an overview of the management of the disposal of radiological material at the proposed minesite. The ESD did not identify radiation as a preliminary key environmental factor for the proposal, and as such, no specific section was included in the PER. Section 1.2.4 of the PER outlines the additional approvals from other State Government agencies required to be obtained by Doral prior to the commencement of the proposal. The Mining Proposal to be prepared by Doral and submitted to the DMP, subject to obtaining approval for the proposal from the EPA, will contain a Radiation Management Plan, including a Waste Management Plan that will be required to meet the requirements of the DMP and approved by the State Mining Engineer.

In response to b) above, no mineral transported by Doral is required to be placarded for radioactive transport. The final tails that are returned to the mine site for the co-disposal with mine tails contain thorium and uranium at concentrations in the order of 4.11 Bq/g, thus not exceeding 10Bq/g and therefore transport of this material is not classified as radioactive for transport as per the Code of Practice for the Safe Transport of Radioactive Materials (ARPANSA 2008).

In response to c) above, Doral will address all the requirements relating to the management of radioactive material in the Radiation Management Plan. This plan will form part of the mining proposal to be submitted to the DMP for review and approval.

In response to d) above, and as discussed in this response, the methods for the responsible return of dry plant tails to the mine void is required to be approved by the State Mining Engineer via the Radiation Management Plan. Dilution and dispersal of naturally occurring minerals is known to not constitute a radiological risk to groundwater contamination. Furthermore, the dilution of the tails for return at depth to its place of origin as a component of land rehabilitation does not result as a contaminated site. Operational controls and post mining monitoring are measures to ensure that post mining impacts of a radiological nature are negligible. Mineral sands have been mined extensively in the southwest of Western Australia since the 1960's.

4.4.6 Summary of Management Commitments

Doral commit to the development of a Radiation Safety Management Plan, including a Waste Management Plan for the proposal.

4.5 PUBLIC REVIEW – RESPONSES RECEIVED – TERRESTRIAL ENVIRONMENTAL QUALITY

ID	Received From	Comment	Doral's Response
Terrestrial Environmental Quality			
General			
51.	Individual Submission	The third paragraph refers to a flocculent but does not specify its constituents. It is unclear if the process involves the use of chemicals. If chemicals are used in the process a mass balance of the chemical(s) should be performed to identify their fate, concentration and potential environmental and/or human health impacts.	<p>The wet processing plant to be established at the minesite separates heavy mineral concentrate (HMC) from the extracted ore utilising a gravity separation process. A chemical product known as a flocculent is used to aid the dewatering of slime material that is removed during the separation process. Doral uses an anionic polyacrylamide for flocculation purposes. Anionic polyacrylamides have no systemic toxicity to organisms or microorganisms as the polymers are too large to be absorbed into tissues and cells.</p> <p>Within Doral's process the anionic polyacrylamide is adsorbed onto the slime material and disposed of in solar evaporation ponds to allow the water to be reclaimed. Once absorbed it is not re-released into the water phase and will remain with the slime material for disposal into the mine void.</p> <p>The flocculent used arrives to the minesite in a powdered form and is delivered by a sealed truck into a closed mixing system minimising the chance of spillage. Solar evaporation ponds are constructed to industry accepted standards. The solar evaporation ponds and pipelines are monitored on a 4 hourly basis while filling and then 6 hourly during drying periods to mitigate the risks of any release to the environment.</p>
52.	Individual Submission	The Project's soak pits will be only about 145 metres from the submitters property and any leaching of chemicals into the groundwater or overflow of the soak pits will affect the quality of their groundwater and soil, both on an immediate and ongoing basis.	<p>Flocculants have been safely used in the mineral sands industry for a long period of time and do not pose a risk to the environment or to the health of the community.</p>

ID	Received From	Comment	Doral's Response
Terrestrial Environmental Quality			
Dieback			
53.	Department of Parks and Wildlife	<p>Recommendation 1: That the following condition be applied to any environmental approval for this proposal to address dieback disease:</p> <ul style="list-style-type: none"> The proponent shall ensure that dieback disease is not spread beyond its current extent as a direct or indirect result of the implementation of the proposal into the protectable areas within the State forest Prior to project implementation, the proponent shall finalise a Dieback Management Plan in consultation with Parks and Wildlife and to the satisfaction of the CEO and make the plan publicly available During the construction and operation of the proposal, the proponent shall implement the Dieback Management Plan. 	Doral acknowledge this recommendation and would be in acceptance of this condition if it was included as a condition of approval for this proposal.
54.	Busselton Dunsborough Environment Centre	There is a strong likelihood that, following the clearing and disturbance necessary for the mine, <i>Phytophthora cinnamomi</i> will be spread into the surrounding uninfested forest. Mapping has already identified 11.5ha already infested with dieback.	Doral acknowledges that the spread of dieback into previously uninfested areas of the State Forest sub-area is a risk for this proposal. Of the 11.5ha mapped, only 5.94 ha are located within the development envelope the area proposed to be cleared. This infected area is located on the eastern end of pit 24.
55.	Individual Submission	The submitter contends that if forest abutting their property was to become affected by dieback, that would have a very detrimental effect on the visual and environmental amenity of the forest and their property.	An area of dieback infestation was mapped adjacent to the boundary of Lot 1869 and State Forest No. 33 as shown in Figure 10-1 of the PER. This area of infestation is located approximately 50 metres from the proposed clearing boundary and will not be disturbed as a direct result of the proposal.
56.	Individual Submission	The submitter contends that no part of the State forest which is unaffected by dieback should be cleared or mined. No matter how rigorously Doral adheres to any proposed machinery, vehicles and equipment wash down and hygiene processes, the submitter contends that there will be an unacceptable risk of the spread of dieback to areas of State forest which are presently unaffected.	Doral is familiar with working in areas containing dieback at its current operation and believe that, through the implementation of a Dieback Hygiene Management Plan, the risks associated with the spread of dieback into previously uninfested areas can be minimised to levels acceptable to the Department of Parks and Wildlife.

ID	Received From	Comment	Doral's Response
Terrestrial Environmental Quality			
57.	Individual Submission	<p>The submitter contends that if mining in areas of State forest which are unaffected by dieback is permitted, then:</p> <ul style="list-style-type: none"> • restrictions on and monitoring of entry by personnel, and compliance with propose hygiene procedures, into all areas of State forest which are unaffected by dieback • monitoring of adherence to proposed machinery, vehicle and equipment wash down procedures; • fencing of areas of State forest which are not be accessed; • no storage of soil or vegetation which comes from unaffected dieback areas on land which is not free of dieback; • full remapping of the State forest within and adjacent to the Project are to determine those parts which are affected and unaffected by dieback prior to the commencement of any activities related to the Project, and remapping at the conclusion of rehabilitation and at a suitable interval after rehabilitation (to determine whether there has been any spread of dieback post mining and rehabilitation) • rigorous monitoring to ensure that there will be no increase in water run-off from dieback affected areas (and no run off from dieback affected soil and vegetation stockpiles) to areas which are unaffected by dieback. 	<p>Doral acknowledge the importance of implementing dieback hygiene protocols during all phases of operation resulting from the proposal.</p> <p>This will be achieved through the development and implementation of a Dieback Hygiene Management Plan. The plan will be developed in consultation with the Department of Parks and Wildlife, to the approval of the Department of Parks and Wildlife.</p>

ID	Received From	Comment	Doral's Response
Terrestrial Environmental Quality			
Acid Sulphate Soils			
In reviewing comments received as a result of the public review, Doral identified that the incorrect version of the acid sulphate soil report was included in the PER released for public comment. The version of the acid sulphate soil report titled "Yoongarillup Deposit ASS Survey" prepared by Soilwater Consultants included in the PER was Version B (14 / 08 / 12). The document that should have been included in the PER was Version C (31 / 08 / 12). Version C includes additional information that addresses a number of the concerns raised in the submissions received. A copy of Version C of the "Yoongarillup Deposit ASS Survey" is provided as Appendix 3.			
58.	Department of Water	The issue for this mine is whether the Leederville aquifer (Mowen) is exposed or dewatered resulting in the oxidation of pyrites. Drill hole data collected during the Acid Sulphate Soil (ASS) definition drilling indicate black carbonaceous and dark grey clays exist in the northern extent of the pit outline. Analysis of these soils produced a pHfox < 3. This indicates that they are Passive Acid Sulphate Soils (PASS) and pyrite is available for oxidation and the generation of acidic groundwater.	<p>The ASS Survey (Version C) states:</p> <p><u>Direct Disturbance</u></p> <p>A review of the drilling data shows that the low pHFOX values (PASS) are found within materials outside of the resource reserve, with the majority occurring to the north of the resource or in a sedimentary layer beneath the resource, and therefore are unlikely to be directly disturbed (i.e. excavated) during mining. The cross sections included in Revision C of the ASS Report (Appendix 3) clearly show the extent of the proposed current pit boundary with the PASS areas well outside the area of direct disturbance.</p> <p><u>Indirect Disturbance</u></p> <p>A detailed hydrological study is needed to predict the effects of mine pit de-watering and the associated drawdown effects this will entail. Detailed management strategies will only be possible once these studies have been completed however a brief overview of potential management with regards to groundwater abstraction and drawdown is given below.</p>
59.	Department of Environment Regulation	Draining of the superficial aquifer may result in oxidation of acid sulfate soils.	<p>A review of the geological model and the ASS data shows that there is an area within mining pits 5, 7 and 10 where PASS is located within 3 metres of the pit floor. These areas are highlighted in the map provided as an attachment to Appendix 3. In these areas, there is a risk that groundwater drawdown may result in the oxidation of in-situ PASS material. As such, Doral has committed to the development and implementation of an Acid Sulphate Soil Management Plan which will provide details of monitoring programs, "trigger-points" and contingency actions/plans to be implemented should monitoring data show evidence of groundwater acidification.</p>

ID	Received From	Comment	Doral's Response
Terrestrial Environmental Quality			
60.	Department of Water	The greatest risk to downstream waterways and wetlands from the proposed development is likely to come from possible acid mine drainage. The PER deals with the risk of oxidation of potential acid forming sediments superficially.	The Groundwater Operating Strategy and Acid Sulphate Soil Management Plan will incorporate a risk assessment of the potential acidification of the Mowen and Superficial aquifers. Monitoring programs, "trigger-points" and contingency plans will be documented in these reports to ensure that that there is no residual impact on these aquifers as a result of mining operations.
61.	Department of Water	The dewatering groundwater model outputs show that the Mowen aquifer will be dewatered to a depth of 2-3 metres below the pit floor. Therefore there is a risk of acidification developing and the possibility of acid mine discharge/drainage at this site. This needs to be assessed as part of their on-going mining (lime treatment) and remediation program.	
62.	Department of Water	It is recommended that a series of in-pit Mowen monitoring bores be established to define the migration or location of any contaminant plume development.	The establishment of in-pit monitoring bores is not practical for the relatively short duration of mining. Doral proposes to supplement the existing monitoring bore (YMB06D) with additional Leederville/Mowen Member monitoring sites. These supplementary monitoring sites may include existing private landholder bores or new monitoring bore installations adjacent to YMB05 and YMB07. Details of the additional bores will be included in the Groundwater Operating Strategy to be submitted to the DoW with the Section 5C application for dewatering the Superficial aquifer.
63.	Department of Environment Regulation	The acid sulphate soil assessment (Assessment 5C of PER) be revised to include: <ul style="list-style-type: none"> - assessment of impacts of dewatering of potential acid sulphate soil sediments within the cone of depression adjacent to the pit void; and protocols for identification of potential acid sulfate soils by test-pitting sufficiently in advance of the mining footprint to enable potential acid sulfate soils to be identified and appropriate management protocols to be formulated;	The revised ASS Survey Report (Version C) states the use of soil colour as a management technique for the field identification of PASS is likely to be effective, and it is recommended that the black clay materials below the ore zone within the Yoongarillup deposit be classified as PASS. Data collected from the ASS Survey including soil classification and pH _{fox} has been incorporated into the geological model to enable areas of PASS within the cone of depression to be mapped. The map provided as an attachment to Appendix 3 shows areas where PASS material has been identified within 3 metres of the pit floor / walls. This mapping will be included in the Acid Sulphate Soil Management Plan developed and implemented for this proposal.

ID	Received From	Comment	Doral's Response
Terrestrial Environmental Quality			
64.	Department of Water	The main groundwater resource condition impacts are the potential oxidation of sulphidic material, associated sulphate plume and the formation of acidic conditions. This is required to be monitored and the rehabilitation progressed to remediate any plume from expanding down hydraulic gradient and impacting on other groundwater users and GDE's. Oxidation of sulphidic sediments through dewatering of the Superficial aquifer is likely, and lime treatment facilities for both solid material and process water must be included to mitigate this risk.	Refer Response No. 63 above
65.	Department of Water	A dewatering licence is required for this project, which must include a comprehensive groundwater monitoring program and groundwater chemistry trigger levels to warn of any oxidation of sulphidic material.	This information will be provided when the Section 5C – Application to Take Water (for dewatering purposes) is submitted to the DoW.
66.	Department of Water	Longer term risks of acid mine discharge to the Vasse Wonnerup system will need to be managed through an appropriate monitoring, mitigation and rehabilitation program and will primarily be the responsibility of agencies other than the DoW.	Doral has committed to the development and implementation of an Acid Sulphate Soil Management Plan and Surface Water Management Plan will be developed to the satisfaction of the Department of Environmental Regulation.
67.	Individual Submission	Acid sulfate soil investigations are insufficient for the scale of the project and documentation presented in Appendix 5C does not allow review due to the absence of bore logs, field tests and laboratory data.	The Acid Sulphate Soil Assessment was undertaken by a suitably qualified consultant. Refer to Appendix 3 for Version C of the Acid Sulphate Soil Report. The revised report contains additional information not contained in Version B of the report.
Radiological Processes			
68.	Department of Environment Regulation	The PER demonstrates that public health and the environment are protected from radiological impacts during commissioning, operation and post-closure	Further discussion on this matter is presented in Section 4.4.5.
69.	Department of Environment Regulation	The transport of radioactive tailings from off-site processing facilities to the mine site should be addressed in the PER.	Further discussion on this matter is presented in Section 4.4.5.

ID	Received From	Comment	Doral's Response
Terrestrial Environmental Quality			
70.	Department of Environment Regulation	The radiological characteristics of all waste streams (including sand tailings, clay tailings, off-site processing waste stream/s, oversize etc.) should be defined in the PER. The radiological characteristics of each waste stream must be defined to ensure that the disposal of each waste stream is appropriately assessed and managed.	Further discussion on this matter is presented in Section 4.4.
71.	Department of Environment Regulation	The PER has not assessed radiological impacts from the proposal, for example, from the thorium and uranium content of the waste after blending at the disposal site.	Further discussion on this matter is presented in Section 4.4.3.
72.	Department of Environment Regulation	The acid sulphate soil assessment (Assessment 5C of PER) be revised to include: <ul style="list-style-type: none"> - assessment of radioactive waste disposal within acid sulphate soil sediments; - leach tests of representative samples at pH 2.9 to simulate pH leaching conditions that would occur if actual acid sulphate soils develop. Leach tests should be undertaken on both the ore and radioactive wastes; - previous consultation with DER on acid sulphate soils technical advice did not include the proposal to dispose of radioactive waste derived from off-site processing facilities at the mine site and may not have considered radiological impacts associated with this activity. 	Further discussion on this matter is presented in Section 4.4.4.
73.	Department of Environment Regulation	That the PER include a statement that a restriction on future land and groundwater uses may be placed on the title(s) of land where radioactive waste is disposed or where groundwater has been impacted by the activity of radioactive waste disposal. The restriction is to ensure that future users of these resources are not unacceptably impacted. Restrictions on future land uses are imposed under Contaminated Sites legislation.	Further discussion on this matter is presented in Section 4.4.5.

5 ENVIRONMENTAL FACTOR: TERRESTRIAL FAUNA

5.1 OVERVIEW

Comments received from the public review focus on the following areas:

- Impact on proposal on local native fauna
- Loss of black cockatoo habitat

Commentary on the above areas is provided below. Individual responses to each comment received from the public review relating to Flora and Vegetation are provided in Section 2.11.

5.2 REVIEW OF DATA PRESENTED IN PUBLIC ENVIRONMENTAL REVIEW

7 conservation significant fauna species were recorded within the Development Envelope.

- Forest Red-tailed Black-Cockatoo
- Carnaby's Black Cockatoo
- Baudin's Black Cockatoo
- Rainbow Bee-eater
- Cattle Egret
- Great Egret
- Western Brush Wallaby
- Quenda
- Coastal Plains Ctenotus

3 species of local significance were recorded within the Development Envelope.

- Speckled Stone Gecko
- Black-backed Hooded Snake
- Forest toadlet

3 rare assemblages were identified within the Development Envelope.

- West Coast Four-toed Lerista / South-western Four-toed Lerista
- West Coast Pale-flecked Morethia / Shrubland Pale-flecked Morethia
- Chain-striped Heath Ctenotus / Odd-striped Ctenotus / Coastal Plains Ctenotus

A review of the potential impacts of the proposal on all fauna identified, excluding black cockatoos, states that it is unlikely that the proposal will significantly impact fauna species given that large areas of habitat of similar or better quality are present outside of the disturbance footprint. Clearing works may result in injury or the death of a few individual animals, however, Doral will ensure that all practical measures are implemented to minimise the risk of this occurring.

For black cockatoos, the loss of 8.68ha of foraging, roosting and potential breeding habitat was determined to result in a significant residual impact, for which environmental offsets are proposed.

5.3 SUPPLEMENTARY INFORMATION NOT INCLUDED IN THE PER DOCUMENT

No additional information to the PER is presented.

5.4 DISCUSSION / COMMENTARY: BLACK COCKATOOS

5.4.1 Breeding Habitat

Doral undertook a further survey of the area proposed to be cleared in late October 2014. The survey found no evidence of any of the trees inspected showing signs of use (current or past) by black cockatoos for nesting. This is consistent with previous observations made during two previous fauna surveys in the area.

With respect to the Yoongarillup Mineral Sands Project Area the probability that any one of the identified trees would in fact ever be used for breeding can be regarded as low. This conclusion is based on the lack of any evidence of use being recorded to date and also given that seven of the ten trees are jarrah, a tree species documented as rarely producing hollows suitable for black cockatoos to use for nesting purposes.

5.4.2 Rehabilitation and return of Black Cockatoo Habitat

Doral has committed to revegetating the area of State Forest proposed to be cleared for this proposal. Revegetation will utilise species of local provenance and will include a focus to include species that provide foraging habitat for black cockatoos. It is anticipated that foraging habitat will become available after 5-10 years.

The PER acknowledges that it will be 50-65 years before habitat values equivalent to those lost will be replaced and approximately 130-200 years before breeding habitat sufficient for use by Black Cockatoos is replaced. Doral has acknowledged that this time-lag will result in a significant residual impact for which environmental offsets have been proposed. Though the provision of environmental offsets, and the rehabilitation of the area to be cleared, Doral believe that there will be a long-term net gain of black cockatoo habitat as a result of this proposal.

5.5 SUMMARY OF MANAGEMENT COMMITMENTS

To minimise and mitigate the impacts the proposal will have on terrestrial fauna, Doral will develop and implement the following:

- Pre-Clearing Fauna Surveys prior to any ground disturbance
- Fauna Management Plan
- Revegetation and Rehabilitation Management Plan
- Dieback Hygiene Management Plan
- Weed Hygiene Management Plan
- Fire Management Plan
- Noise Management Plan

The above plans will be developed in consultation with DPaW.

To control feral and pest animals, Doral will liaise with DPaW to obtain approvals to establish a population control program for the management of pest species (foxes, rabbits, kangaroos) impacting rehabilitation programs within the project area.

Doral will rehabilitate cleared area of State Forest No. 33 to create a stable, free draining, post mining landform, revegetated with self-sustaining native vegetation using local provenance species.

To address the significant residual impact on Black Cockatoo Habitat, Doral will implement an environmental offset package (refer Section 9).

5.6 PUBLIC REVIEW - RESPONSES RECEIVED – TERRESTRIAL FAUNA

ID	Received From	Comment	Doral's Response
Terrestrial Fauna			
General			
74.	Busselton Dunsborough Environment Centre	<p>There is a comprehensive suite of threatened fauna species in the area of State Forest 33 proposed for clearing. They include the:</p> <ul style="list-style-type: none"> - Southern Brown Phascogale - Quenda - Western Brush Wallaby - Rainbow Bee Eater - Black Cockatoos (Baudins, Carnaby's & Red Tailed) - Rare Chain Striped SW Ctenotus - Odd Striped Ctenotus - Coastal Plains Ctenotus <p>Fauna of conservation significance include the:</p> <ul style="list-style-type: none"> - Forest Toadlet - Speckled Stone Gecko - Black backed snake <p>It is also likely Chuditch and Western Ringtail Possums also occur.</p>	<p>Section 7 of the PER provides a comprehensive assessment of the impact of the proposal on Terrestrial Fauna within the Development Envelope.</p> <p>Table 7-4 of the PER documents the potential impacts on fauna of conservation significance. This review has assessed that the loss of 8.68ha of native vegetation may impact on a number of fauna, however, the impact was assessed as not being significant, except for Black Cockatoos, where a significant impact has been predicted.</p> <p>Doral will implement management measures to ensure any impacts from the proposal on native fauna are minimised. These management measures include:</p> <ul style="list-style-type: none"> • Pre-clearing Surveys • Development and Implementation of Management Plans <ul style="list-style-type: none"> - Fauna Management Plan - Rehabilitation Management Plan - Fire Management Plan - Dieback Management Plan - Noise Management Plan
75.	Individual Submission	<p>We can make comment on the occurrence of animals in the area of the proposed mine and adjacent area, including the Southern Carpet python, Black Cockatoos (Carnaby's, Baudins & Forest Red Tailed), Rainbow Bee-eater, Chuditch, Southern Brush Tailed Phascogale, Western Bandicoot, Western Ringtail Possum, Western Grey Kangaroo, Emu.</p>	<p>The significant impact on Black Cockatoo habitat will be addressed through the provision of a rehabilitation program and environmental offsets.</p>
76.	Individual Submission	<p>Clearing proposals in the State Forest will have a significant impact on 8 species of native animals and birds considered to be threatened (vulnerable, endangered, rare or in need of special protection), with an additional 4 Department of Wildlife priority species present or likely to be present.</p>	
77.	Individual Submission	<p>We have red tailed cockatoos in this area (farm)– also in the area are chudditch's, native cats, numbats, and countless other native animals</p>	

ID	Received From	Comment	Doral's Response
Terrestrial Fauna			
78.	Individual Submission	The proponents have not identified the Western Grey Kangaroo as being a species worthy of listing. Also they have not listed the Western Bandicoot or Emu. We question the validity of their report as a result.	Both emus and western grey kangaroos are declared pests of agriculture under the provisions of the Agriculture and Related Resources Protection Act 1976. These species are not considered as fauna of conservation significance and were not considered in the development of the public environmental review document. The fauna survey identified "Southern Brown Bandicoots", also known as "Quenda" within the National Park area however, no observations of "Western Bandicoots" were made during the survey.
79.	Individual Submission	Reductions in fauna habitat should be deemed unacceptable.	Doral has assessed that the clearing of 8.68ha of State Forest No. 33 will only result in a significant impact on Black Cockatoos, for which a rehabilitation program and offset strategy is proposed to counterbalance the impacts identified.
80.	Individual Submission	The submitter contends that the proposal would potentially cause significant impacts on the Environment. Many species of flora and fauna including species on the endangered list are found in the bush that is to be impacted by the mine. This includes the Black Cockatoo's.	
81.	Busselton Dunsborough Environment Centre	"Consistency with EPA policies and guidelines is vital 1) Contiguous habitats on the Whicher Scarp are likely to be important in facilitating seasonal movement of fauna species that require different habitats/plant species for resources during different seasons and it is likely that some of the Whicher Scarp endemic plants have specialised pollinator species restricted to them"	Point 1) references EP Bulletin No. 6 – The Natural Values of the Whicher Scarp. EP Bulletin No.6 also states that: <i>"The EPA will, as required under the Environmental Protection Act 1986, continue to consider proposed developments for this area on an individual basis"</i> The document referenced in point 3), Environmental Protection Bulletin No 8 – South West Ecological Linkages was withdrawn by the EPA on 31 December 2013. The total area of State Forest No. 33 is approximately 49,000ha. This proposal seeks to clear 8.68ha of native vegetation within State Forest No. 33. The maximum distance from the current edge of clearing, adjacent to the paddock, to the extent of clearing for

ID	Received From	Comment	Doral's Response
Terrestrial Fauna			
82.	Busselton Dunsborough Environment Centre	3)"The current extent and condition of native vegetation in this region has resulted in a landscape which is fragmented to such a degree that a substantial loss of native species is already occurring. For many of these species to persist it will be necessary for populations to relocate over time in response to changing climatic conditions. Landscape fragmentation results in barriers which impeded and, for a significant number of species, prevent this migration (EP Bulletin No. 8 - SW Regional Ecological Linkages)	this proposal is 200 metres (at the apex of mining pit 24). A large area of habitat exists south of the edge of the proposed clearing, within State Forest No. 33, as such, it is not anticipated that the proposal will result in the fragmentation of vegetation that will impede the migration of fauna.
83.	Individual Submission	The submitter contends that State Forest no 33 is a biodiversity hotspot, whose vegetation has been rated at very good to excellent condition. The submitter also contends that the fact that this high value asset vegetation is home to critically threatened fauna including Black Cockatoos and the migratory rainbow bee eater, should be the logical trigger for potentially rejecting the proposal.	<p>Section 7.2.3 of the PER states the conservation significance status of fauna recorded in the Development Envelope. Specifically, under the EPBC Act,</p> <ul style="list-style-type: none"> • Baudin's Black Cockatoos are listed as vulnerable • Carnaby's Black Cockatoo is listed as endangered • Forest Red Tail Black Cockatoo is listed as vulnerable • Rainbow Bee-Eater is listed as migratory <p>and not critically threatened as stated in the submission.</p> <p>A review of the potential impacts of the proposal on all fauna identified, excluding black cockatoos, states that it is unlikely that the proposal will significantly impact fauna species given that large areas of habitat of similar or better quality are present outside of the disturbance footprint.</p> <p>Doral has acknowledged that, as a result of the loss of 8.68ha of native vegetation, there will be a significant impact on Black Cockatoo habitat, for which an environmental offset has been proposed, in accordance with the requirements of the document "WA Environmental Offsets Guidelines – August 2014"</p>

ID	Received From	Comment	Doral's Response
Terrestrial Fauna			
Black Cockatoos			
84.	Individual Submission	Our primary concern with flora is the removal of the Cockatoo habitat trees.	Doral has acknowledged the proposal will result in a significant impact on Black Cockatoo habitat and propose to counterbalance this through the provision of an environmental offsets.
85.	Individual Submission	Affected include all three threatened Black Cockatoo species (Baudins, Carnaby's and Forest Red Tail). The Black Cockatoo habitat assessment (referenced in Appendix 7 Seasonal Fauna Survey) identified the presence of substantial areas of preferred foraging and potential breeding habitat for the three species.	
86.	Wildflower Society of WA	Loss of habitat and breeding sites for ALL black cockatoo and other significant fauna	
87.	Busselton Dunsborough Environment Centre	The loss of 110 Black Cockatoo habitat trees of more than 50cm DBH will have a high risk, significant impact on the cockatoos' nesting, foraging and roosting habitat (Point 7.4) however Doral argues this will only be a temporary situation with the site expected to be restored in between 50-65 years. In the light of climate change with reduced rainfall and the increase in the spread of disease this is probably only wishful thinking.	Doral has acknowledged the proposal will result in a significant impact on Black Cockatoo habitat and propose to counterbalance this through the provision of environmental offsets. Further discussion on the impact of the proposal on Black Cockatoos is provided in Section 5.4.
88.	Individual Submission	We are very concerned at the loss of up to 110 (table 7-4) black cockatoo habitat trees in the forested area proposed for clearing. We believe that is too high a price to pay for the benefit gained. As these trees take 85/100 years to attain the size and structure to be suitable for cockatoo habitat & nesting, the effect of mining is not 5 years, but 130. 7.6 dot point 2 Doral claim there will be a net gain in Cockatoo breeding & roosting habitat, yet admit that it takes 130 to 200 years for a nesting tree becomes available. Are they saying the net gain will take 130 plus years? If so that is not a gain but a long term loss. According to 7.6 there are 110 trees DBH>50cm and 10 trees containing large hollows. In Fig 7.2 it shows these trees but labels them as having "not less than one hollow" the total is 120 trees suitable now or in the short term for nesting hollows, and these would all be lost.	

ID	Received From	Comment	Doral's Response
Terrestrial Fauna			
89.	Individual Submission	We are concerned that Black Cockatoo breeding pairs would be disturbed from nesting in the surrounding forest by the vibration, noise & lights of the mining operations. We would like the EPA to reject the proposal as it relates to clearing and mining the forest in 24 & 25 because of the significant effect that will have on the habitat of the 3 black Cockatoo species. Due to their threatened/endangered status, any loss of their habitat and breeding sites will further curtail their recovery.	The Fauna Management Plan to be developed and implemented by Doral will incorporate a section on how lighting is to be managed on the site to minimise impacts on fauna. This includes ensuring lighting is not orientated to directly shine on the State Forest Area. Doral will ensure that lighting on the site meets the requirements of AS 4282 – Control of Obtrusive Effects of Outdoor Lighting.
90.	Individual Submission	Doral claim in 7.6 that there will be a net gain for a number of species as a result of clearing the forestry areas (24, 25). This must be from a baseline cleared state. If the forest was left uncleared, the gain would be continuous without interruption. Doral claim the habitat will return to equivalent values within 50-65 years, that's 50-65 years of a net loss of habitat values.	Doral acknowledge that there will be a timelag between the completion of rehabilitation works and when revegetated areas can provide fauna habitat, however, it is anticipated that fauna habitats will be restored to cover the same area of land that existed prior to mining operations. With the provision of a conservation offset, the amount of habitat secured under formal reserve as a result of the proposal will increase, providing a net conservation gain.
Pest / Nuisance Fauna			
91.	Individual Submission	We have more grazing animals such as emus and kangaroos being squeezed onto our farm because of Iluka's disruption, this will only compound the issue.	High kangaroo and emu populations are a common problem where agriculture and native forest adjoin along the periphery of the Swan Coastal Plain. This is an existing issue which will not be significantly influenced by the proposed mine. Doral will liaise with DPaW and the community to discuss possible options for the control of kangaroo numbers in the vicinity of the minesite.
92.	Individual Submission	With the nesting and foraging habitats of the Black Cockatoos being adversely affected (as stated in Section 2.2) we are concerned that foraging from these birds on our horticultural crops will increase. Currently they can be seen in small flocks (from 8-15 cockatoos at a time) intermittently foraging in our crops. If the range of their foraging habitat is decreased through the mining project it seems logical to conclude that they will visit the surrounding areas including our horticultural crops in larger numbers with more frequency. This would be very detrimental to the health of the crops themselves, and ultimately to the viability of the crop.	Doral propose to clear 8.68ha of native vegetation within State Forest No. 33. The size of State Forest No. 33 is approximately 49,000ha. The area proposed to be cleared as a result of the proposal is 0.02% of the area of State Forest No.33. Doral do not anticipate that the reduction in area of State Forest No. 33 by 0.02% will result in any increase in foraging of Black Cockatoos within horticultural crops.

6 ENVIRONMENTAL FACTOR: HYDROLOGY

6.1 OVERVIEW

Comments received from the public review focus on the following areas:

- Rights in Water Irrigation Act 1914
- Groundwater Modelling
- Water Monitoring
- Other Groundwater Users
- Discharge of Water
- Impact of Groundwater Drawdown on Vegetation

Commentary on the above areas is provided below. Individual responses to each comment received from the public review relating to Hydrology are provided in Section 6.10.

6.2 REVIEW OF DATA PRESENTED IN PUBLIC ENVIRONMENTAL REVIEW

Section 8 of the PER describes how the proposal will interface with the local and regional hydrology. A review of the information presented in the PER has identified an error in the last paragraph of Section 8.2.1. Doral acknowledge that the statement made in the PER is inconsistent with the information presented in the Simple Water Balance for the proposal. Doral proposed to amend the last paragraph of Section 8.2.1 of the PER to read as follows:

“Based on the simple water balance (PB, 2014c) (Appendix 8-D), the net water demand for the proposal can be up to 129ML per month and therefore, even during a wet year, groundwater will be required to supplement the net water demand. During dry years nearly all of the water demand will have to be sourced from groundwater because any rainfall that occurs during these months will be lost to evaporation (PB,2014c).

Doral propose to supplement direct rainfall and pit inflow water sources with groundwater sourced from the Yarragadee aquifer. The simple water balance (PB,2014c) states that a pumping rate of 50L/s is sufficient to meet the unmet water demands for the proposal. This equates to 1.6 GL/year. Doral propose to secure water for the Proposal through the legislative instruments of the RIWI Act. An application for a licence to abstract 1.6GL/year from the Yarragadee aquifer has been submitted to the DoW.

6.3 SUPPLEMENTARY INFORMATION NOT INCLUDED IN THE PER DOCUMENT

The following technical documents were prepared as a response to comments received from the public review:

- Appendix Review/Response to Department of Water comments (Parsons Brinckerhoff – Letter/Technical Note, 2015) (Appendix 4)
- A Review and Impact Assessment of Potential Water Drawdowns on Groundwater Dependent Ecosystems at the Proposed Yoongarillup Mineral Sands Project (EcoEdge 2015) (Appendix 1-A)

6.4 DISCUSSION / COMMENTARY – RIGHTS IN WATER IRRIGATION ACT 1914

An application for a 1.6GL/year allocation from the Yarragadee aquifer has been made to the Department of Water.

A second application will be made to the Department of Water for a Section 5C - Licence to Take Water from the superficial aquifer for the purpose of dewatering mining pits. This application will be submitted upon gaining EPA approval for the proposal and will be accompanied by a Groundwater Operating Strategy. An assessment of the predicted inflows of water from the superficial aquifer has been undertaken by Parsons Brinckerhoff, with the predicted dewatering rates outlined below in Table 6-1. The application will seek to extract 0.22GL/year from the superficial aquifer (being the maximum annual value for the duration of the mining operation), however, it is anticipated that this maximum amount will only be required in the third year of operations, with only 10-15% of this maximum amount being required in the other years of operations.

Year	2015	2016	2017	2018
Dewatering Volume (GL)	0.03	0.02	0.22	0.01

TABLE 6-1 PREDICTED DEWATERING VOLUMES – SUPERFICIAL AQUIFER

The Department of Water has queried the total volume of additional water required to be sourced for the project. Doral has identified that the actual volume to be extracted from the Yarragadee aquifer may vary from year to year during the operation, depending on rainfall received and volume of water sourced from dewatering processes. The volume of rainfall and volume of groundwater sourced from dewatering activities varies during the life of the mine and cannot be relied upon for the provision of water for processing activities. An allocation for the full requirement of 1.6GL/year from the Yarragadee aquifer has been applied for. This is the maximum predicted requirement in a dry year, with low volumes of groundwater flowing into the mining pits and recovered into the process water system.

6.5 DISCUSSION / COMMENTARY – GROUNDWATER MODELLING

Doral acknowledges the concerns raised by both regulators and the public with respect to their confidence in the groundwater model.

The current model has been classified by Doral's hydrogeologists, Parson Brinckerhoff, as a Class 2 model. According to the Australian Groundwater modelling guidelines (Barnet et al, 2012, Table 2-1: Model confidence level classification—characteristics and indicators), a Class 2 model is adequate for the purpose of predicting inflow and drawdown of a proposed mine.

Doral has committed to reviewing and validating the groundwater model after 6 months of operation. At such time, an additional 12-18 months of data will be available to be incorporated into the model, along with data from the proposed 11 additional monitoring bores (refer Section 6.6).

Where the validation varies from the current model, an assessment as to the impacts of the variations identified will be undertaken and if required, changes to the Groundwater Operating Strategy will be undertaken in consultation with the DoW, DER and DPaW.

The Department of Water has raised concern that seasonal variability has not been included in the assessment of groundwater drawdown. Appendix 8 contains charts of the current groundwater monitoring data, showing the seasonal trends at each bore location. In the

development of the Groundwater Operating Strategy, a review of the groundwater drawdown including both the season variation and the predicted mining impacts will be undertaken.

6.6 DISCUSSION / COMMENTARY – WATER MONITORING

Ground and surface water monitoring has been ongoing during 2014 and continues into 2015.

Doral propose to establish an additional 11 monitoring bores to enable additional groundwater level and quality data to be collected. This additional data will assist in monitoring the impact of the mining operations on the underlying aquifers. A map of the proposed locations for the additional bores is provided in Appendix 6.

6.7 DISCUSSION / COMMENTARY – OTHER GROUNDWATER USERS

Groundwater modelling does not predict any impacts to private bores located outside the development envelope. In the event that groundwater supplies are affected as a result of mining operations, Doral has committed to working with landholders to provide them with an alternative water supply.

6.8 DISCUSSION / COMMENTARY – IMPACT OF GROUNDWATER DRAWDOWN ON VEGETATION

A potential groundwater dependent ecosystem (GDE) has been identified on the southern boundary of the development envelope. This potential GDE is located approximately 70m from the 0.1m drawdown contour and just over 200m from the edge of the mine pit. No adverse impacts on this potential GDE have been predicted as a result of the mining operation, however, to ensure that the area of GDE is managed and monitored during the operation, Doral has committed to the development of a Groundwater Dependent Ecosystem Management Plan.

The impacts of predicted groundwater drawdown on vegetation in close proximity to the mining pits are discussed in Section 2.7.

6.9 SUMMARY OF MANAGEMENT COMMITMENTS

Doral has committed to the development and implementation of a comprehensive Environmental Management System (EMS) for this proposal. Specific management plans and procedures included in the EMS relating to minimising impact on Hydrology include the development and implementation of a:

- Groundwater Operating Strategy and Management Plan;
- Groundwater Dependent Ecosystems Management Plan;
- Surface Water Management Plan, incorporating the management of emergency discharges of water from the site; and
- Acid Sulphate Soils Management Plan.

To provide a comprehensive groundwater monitoring network, Doral has committed to the installation and monitoring of an additional 11 monitoring bores within the Superficial and Leederville aquifers. Additionally, monitoring points will be established to enable the monitoring of the Yarragadee aquifer, making use of existing bores where possible.

Should field observations not reflect the hydrological modelling, and private water supplies are disrupted as a result of the proposal (however unlikely), Doral has committed to providing supplementary water supplies to affected landholders.

6.10 PUBLIC REVIEW - RESPONSES RECEIVED – HYDROLOGY

ID	Received From	Comment	Doral's Response
Hydrological Processes			
General			
93.	Department of Water	Section 8.2.1, Water Balance notes that inputs to the process water dam will include dewatering output and collected stormwater, however Chart 3-1: Flow Chart of Mining Operations does not show any water going from the Mine Void or drainage sites to the Process Water Dam and this Chart should be updated.	The revised PER will include an updated Chart 3-1. A copy of the updated Chart is included in Appendix 11-A.
94.	Department of Environment Regulation	That the PER include details of the depth of mining and provide representative to-scale cross sections of the mine footprint to the full depth of excavation. Without depth information, it is not possible to fully assess impacts of the proposal. The PER does not adequately describe the proposal being assessed.	Doral had planned to incorporate the requested cross-sections into the Mining Proposal to be submitted to the DMP. Referring to comments provided by the DMP in the public review of the PER, Doral note that the DMP acknowledge that the level of information covered in the PER focusses on the most significant issues identified through the Environmental Scoping Document, as such, does not detail all the matters that DMP expects to be covered via a Mining Proposal under the Mining Act 1978. Doral has, however, prepared a number of cross section of the proposed operation (included as Appendix 5) to satisfy the comments raised by the DER.
95.	Department of Environment Regulation	Provide design details of any surface water treatment and containment infrastructure, including settling ponds, settling calculations and freeboard storage allowances.	Section 8.2.1 of the PER provides a summary of the capacity of the Process Water Pond. Doral believe the level of information requested in this comment is applicable to the Works Approval process and not the Public Environmental Review process. Doral has initiated discussion with the DER with regard to the Works Approval process and will actively progress the development of the Works Approval after EPA approvals have been obtained for this proposal.

ID	Received From	Comment	Doral's Response
Hydrological Processes			
Rights in Water Irrigation Act 1914			
96.	Department of Water	<p>The PER does not present the full picture of the groundwater licensing requirements of the project under the Rights in Water and Irrigation Act 1914, nor adequately discriminates between groundwater proposed to be drawn from the Superficial aquifer as part of dewatering operations, and groundwater proposed to be drawn from the Yarragadee aquifer. Points to note are:</p> <ul style="list-style-type: none"> - The proposed mine will require a Licence to Take under section 5C of the Act from each of the two groundwater resources; <ol style="list-style-type: none"> 1) for dewatering of the Superficial aquifer 2) for groundwater drawn from the confined Yarragadee aquifer - Doral has submitted and advertised an application under section 5C to draw up to 1.6 GL of groundwater from the Yarragadee aquifer, and have been issued with a 26D Licence to Construct or Alter Well for up to two production wells and an appropriate number of associated monitoring wells drilled in to the Yarragadee aquifer <p>the PER makes no mention of the requirement for a section 5C licence in relation to dewatering of the Superficial aquifer to allow dry mining to proceed. Doral has yet to apply for this licence</p>	<p>The PER acknowledges that the key legislation relating to the abstraction of groundwater for the Proposal is the RIWI Act and that licensing under this act is required to be obtained.</p> <p>Doral acknowledge that a Section 5C – Licence to Take Groundwater will be required to enable the passive dewatering of groundwater from the Superficial aquifer flowing into mining voids. Doral propose to apply for this licence upon obtaining approvals from the EPA for this proposal.</p>

ID	Received From	Comment	Doral's Response										
Hydrological Processes													
97.	Department of Water	There is a lack of clarity regarding the draw from the Superficial aquifer and the Yarragadee aquifer. Table 3-1 under Operational Elements, identifies dewatering 'extraction of no more than 1.6 GL per annum', while Table 3-2 identifies water supply sources of '1.6GL per annum from the Yarragadee aquifer' with 'pit dewater and rainfall catchment' supplementing 'the abstracted water where possible'	<p>It is proposed that 1.6GL per annum is drawn from the Yarragadee aquifer for mine water supply purposes. The volume of inflow from the Superficial aquifer and subsequent passive dewatering will vary during the life of the mine depending on the location of active mining operations. The annual estimated inflows are summarised in the table below.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Dewatering Volume (GL)</td> <td>0.03</td> <td>0.02</td> <td>0.22</td> <td>0.01</td> </tr> </tbody> </table> <p>An application to take water from the Superficial aquifer under Section 5C for the purpose of passively dewatering mining pits will be submitted to the DoW upon approval of the proposal by the EPA.</p>	Year	2015	2016	2017	2018	Dewatering Volume (GL)	0.03	0.02	0.22	0.01
Year	2015	2016	2017	2018									
Dewatering Volume (GL)	0.03	0.02	0.22	0.01									
98.	Department of Water	Parsons Brinkerhoff's Yoongarillup hydrological investigation and modelling report January 2014 (Appendix 8-B; section 3.10.2) predicts monthly inflow into the mine pits will average 306 kL/d, representing 111,690 kL/y. Table 3.4 Predicted dewatering rates, shows peak dewatering extraction over calendar year 2017 totalling 240,677kL. These figures are significantly greater than the 2ML per month or 24,000kL/y referred to in section 8.2.1 of the PER.	<p>A review of the information presented in the PER has identified an error in the information presented in the last paragraph of Section 8.2.1. Doral acknowledge that the statement made in the PER is inconsistent with the information presented in the Simple Water Balance for the proposal.</p> <p>Doral proposed to amend the last paragraph of Section 8.2.1 of the PER to read as follows:</p> <p><i>Based on the simple water balance (PB, 2014c) (Appendix 8-D), the net water demand for the proposal can be up to 129ML per month and therefore, even during a wet year, groundwater will be required to supplement the net water demand. During dry years nearly all of the water demand will have to be sourced from groundwater because any rainfall that occurs during these months will be lost to evaporation (PB, 2014c).</i></p> <p><i>Doral propose to supplement direct rainfall and pit inflow water sources with groundwater sourced from the Yarragadee aquifer. The simple water balance (PB, 2014c) states that a pumping rate of 50L/s is sufficient to meet the unmet water demands for the proposal. This equates to 1.6 GL/year. Doral propose to secure water for the Proposal through the legislative instruments of the RIWI Act. An application for a licence to abstract 1.6GL/year from the Yarragadee aquifer has been submitted to the DoW.</i></p>										

ID	Received From	Comment	Doral's Response										
Hydrological Processes													
99.	Department of Water	An application to draw water from the Superficial aquifer for dewatering purposes will need to include the maximum expected annual extraction volume (maximum expected in the heaviest draw year, not an average) and will need to be advertised. Given the wording in the PER in relation to groundwater extraction, the general public may perceive this draw to be additional to the 1.6GL per annum proposed to be drawn from the Yarragadee aquifer, already applied for and advertised.	<p>It is proposed that 1.6 GL per annum is drawn from the Yarragadee aquifer for mine water supply purposes, and a smaller volume is proposed to be drawn from the Superficial aquifers in associated with the limited passive dewatering required to allow dry mining conditions. The proposed Superficial aquifer draw for each year of operation is shown in the table below.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Dewatering Volume (GL)</td> <td>0.03</td> <td>0.02</td> <td>0.22</td> <td>0.01</td> </tr> </tbody> </table> <p>The Section 5C application to take water from the Superficial aquifer for the purpose of passively dewatering mining pits will be for the maximum estimated extraction rate of 0.22 GL/year, expected to occur in the 3rd year of mining operations. The annual rate of extraction for 2/3 of the operation is estimated to be below 0.03 GL/year, with only one year of operation anticipated to result in the dewatering of 0.22 GL from the Superficial aquifer. This information will be presented to the public upon submission of the Section 5C application to the DoW and subsequent advertising of the application to the community.</p>	Year	2015	2016	2017	2018	Dewatering Volume (GL)	0.03	0.02	0.22	0.01
Year	2015	2016	2017	2018									
Dewatering Volume (GL)	0.03	0.02	0.22	0.01									
100.	Department of Water	Pit in-flow is expected to include indirect leakage of Leederville aquifer water from below the pit floor and down-slope drainage from the Whicher scarp. This flow will not require a separate section 5C groundwater licence due to the indirect nature of the flow (no bores or pits will be intersecting the aquifer) and the inability to directly measure the volume for compliance purposes.	Acknowledged.										

ID	Received From	Comment	Doral's Response
Hydrological Processes			
101.	Department of Water	<p>Information required to be provided to DOW as part of application for section 5C licence to conduct dewatering operations at the minesite:</p> <ul style="list-style-type: none"> - updated plan showing both the 0.5m and 0.1m modelled drawdown contours to illustrate the extent of the dewatering area of influence within the Superficial aquifer and the Mowen Member - Detailed hydrological cross-sections of the orebody showing the relationships between individual units of the Superficial Formation and the Leederville Formation" 	<p>Doral propose to submit a Section 5C licence application upon obtaining advice from the EPA that the proposal has been approved.</p> <p>In response to the submission provided by the DoW, Doral has had Parsons Brinckerhoff prepare plans showing the predicted 0.5m and 0.1m drawdown contours. Refer Appendix 4 for mapping of the 0.1m and 0.5m drawdown contours along with a number of cross sections of the proposed operation.</p>
102.	Department of Water	<p>Potential impacts to groundwater resources, other users and groundwater dependent vegetation arising from dewatering activities and the extraction of Yarragadee aquifer groundwater will need to be managed through a comprehensive monitoring program required under the terms of groundwater licences issued under section 5C of the Rights in Water and Irrigation Act, 1914</p>	<p>Doral will engage a suitably qualified consultant to assist in the preparation of a Groundwater Management Plan and Groundwater Operating Strategy for the proposal. These documents will be prepared to the requirements of the DoW and include:</p> <ul style="list-style-type: none"> - Administrative requirements such as already existing licenses, the reasons for a basic operational strategy and other project backgrounds; - water source description such as existing bores, abstraction methods etc.; - a list of identified groundwater related issues and management objectives and responses; - operating rules for all production bores in use such as annual abstraction and abstraction schedule; - future monitoring and reporting requirements; - environmental impact management; - contingency program; - associated Maps showing topographic features, GDEs, other beneficial users, irrigation areas; and - water use efficiency measures.

ID	Received From	Comment	Doral's Response
Hydrological Processes			
Groundwater Modelling			
103.	Department of Water	The PER has indicated that the combined abstraction will only impact 1m drawdown at 90m distance from the production bores in the Yarragadee, and 1m at 180m distance within the Lower Leederville (Vasse) aquifer. In assessing the drawdown at 50 litres/sec using the Theis equation, the predicted drawdown is estimated by the DoW to be approximately 2.7m at 90m within the Yarragadee aquifer. At 25 litres/sec, there is a 1.5m drawdown at 90m so it is suspected that there are errors in their analysis. There is also drawdown beyond 90m.	<p>The Theis (1935) unsteady-state equation is a simplified solution contingent on conditions and assumptions which are not all relevant in this instance (no recharge/leakage from layers above, horizontal flow, isotropic homogenous aquifer and so forth).</p> <p>Doral's hydrological consultants, Parsons Brinckerhoff, consider the numerical model better accommodates the complexities of the system and more accurately predicts the likely drawdown.</p>
104.	Department of Water	The model is required to be updated to a transient model, have new parameter estimation completed, recalibrated including all other groundwater use within the model boundary, detailed sensitivity and predictive analysis and a new prediction of drawdown established that can then be compared to the monitoring data collected	<p>The model is not intended to be a standalone document for approval purposes. The model results and an accompanying Groundwater Operating Strategy will be used to support a 5C application to abstract groundwater from the Superficial aquifer.</p> <p>The model is calibrated to steady state condition and shows good calibration for 74 boreholes, which is considered to be an adequate number of calibration targets for the model domain.</p>
105.	Department of Water	There is no long term groundwater level data available in model grid to validate calibration. Model hydraulic parameters were estimated using slug tests on drilled monitoring bores which can be misleading due to the monitoring bore construction; that is, testing the gravel packing around the screen interval rather than the aquifer material.... Due to the scarcity of all data and the model calibration and construction, the drawdowns could be buffered (meaning the full extent of drawdown hasn't been realised yet).	<p>Slug test results have also been compared against literature values to increase confidence and hydraulic parameters were adjusted during calibration.</p> <p>The current model may be classified as a Class 2 model, which is adequate for the purpose of predicting inflow and drawdown of a proposed mine, according to the Australian Groundwater modelling guidelines (Barnet et al, 2012, Table 2-1: Model confidence level classifications – characteristics and indicators).</p>
106.	Department of Water	The drawdown prediction and analysis will be rectified when a pumping test is conducted as part of the Yarragadee licence application. This will give a better understanding of the impacts to other users, albeing it is stated that Doral will supplement other user's supplies because the analysis suggests they will be impacted.	Acknowledged.
107.	Department of Water	Monitoring bores may be required to measure the Yarragadee drawdown so other users can be adequately informed and supplemented accordingly.	Acknowledged. Information regarding groundwater monitoring bores will be presented to the DoW in the Groundwater Operating Strategy.

ID	Received From	Comment	Doral's Response
Hydrological Processes			
108.	Department of Water	Recharge estimation needs to be more robust and transparent as the estimates applied around the pit area are unusually high, is high for general forested recharge and requires transient estimation.	Recharge was a calibration constraint and was adjusted to produce a good fit to the measured water levels. To the south of the pit, recharge may be higher into the edge of the Superficial due to the increased runoff (limited rainfall infiltration in the outcropping Mowen Member). To the east, recharge may be higher due to enhanced recharge to the Superficial formations near the Sabina River.
109.	Department of Water	Yarragadee parameters are too high in the Kz direction and a pump test of each bore is required to determine parameters than used in the transient recalibrated model	Acknowledged. This was a reporting error. The model and the modelled Kz was 10% of the existing Kx, consistent with other layers.
110.	Department of Water	There are no climatic scenarios	The proposed Life of Mine is about 3 years, from 2015 – 2018, and the effect of climate change is not considered significant.
111.	Department of Water	Two climate scenarios should be developed. A 5 yr wet and dry period post 1975 should be used to determine drawdown over the 3 year mine life. This will provide robust drawdown predictions.	
112.	Department of Water	Linear recovery and linear drawdowns lacks seasonality	The seasonality was not modelled in order to predict the mining induced impacts rather than natural variations. A validation of the groundwater model will be undertaken after 6 months of operations to ensure that the model and associated groundwater drawdown predictions are representative to field observations. Groundwater monitoring results showing seasonal variation are provided as Appendix 8.
113.	Department of Water	The comparison of groundwater drawdown to current seasonal fluctuations is misleading. Drawdown in the Mowen Member sediments will be in addition to seasonal fluctuations already experienced.	
114.	Department of Water	The recalibrated transient model requires an external model review.	All models may benefit from an independent review. However, the relatively small proposed scale of abstraction and duration of operations (3 years) suggest the potential for impacts to occur is limited.

ID	Received From	Comment	Doral's Response
Hydrological Processes			
115.	Department of Water	It is recommended that Doral install a series of pit perimeter monitoring bores and perpendicular transects extending from the pit perimeter monitoring bores into the Yoganup and Leederville aquifers that will delineate the model's accuracy and prediction of the simulated 350m (1m contour) drawdown cone. This will determine the actual drawdown dimensions and thus can be used to recalibrate the model for better prediction and monitoring.	An additional 11 monitoring bores are proposed to be installed by Doral in order to provide calibration data and allow measurement of water levels in the Superficial Aquifers during operation. The proposed bores are located adjacent to the pit perimeter in the direction of potentially sensitive receptors (native vegetation in State Forest and adjacent residences). A preliminary layout of the proposed 11 monitoring bores is provided in Appendix 6. Actual location of monitoring bores will be provided in the Groundwater Operating Strategy after consultation with DPaW and DoW.
116.	Department of Environment Regulation	That the groundwater assessment in Appendix 8B of the PER is revised to include sufficient groundwater monitoring bores within the superficial aquifer to characterise the superficial aquifer dbgl at the mine site. The superficial aquifer is the surface aquifer that, when drained, will result in the most significant impact on the environment.	
117.	Individual Submission	The monitoring bore network should extend offsite to assess the local hydrogeology outside the proposal that may be impacted.	
118.	Department of Water	Recharge applied is higher around the pit area and is high for general forested recharge	Recharge was a calibration constraint and was adjusted to produce a good fit to the measured water levels. To the south of the pit, recharge may be higher into the edge of the Superficial due to increased runoff (limited rainfall infiltration in the outcropping Mowen Member). To the east, recharge may be higher due to enhanced recharge to the Superficial formations near the Sabina River.
119.	Department of Water	Model boundaries don't need to be necessarily constrained by topography	The model boundaries generally follow surface catchment boundaries, which often coincide with groundwater divides and therefore act as no flow boundaries.
120.	Department of Water	No cumulative drawdown from other groundwater uses is accommodated	As the modelled drawdown does not extend to other groundwater users, a cumulative assessment is not considered necessary.
121.	Individual Submission	The groundwater model does not take into account abstraction on nearby farming and horticultural properties and does not take into account surface water interactions	
122.	Department of Water	Reproduce contours at 0.5m and 0.1m to detail the full extent of dewatering and production drawdown impacts	0.5m and 0.1m drawdown contours have been included in the map provided as Figure 2-1 in Appendix 4.
123.	Department of Water	An independent review of the modelling should be undertaken once additional information is available from the pumping tests still to be conducted on the Yarragadee bore(s)	Results from pump tests on the Yarragadee bore(s) will be used to validate the model for the Yarragadee aquifer. Results of the pump tests and the validation assessment will be forwarded to the DoW for review.

ID	Received From	Comment	Doral's Response
Hydrological Processes			
124.	Department of Environment Regulation	Appendix 8B should be updated to include the depth below ground level (dbgl) of all aquifers.	Updated information will be included in the Groundwater Operating Strategy. Appendix 5 provides cross sections showing the location of the proposed mine pit in relation to the underlying aquifers.
125.	Department of Environment Regulation	Appendix 8B has included plots of groundwater draw-down as a result of mining but it has not presented to dbgl of the related aquifer/s. Without knowledge of the dbgl of groundwater, it is not possible to assess impacts of groundwater de-watering.	20 mbgl was referenced in the PER as the maximum anticipated depth of mining. The depth of the ore body varies throughout the operation. Hydrological modelling has utilised a 3D model of the proposed mining pit.
126.	Individual Submission	Ore will be mined to a maximum depth of 20 mbgl. It is unclear if 20 mbgl has been used in the hydrological assessment.	The cross sections provided in Appendix 5 show how the mine pits vary in depth across the disturbance area.
127.	Department of Environment Regulation	That the draw-down assessment outlined in Appendix 8B is updated based on an assumption that the groundwater is lowered to a level of one metre (m) below the pit floor, not at 0m (ie. A saturated pit floor) as assumed in the modelling. A saturated pit floor is not trafficable and will not occur in practice. It is accepted industry practice within sand mines that at least 1 metre of unsaturated medium is required on the pit floor to allow the movement of vehicles. The assumption of the groundwater modelling that the pit floor will be saturated is invalid and will likely result in a significant under-estimate of groundwater draw-down and volumes of dewatering water produced. The water balance should be updated to reflect revised estimates of groundwater to be dewatered.	Groundwater drawdown from below the pit floor will be prevented by employing only suction pumps for dewatering activities (no submersible pumps will be used). Suction pumps will be installed at a designated height above the base of the pit (usually 0.5m) in order to maintain a saturated pit floor.
128.	Department of Environment Regulation	The PER has not included any groundwater depth measurements for the superficial aquifer. Appendix 8B presents a model of the superficial aquifer based on regional data and may not be representative of the groundwater conditions that occur at the mine.	Appendix 8A provides groundwater depth measurements for a number of the monitoring bores established around the Yoongarillup site. YMB5, YMB6S and YMB7 monitor groundwater levels within the superficial aquifer.
129.	Department of Environment Regulation	That the PER include an assessment of the potential for perched groundwater (permanent or intermittent) within the mining footprint. There is potential for significant volumes of perched groundwater within the mine pit void that have not been accounted for in the water balance calculations. The volume of perched groundwater may be in excess of the current design infrastructure requirements.	Exploration drilling and geological interpretation/modelling do not indicate the presence of perched aquifers within the area to be excavated. In the unlikely event that excess water from perched aquifers be encountered within mining excavations (superficial aquifer), the rate of pumping water from the Yarragadee aquifer will be reduced by an equivalent amount so there will be no net increase in the volume of water on site and no additional pressures placed on minesite infrastructure.

ID	Received From	Comment	Doral's Response
Hydrological Processes			
130.	Individual Submission	The assessment of hydrological processes is considered fatally flawed for the reasons of insufficient data being available to allow for confidence in modelling undertaken, including: <ul style="list-style-type: none"> groundwater quality characterisation of local hydrogeology and hydro-geochemistry insufficient data to allow for calibration to transient model insufficient data to model seasonally varying groundwater conditions 	Groundwater quality and hydro-geochemistry monitoring data has been provided in Appendix 8A. Calibration to Transient Model: Refer Response No. 105. Seasonally Varying Groundwater Conditions: Refer Response No. 113.
131.	Individual Submission	The groundwater model does not account for perched aquifers which are likely to develop seasonally in the locality.	Refer Response No. 129.
132.	Individual Submission	The groundwater model does not take into account the presence of preferential pathways albeit a void was encountered in one of the drilled bores.	The opinion of the respondent is noted, however, it is a recognised shortfall of mud rotary drilling that when circulation is lost, no sample is returned to surface for geological logging. This can occur when there is a cavity but can occur for other reasons. It is the opinion of Doral geologists that no voids are present within the mine footprint.
133.	Individual Submission	Meteorological data from BOM weather station is distant from the proposal and may not adequately reflect local rainfall and evaporation conditions	The BOM weather station (Busselton Airport) was used as it provided the closest comprehensive weather data set to the proposed site. Doral will establish a weather monitoring station on the site to monitor local rainfall and wind conditions during the operations.
134.	Individual Submission	A weather station should be installed to collect site specific data for two years to assess if different to the remote data used in the assessment.	
135.	Individual Submission	Groundwater modelling should be recalibrated and improved to include and assess the current shortfalls.	A validation of the groundwater model will be undertaken after 6 months of operations to ensure that the model and associated groundwater drawdown predictions are representative to field observations.
136.	Individual Submission	Doral have applied for water out of the Yarragadee aquifer which is fully allocated.	Doral has submitted an application for a licence to abstract 1.6GL/yr from the Yarragadee aquifer and this application will be assessed by the DoW in accordance with their procedures.
137.	Individual Submission	The submitter contends that the Yarragadee aquifer supplies the Southwest and Perth. How can the 1.6 GL of water be supported given the pressures on the Yarragadee aquifer?	

ID	Received From	Comment	Doral's Response
Hydrological Processes			
138.	Individual Submission	The submitter contends that the impact/risk to water quality and hydrology and the likely variance presented by the proposal is significant. The proponent is also seeking 1.6 gigalitres per annum from the fully allocated Busselton-Yarragadee subarea. The potential lowering of groundwater levels by dewatering should not be under estimated on the impact to groundwater dependent vegetation.	<p>Section 8 of the PER and Section 6 of this document provide an analysis of the hydrology of the area surrounding the minesite and the predicted impact the minesite will have on both surface and sub-surface hydrology.</p> <p>Section 2.7 of this document outlines the potential indirect impacts of the mining proposal on vegetation adjacent to the minesite, including the potential impacts on groundwater dependent vegetation.</p> <p>Doral has submitted an application for a licence to abstract 1.6GL/yr from the Yarragadee aquifer and this application will be assessed by the DoW in accordance with their procedures.</p>
Water Monitoring			
139.	Department of Water	The DoW will monitor changes in groundwater chemistry through a groundwater monitoring program included in an Operating Strategy required under the terms of a dewatering licence.	A Groundwater Operating Strategy will be submitted to the DoW as part of the Section 5C licencing application associated with the dewatering operations for the proposal.
140.	Department of Environment Regulation	That the PER also includes baseline monitoring of the groundwater quality (including radionuclide and radioactivity levels). The PER has included some limited baseline monitoring data (Appendix 8A) however a location plan has not been provided and it cannot be discerned from the information presented if the groundwater monitoring is representative of the groundwater regime that exists at the mine site.	Figure 8-6 of the PER and Figure 2-3 of the Groundwater Modelling Report (Appendix 8 of the PER) contain maps of the locations of monitoring bores referenced in the PER.
141.	Department of Environment Regulation	The PER has not included a baseline assessment of surface waters.	Surface water monitoring commenced in November 2013. Locations of surface water monitoring points are provided in Appendix 7. Surface water quality data will be incorporated into the Works Approval application that will be forwarded to the DER upon obtaining approval from the EPA for this proposal.

ID	Received From	Comment	Doral's Response
Hydrological Processes			
142.	Individual Submission	Groundwater level and quality monitoring should continue for a minimum of two years. The frequency of water quality analysis should be increased.	Groundwater monitoring has continued to be undertaken throughout 2014 and continues into 2015. At present, monthly monitoring is undertaken.
143.	Individual Submission	There is no assessment of potential impacts on groundwater quality.	Doral will assess and monitor groundwater quality in accordance with DoW and DER requirements.
144.	Individual Submission	The submitter asks how are farmers bores and the Sabina River going to be monitored?	Doral currently undertake water quality monitoring of groundwater and surface water around the proposal, including from the Sabina River. Doral will develop and implement a Groundwater Operating Strategy that will outline what monitoring will be undertaken and what frequency it will occur. This strategy will be reviewed by the DoW for suitability and will meet all DoW and DER requirements.
Other Groundwater Users			
145.	Individual Submission	The submitter is concerned about the effect of the mining activity on groundwater supplies drawn from their Lot. The submitter relies on the use of groundwater for personal use and watering of animals and irrigation of gardens and has no other water supply. The submitter is concerned that the location of their water bores are not shown on Figure 8-1 and request confirmation from Doral or the EPA that their bores have been assessed and included in the PER's consideration of impacts on private bores.	Section 8.4.2 of the PER states that, of the 48 registered private bores located within 5km of the mine pits, only 3 will experience temporary minor drawdown. Of those 3 bores, all are located within the development envelope. Modelling predicts that no registered private bores located outside of the development envelope will be affected by the proposal. Data from Figure 8-1 (PER) has been sourced from the Department of Water. Where a landholder has a bore that is not shown on Figure 8-1 (PER), a review of the predicted drawdown contours in Appendix 4 can be used to identify the predicted drawdown within the vicinity of their bore/well.
146.	Individual Submission	The submitter notes that Section 8 of the PER discusses the modelling regarding potential effects and states that no impact is expected past 0.35 km from the mine. The landowner's concern is a drop in groundwater levels as the landowner property relies on surface wells to supply the household and a small dam for water and is part of the visual amenity of their property.	Doral state in the PER that, where landholder water supplies are affected as a result of the mining operations, Doral will provide supplementary water as required.
147.	Individual Submission	The submitter is concerned about the potential impact on surface water that supplies water to houses and for agricultural uses and asks will Doral make good with alternative supplies.	

ID	Received From	Comment	Doral's Response
Hydrological Processes			
148.	Individual Submission	The submitter contends that in the event of a drop in surface water (or the bore) the landowner will need an effective solution which would likely entail a bore from a deeper reserve to supply water and to keep the dam at an appropriate level.	Refer Response No. 145.
149.	Individual Submission	If the draw of water from our bores is affected by the Project, the submitter has advised that they have no other water supply and it should be a condition of any consent or approval relating to the Project that Doral provide make-up water in the event that the submitter is unable to draw sufficient quantities and flow of ground water for their requirements.	Groundwater modelling does not predict any adverse impacts from mining operations on bores outside the development envelope. Section 8.5 of the PER states that Doral will provide affected landholders with supplementary water as required, where it is determined that the mining operations have resulted in an impact on their water supply.
150.	Individual Submission	Doral claims that there will be limited affect on the ground water of residents. The submitter expresses concerned that Doral has not requested to monitor their Yarragadee bore, either to establish water level fluctuations or to use it as a monitoring station during operations. The submitter has advised that they also hold water allocations for the Leederville & Superficial formations. All 3 sources are used for domestic & horticulture operations. The submitter has requested that Doral monitor the levels of their bores/dam and to remediate any loss of water availability or quality.	Should approval for the proposal be forthcoming, Doral will liaise with adjacent and nearby landholders to identify opportunities for monitoring existing water bores. Doral will develop a comprehensive water monitoring program which will include monitoring of the Yarragadee, Leederville and Superficial aquifers. Details of the water monitoring program will be incorporated into the Groundwater Operating Strategy to be submitted to the DoW for approval. Refer Response No. 145 for details on provision of supplementary water.
151.	Individual Submission	The submitter has stated that their household (drinking and domestic use) water supply for each residence is solely obtained from two bores. These bores also supply water for livestock. Their bores draw groundwater from the Superficial (Yoganup formation) and Leederville aquifers and the submitters concern is that mine pit dewatering and the groundwater drawdown will have an adverse impact on their water supply. What will Doral do if we run out of water and for how long?	Refer Response No. 145.

ID	Received From	Comment	Doral's Response
Hydrological Processes			
152.	Individual Submission	Threat to Water Supplies: The submitter has stated that their only water supply for their block and garden is a small dam which is situated in the superficial layer and is subject to the fluctuations of the water table. In the height of winter - depending on seasonal rainfall - the submitter's dam would be at its maximum level. Conversely, at the end of summer, the dam is at its lower capacity. The submitter is concerned that given the amount of groundwater the proposed mine will be utilising, there will be a risk that their water supply will be detrimental affected.	Refer Response No. 145.
153.	Individual Submission	The submitter contends that there are major concerns regarding the potential impacts to the surface water table. Farms within 1km of the proposed mine rely on surface water for cattle [ie: wells]. There has been previous history of mining in the area (not specified) lowering surface water causing diminished dam and well capacities	
154.	Individual Submission	Suspected decrease in water quality, availability, and ground water levels: The submitter has stated that all of the water on their property comes from their licensed bore which accesses the Leederville Aquifer. Anecdotal evidence suggests that the water quality and water levels of local properties close to horticultural properties with a Yarragadee allocation have been adversely affected by the substantial amounts of water used by the horticultural properties. It would seem logical to predict that the mining operations so close to the submitter's property would also have a negative impact on their water quality and levels. The submitter has stated that not only do they need a good quality reliable water source for their own existence, their crops and stock depend on it. Any decrease in quality or level will have a negative impact on the submitter.	
155.	Individual Submission	Care should be taken that the water supply to surrounding landowners of this proposed project is protected.	

ID	Received From	Comment	Doral's Response
Hydrological Processes			
156.	Individual Submission	There is also the risk of contamination of water supplies in the immediate and outlying areas. The ramifications of this happening would indeed lead to our flora, including a sustainable vegetable garden, suffering and perhaps being non-existent.	Doral will be undertaking a comprehensive groundwater monitoring program that includes monitoring groundwater quality. Doral has assessed the risk of contamination to both ground and surface water in the vicinity of the mining operations as low. The only chemical used in the processing plant is a flocculent. Flocculants have been safely used in the mineral sands industry for a long period of time and do not pose a risk to the environment or to the health of the community.
Discharge of Water			
157.	Department of Water	It is noted that the proponent has committed to testing of mine water discharge in the event of an emergency discharge and presented three options for dealing with the distribution of this discharge once it has been tested. It is recommended that testing incorporate criteria (or testing of parameters) related to management of acid mine drainage and potential risks to downstream environments.	Acknowledged. Doral has committed to developing and implementing a Groundwater Operating Strategy and Acid Sulphate Soil Management Plan. These plans will be submitted to the DoW and DER for review and approval upon obtaining approval from the EPA for this proposal.
158.	Department of Environment Regulation	That the words "emergency discharge points" are removed from the PER and replaced with the words "discharge points". All discharge locations referenced in the PER are proposed to be operated as routine discharge locations during normal operations, not emergencies.	Doral do not anticipate releasing water from the site as part of normal operations. Water will only be discharged from site during extreme weather events where it is not possible to retain stormwater onsite. Doral will review the nomenclature used in the Water Discharge Diagram with the DER during the development of the Works Approval application.
159.	Individual Submission	The submitter has asked "What happens if there is a flood?".	Doral do not anticipate releasing water from the site as part of normal operations. Water will only be discharged from site during extreme weather events where it is not possible to retain stormwater onsite. Any water discharged from the site will be in accordance with Department of Environment Regulation licence conditions and in accordance with Doral's Surface Water Management Plan.

ID	Received From	Comment	Doral's Response
Hydrological Processes			
160.	Individual Submission	The submitter notes the Sabina River is in close proximity and is one of the most pristine waterways in the south west.	Although the Sabina River is located close to the proposal, hydrological modelling predicts no adverse impacts to the Sabina River or its catchments as a result of the proposal. Should water be required to be discharged from the minesite during an extreme weather event, discharge water will flow in a north, north-west direction, away from the Sabina River catchment area.
161.	Individual Submission	The submitter contends that the mine would potentially impact the water quality of the Sabina River. The river has previously been identified by Geo Catch as being pristine.	
Impact of Groundwater Drawdown on Vegetation			
162.	Department of Environment Regulation	Draining of the superficial aquifer may result in death of vegetation which is using this aquifer for a water source	Acknowledged. Doral has committed to the development and implementation of a number of management plans that address the monitoring of vegetation, establishment of "trigger points" and contingency actions to be implemented to minimise any detrimental impacts on vegetation health as a result of groundwater drawdown.
163.	Department of Parks and Wildlife	Recommendation 6: That the proponent provides management options for maintaining pre-mining hydrological regimes.	
164.	Department of Water	<p>The DoW has some concerns with the validity of this assessment and believes there is a high risk of impacts to vegetation beyond the area to be cleared. The concerns identified are:</p> <ul style="list-style-type: none"> - Drawdown of less than 1m will extend into State Forest 33 and have potential to impact the vegetation. The vegetation will likely be accessing groundwater from the Mowen Member sediments above the Vasse Member. Whilst the modelling conducted indicates there will be some drawdown (down-slope drainage) in the overlying Mowen sediments and there is potential for impacts to vegetation as a result. - Assessment of the above potential impacts is not possible based on the information provided in the PER and supporting hydrogeological reports. Information on the current depths to groundwater in areas adjacent to the mine pit (immediately south) is not provided. This is critical information to allow the assessment of the potential risk to groundwater dependent vegetation outside of areas to be cleared. 	<p>Mining of the State Forest sub-area is scheduled to take 13 months in total, with the area to be mined in two halves, taking 6-7 months for each half. Progressive backfilling of mine voids will minimise the timeframe that excavations intersecting underlying aquifers are left open. It is anticipated that the maximum duration that an excavation intersecting underlying aquifers is left open will be 12 months. It is proposed to commence mining operations in the paddock areas west of Sues Road. Mining of the State Forest sub-area will commence in the 2nd half of the 1st year of operations.</p> <p>As soon as approvals for the proposal are forthcoming, an additional 11 monitoring bores will be established around the perimeter of the mine pits, providing more groundwater level data points that can be incorporated into the validation of the groundwater model.</p> <p>Groundwater level data (from the existing bores and the additional 11 monitoring bores) will be used to validate the groundwater model prior to mining commencing within the State Forest sub-area. This validation will allow for a review of the predicted drawdown contours within the State Forest sub-area and if required, redefine the zones where soil moisture monitoring and vegetation health monitoring will be undertaken.</p> <p>The risk to vegetation beyond the mine pit boundary has been assessed in the report "A</p>

ID	Received From	Comment	Doral's Response
Hydrological Processes			
165.	Department of Water	Predicted drawdowns should be presented in addition to current seasonal fluctuations as changes in the water regime that will result during and post mining. This will allow the proponent to assess the risk to vegetation beyond the mine pit boundary.	Review and Impact Assessment of Potential Water Drawdowns on Groundwater Dependent Ecosystems at the Proposed Yoongarillup Mineral Sands Project" (EcoEdge 2015) (Appendix 1-A). The report states that the relatively shallow depth of the Superficial Aquifer within the Project Area south of the proposed Mine Pit means that some deeper rooted species are likely to be dependent on groundwater for part of the year; however, they are unlikely to be dependent on it for their continued survival. The report acknowledges that Doral propose to progressively backfill mining voids to minimise the timeframe excavations intersecting aquifers are open. The report recommends that "trigger points" (or thresholds) are identified (eg. soil moisture levels, plant health indicators) and appropriate responses formulated. Doral propose to incorporate such "trigger points" into a Groundwater Dependent Ecosystem Management Plan and Flora and Vegetation Management Plan. These plans will include monitoring programs, "trigger points" and contingency actions to be implemented to ensure that the risk of detrimental effects on adjacent vegetation as a result of any groundwater drawdown are minimised.
166.	Department of Water	- Details of any proposed monitoring to manage potential risks to the vegetation adjacent to the mine pit is lacking. The commitment to recalibrate the groundwater model is supported but should be complimented by commitments to establish adequate monitoring bores to assess the progression of groundwater drawdown beyond the pit boundary.	Doral proposed to establish an additional 11 monitoring bores to provide calibration data and allow measurement of water levels in the Superficial Aquifers during operation. The proposed bores are located adjacent to the pit perimeter in the direction of potentially sensitive receptors (State Forest and Residences). A Groundwater Operating Strategy will be prepared to support the 5C abstraction licence application which will highlight trigger levels, monitoring commitments and mitigation measures. Proposed monitoring includes groundwater level monitoring, soil moisture monitoring, plant stress monitoring (quantitative procedure that can identify deterioration in plant health prior to any visual signs of distress) and visual monitoring.

ID	Received From	Comment	Doral's Response
Hydrological Processes			
167.	Department of Water	Drawdown impacts on the State Forest are expected, and are considered to be unacceptable. Contingency plans must be prepared including the provision of infiltration trenches along the western boundary of the State Forest to maintain the water table within the Leederville aquifer	Doral has committed to the development and implementation of a Groundwater Dependent Ecosystems Management Plan and a Flora and Vegetation Management Plan. These plans will incorporate contingency plans/actions to be implemented should agreed "trigger points" be reached. Plans will be developed in consultation with DoW and DPaW. Contingency actions will be defined in the management plans and will be developed in consultation with DoW and DPaW. These actions may include the construction of infiltration trenches, irrigation of vegetation or re-injection of water into upslope aquifers.
168.	Department of Water	Contingency planning needs to include the provision of infiltration trenches along the western boundary of the State Forest adjacent to the mine development area, to be activated when water level monitoring indicates drawdown is beyond seasonal range - not after any deterioration in vegetation health is evident.	
169.	Department of Parks and Wildlife	Recommendation 6: That the proponent provides management options for maintaining pre-mining hydrological regimes.	
170.	Busselton Dunsborough Environment Centre	Doral acknowledges that the drawdown from the dewatering of mine pits may affect native vegetation in the state forest sub area and the Whicher National Park. Nevertheless they assert the risk to be minor. The BDEC are extremely sceptical that adaptive management measures can be capable of protecting vegetation retrospectively once obvious signs of deterioration are observed.	
171.	Wildflower Society of WA	probable hydrological impact on the surrounding state forest and the Whicher National Park	
172.	Wildflower Society of WA	There should also be an adequate buffer area provided so that the native vegetation is not affected by unacceptable hydrological impacts from any adjacent mining.	

ID	Received From	Comment	Doral's Response
Hydrological Processes			
173.	Forest Products Commission	Lowering the water table may directly impact the productive capacity of the adjacent pine plantations. The current plantation has 16 years of growth remaining until harvest and there is an intention to establish future rotations. Fluctuations in the water table impact productivity, and there have been situations in other parts of FPC estate where the whole plantation has died because of rapid changes in the water table.	Doral engaged EcoEdge to undertake a review of the impact of groundwater drawdown on adjacent vegetation. A copy of this report is provided as Appendix 1-A. Section 6.3 of this report states: "sited as it is on moderately deep sand, it is unlikely that the pine plantation at Yoongarillup sources much of its water from groundwater. It is unlikely that a fall in the groundwater table in the region of 0.1 m will have any effect on growth in the plantation."
174.	Forest Products Commission	The FPC requires an assurance, based on scientifically robust analysis, that the project will not impact State forest plantations	Doral will continue to consult with FPC to ensure mining operations do not adversely affect the health of the trees in the plantation.
175.	Individual Submission	The submitter has expressed concern about the impact of the proposal on their bluegum plantation, which draws water from the water table. The submitter contends that the health of their trees will be affected by any reduction in the water table, which will result in financial loss to the submitter.	The bluegum plantation is located over 120m outside the 0.1m drawdown contour. It is not anticipated that the mining operation will impact on the health of the bluegum plantation. Doral will continue to consult with the owners of the bluegum plantation to ensure mining operations do not adversely affect the health of the trees in the plantation.
Vasse Wonnerup System Ramsar Wetland			
176.	Department of Water	The proposal will result in a minor reduction in the catchment area for the Vasse River sub area. The reduction is minor and it is considered that this will not result in any measurable impacts to the Vasse River or the Vasse Wonnerup wetlands. The proponent's assessment and conclusion is reasonable and supported.	Acknowledged.
177.	Department of Water	The Environmental Scoping Document (ESD) required consideration of potential impacts from groundwater drawdown on the Vasse Wonnerup wetlands. The proponent's conclusion that impacts are unlikely, given that the wetlands are 14 kilometres away, is supported by the information presented in terms of likely extent of aquifer drawdown.	Acknowledged.

ID	Received From	Comment	Doral's Response
Hydrological Processes			
178.	Department of Environment Regulation	<p>The location of the Ramsar wetland and any surface or groundwater flow paths between the mine site and the wetland should be defined in the PER.</p> <p>If hydraulic conductivity exists between the mine site and the Ramsar wetland, then the PER should define the hydraulic connectivity pathways and assess the potential impacts of those on the Ramsar wetland. If no surface or groundwater hydraulic connectivity exist, then the PER should demonstrate that this is the case."</p>	<p>The PER (Section 8.4.7) states that the proposal will not impact on the Vasse-Wonnerup System Ramsar Wetland.</p> <p>The Department of Water have supported Doral's conclusions that impacts are unlikely given that the wetlands are 14 kilometres away and the likelihood of aquifer drawdown impacting on the Vasse-Wonnerup System Ramsar Wetland is low.</p>
179.	Individual Submission	Appendix 8C Surface Water Report states that the mine proposal will result in a reduction in the surface water yield to the Vasse River catchment of between 14-21% and a reduction from the foothills subcatchment of 25%. The mine proposal is therefore likely to have a substantial and measurable impact on the hydrological regime of the downstream Ramsar-listed Vasse-Wonnerup wetland system. The Vasse Wonnerup wetland system is already struggling as a result of cumulative environmental impacts and the mine proposal is likely to exacerbate the situation further.	
180.	Individual Submission	The submitter contends that the project would potentially effect surrounding bores and water ways and the Ramsar wetlands.	
181.	Individual Submission	All fresh water streams flow towards Busselton. Given a world shortage of fresh water we do need to take this seriously, if nature (example, a storm) drops heavy rain fall in this area and a breach occurs, every land and waterway will be polluted, including wetlands around the City of Busselton	<p>Doral will be developing and implementing a Surface Water Management Plan that includes a section on the Emergency Management of excess water on site. Doral is required to obtain an operating licence from the Department of Environment Regulation, which incorporates how water is managed on site.</p> <p>As the material stored in the Solar Evaporative Ponds is inert, the risk of contamination of downstream waterways is low.</p>

ID	Received From	Comment	Doral's Response
Hydrological Processes			
General			
182.	Individual Submission	The submitter notes the Yarragadee Aquifer is under pressure. The submitter understands the mine could mean 24% less water for the wetlands in the region	Doral has submitted an application for a licence to abstract water from the Yarragadee aquifer and this application will be assessed by the DoW in accordance with their procedures. For surface water, Doral propose to, where practicable to do so, redirect surface water flows around the minesite, resulting in a predicted reduction of 0.05GL/yr (3%) of water flowing into the Vasse River sub-catchment, as documented in Section 8.2.3 of the PER.
183.	Individual Submission	The submitter is a landowner concerned about the potential impacts of the mine on surface water.	Doral predict a reduction of 0.05GL/yr (3%) of water flowing into the Vasse River sub-catchment as a result of the proposal, as documented in Section 8.2.3 of the PER. Doral will be developing and implementing a Surface Water Management Plan to ensure that the any impacts from the proposal on surface water flows in the vicinity of the minesite are minimised.

7 ENVIRONMENTAL FACTOR: PEOPLE / AMENITY

7.1 OVERVIEW

Comments received from the public review focus on the following areas:

- Noise
- Dust
- Visual Amenity

Commentary on the above areas is provided below. Individual responses to each comment received from the public review relating to Amenity are provided in Section 7.5.

Through the implementation of the management plans and standards described below for Noise, Dust and Visual Amenity, Doral believe that the EPA objective for Amenity, to ensure that aesthetic values are considered and measures adopted to reduce visual impact on the landscape to as low as reasonably practicable, can be achieved.

7.2 NOISE

7.2.1 Review of Data Presented in Public Environmental Review

The DER identified a typographical error with Table 10-2 of the PER. The PER incorrectly quoted maximum permitted noise levels. The corrected values are presented below and have been included in the Revision 1 of the PER document.

TYPE OF PREMISES RECEIVING NOISE	TIME OF DAY	ASSIGNED LEVEL (dB)		
		L _{A 10}	L _{A 1}	L _{A max}
Noise Sensitive premises: highly sensitive area	Mon-Sat 0700 – 1900	45+	55+	65+
	Sun & Pub Hol. 0900 - 1900	40+	50+	65+
	All Days 1900 – 2200	40+	50+	55+
	Mon - Sat 2200 – 0700	35+	45+	55+
	Sun & Pub Hol. 2200 – 0900	35+	45+	55+

+ influencing factor (a 1dB influencing factor is applicable to R2 and R3 as discussed in SVT (2015))

TABLE 7-1 CORRECTED DATA FOR TABLE 10-2 FROM PER

The data presented in the PER was based on the noise assessment undertaken by SVT Engineering (2014). The report predicted a number of non-compliances with the EP (Noise) Regulations for which Doral had proposed a number of management measures to address.

In reviewing the comments received from the public review, Doral undertook a review of the original noise assessment and considered alternative mining methodologies, including changes to the plant fleet, to identify whether changes could be undertaken, and additional mitigation measures implemented (ie. construction of additional noise bunds), to reduce the noise emissions from the proposal.

Doral engaged SVT Engineering to re-model the proposed operations incorporating the changes to the mining methodology and changes to the plant fleet. This revised noise assessment report (SVT, 2015) resulting from this re-modelling is presented as Appendix 9.

7.2.2 Supplementary Information not Included in the PER Document

A review of the comments received during the public review period has resulted in Doral investigating additional measures to reduce noise generated from the proposal. This has involved a thorough review of the original noise modelling, including a review of the location of noise bunds, equipment used and topography model utilised in the analysis.

The outcome of this review and remodelling of the proposal has resulted in a revised Noise Impact Assessment (SVT,2015), included as Appendix 9.

Some of the changes that have been included in the revised noise assessment include:

- Additional noise bunding to be constructed within the paddock areas west of Sues Road;
- Use of Carry Graders instead of a Dozer for topsoil and subsoil stripping operations within Pits 24 and 25;
- Construction of a temporary noise bund (utilising topsoil material) within Pit 24;
- A 6.5m high noise barrier to be constructed on the western edge of Pit 25;
- The construction of a 5.5m high noise bund along the north and eastern edge of Pit 2;
- The construction of a temporary noise bund, 2.5m high within Pits 7 and 8;
- An additional 4 residences modelled, referenced as R13 to R16.

As a result of the revised noise modelling, Doral has amended Section 10.5 of the PER to reflect the information presented in the revised modelling. A summary of the revised modelling results, as presented in the document “Environmental Noise Impact Assessment of the Proposed Yoongarillup Mining Operation, Rev 2 -2 April 2015” (SVT,2015) (Appendix 9), is presented below. The information presented in Table 7-2, Table 7-3, and Table 7-4 shows compliance with the EP(Noise) Regulations 1997 and its 2013 amendment.

Closest Residence	Adjusted Worst-Case Noise Levels in dB(A), inclusive of tonality characteristics (<i>shown in bold italic</i>)											
	S1		S2		S3		S4		S5		S6	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
R1	31.8	24.3	24.8	31.5	26.3	32.0	26.0	26.8	24.7	27.2	22.5	
R2	53.2	32.9	33.1	45.2	31.2	45.1	34.0	31.1	28.9	33.4	30.0	
R3	49.3	32.4	32.7	37.3	30.4	37.7	31.6	31.3	28.8	32.9	30.3	
R4	26.9	21.4	22.0	25.1	21.3	25.6	18.5	20.7	16.9	22.9	16.9	
R5	29.3	26.9	27.4	27.9	25.0	28.6	22.3	24.1	20.6	26.3	20.7	
R6	31.3	29.9	30.3	31.9	30.4	31.4	25.7	27.5	24.1	29.7	24.1	
R7	26.5	27.1	27.6	27.7	26.8	29.2	25.9	30.2	22.8	31.2	23.0	
R8	29.8	31.3	31.7	31.2	30.4	33.1	29.7	38.3	27.9	38.2	28.8	
R9	27.7	29.0	29.4	29.0	28.2	31.0	27.4	36.6	25.4	36.7	27.9	
R10	27.2	28.3	28.7	28.4	27.5	30.4	26.7	37.1	24.6	37.3	28.6	
R11	26.7	30.3	30.8	30.2	29.7	31.1	28.6	36.3	27.0	36.4	30.8	
R12	21.2	20.3	20.7	21.3	20.4	23.7	20.1	29.5	19.2	26.9	23.1	
R13	22.9	23.3	23.9	23.7	22.9	26.4	22.1	30.1	19.2	30.7	22.9	
R14	26.2	26.9	27.4	27.4	26.5	29.1	25.9	30.7	22.7	31.5	23.0	
R15	26.1	26.7	27.3	27.3	26.5	28.9	25.7	30.2	22.5	31.1	22.7	
R16	24.7	25.1	25.6	25.7	24.9	27.4	24.1	28.4	20.8	29.5	21.0	

TABLE 7-2 PREDICTED WORST-CASE NOISE LEVELS dB(A)

Closest Residence	Assigned Noise Levels db(A)	Worst-Case Noise Levels (dBA)				
		DAYTIME				
		Scenario				
		2	3	4	5	6
R1	45	24.3	31.5	32.0	26.8	27.2
R2	46	32.9	45.2	45.1	31.1	33.4
R3	46	32.4	37.3	37.7	31.3	32.9
R4	45	21.4	25.1	25.6	20.7	22.9
R5	45	26.9	27.9	28.6	24.1	26.3
R6	45	29.9	31.9	31.4	27.5	29.7
R7	45	27.1	27.7	29.2	30.2	31.2
R8	45	31.3	31.2	33.1	38.3	38.2
R9	45	29.0	29.0	31.0	36.6	36.7
R10	45	28.3	28.4	30.4	37.1	37.3
R11	45	30.3	30.2	31.1	36.3	36.4
R12	45	20.3	21.3	23.7	29.5	26.9
R13	45	23.3	23.7	26.4	30.1	30.7
R14	45	26.9	27.4	29.1	30.7	31.5
R15	45	26.7	27.3	28.9	30.2	31.1
R16	45	25.1	25.7	27.4	28.4	29.5

TABLE 7-3 COMPLIANCE ASSESSMENT FOR DAYTIME OPERATIONS

Closest Residence	Assigned Noise Levels db(A)	Worst-Case Noise Levels (dBA)				
		NIGHT-TIME				
		Scenario				
		2	3	4	5	6
R1	35	24.8	26.3	26.0	24.7	22.5
R2	36	33.1	31.2	34.0	28.9	30.0
R3	36	32.7	30.4	31.6	28.8	30.3
R4	35	22.0	21.3	18.5	16.9	16.9
R5	35	27.4	25.0	22.3	20.6	20.7
R6	35	30.3	30.4	25.7	24.1	24.1
R7	35	27.6	26.8	25.9	22.8	23.0
R8	35	31.7	30.4	29.7	27.9	28.8
R9	35	29.4	28.2	27.4	25.4	27.9
R10	35	28.7	27.5	26.7	24.6	28.6
R11	35	30.8	29.7	28.6	27.0	30.8
R12	35	20.7	20.4	20.1	19.2	23.1
R13	35	23.9	22.9	22.1	19.2	22.9
R14	35	27.4	26.5	25.9	22.7	23.0
R15	35	27.3	26.5	25.7	22.5	22.7
R16	35	25.6	24.9	24.1	20.8	21.0

TABLE 7-4 COMPLIANCE ASSESSMENT FOR NIGHT-TIME OPERATIONS

Visual representation of the data presented in Table 7-2 is shown in Figures 7-1 to 7-11.

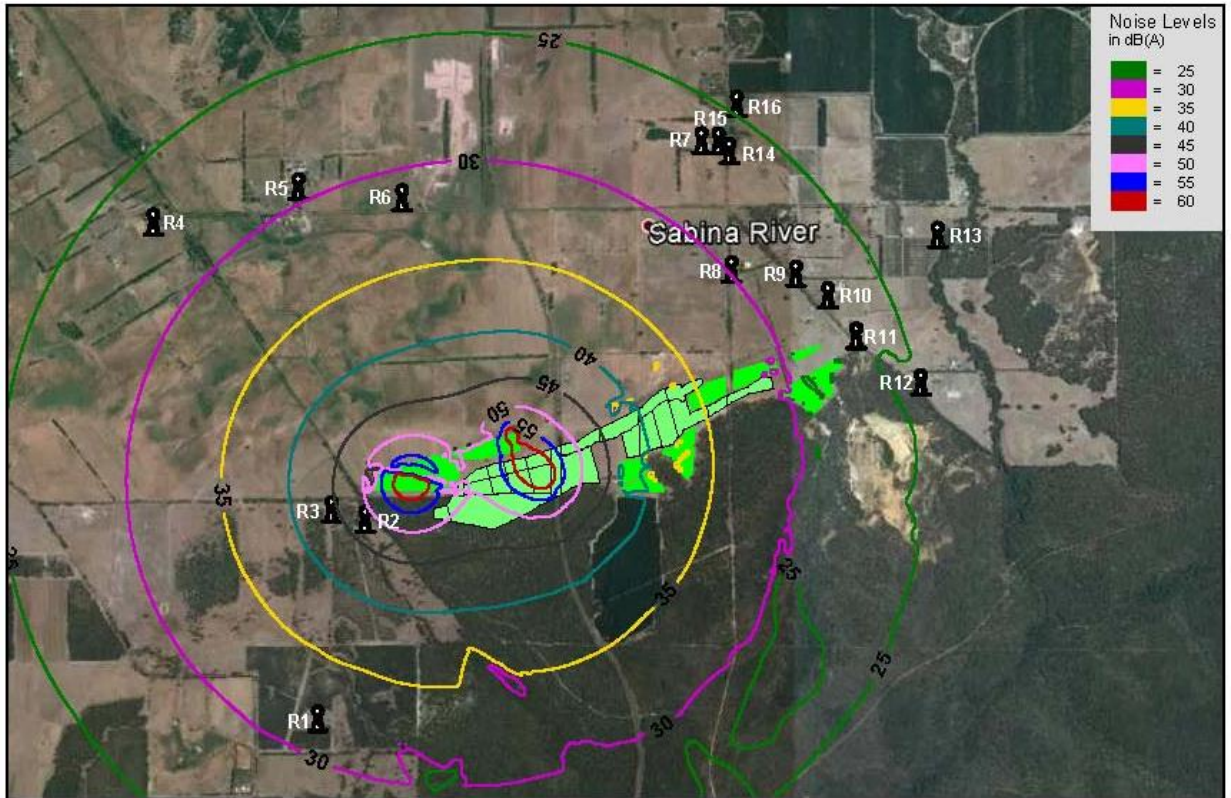


FIGURE 7-1 WORST CASE NOISE LEVEL CONTOURS FOR SCENARIO 1 – DAY-TIME - CONSTRUCTION

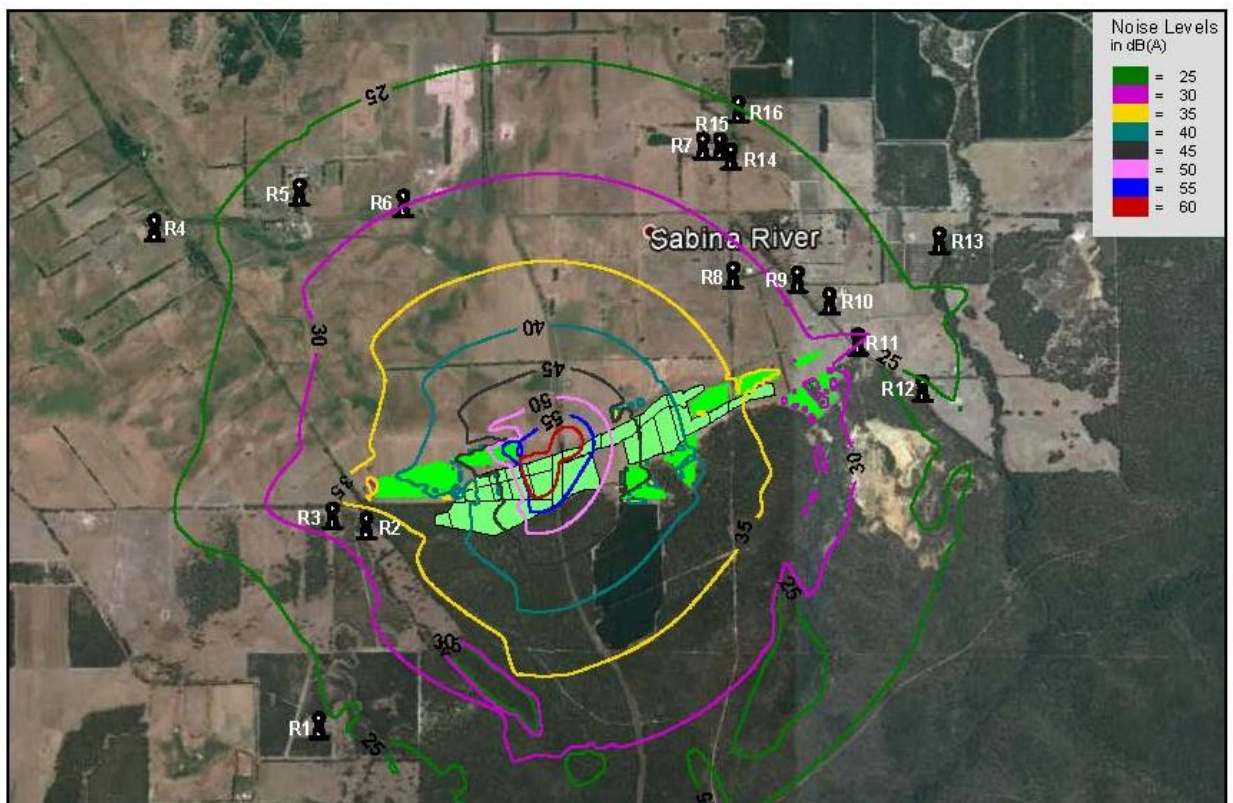


FIGURE 7-2 WORST CASE NOISE LEVEL CONTOURS FOR SCENARIO 2 – DAY-TIME

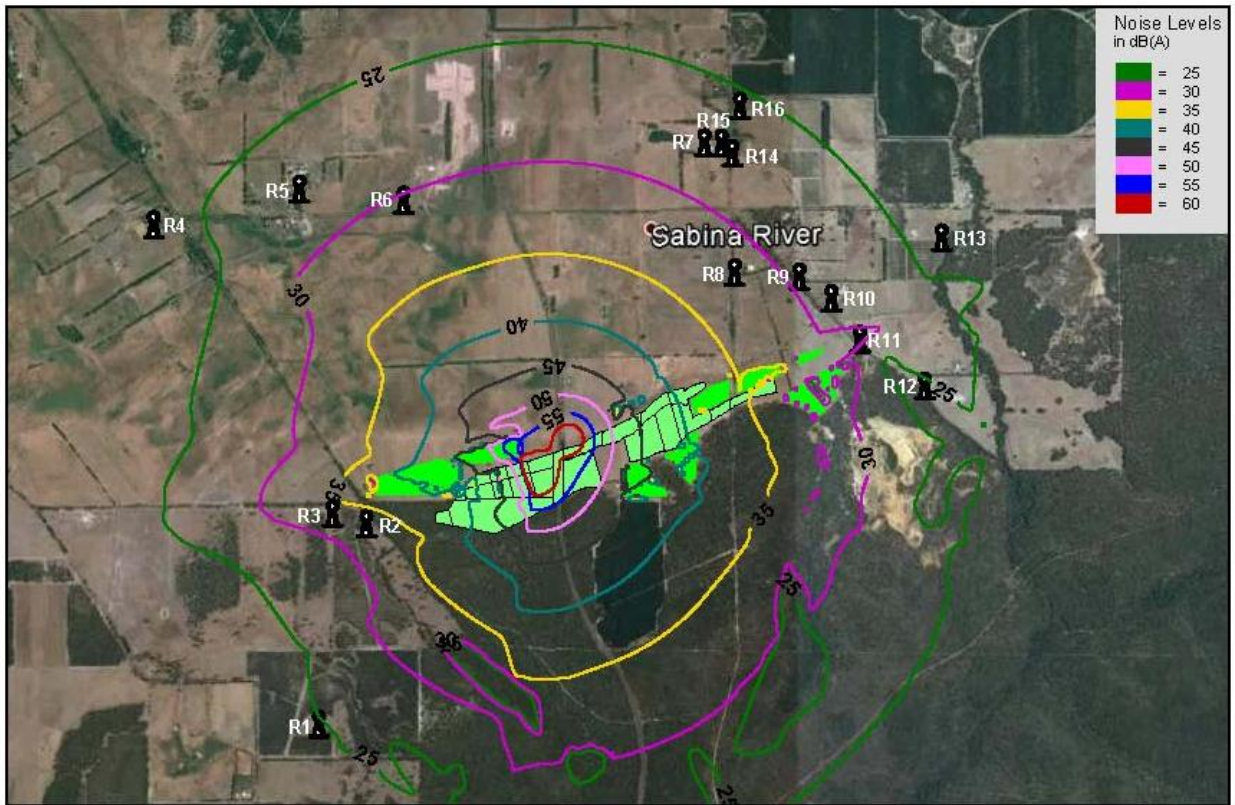


FIGURE 7-3 WORST CASE NOISE LEVEL CONTOURS FOR SCENARIO 2 – NIGHT-TIME

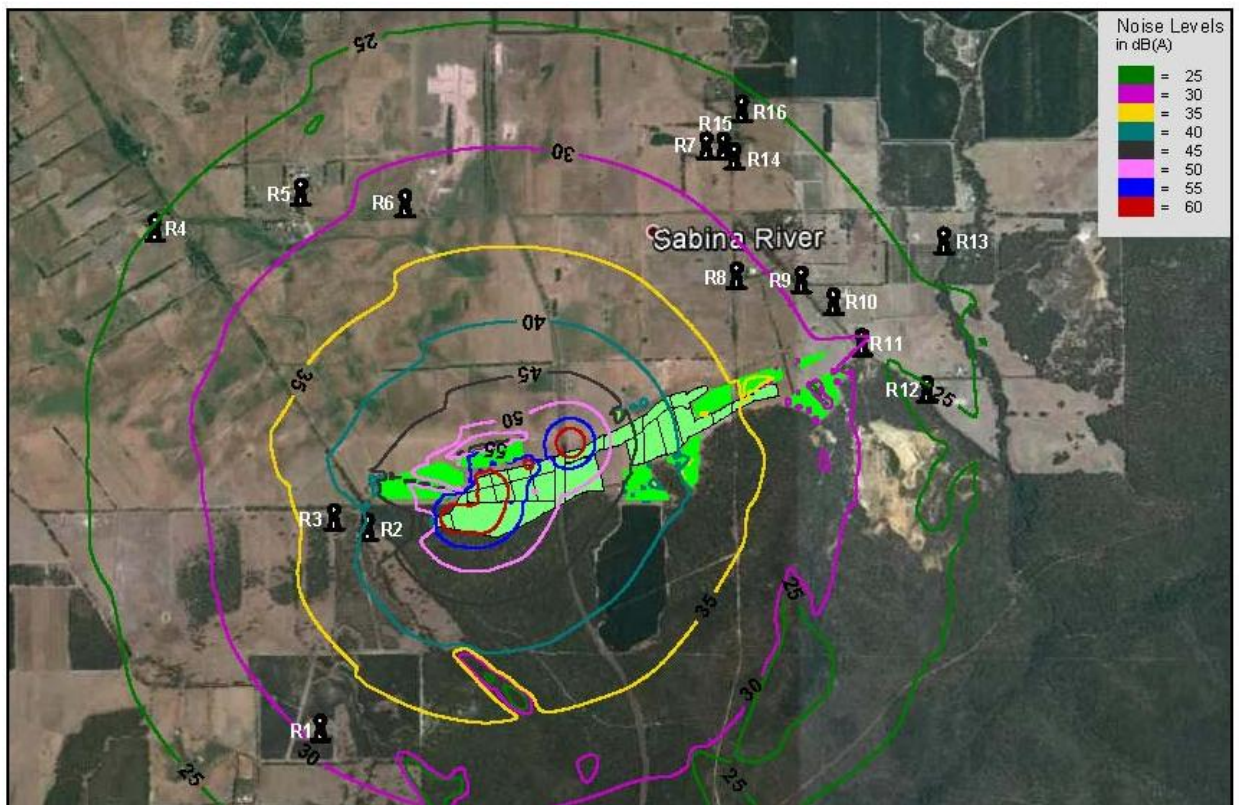


FIGURE 7-4 WORST CASE NOISE LEVEL CONTOURS FOR SCENARIO 3 – DAY-TIME

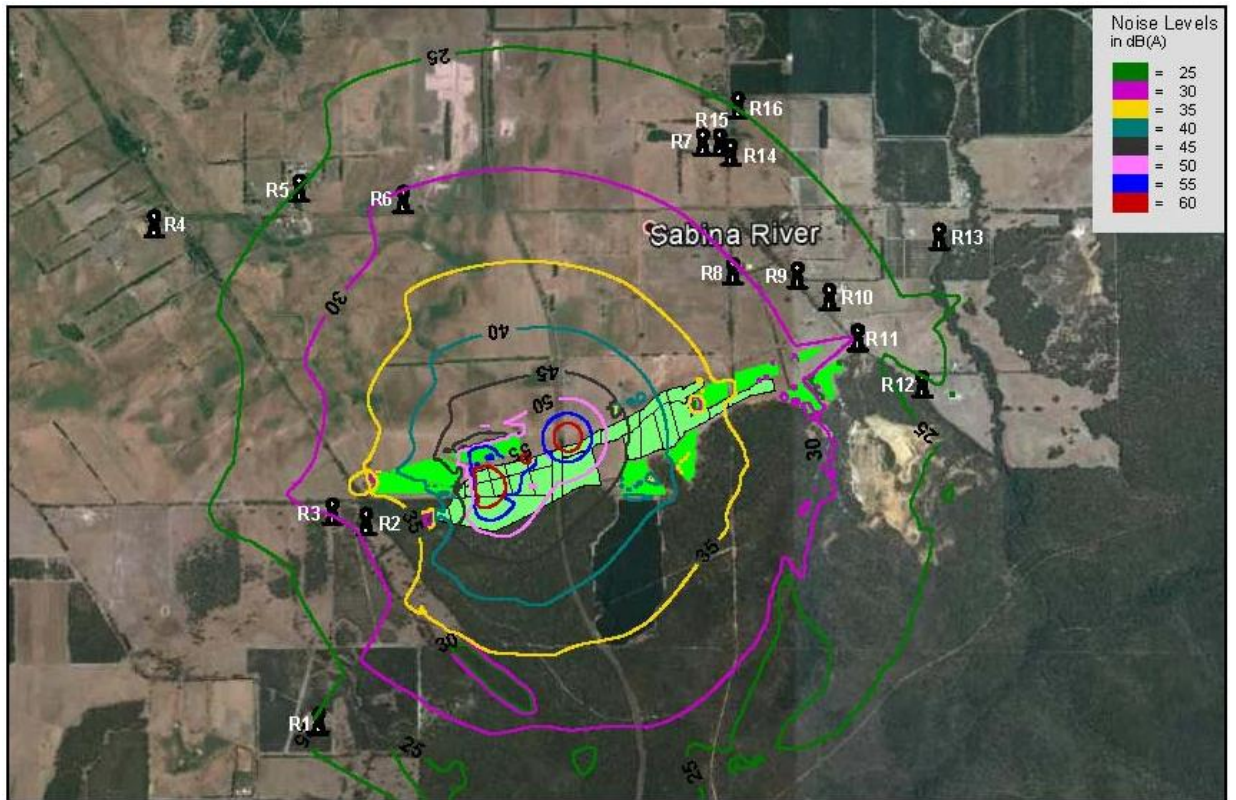


FIGURE 7-5 WORST CASE NOISE LEVEL CONTOURS FOR SCENARIO 3 – NIGHT-TIME

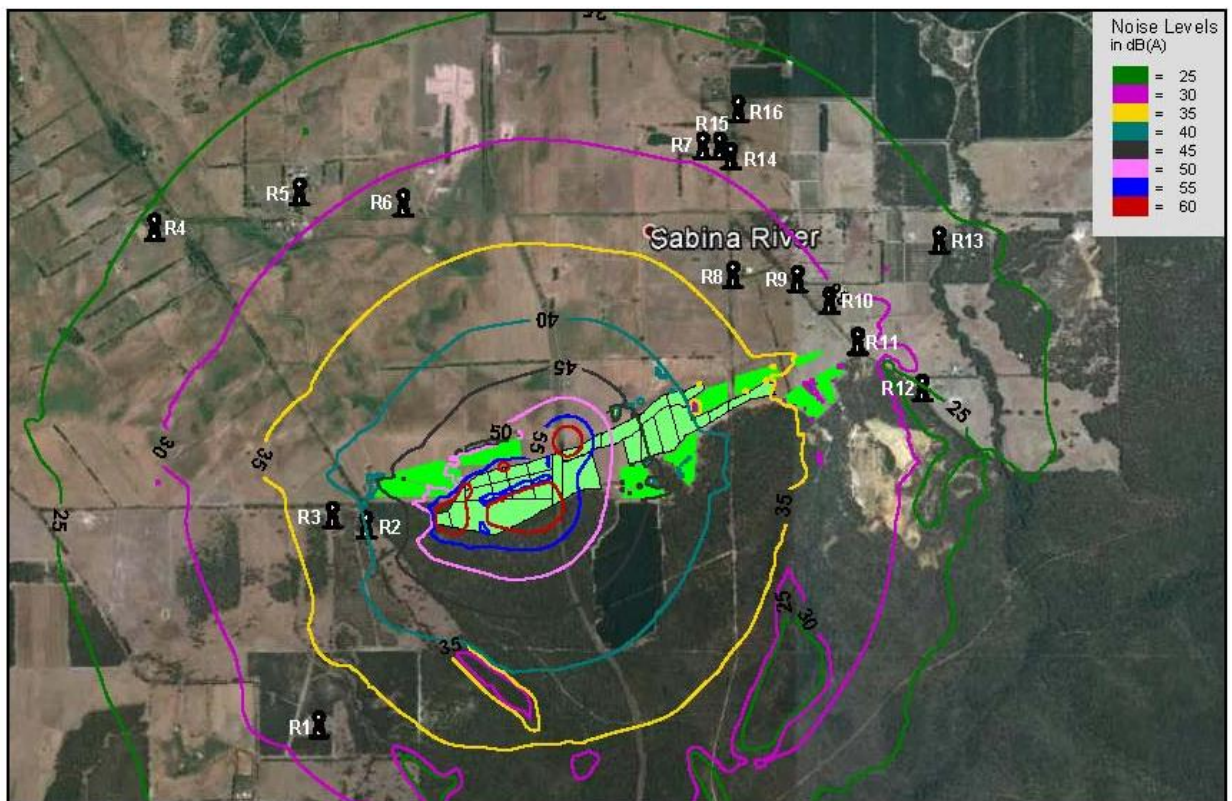


FIGURE 7-6 WORST CASE NOISE LEVEL CONTOURS FOR SCENARIO 4 – DAY-TIME

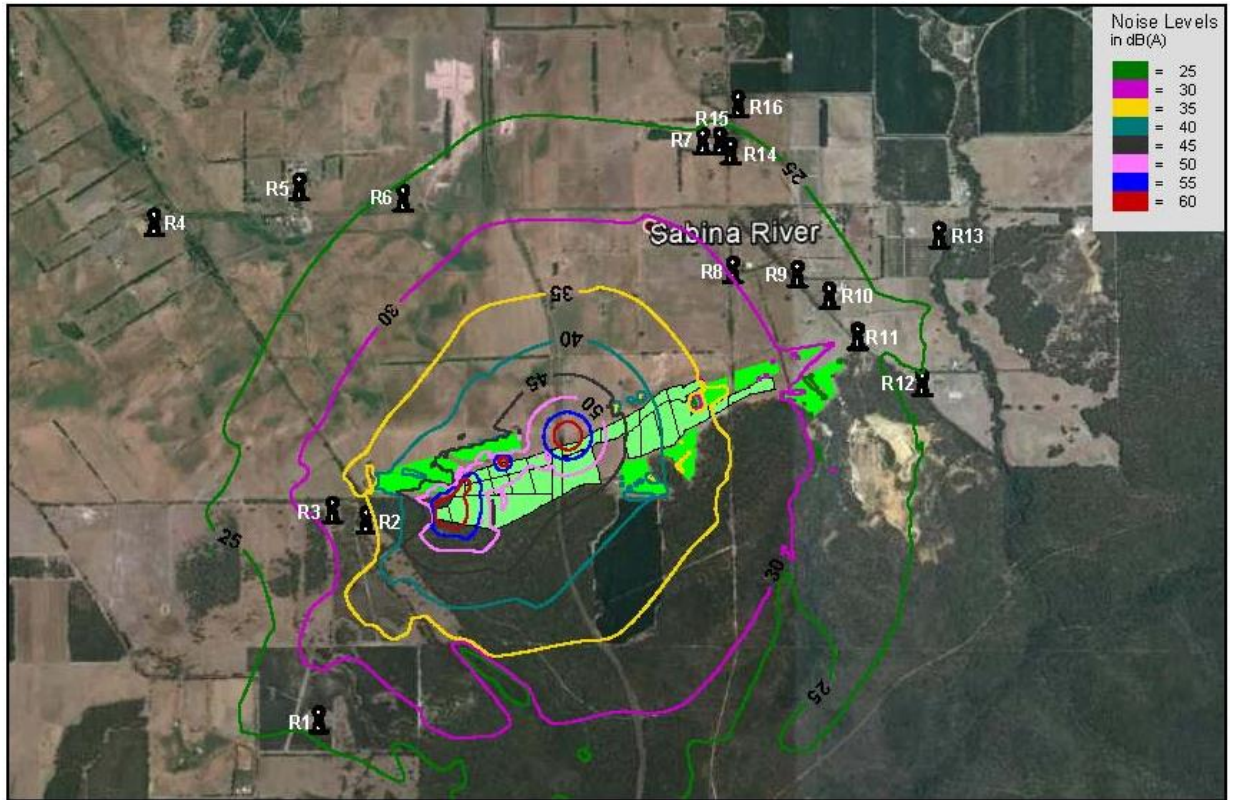


FIGURE 7-7 WORST CASE NOISE LEVEL CONTOURS FOR SCENARIO 4 – NIGHT-TIME

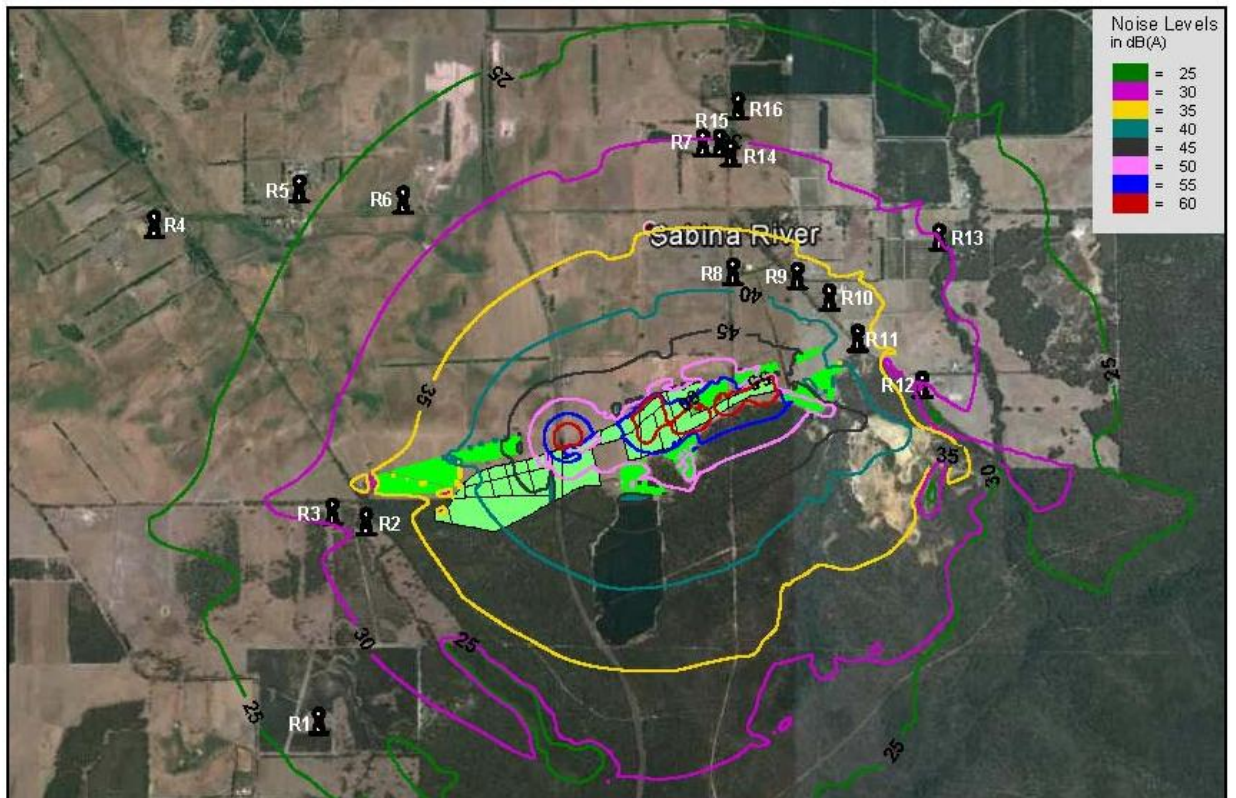


FIGURE 7-8 WORST CASE NOISE LEVEL CONTOURS FOR SCENARIO 5 – DAY-TIME

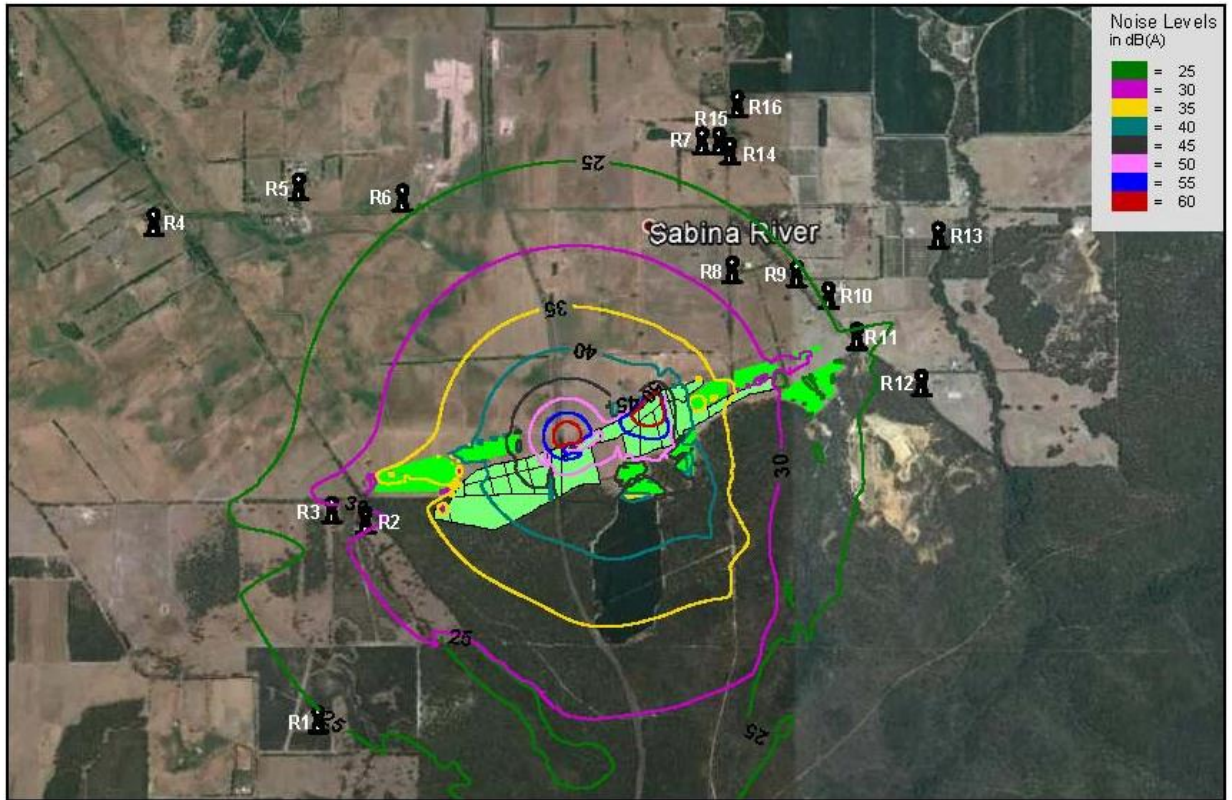


FIGURE 7-9 WORST CASE NOISE LEVEL CONTOURS FOR SCENARIO 5 – NIGHT-TIME

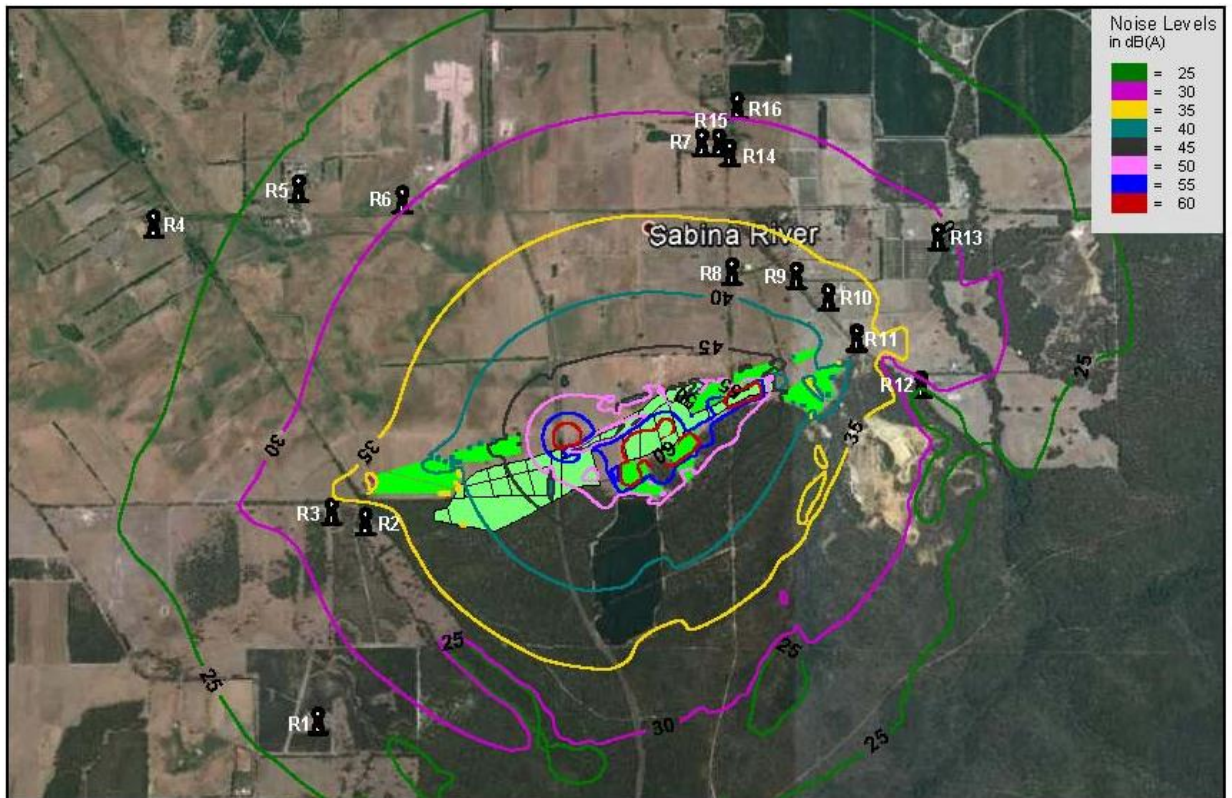


FIGURE 7-10 WORST CASE NOISE LEVEL CONTOURS FOR SCENARIO 6 – DAY-TIME

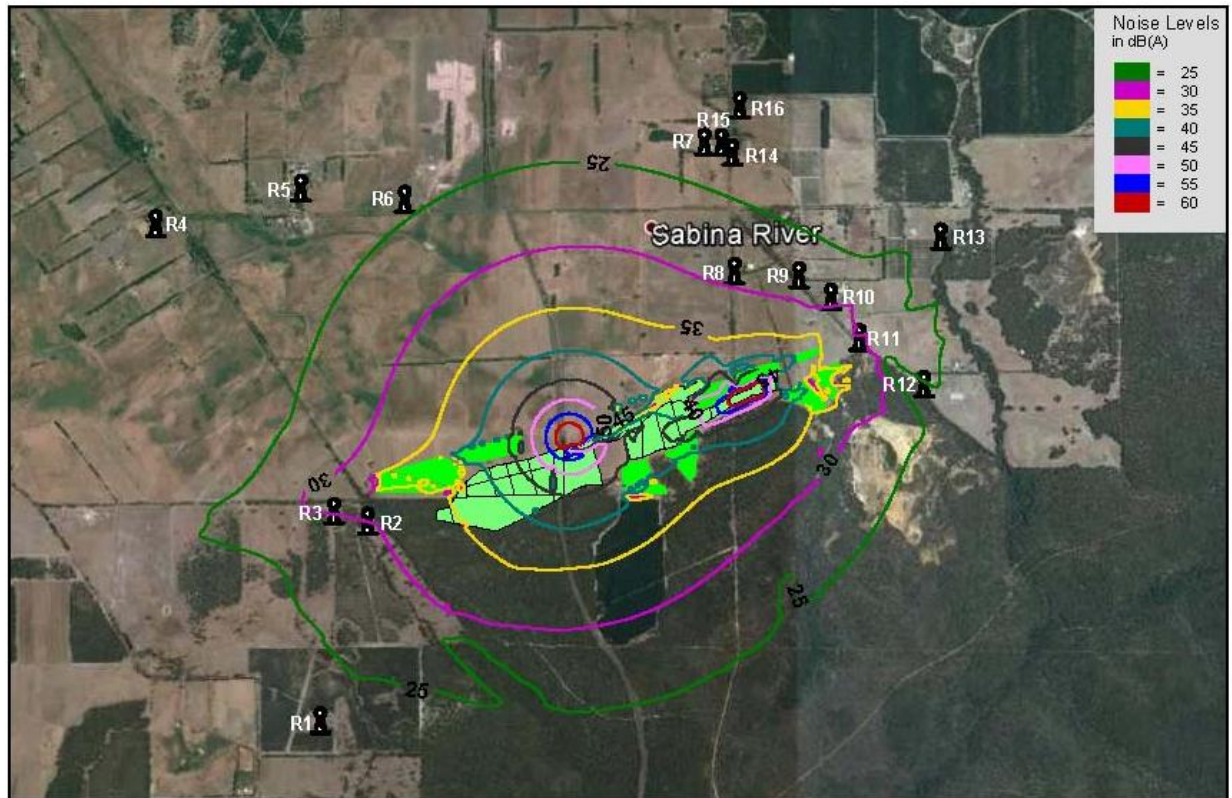


FIGURE 7-11 WORST CASE NOISE LEVEL CONTOURS FOR SCENARIO 6 – NIGHT-TIME

7.2.3 Discussion / Commentary: Noise Emissions

Doral is aware that one of the primary concerns of the wider community is the impact the proposal will have on their amenity, specifically how noise generated from the proposal will impact their everyday lives.

Doral acknowledge that the mining operation will, in the short-term, alter the existing amenity of the surrounding environment, introducing new noise emissions into a rural community. Chart 7-1 (below) shows a comparison of noise levels to provide an indication as to what level of noise may be expected as a result of the proposal. For example, the maximum permitted night-time level for the proposal as specified in the EP(Noise) Regulations 1997 is 35dB (+ influencing factor). This is comparable to noise levels experienced in a quiet suburban area at night.

During the construction phase of the project, the worst-case daytime noise level predicted to be experienced by adjacent residences is 53.2 dB(A) (at residence R2). During the mining phase, the worst-case daytime noise level predicted to be experienced by adjacent residences is 45.2 dB(A) at residence R2, and for worst-case night-time levels, 34.0 dB(A), again at residence R2.

Doral are experienced in working in close proximity to residences at its current operation in Dardanup/Burekup and understand the concerns of the community. As such, Doral are committed to operating such that the impact of the proposal on the community is minimised as far as is practicable. Doral will liaise with surrounding landholders to ensure that they are aware of Doral's operations and provide them lines of communication to mine management should they wish to raise any concerns about the operation.

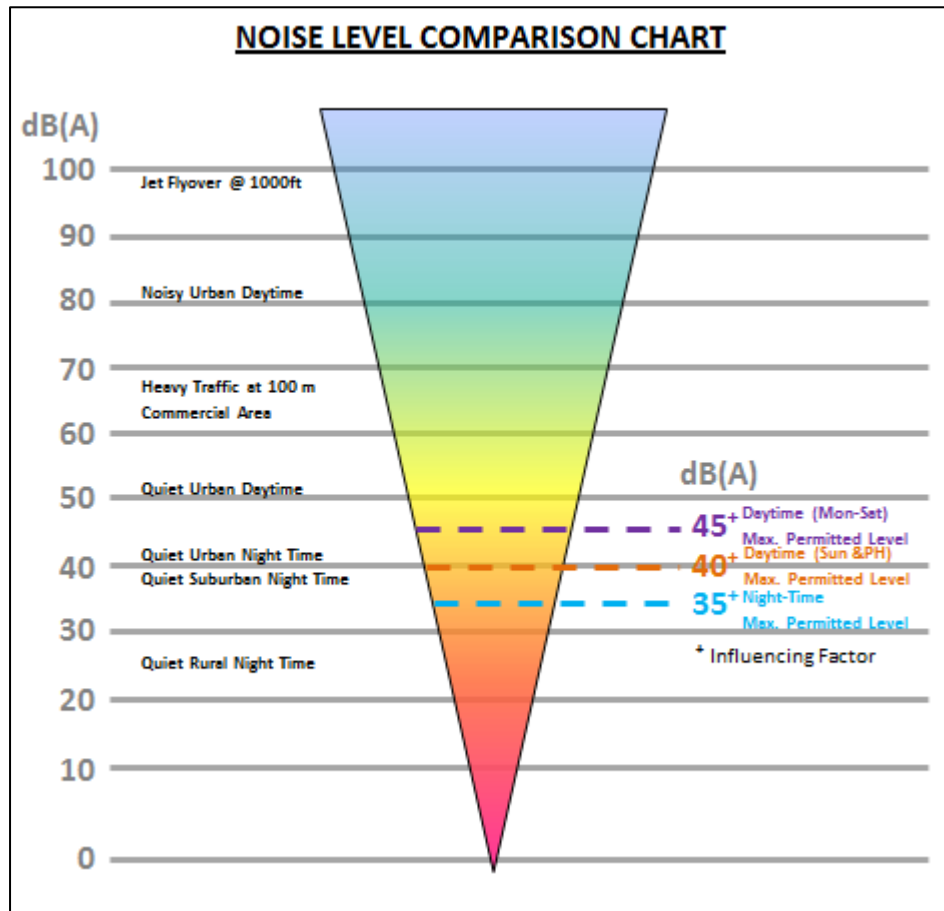


CHART 7-1 COMPARATIVE NOISE LEVELS

7.2.4 Summary of Management Commitments

Remodelling of noise scenarios incorporating changes to the mining methodology and inclusion of additional noise bunding does not predict any non-compliance with the EP(Noise) Regulations 1997, however, to ensure that the proposal does result in the lowest noise emissions practicable, Doral will:

- Develop and implement a Noise Management Plan in accordance with DER requirements;
- Install a noise monitoring device with real-time data transmission at the furthest extent of the operation, closest to noise sensitive receptors (ie. establish one at the western extent when mining west of Sues Road to monitor noise levels for R2 and R3 and then relocating the device to the eastern extent of the operation when mining east of Sues Road to monitor noise levels for R10 and R11)
- Seek to establish amenity agreements with adjacent landholders;
- Relocate equipment should noise monitoring indicate noise levels exceed maximum permitted levels;
- Temporarily shut-down operations if equipment relocation fails to reduce levels to below maximum permitted levels.

The Noise Management Plan will include the following provisions:

- Constructing all noise bunds/walls as outlined in the revised noise assessment (Appendix 9);
- Using the quietest equipment reasonably available;
- Installing silencers on equipment to reduce exhaust noise of dozers and front-end loaders;

- Ensuring that no overburden fleet or ore fleet will operate simultaneously in the same mining block at any one time;
- Restricting the operation of machinery relative to worst case weather conditions on Sundays and Public Holidays;
- Restricting the operation of ancillary machinery (water cart and grader) to only one operation at a time and operation during day-time hours only;
- Establishing preventative maintenance schedules for all vehicles, fixed plant and mobile equipment;
- Educating employees and contractors on the importance and requirements for noise management prior to commencing work on the mine, as part of the induction process;
- Maintaining ongoing, effective dialogue with nearby residents to ensure noise impacts are communicated to Doral to allow for rapid resolution;
- Continue to implement an effective public comment and complaint communication system to ensure all concerns are received, recorded and acted upon.

Through the implementation of the Noise Management Plan, Doral is confident that the EPA objective, to protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring the noise levels meet statutory requirements and acceptable standards.

7.3 DUST

7.3.1 Review of Data Presented in Public Environmental Review

Dry mining has the potential to generate dust from the stripping of topsoil and overburden, by vehicular movement and surface lift-off from exposed surfaces (eg. stockpiles, mine pits) and rehabilitation activities prior to the re-establishment of vegetation during dry and windy ambient conditions.

Doral acknowledges that dust generation can result in adverse impacts on surrounding vegetation and create nuisance to landowners in the vicinity of the mine disturbance areas.

Doral are experienced in the management of dust in close proximity to residences, with over 12 years' experience dry mining at its Dardanup operation.

Doral implement a range of control techniques to eliminate, minimise and control the generation of dust, including, but not limited to:

- Educating employees and contractors about the importance of minimising dust generation;
- Restrictions on the area open at any one time to ensure safe and efficient operations;
- Retention and removal of pasture and understorey species together with the topsoil;
- Scheduling topsoil stripping activities to avoid high wind conditions and suspending topsoil stripping activities in high wind conditions;
- Watering all high traffic and haulage areas on a routine bases to reduce the dust generation potential from internal access roads;
- Spreading stockpiles, noise control bunds and pond embankments with fine clay solution to bind surface particles, reducing the dust generating potential of the surfaces;
- Minimising the number and size of stockpiles;

- Encouraging vegetation cover on stockpiles to bind the particles on the surface, reducing the dust generating potential of the surface;
- Management and monitoring of ore loading and unloading operations to minimise dust generation;
- Spraying HMC stockpiles with water as required to prevent dust generation;
- Co-disposal of sand tails and clay tails in to pit backfill areas, reducing the potential for dust generation;
- Employing, where necessary, other dust suppression measures as required (emulsion sprays, wind barriers etc.); and
- Employing routine maintenance and housekeeping practices to ensure water materials in and around the mine voids and infrastructure do not accumulate and lead to the generation of unacceptable airborne particles.

7.3.2 Supplementary Information not Included in the PER Document

No additional information to the PER is presented.

7.3.3 Discussion / Commentary: Dust

Implementation of the dust control measures outlined in the PER (and summarised above in Section 7.3.1) will minimise dust generation. As part of the DER Works Approval application, Doral will submit a Dust Management Plan which will incorporate details of the proposed dust monitoring program for the site. As part of its Works Approval and Operating Licence, Doral will be required to report on dust management on the site, along with any non-compliance with licence conditions, actions taken in the event of a non-compliance and measures implemented to ensure the non-compliance is not repeated. In its application for a Works Approval, Doral will provide details of the dust monitoring program to be implemented on the site.

Doral is confident that with the above measures in place, the EPA objective to ensure that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses can be achieved.

7.3.4 Summary of Management Commitments

Doral is committed to liaising with neighbours located within close proximity to the proposal to ensure that dust related concerns are identified and monitored, and where required, steps implemented to mitigate/address adverse impacts arising from dust generated from the mine site.

To minimise and mitigate the impacts the proposal will have on dust, Doral will develop and implement a Dust Management Plan.

Through the implementation of the Dust Management Plan, Doral is confident that the EPA objective, to ensure that dust emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards, can be achieved.

7.4 VISUAL AMENITY

7.4.1 Review of Data Presented in Public Environmental Review

The visual impact of the proposal was not identified in the Environmental Scoping Document as a factor to be considered when developing the Public Environmental Review document. As such, the

PER did not contain any information related to the impact the proposal would have on the visual amenity of the areas surrounding the proposal.

7.4.2 Supplementary Information not Included in the PER Document

In view of the comments received from the public review, Doral engaged a landscape architect to undertake a visual impact assessment of the proposal.

A Visual Impact Assessment (Woodlands, 2015) is provided as Appendix 10.

7.4.3 Discussion / Commentary: Visual Amenity

It is acknowledged that several residences are likely to be able to see the mine activities and that the mine will be visible from Sues Road, Yoongarillup Road, Goulden Road and Piggott Road. Doral will employ the following management practices to minimise the visual impact of the proposed mine:

- Earth bund to be constructed along the northern perimeter of the site, to a height of 3 metres;
- Minimising and stabilising the area of disturbance where possible;
- Maintaining the site in a neat and tidy condition;
- Keeping plant and equipment in good, presentable order;
- Confining all disused equipment to selected areas;
- Implementing dust suppression techniques and management practices;
- Implementing measures to minimise light overspill and light glow; and
- Undertaking progressive rehabilitation of the site.

Implementation of the above strategies and practices will ensure that the EPA objective, to ensure that aesthetic values are considered and measures adopted to reduce visual impact on the landscape to as low as reasonably practicable, is achieved.

7.4.4 Discussion / Commentary: Artificial Lighting

EPA objective is to avoid or manage potential impacts from light overspill and comply with acceptable standards.

Australian Standard AS 4282-1997 Control of the Obtrusive Effects of Outdoor lighting outlines a range of management measure that can be utilised to assist in reducing the amount of diffusion and spill lighting created from proposals.

Processing operations at the Yoongarillup Mineral Sands Project will be undertaken on a 24 hour basis. Artificial lighting is required to ensure that the safety and security of operations is not compromised. However, Doral acknowledge that lighting of night operations can have negative external effects on nearby residents and traffic.

Potential impacts from artificial lighting can arise from obtrusive light spill, by general luminance diffusion, reflection from existing surfaces or through atmospheric scattering. These impacts can directly impact neighbouring residences, have the potential to create safety hazards on adjacent roads and reduce the overall amenity of the night sky.

The majority of earthmoving activities will generally be restricted to daylight hours with, in general, only a front end loader operating 24 hours per day taking ore to the in-pit hopper. This results in the impact of artificial light being limited to mobile equipment and processing activities.

The in-pit hopper will be located below the natural surface level which will minimise nuisance light overspill from the mining area. Light towers will be erected as required to ensure safe operations

at the site, however, lights from these towers will be aligned to minimise the impact on neighbours, general public and forested areas.

7.4.5 Summary of Management Commitments

To minimise and mitigate the impacts the proposal will have on visual amenity, Doral will develop and implement the following:

- Revegetation and Rehabilitation Management Plan
- Visual Amenity Management Plan

The Australian Standard AS 4282-1997 Control of Obtrusive Effects of Outdoor Lighting outlines a range of management measures that can be utilised to assist in reducing the amount of diffusion and spill lighting created from the proposal. Doral will utilise this standard when developing its lighting strategy for the site. Through compliance with this standard, Doral believes that the EPA objective, to avoid or manage potential impacts from light overspill, can be achieved.

7.5 PUBLIC REVIEW - RESPONSES RECEIVED – AMENITY

ID	Received From	Comment	Doral's Response
AMENITY			
General			
184.	Individual Submission	The EPA Assessment of Environmental Factors - Separation Distances between Industrial and Sensitive Land Uses proposes several different separation distances that should be applied to mineral sands related projects. The PER does not appear to acknowledge the EPA document.	<p>This statement refers to EPA Guidance Statement No. 3 - Separation Distances between Industrial and Sensitive Land. This purpose of this document is to “provide advice on generic separation distances between specific industry and sensitive land uses to avoid or minimise the potential for land use conflict. The distances outlined in Appendix 1 of EPA Guidance Statement No. 3 are not intended to be absolute separation distances, rather they are a default distance for the purposes of:</p> <ul style="list-style-type: none"> •identifying the need for specific separation distance or buffer definition studies; and •providing general guidance on separation distances in the absence of site specific technical studies. <p>Appendix A of Guidance Statement No. 3 does not include a category which accurately fits this proposal. The Guidance Statement includes three categories under “Mineral Sands”. They are “Mineral Sands – Dry Processing Only” and “Mineral Sands –secondary treatment plant” which both have a separation distance of 1,000m to 2,000m and “Mineral Sands - Synthetic Rutile Plant”, with a separation distance of 3,000m to 5,000m. All of these categories relate to processing activities which will not be conducted at the proposed mine site. Mining and wet concentration are the only activities which will be conducted at the site. The activities to be conducted more closely relate to “sand and limestone extraction”, as there will be no grinding or milling works conducted. The recommended separation distance for “sand and limestone extraction” is 300 to 500m. Doral consider that this is the most appropriate separation distance to apply to the proposed operation, should these generic buffer distances be applied, however, as stated previously, the generic buffer distances are used as a guide in the absence of site specific technical studies.</p> <p>Doral has undertaken site specific technical studies, the data of which has been used in the compilation of the PER and in the provision of responses to submissions received during the public review.</p> <p>The revised Noise Assessment (Appendix 9) shows compliance with the EP (Noise) Regulations 1997. Doral has committed to implementing dust management control to ensure dust does not impact on the amenity of surrounding landholders.</p>

ID	Received From	Comment	Doral's Response
AMENITY			
185.	Individual Submission	All adjoining residents (neighbours) of the minesite must have a 24/7 line of contact with the Mine Superintendent	Doral will develop a Communication Management Plan that will outline communication paths open to the public should they need to contact staff at Doral operations. At Doral's current operation (Dardanup/Burekup), local landholders have the mobile phone number of the Mine Manager and other key personnel as required. On weekends and out of hours, operational crew leaders are in control of the site mobile phone and local landholders, upon request, can obtain a copy of this number. A similar arrangement will be established at the Yoongarillup operations.
186.	Individual Submission	The submitter contends that the potential deleterious impact of noise and light from the proposed 24/7 mining project is an intolerable scenario for residents that abut the mine whilst placing their physical and emotional health at substantive risk.	Doral has committed to ensuring noise emissions meet the requirements of the WA State Government Environmental Protection (Noise) Regulations – 1997. Doral has also committed to ensuring that light emissions meet the requirements of Australian Standard 4282 – Control of the obtrusive effects of outdoor lighting. Doral will continue to liaise with adjacent landholders to ensure the impacts to them from the proposal are minimised as far as is practicable.

ID	Received From	Comment	Doral's Response
AMENITY			
Visual Amenity			
187.	Department of Parks and Wildlife	In addition to impacts on biodiversity values, the proposed mine will significantly impact the scenic values of this section of the Whicher Scarp. The visual impacts of this proposal have not been mentioned within the PER; the clearing, mine void and years of regenerating rehabilitation on an elevated scarp adjacent to cleared paddocks and a major transport corridor will be clearly visible for a considerable distance, negatively impacting the scenic value of the scarp landform and the adjoining national park when viewed from the north. Both the potential impacts on flora and fauna diversity and the maintenance of scenic value were concerns that prompted the original CTRC reservation recommendation (CTRC 1974).	<p>Doral has engaged a landscape architect to undertake a Visual Impact Assessment of the proposal (Appendix 10). A number of visual representations of the proposal have been developed. A view from Sues Road, around the location of the cattle overpass, facing south is presented. This provides an indication as to the impact of the mining operations on the surrounding vista.</p> <p>EP Guidance Statement 6 – Rehabilitation of Terrestrial Ecosystems states that one consequence of failure to rehabilitate natural ecosystems to appropriate standards can include loss of visual amenity. Recovering visual amenity is normally a key objective of rehabilitation. Permanent changes to visual amenity are to be considered at the EIA stage for major projects. As Doral will be undertaking a rehabilitation program to revegetate the area proposed to be cleared within State Forest No. 33, we do not believe that the proposal will result in a significant permanent change to the visual amenity of the area. Doral acknowledge that there will be a time lag between the establishment of vegetation and the provision of vegetation cover equivalent to the vegetation cleared, however, the area to be cleared has been cleared previously and over time, has returned to provide a good visual amenity.</p> <p>Further discussion on the impact on visual amenity from the proposal is presented in Section 7.4.3 of this document.</p>
188.	Individual Submission	The overview does not provide a visual representation of the mine pits, associated infrastructure or SEP's preventing the local community and general public from understanding what the project may look like when in operation. Photographs of the current operation should have been included to provide perspective.	
189.	Individual Submission	The submitter contends that the proposed mine would affect the visual amenity of the region including of the wider Geographe bay.	

ID	Received From	Comment	Doral's Response
AMENITY			
190.	Individual Submission	Loss of Clarity of Night Sky: One of the beauties of our property is the ability to gaze up to the open sky at night-time and marvel at the starscape. The light emissions from the mine site will spill into the sky and affect this clarity.	<p>Doral acknowledges the potential for light from the operation to impact on nearby residents, and outlines the management practices that will be undertaken to minimise impact.</p> <p>This includes:</p> <ul style="list-style-type: none"> • Restricting the majority of earthmoving activities to between 7 am and 7 pm; • locating the in-pit hopper and screen plant below the natural ground surface level and behind constructed bunds; • erection of light towers to enable redirection of lights in response to light issues; and • use of Australian Standard AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting <p>Further details on the potential impacts of lighting from the operation on visual amenity are presented in Section 7.4.4 of this document.</p>
191.	Individual Submission	Loss of Sleep: Extra light activity at night may also upset the sleeping patterns of us, our stock and our guinea fowls.	
192.	Individual Submission	No reference to the extent of artificial lighting related to the Project is provided. Presumably, there will be artificial lighting after day light hours.	
193.	Individual Submission	The submitter has stated that construction, mining and rehabilitation operations will be visible from their residences and artificial lighting at the site will have a direct impact on the ambient light at their Lot. The submitter believes that consideration should be given to minimising the amount and duration of artificial lighting. They also believe that there should be an examination of the impact on ambient lighting at their residence.	
194.	Individual Submission	Light overspill has the potential to affect the submitter. The submitter notes that the existing mines at the corner of Sue's Road and Bussell Highway are unshielded and there are excess lights. The submitter believes these mines are run by Doral.	
195.	Individual Submission	The submitter contends that residents live in this area because of the peace and quiet and clear night sky.	
196.	Individual Submission	The submitter is concerned that the lights used during the night-time operations will shine into their residences, disturbing their amenity. If the suggested proposals to reduce noise are adopted, the lights should not be a problem. In any event, we would ask that Doral be required to ensure that no light affects residences.	

ID	Received From	Comment	Doral's Response
AMENITY			
Dust			
197.	Individual Submission	Doral has used Busselton Airport as the basis of their wind modelling. As any local will testify the winds adjacent to the Whicher Scarp (the proposed mine area) are totally different to those 5km away, as we can experience 20/25 knot winds from the SE/SW while the Airport has no wind. The winds from any direction, from E around to S & W, funnel down the two adjacent valleys to curve around a SE to SW direction. The result is our property experiences SE, S, SW & W winds from August until early December. In the table 10-1 the indication is we are affected in Aug & Sept.	<p>Busselton Airport data was used as it was the site that provided the closest Weather and Climate Data publically available from the Bureau of Meteorology, with the longest history of records.</p> <p>To provide real-time, local data, Doral will establish an onsite weather station that will allow for monitoring of rainfall and wind strength/direction data at the proposed site.</p> <p>Doral are familiar with working on the slopes of the Whicher Scarp, and understand that wind conditions can vary significantly between the scarp and coastal areas.</p>
198.	Individual Submission	A further concern the submitter has is the impact of dust blown from the NW to NE quadrant and its coating effect on native plants. There is no protection provided for vegetation to the south of block 24 & 25. We suggest that a provision be made to ensure dust is not able to invade the forest area.	Doral has committed to developing and implementing a dust management plan for the proposal. Doral will also be undertaking plant health monitoring of the native vegetation areas within the State Forest sub-area. Should any deterioration in plant health in the State Forest sub-area be attributed to the deposition of dust, Doral will undertake a review of the Dust Management Plan and, where required, implement additional measures to ensure impacts on the State Forest sub-area are minimised.
199.	Individual Submission	The PER does not address dust impact on residents. How will this be monitored to ensure compliance? There is no guarantee that we will not be impacted by dust nuisance and exposure to inhaled thorium is a risk from mineral sands dust. The local government fails to enforce dust management compliance with shallow sand pits in our locality, so we have no comfort that a mineral sands mine would be any better.	<p>Doral has committed to the development and implementation of a Dust Management Plan.</p> <p>Compliance with licencing conditions for this proposal is not the responsibility of the local government. Doral is required to obtain a Works Approval and Operating Licence from the Department of Environment Regulation for this proposal. Management of air quality will be incorporated into the approval and licence for the site and will be required to be monitored and reported to comply with licencing conditions.</p> <p>Doral is required to develop and implement a Radiation Management Plan to the satisfaction of the DMP. Increased thorium levels as a result of the proposal are not predicted and Doral has assessed the risk of exposure to inhaled thorium as a result of dust borne particles leaving the project boundary as low. Further discussion on radiological processes is provided in Section 4.4.</p>

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200.	Individual Submission	The adjacent Council quarry generates dust and has not been considered in terms of cumulative impacts.	Doral contacted the City of Busselton to request information about the operation of the quarry located to the south east of the proposal. The City of Busselton has advised that they do not have any records of dust complaints being received with regard to the operation of the quarry. Doral were advised that the quarry operates for 2-3 days / fortnight. The City of Busselton has a local law "Dust and Building Waste Control Local Law 2010". It is assumed by Doral that the City of Busselton, in the operation of their gravel pit, would comply with the requirements of this law.
201.	Individual Submission	The status quo is there is little or no soil disturbance practiced during the dry months; any crop preparation is done after first rain so dust is not a problem for residents.	Doral will develop and implement a Dust Management Plan for the proposal. Doral will implement the dust controls outlined Section 7.3.4 to ensure that the proposal does not generate dust that has adverse impacts on the amenity of the areas surrounding the proposal.
202.	Individual Submission	Doral's proposal requires a massive amount of soil disturbance and long term exposure and as wind is the major propagator of dust pollution our concerns are with this factor.	
203.	Individual Submission	The submitter has stated that their residence is very close to the Proposal and will be the residence most susceptible to dust carried on prevailing winds during 9 of the 12 months of the year. The submitter has advised that they suffer from hayfever which is exacerbated by dust. Consequently, dust raises health (as well as amenity) concerns for the submitter.	Doral will develop and implement a Dust Management Plan for the proposal. Doral will implement the dust controls outlined Section 7.3.4 to ensure that the proposal does not generate dust that has adverse impacts on the amenity of the areas surrounding the proposal. Through the implementation of the Dust Management Plan, Doral do not anticipate that any adverse impacts on adjacent properties will arise.
204.	Individual Submission	The submitter is of the view that dust management is very difficult given the high winds in the area and the location of the mine at the base of the scarp. The submitter's view is that dust affects people's health.	Doral will, however, consult with landholders to ensure they are provided with a mechanism to raise concerns over dust issues. This consultation mechanism will be documented in the Dust Management Plan.

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205.	Individual Submission	<p>The dust assessment is qualitative at best and the commitment to management is unclear. It does not address the following factors:</p> <ul style="list-style-type: none"> - Dust emissions from all processes of the proposal. At present the assessment only compares distance from mine pit to houses. - TSP levels at property boundaries - PM10 levels at property boundaries - Impact on sensitive receptors such as asthma sufferers. - Impact on yield of local grass and horticultural crops. - Cumulative impact of proposal and other quarries in locality. <p>A full dust emission inventory and modelling assessment should be performed to address the above factors.</p>	<p>Doral disagree that the submittor's comment that Doral's commitment to the management of dust is unclear. Section 10.4.4 of the PER provides a comprehensive list of management and operational strategies to be employed to reduce the amount of dust generated by the proposal.</p> <p>Doral will undertake monthly dust monitoring during dry periods (generally September to May). Monitoring will record Total Suspended Particulates (TSP) using a High Volume Air (HVA) sampler at a number of monitoring points around the operation. The location of the monitoring points will be incorporated into the Dust Management Plan to be submitted to the DER as part of the Works Approval / Licencing process. The Dust Management Plan will incorporate details of dust sensitive receptors.</p> <p>It is Doral's understanding that other quarry operations would be required to comply with the City of Busselton's local law related to the control of dust within the boundaries of their operation, and as such, there should be no cumulative impact from dust.</p>
206.	Individual Submission	<p>The submittor has stated that the management measures referred to in paragraph 10.4.4 of the PER should be implemented as a condition of any development approval for the Project.</p>	<p>Doral has committed to the implementation of the management measures outlined in Section 10.4.4 of the PER.</p>
207.	Individual Submission	<p>The suggested bund (for noise) would have some effect to mitigate the dust issue</p>	<p>The impact of dust will also be reduced through the implementation of the Dust Management Plan.</p>

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208.	Individual Submission	A condition of any approval of the Project that Doral pay the cost of contract cleaning of dust for the submitter's residences and outbuildings on a fortnightly basis for the duration of the Project.	<p>Through the implementation of the Dust Management Plan, Doral do not anticipate that any adverse impacts on adjacent properties will arise.</p> <p>Doral will, however, consult with landholders to ensure they are provided with a mechanism to raise concerns over dust issues. This consultation mechanism will be documented in the Dust Management Plan.</p> <p>Should there be a release of dust from the project site resulting in adverse impacts on adjoining landholders, Doral will consider all reasonable requests for compensation to address the impacts of any such release.</p>
209.	Individual Submission	If dust becomes a problem to us, we expect Doral to take the necessary action to remove problem source and to remediate affected area	
210.	Individual Submission	The submitter understands that Doral has management plans in place to maintain minimal impact on surrounding properties from dust created by mining activities and vehicle movement. However, the submitter has observed that the Yoongarillup mine is in an area where there are very strong winds from all directions compared to Busselton. The submitter contends that no matter the lengths Doral are willing to go to minimise the effects on adjacent and nearby properties, there will inevitably be an impact on properties and the businesses they run.	
211.	Individual Submission	Dust has the potential to affect peoples allergies and their health.	
212.	Individual Submission	We collect and use rain water for our houses and expect Doral to be required to remediate if that is contaminated with dust. If dust is found to be a problem with our house, vegetables, crops or gardens we also expect Doral be required to remediate.	
213.	Individual Submission	Water is a major concern to the submitter. In particular the potential for contamination of rainwater tanks from dust.	
214.	Individual Submission	The submitter is very concerned about the potential for contamination rainwater tanks from dust.	

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215.	Individual Submission	We have had firsthand experience of dust invasion from a location south of our block when the occupants were engaged in earthmoving activities. Over the spring, summer and autumn months we were constantly subjected to dust invasion. The dust settled on the roof of our house leading to contamination of our collected rainwater supply. We are not on scheme water, we rely on our collection of rain water for our household supply. Our concern is with the location of the proposed mine site along with the prevailing winds from that direction, we will be subjected once again to dust invasion resulting in potential pollution of our household rainwater supply.	Refer Response No. 208.
216.	Individual Submission	The submitter contends that dust could affect rainwater tanks and horticultural crops on adjoining properties. Landowners should have the right to independent tests not done by Doral but paid for by Doral	
217.	Individual Submission	Dust effects on us, and our home: The winds that scream down from the Whicher Range are substantial. As the grounds between us and the ranges are currently covered in pastures and natural vegetation the accompanying dust or drifting sands is minimal. However, with a mineral sands operation between us and the ranges it seems obvious that the winds will pick up and disperse the sand and dust straight in our direction and onto our property. We are concerned that this dust and sand will be in the air causing stress and discomfort to ourselves, and our animals. We are also concerned that it will settle on our farm buildings and home making a visible mess.	
218.	Individual Submission	The submitter has raised concern about dust affecting horticultural crops on nearby farms. The submitter has also stated that their dairy company may not take their milk if dusting occurs.	

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219.	Individual Submission	The submitter runs a business which practices organic farming. Dust emissions are a serious concern to the submitter in relation to the land uses that surround the mine and from the impact on residences. Dust has the potential to affect the quality and premium price that can be obtained in this area from many of the small businesses that are associated with the rural uses and lifestyle given the existing quality of the rural environment.	Refer Response No. 208.
220.	Individual Submission	Dust effects on our crops: Dust depositing on our horticultural crops will result in a poor yield and poor quality which will result in now sale, having both immediate and future negative economic repercussions. It is clear there is a substantial risk to our crop from dust cover.	
221.	Individual Submission	Dust monitors to be installed on eastern boundaries of location 1875 and 1874. The monitoring devices must be connected personally to mining supervisor(s) 24/7 for safety reasons.	<p>Doral undertake routine monitoring for dust on a monthly basis (during dry periods, generally between September and May). A number of dust monitoring sites will be established and reading taken using a mobile monitoring unit. The location of dust monitoring sites and the frequency of dust monitoring will be incorporated into the Dust Management Plan that will be submitted to the Department of Environment Regulation for approval during the Works Approval process.</p> <p>Should any concerns relating to dust arise, adjacent landholders will be able to have a direct line of communication with the Mine Manager and/or Mine Supervisors to advise of their dust related concerns. The Mine Manager and/or Mine Supervisors will then investigate these concerns and address them in accordance with the requirements of the Dust Management Plan.</p>

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222.	Department of Environment Regulation	Change the noise limits quoted in Table 10-2 to the assigned noise levels for 'Noise sensitive premises: highly sensitive area', as specified in the noise regulations. Limits for mining noise received at residences as listed in Tale 10-2 are incorrect. These are the assigned noise level for any locations on the receiving premises further than 15 m from the residential building. Due to the fact that the neighbouring residential premises have residential builds with occupants residing in them, the significantly more stringent assigned noise levels for 'noise sensitive premises: highly sensitive area should be quoted here.	<p>The noise modelling compliance assessment was undertaken on the correct values, however, Doral acknowledge the values quoted in the PER in Table 10-2 were incorrect. Additional noise modelling has been undertaken since the release of the PER and section 10.5 of the PER requires amendment. A copy of the amended Section 10.5 of the PER is provided in Appendix 9.</p> <p>The corrected table shown below will be incorporated into the amendment. Updated Table 10-2 from PER</p> <table border="1"> <thead> <tr> <th rowspan="2">Premise</th> <th rowspan="2">Time of Day</th> <th colspan="3">Assigned Level (dB)</th> </tr> <tr> <th>L_{A10}</th> <th>L_{A1}</th> <th>L_{Amax}</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Noise Sensitive premises: highly sensitive area</td> <td>Mon-Sat 0700 – 1900</td> <td>45+</td> <td>55+</td> <td>65+</td> </tr> <tr> <td>Sun & Pub Hol. 0900 - 1900</td> <td>40+</td> <td>50+</td> <td>65+</td> </tr> <tr> <td>All Days 1900 – 2200</td> <td>40+</td> <td>50+</td> <td>55+</td> </tr> <tr> <td>Mon - Sat 2200 – 0700 Sun & Pub Hol. 2200 – 0900</td> <td>35+</td> <td>45+</td> <td>55+</td> </tr> </tbody> </table> <p>+ influencing factor</p>	Premise	Time of Day	Assigned Level (dB)			L _{A10}	L _{A1}	L _{Amax}	Noise Sensitive premises: highly sensitive area	Mon-Sat 0700 – 1900	45+	55+	65+	Sun & Pub Hol. 0900 - 1900	40+	50+	65+	All Days 1900 – 2200	40+	50+	55+	Mon - Sat 2200 – 0700 Sun & Pub Hol. 2200 – 0900	35+	45+	55+
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223.	Department of Environment Regulation	That the PER outline measures to address the modelled noise exceedances of the Environmental (Noise) Regulations 1997 (as amended 2013) thresholds	Since the release of the PER, Doral has undertaken further work with noise consultants SVT Engineering to develop methodologies and strategies to ensure compliance with the EP (Noise) Regulations. A change in mining methodology and a review of the topography model used in the noise modelling has been undertaken. The revised model has resulted in compliance to the noise regulations at all noise sensitive receptors.																									
224.	Department of Environment Regulation	Appendix 10 has demonstrated that the mining proposal will exceed the noise regulation thresholds at some receptors. The PER should demonstrate how compliance with the noise regulation thresholds will be achieved.	<p>A copy of the updated noise assessment is provided as Appendix 9. As a result of the revised noise modelling, an amendment to Section 10.5 has been prepared and is included in Appendix 11-E of this report.</p> <p>Further details of the measures to be implemented to ensure compliance with the noise regulations will be documented in the Noise Management Plan to be submitted to the DER with the Works Approval application.</p>																									

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225.	Department of Environment Regulation	Seek amenity agreements with the three closest residences (R9, R10, R11) to the east. It was predicted by the proponent's acoustic consultant SVT that the mining noise would exceed the noise limits at three residences (R1 to R3) to the east and five residences (R8 to R12) to the west at different mining stages. The exceedance can be up to 15.3 dB(A). Among these seven residences, five of them are within 450m to the proposed mining pits at various stages.	The revised noise modelling (SVT 2015) provided in Appendix 9 shows compliance with the noise regulations at all noise sensitive receptors. Doral will seek to establish amenity agreements with adjacent landowners due to their close proximity to the site, however, where no agreement can be established, Doral are committed to temporarily relocating noise generating equipment and if required, temporarily shutting down operations in specific areas when unfavourable weather conditions are present and real-time noise monitoring indicates that an exceedances of the noise regulations may occur.
226.	Department of Environment Regulation	It is recommended that DMS justify the overall benefits of the construction of the proposed noise bunds of the affected residents, and justify that the noise from the construction of the proposed noise bunds can be exempted under noise regulation 13 of the Noise Regulations. The proposed mine site will have a life of less than 3 years and the life of each pit could be only several months. The building of the noise bunds can generally take a relatively long time - from weeks to months.	<p>Without the construction of the noise bunds, noise generated by the proposal is predicted to exceed the EP(Noise) Regulations 1997 and its 2013 amendments. The duration of mining within the paddock areas west of Sues Road is scheduled to take eight (8) months. Noise bunds are constructed using in-situ earth material, which, for some bunds, may contain a percentage of heavy mineral. Bunds containing ore material will be progressively mined as the mining face moves forward in a westerly direction. The noise bunds have been designed to reduce the noise generated by mining operations to levels below the EP(Noise) Regulations. 3 noise bunds, with a total length of 500 metres are proposed to be constructed within the paddock areas on the western side of Sues Road. The construction of these bunds is anticipated to take 1 week, with construction undertaken between 0700-1900 hours, Monday to Saturday. Doral believe that a construction period of 1 week, in comparison to 8 months of mining, is justified to enable compliance with the EP(Noise) Regulations.</p> <p>Noise bunds on the eastern side of Sues Road will utilise topsoil, subsoil and overburden as a construction material. This material would be required to be excavated as part of mining operations to expose and facilitate mining of the ore body. Doral has the option of constructing large stockpiles with this earthen material or, utilising it in the construction of the earthen noise bunds. The time difference in constructing earthen noise bunds as compared with constructing large stockpiles of material that had to be otherwise excavated is minimal. Constructing earth noise bunds out of this material enables the operation to address the operational matter of where to store this material whilst providing a dual role of functioning as a noise bund.</p>

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227.	Individual Submission	The submitter states that their residences will likely be affected by noise exceedances from mining operations associated with the Project. The likelihood of noise exceedances at their residences (including at night time) means that the greatest possible measures should be taken to reduce those measures to lower than the maximum permissible level	Doral has undertaken a review of the noise model and has proposed alternate mining methodologies to reduce noise emissions. This includes utilising carry-graders within the State Forest sub-area instead of utilising a dozer as was modelled in the previous report. Doral has also committed to the installation of a 6.5m noise wall within the State Forest sub-area to further reduce noise emissions. The revised noise model does not predict any exceedances of the noise regulations as a result of mining operations.
228.	Individual Submission	The submitter contends that the proposal should not receive approval and should not proceed because of the projected noise exceedances. That the predicted noise exceedances will have detrimental effects that are likely to impact the submitter's health, lifestyle and their enjoyment of the amenity of their Lot and its natural surroundings.	Doral will develop and implement a Noise Management Plan that will document processes and procedures to minimise, as far as is practicable, the noise generated from the site. The plan will also outline noise monitoring programs, the location of noise monitoring stations and remedial actions to be undertaken should noise levels exceed the permitted levels. Doral will continue to liaise with adjacent landholders with the aim of establishing amenity agreements with them to address noise concerns.
229.	Individual Submission	The submitter requests that conditions should be imposed as follows: Equipment used in relation to the construction and operation of the Project be the quietest reasonably available (not the quietest equipment "feasible" as state in paragraph 10.5.6 of the PER in case economic cost has any relevance to what is "feasible")	Doral has amended Section 10.5 of the PER as a result of the revised noise modelling. Doral has included the requested change from "Quietest reasonably feasible" to "Quietest reasonably available" in the amended Section 10.5 of the PER (Appendix 11-E)
230.	Individual Submission	The submitter requests that conditions should be imposed as follows (Construction Period): - Limiting construction work on the Project to hours between 0700 and 1900 hours on any day which is not a Saturday or Sunday or a public holiday; Construction work to be carried out in accordance with control of environmental noise practices set out in Section 4 of AS 2436 : 2010 Guide to Noise and Vibration Control on Construction, Maintenance and Demolition Sites	The EP(Noise) Regulations sets variable noise limits depending on the day and time of operations. Monday to Saturday: 0700 – 1900 hours Sundays & Pub Hols: 09:00 – 19:00 hours All Days: 1900 – 2200 hours Monday to Saturday: 22:00 – 0700 hours Sundays & Pub Hols: 22:00 – 09:00 hours Doral will undertake operations in accordance with the requirements of the Works Approval/Operating Licence, which requires compliance to the EP(Noise)Regulations. Doral has committed to operating in accordance with AS 2436 – Guide to Noise and Vibration Control on Construction, Maintenance and Demolition Sites during the construction phase of the project. Refer further discussion in Section 7.2.3.

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231.	Individual Submission	We value the amenity of our quiet neighbourhood and do not wish it to be disturbed. Doral's proposed mining would disturb it a great deal. They say it is only for 2 years 10 months but of 24/7 disturbance. We suggest that Doral be required to operate on a 6day 0700 to 1900 hr basis to ensure local residents have some semblance of a normal life as do most Australians. This is not a remote area as there are approx. 26 homes within about 1.5km of any part of the proposed area.	Refer Response No. 230. Further discussion on this matter is provided in Section 7.2.3.
232.	Individual Submission	The submitter is concerned about Night time noise if the project is a 24hour mine.	
233.	Individual Submission	The submitter understands that Doral have management plans in place to ensure that noise is kept at a minimal to avoid disturbance to surrounding property's. One of the main attraction to residing in this area is escaping the hustle and bustle of town and the noise that follows. With the wind, vehicle operations and 24 hour mining, the submitter contends that these factors will Interfere with the peace and quiet that is enjoyed by the residents.	Doral acknowledge that existing noise levels in the area surrounding the mine are generally low and that mining operations will bring new noise emissions to the area. Doral believe that, through the implementation of a Noise Management Plan, incorporating recommendations from the Noise Modelling Report, noise levels can be maintained below the maximum permitted levels required under the EP (Noise) Regulations. Refer Section 7.2.3 for information about comparative noise levels showing how the proposal may impact on background noise levels.
234.	Individual Submission	The submitter requests that conditions should be imposed as follows (Mining Operations): <ul style="list-style-type: none"> - Limiting mine operations after 1900 hours daily and on Sundays and public holidays so that there are no exceedances of maximum noise limits at residences on those days; - Construction of a 6.5m noise bund in accordance with the recommendation of SVT Engineering Consultants on page 28 of their report. In this regard, the submitter is not optimistic of agreeing to an amenity agreement with Doral, in which case the construction of a 6.5m noise bund within the State forest area of the Project will be an essential requirement for noise control; Adoption of the noise control strategies referred to in paragraph 10.5.6 of the PER are required so that noise levels do not exceed at residences during day-time or night-time	Refer Response No. 230 for Doral's comments relating to hours of operation. Doral propose to implement all noise control options outlined in the revised noise model, including a 6.5 metre noise wall to be constructed on the western end of Pit 25.

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235.	Individual Submission	The submitter requests that a range of penalties and outcomes be imposed on Doral in the event that noise exceedances are recorded on monitoring equipment at their residences, with the range of penalties and restrictions to be related to the frequency and extent of exceedances. Those penalties and restrictions should ultimately include cessation of all night-time activity related to the Project, and must be of sufficient consequence that they promote prompt and reliable response from Doral.	Doral will monitor and report noise levels in accordance with the requirements of its DER Works Approval and Operating Licence. Doral will incorporate a Noise Complaint procedure into its Noise Management Plan, a copy of which will be provided to adjacent landholders. When a noise complaint is received, Doral will promptly investigate to determine the source of the noise and to assess whether any exceedances of the maximum permitted noise levels has occurred. Doral has committed to the establishment of a noise monitor at the furthest extents of the proposal to ensure noise monitoring of the closest residences is undertaken on a continuous basis.
236.	Individual Submission	The submitter does not believe that the noise exceedances (particularly night-time exceedances) at their residences can be adequately managed by noise control processes implemented by Doral. The submitter is concerned that responses to noise exceedances will be delayed and ad-hoc, and will not effectively limit the likelihood of future noise exceedances unless there are agreed penalties or restrictions upon Doral linked to the frequency and severity of noise exceedances. Those penalties and restrictions should ultimately include cessation of all night-time activity related to the Project and must be of sufficient consequence that they promote prompt and reliable response from Doral.	Revised noise modelling predicts that proposed mining operations will not result in any noise levels that exceed the maximum permitted levels. Revised noise modelling has included a number of additional residences, including a two-story residence located to the north-east of the proposal, for which, noise levels are predicted to be below those permitted under the EP(Noise) Regulations 1997. Doral has committed to the establishment of real-time noise monitoring near the closest residences (when mining operations are occurring in proximity to that residence). Doral has also committed to relocating plant/equipment should noise exceedances occur and, should relocation not result in noise levels returning to levels below the maximum permitted values, Doral has committed to ceasing mining operations until such time as the noise exceedances can be maintained below maximum permitted values under the EP(Noise) Regulations 1997.
237.	Individual Submission	The submitter contends that all the noise studies are computer modelled, which are open to human error and are not realistic. It's the submitter's view that residents should not have to listen to noise 24 hours a day. Individual houses may be subject to increased impacts given their position in the landscape or even because they are two story.	Noise modelling has been undertaken by professional engineering consultants experienced in the modelling of noise generated from industrial/mining operations. Modelling was undertaken using industry accepted technology and software.
238.	Individual Submission	The submitter has requested that noise monitoring stations be set up and monitored at Doral's cost at their residence; and	When mining west of Sues Road (Noise Modelling Scenario 2, 3 and 4), Doral has committed to the installation of a noise monitor at the western end of the proposal to provide real-time noise data to mining supervisors. The exact location of the noise monitor is yet to be finalised, but will be included in the Noise Management Plan.

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239.	Individual Submission	Noise monitors to be installed on eastern boundaries of location 1875 and 1874. The monitoring devices must be connected personally to mining supervisor(s) 24/7 for safety reasons.	When mining east of Sues Road (Noise Modelling Scenario 5 and 6), Doral has committed to the installation of a noise monitor at the eastern end of the proposal to provide real-time noise data to mining supervisors. The exact location of the noise monitor is yet to be finalised, but will be included in the Noise Management Plan.
240.	Individual Submission	A noise control bund to a height of 7.5m constructed from Sues Road along the boundary between 1873/1875 and 1874/1876 then along Yoongarillup Road to Piggott Road, then along Goulden Road to forest or boundary of mine pit. This shall ensure that tailings placed there, or similarly, shall not create dust problems in summer months. Vegetation along this area to have required fire break to suit shire requirements and keep dust down best as practical.	Doral will construct noise bunding to provide compliance with the EP(Noise) Regulations. An additional 3m high bund will be constructed along the northern perimeter of the proposal, east of Sues Road. This bund will provide noise, dust and visual screening to the project area. The noise bund surface will be stabilised so as not to generate dust in windy conditions.
241.	Individual Submission	Table 10.5.1 Doral claim they will meet statutory requirements and acceptable standards, but they have no base level for this area to assess what is a base level, thus no basis to establish an acceptable standard.	Doral will operate in accordance with the EP(Noise) Regulations. Revised noise modelling indicates that noise generated from the proposal will not exceed the EP(Noise) Regulations. The revised noise modelling shows that the maximum noise level predicted to be experienced by adjacent properties is 45.2 dB(A) at residence R2 (during mining operations). During the initial construction phase, modelling predicts the maximum noise level to be experienced by adjacent residences to be 53.2 dB(A), again at residence R2. The construction phase of the project will be undertaken between 0700-1900 hours, Monday to Saturday and last for a duration of approximately 3 months. The predicted noise is not anticipated to occur at all times during this period, only during the worst-case scenario presented in the revised noise assessment (Appendix 9) Refer Section 7.2.3 for information about comparative noise levels showing how the proposal may impact on background noise levels.
242.	Individual Submission	The mine is going to operate in an area that has an extremely low to no background noise levels. We do not have highway, rail, urban or industrial background noise, so any continuous noise levels will be intrusive and annoying. Noise is not being added to an existing level, but creating a background noise level from a predicted 17dB to 101dB for 24 hours a day (SVT table 3-2). The mitigation of this noise level will not reduce it to a pre mine level so we will be affected significantly.	
243.	Individual Submission	Current background noise levels are low and the locality would be best described as a quiet rural community with noise levels below the noise regulations used to assess impact.	
244.	Individual Submission	Table 10.4 purports to attend to the noise impact on the closest neighbours, but as our house has been overlooked in the scenarios it is unclear what they perceive the levels to be for us.	

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245.	Individual Submission	Negative impact on quality of living: Any increase in noise related activity at the mine site will impact on our current quality of living.	Refer Section 7.2.3 for information about comparative noise levels showing how the proposal may impact on background noise levels. Doral acknowledge that the proposal will result in the generation of noise, however, noise levels are predicted to be within the maximum permitted levels specified in the EP(Noise) Regulations.
246.	Individual Submission	Loss of Sleep: We are concerned that the increased noise activity will result in our own sleep deprivation	
247.	Individual Submission	The submitter contends that the scenario of mining 30 metres from the boundary fence of residents that abut the proposed mine properties in 8.9 ha of State forest is unacceptable.	The Development Envelope is located approximately 30m from the adjacent property boundary, however, however, only the area designated as mining pits will be cleared within the State Forest area. The boundary of mining pits within the State Forest area is located approximately 345m from the adjacent property boundary. Mining within the State Forest area is scheduled to take 13 months in total. Following this, rehabilitation and revegetation works will be undertaken during day-time hours only.
248.	Individual Submission	Distress of livestock: We cannot locate in Doral's review any consideration of noise levels on stock.	For over 12 years, Doral has operated its Dardanup Mineral Sands Mine (located between Burekup and Dardanup) adjacent to farming properties containing livestock (cattle/sheep). During this time, Doral has maintained regular communications with landowners and no concerns relating to the distress of livestock from minesite noise emissions have been raised.
249.	Individual Submission	The submitter is of the view that no amount of bunding would prevent noise impacting residences.	Noise modelling has incorporated the proposed noise bunds. A significant difference is seen between modelling where noise bunds have been included and modelling that does not incorporate noise bunds. Monitoring of noise levels during minesite operations will provide confidence that noise levels are being maintained below the permitted values.
250.	Individual Submission	A noise control bund to a height of 7.5m constructed from Sues Road along the boundary between 1873/1875 and 1874/1876 then along Yoongarillup Road to Piggott Road, then along Goulden Road to forest or boundary of mine pit. This shall ensure that tailings placed there, or similarly, shall not create dust problems in summer months. Vegetation along this area to have required fire break to suit shire requirements and keep dust down best as practical.	Doral will construct noise bunding to provide compliance with the EP(Noise) Regulations. An additional 3m high bund will be constructed along the northern perimeter of the proposal, east of Sues Road. This bund will provide noise, dust and visual screening to the project area. The noise bund surface will be stabilised so as not to generate dust in windy conditions.

ID	Received From	Comment	Doral's Response																													
AMENITY																																
251.	Individual Submission	The noise mitigation proposed is the construction of a 5.5m noise bund at the end of pit no2, which will have the effect of reducing noise from the operation in that pit (Nov 2017) but will not have any mitigating effect on noise output from the concentrator proposed to be adjacent to the power supply. There is a direct line of sight from the concentrator to adjacent residences to the east plus other homes not included in the report (down Espinos & Yoongarillup Rd's). The Concentrator noise level at 1km is 101.1dB (SVT report table 3-2) this is a level at the above homes and is proposed to operated 24/7.	<p>With respect to the submitter stating that Concentrator noise levels 1km from the Concentrator will be 101.1dB, Table 3-2 from the SVT Noise Report shows the dB(lin) related to the Octave Band Sound Power Levels. The values in the row shown below (3.15, 63, 125 etc.) do not relate to linear distances, rather they relate to the frequency (Hz) of the sound generated, as sound energy can occur over a broad frequency range.</p> <p><i>Table 3-2: Measured sound power levels for proposed fixed plant and mobile equipment.</i></p> <table border="1"> <thead> <tr> <th rowspan="2">Equipment</th> <th colspan="8">Octave Band Sound Power Levels in dB(lin)</th> <th rowspan="2">O/A dB(A)</th> </tr> <tr> <th>31.5</th> <th>63</th> <th>125</th> <th>250</th> <th>500</th> <th>1k</th> <th>2k</th> <th>4k</th> <th>8k</th> </tr> </thead> <tbody> <tr> <td colspan="10" style="text-align: center;">Fixed Plant</td> </tr> </tbody> </table>	Equipment	Octave Band Sound Power Levels in dB(lin)								O/A dB(A)	31.5	63	125	250	500	1k	2k	4k	8k	Fixed Plant									
Equipment	Octave Band Sound Power Levels in dB(lin)								O/A dB(A)																							
	31.5	63	125	250	500	1k	2k	4k		8k																						
Fixed Plant																																
252.	Individual Submission	Proposed suggestion to reduce impact of noise include: - Similar bunds along the north boundary from the Concentrator to and along Piggott Rd to the bush then 3 hay bale high along the fire break to the entrance of the gravel pit. This proposed bund would have the effect of reducing sound transmission to adjacent residences located east of the proposal and those down Espinos & Yoongarillup Rd's Increasing the height of SEP 7, 8 & 9 to 6m	Should the submitter require further clarification on the details provided in the Noise Report, Doral would be happy to sit down with them to go through the revised report should they wish to do so.																													
253.	Individual Submission	A Bund at least 8 metres from the road needs to be created along Goulden Road (7.5m high) with vegetation covering																														
254.	Individual Submission	The submitter is informed that reversing beepers are very noticeable when mines are established. The submitter is of the view that when this issue was raised in public meetings the community did not receive an informed response	Doral will utilise directional broadband white noise alarms (commonly known as "squawkers") rather than standard reversing beepers to ensure the noise generated from reversing alarms is minimised. White noise produced from these alarms dissipates quickly outside the hazard zone, reducing the nuisance noise commonly experienced from standard alarm systems.																													
255.	Individual Submission	The submitter contends that noise from the mine will be unbearable particularly when the topography of the area is taken into account.	Further discussion on the predicted noise emissions is provided in Section 7.2.3. Chart 7-1 contained in this section provides a comparison of various noise levels, showing the maximum permitted levels Doral will be required to maintain noise emissions to. Doral can confirm that a topographical data for the site and surrounding areas was incorporated into the noise modelling software to enable the predicted noise emissions to be calculated.																													

ID	Received From	Comment	Doral's Response
AMENITY			
256.	Individual Submission	<p>Comments on noise modelling methodology:</p> <ul style="list-style-type: none"> - The adjacent Council quarry generates noise and has not been considered in terms of cumulative impacts. Does not consider cumulative impacts with the Local Authority Quarry. - Does not consider effect of local topography on noise levels. - The tonal penalty of 5dBA is insufficient. Based on operations at the Local Authority quarry reversing beacons on front end loaders are by far the most dominant and penetrating noise emissions which penetrate the surround remnant forest. <p>The noise assessment should be conducted again taking into account the above factors, documented and released for public review.</p>	<p>Noise modelling has incorporated local topography data. Doral has been advised that the council gravel pit, located to the south east of the proposal, generally operates 2-3 days/fortnight during construction periods, utilising a single front end loader and a varying number of trucks (6 wheel tip trucks to semi tip trucks) during daylight hours. The cumulative impact of the gravel pit was not considered in the noise model as the gravel pit is located over 600 metres from mining operations.</p> <p>Doral undertaken routine noise monitoring during construction and operations and will incorporate monitoring during periods when the gravel pit is being used to confirm that the cumulative levels of both operations remains under the maximum permitted levels.</p> <p>Doral will utilise directional broadband white noise alarms rather than standard reversing beepers to ensure the noise generated from reversing alarms is minimised. White noise produced from these alarms dissipates quickly outside the hazard zone, reducing the nuisance noise commonly experienced from standard alarm systems.</p>
257.	Individual Submission	Table 10.4 purports to attend to the noise impact on the closest neighbours, but as our house has been overlooked in the scenarios it is unclear what they perceive the levels to be for us.	The revised noise modelling includes a number of additional residences that were not previously modelled. Refer Appendix 9 and Appendix 11-E for details on the noise data for the additional residences modelled.
258.	Individual Submission	We would ask the EPA to require Doral to engage an independent body (University) to undertake sound level monitoring to establish the local background noise levels so a reasonable acceptable standard of noise can be established.	Doral has engaged suitably qualified engineering consultants to undertake the noise modelling. The noise assessment will be reviewed in further detail by the DER Noise Branch during the Works Approval/Licencing process. The DER Noise Branch is experienced in reviewing noise assessments and is the body responsible for the compliance with the noise regulations.

8 ENVIRONMENTAL FACTOR: REHABILITATION

8.1 OVERVIEW

Comments received from the public review focus on the following areas:

- Clearing of Native Vegetation within the Whicher Scarp Soil Landscape System
- Impacts on Priority 1 Ecological Community WHSFCT C1
- Impacts on Conservation Significant Flora
- Management of Dieback
- Management of Weeds
- Indirect Effects of Mining Operations
- Likelihood of Rehabilitation Success

Commentary on the above areas is provided below. Individual responses to each comment received from the public review relating to Flora and

8.2 REVIEW OF DATA PRESENTED IN PUBLIC ENVIRONMENTAL REVIEW

8.2.1 Topsoil Management

Doral has undertaken a review of its proposed methodology for the management of topsoil within the State Forest sub-area. Section 3.7.2 of the PER describes a process for the storage of “native vegetation” topsoil within backfilled areas of mining pits 15,17,19 and 21, within the cleared agricultural paddocks west of Sues Road.

Discussions with DPaW at a site meeting held in November 2014 highlighted the concern of DPaW with regard to the proposed methodology, specifically related to exposing the native vegetation topsoil to an area that contains an increased weed loading (as compared to areas within the State Forest sub-area). Concern with regard for the potential of weeds to infest the State Forest sub-area was also raised in DPaW’s written submission to the public review.

Taking into consideration the comments raised, Doral has reviewed its mining methodology to enable the storage of native vegetation topsoil within the State Forest sub-area, thereby reducing the topsoils exposure to areas of high weed loading. The revised methodology will see the State Forest sub-area mined as follows:

Stage	Description of Works
1	Vegetation cleared from within all areas of State Forest sub-area, excluding 24C, which is the area directly west of Sues Road, assessed as containing dieback. Vegetation will be stockpiled within mining block 24B.
2	Topsoil will be removed from mining blocks 25 and 24A, with topsoil being stockpiled in mining block 24B
3	Mining blocks 25 and 24A will be mined and backfilled to within 150mm of final surface level.
4	Topsoil from the stockpiles within mining block 24B will be respread over the backfilled mined areas.
5	Topsoil from mining block 24B will be removed and stockpiled on the reconstructed soil profile located within mining block 24A.

6	Mining block 24B will be mined and backfilled within 150mm of the final surface level.
7	Topsoil stockpiled in mining pit 24A will be respread over the backfilled mining pit 24B
8	Revegetation works will commence on mining pits 25, 24A and 24B

*Mining pit 24C will be mined separately to mining pits 24A/B to avoid cross-contamination of dieback

Appendix 11-C contains a revision to the PER that incorporates the modified topsoil strategy.

8.3 SUPPLEMENTARY INFORMATION NOT INCLUDED IN THE PER DOCUMENT

Doral has established communication links with rehabilitation practitioners at other mining operations (Iluka, Alcoa and Tronox) and at Main Roads WA to facilitate knowledge sharing of best practice, enable discussions on applicable rehabilitation techniques, methodologies and planning strategies.

This network of practitioners will be utilised by Doral to ensure that the rehabilitation programs included in the Rehabilitation Management Plan utilise current best practice techniques and methodologies.

8.4 DISCUSSION / COMMENTARY: REHABILITATION OF STATE FOREST SUB-AREA

Although Doral has not undertaken broad scale rehabilitation as is proposed for the Yoongarillup operation, it has had five years' experience in undertaking rehabilitation on smaller scale areas and would apply the skills and expertise learned from rehabilitation at the Dardanup operation in undertaking rehabilitation on the areas of native vegetation proposed to be cleared at the Yoongarillup site. Doral has engaged a number of experienced professional (botanists, rehabilitation specialists and environmental consultants) to assist in the preparation of rehabilitation programs.

It is inevitable that there will be some loss of value resulting from the clearing and mining of the State Forest both in the short and long term. Some species cannot be established through revegetation, and therefore these are likely to be missing from any rehabilitation areas, at least until such time as they are recruited from within the intact areas of State Forest to the south of the proposed mining area.

Provided that best practice methods are undertaken in relation to topsoil handling, storage and replacement; that effective weed control and grazing management are undertaken, and; that onsite staff are vigilant in terms of monitoring the success of rehabilitation and quick to implement any necessary responsive action, there is no reason why rehabilitation of the State Forest would not be successful, particularly in consideration of that fact that vegetation within the clearing area was in 'Very good' condition pre-clearing and had a very low weed burden. Responsive action may involve such things as watering should a dry winter season inhibit germination or subsequent survival of seedlings, hand-weeding and or careful application of selective herbicides should pasture grasses or other exotic species establish, treatment with Phosphite should new occurrences of Phytophthora dieback be observed (although this is unlikely to be detected in the first few years of rehabilitation due to the way the pathogen

expresses) and undertaking additional infill seeding or planting as required. A full and more detailed list of responsive actions, including triggers and thresholds would be presented in the Rehabilitation Management Plan.

8.5 SUMMARY OF MANAGEMENT COMMITMENTS

Doral has committed to the development and implementation of a comprehensive Environmental Management System (EMS) for this proposal. Specific management plans and procedures included in the EMS relating to minimising impact on Rehabilitation include the development and implementation of a:

- Topsoil Management Plan
- Flora and Vegetation Management Plan
- Mine Closure Plan
- Revegetation and Rehabilitation Management Plan
- Dieback Hygiene Management Plan
- Weed Hygiene Management Plan
- Fire Management Plan

8.6 PUBLIC REVIEW – RESPONSE TO SUBMISSIONS - REHABILITATION

ID	Received From	Comment	Doral's Response
Rehabilitation			
Mine Closure			
259.	Department of Mines and Petroleum	The Mine Closure Plan provided in Appendix 12 of PER document was a preliminary one. DMP will assess the final version when it is submitted with the Mining Proposal	Prior to the submission of the Mining Proposal to the DMP, Doral will undertake consultation with DPaW and other relevant government agencies as required to ensure their feedback and comments on the Mine Closure Plan are incorporated into any revisions of the document.
260.	Department of Mines and Petroleum	DMP considers that the stakeholder consultation, baseline data collection and completion criteria sections of the MCP were completed to a good standard.	
261.	Department of Mines and Petroleum	DMP expects well developed completion criteria, and Doral are well advanced in this respect.	
262.	Department of Mines and Petroleum	DMP considers the MCP meets the requirements of the DMP/EPA Guidelines.	
263.	Department of Parks and Wildlife	Recommendation 8: That the Mine Closure Plan for the proposal be developed in close consultation with Parks and Wildlife for approval of the CEO of the OEPA.	
264.	Individual Submission	The submitter states that they have no capacity to assess the financial security of Doral. The submitter contends that there should be safeguards imposed in the environmental approvals related to the Project to ensure the guaranteed availability of funds for rehabilitation, monitoring and remediation in a timely manner.	Doral is required to provide details of financial capabilities, including the capacity to undertake mine closure, in its mining proposal to be submitted to the DMP. Doral incorporate mine closure provisions into the financial model for the proposal. Doral is also required to contribute to the Mining Rehabilitation Fund (MRF), a pooled fund established by the WA State Government that is used to rehabilitate abandoned mine sites in Western Australia.
265.	Individual Submission	The submitter contends that detrimental impacts of the Project on the monetary value of their property will depend upon: -completion of rehabilitation and re-establishment of pasture and vegetation to a sufficient extent to disguise evidence of mining activity	Doral propose to undertake rehabilitation works as soon as is practicable after the completion of mining. Doral has significant experience in returning mined paddocks to productive pasture at its Dardanup operation, resulting in a landform that shows no signs of previous mining activity shortly after the rehabilitation works have been completed. Revegetation of the cleared areas within the State Forest sub-area will take longer to establish, however, through the use of best practice methodologies, Doral believe that sustainable native vegetation will be returned to infill the area to be cleared.

ID	Received From	Comment	Doral's Response
Rehabilitation			
Rehabilitation of Cleared Areas of State Forest No. 33			
266.	Department of Parks and Wildlife	There is a relatively low probability of the proponent being able to satisfactorily restore the full range of affected State forest values in the medium to long term.	Further discussion on the rehabilitation of the State Forest sub-area is provided in Section 8 of this document.
267.	Department of Parks and Wildlife	There is a relatively high probability of rehabilitation areas in this environment being adversely affected by weeds and dieback.	Doral acknowledge DPaW's concerns with relating to the increased risk of spreading weeds and dieback into the State Forest sub-area. Doral has committed to the development and implementation of a Weed Hygiene Management Plan and a Dieback Hygiene Management Plan. Development of these plans will include consultation with DPaW to ensure that DPaW is satisfied with the management practices and procedures to be implemented during the proposal operations.
268.	Busselton Dunsborough Environment Centre	BDEC have concerns relating to: <ul style="list-style-type: none"> - the ability to rehabilitate the site to achieve a self-sustaining native plant community that was as close to the original as possible; - the ability to rehabilitate cleared areas to the same species richness and similar floristic composition to that which existed pre-mining; - uncertainty as to the effect of altered soil profiles on revegetation post mining. 	Doral acknowledge that the rehabilitation and revegetation of the State Forest sub-area will require substantial effort and the implementation of best practice methodologies to ensure the best chance for rehabilitation success. Doral acknowledge that it will be difficult to return all the pre-mining biodiversity values present in the State Forest sub-area and as a result, have stated that the proposal will have a significant residual impact on the Whicher Scarp Soil Landscape system and the PEC WHSFCT C1, for which an environmental offset has been proposed. The revegetation of the State Forest sub-area is only one component of the offset strategy. Doral has developed an Offset Strategy that has been submitted to the EPA for review and consideration. The Offset Strategy provides a number of components to address the predicted significant residual impacts resulting from the proposal.
269.	Wildflower Society of WA	To this date there is no successful rehabilitation of native vegetation on the Swan Coastal Plain in the Busselton area or on the Whicher Scarp, such rehabilitation cannot be claimed as an offset.	

ID	Received From	Comment	Doral's Response
Rehabilitation			
270.	Individual Submission	Rehabilitation of mine sites, where native vegetation has been cleared, usually result in a poor to fair outcome at best. Where complex vegetation systems occur, such as the Whicher Escarpment, it would be almost impossible to replicate all flora species that existed prior to mining and for that reason alone, mining should not be permitted there.	Doral acknowledge that the rehabilitation and revegetation of the State Forest sub-area will require substantial effort and the implementation of best practice methodologies to ensure the best chance for rehabilitation success. Further discussion on the rehabilitation of the State Forest sub-area is provided in Section 8 of this document.
271.	Individual Submission	It is the submittor's view that rehabilitation of the area is not the solution.	
272.	Individual Submission	The submittor contends that the proposal would impact endangered flora. Previous rehabilitation efforts for endangered flora including in the State Forest have failed. The seed bank and the soils have not been protected	
273.	Individual Submission	We are concerned for the viability of the seed bank in the removed soil and that it may degrade before replacement in the rehabilitation process. We require Doral to ensure preservation of this and to make good of losses by planting seedlings to replicate the original forest.	Doral has committed to the development and implementation of a Topsoil Management Plan. The plan will be developed in consultation with DPaW to ensure their concerns relating to topsoil management are addressed.
Rehabilitation of Paddocks			
274.	Individual Submission	No vegetation to be planted closer than 100 metres to adjoining properties.	Unless otherwise agreed with the landholder, the post-mining land use is the same as the pre-mining land use. Doral will liaise with landholders when developing the final rehabilitation plans for the site.

9 ENVIRONMENTAL FACTOR: OFFSETS

9.1 OVERVIEW

Comments received from the public review focus on the following areas:

- Suitability of environmental offsets to address impacts from the proposal
- Assessment of the proposed offset site
- Requirements for any proposed offset site

9.2 REVIEW OF DATA PRESENTED IN PUBLIC ENVIRONMENTAL REVIEW

The proponent has identified the proposal will result in the following significant residual impacts:

- Clearing of 8.68ha of native vegetation within the Whicher Scarp soil landscape system, including clearing of 8.22ha of Priority 1 Ecological Community FCT C1
- Clearing of 8.68ha of Black Cockatoo habitat located within State Forest No. 33

9.3 SUPPLEMENTARY INFORMATION NOT INCLUDED IN THE PER DOCUMENT

An offset strategy has been submitted to the OEPA for review and consideration, a copy of which is provided in Appendix 11-G. The proposed offset site is located within the Whicher Scarp soil landscape system. It contains:

- Black Cockatoo Habitat
- Approximately 4 ha of remnant vegetation similar to Floristic Community Type WHSFCT C1
- Approximately 5.8 ha of remnant vegetation (including the 4ha of WHSFCT C1) classified as being in 'Good', 'Good to Very good' or 'Very good' condition

It is anticipated that natural regeneration of native vegetation within the proposed offset site will occur once appropriate management actions are undertaken (ie. fencing, weed control, pest species control). This will create the necessary favourable conditions required to improve the condition of native vegetation within these areas.

9.4 DISCUSSION / COMMENTARY: OFFSETS

Doral has provided the OEPA an offset strategy that addresses the requirement of the WA Government Offsets Policy (2011) and the offset requirements outlined in the EPBC Act. The strategy addresses the significant residual impacts predicted to occur as a result of the proposal.

In summary, Doral has provided a strategy that proposes:

- Land acquisition of a proposed offset site
- Delivery of a rehabilitation program to improve the condition of native vegetation within the proposed offset area, including:
- Establishment of exclusion fencing to prevent grazing on native vegetation and degradation of soils from pest species (native and introduced)

- Revegetation program within degraded areas of the site to reintroduce understorey species.
- Weed control
- Revegetation of cleared paddock areas within proposed offset site with native vegetation to provide additional black cockatoo habitat.

9.5 SUMMARY OF MANAGEMENT COMMITMENTS

Doral has committed to the development and implementation of a comprehensive Environmental Management System (EMS) for this proposal. Specific management plans and procedures included in the EMS relating to the proposed offset site include the development and implementation of a:

- Rehabilitation and Revegetation Management Plan
- Offset Management Plan
- Dieback Hygiene Management Plan
- Weed Hygiene Management Plan

9.6 PUBLIC REVIEW – RESPONSE TO SUBMISSIONS - OFFSETS

ID	Received From	Comment	Doral's Response
Integrating Factor: Offsets			
275.	Department of Parks and Wildlife	If the proposal is considered environmentally acceptable, a suitable offset should be considered to address the significant residual impacts on biodiversity and other State forest values, noting that it is likely to be difficult to fully achieve 'like for like' outcomes through averted loss or rehabilitation offsets.	Doral propose to undertake a comprehensive rehabilitation and revegetation program on the area proposed to be cleared, however, Doral understands that it will be difficult to achieve the pre-mining biodiversity values found in PEC WHSFCT C1. Doral has acknowledged that the proposal will result in the following significant residual impacts:
276.	Department of Parks and Wildlife	Recommendation 7: That the final offset for the proposal, if found environmentally acceptable, reflects the reality that the rehabilitation of State forest is unlikely to achieve high quality native vegetation outcomes for WHSFCT C1 or conservation significant flora and fauna, and will likely result in a highly modified and compromised native vegetation outcome with a significant residual impact on the conservation values of affected State forest area.	- loss of 8.68ha of native vegetation within the Whicher Scarp soil-landscape system - loss of 8.22ha of PEC WHSFCT C1 - loss of 8.68ha of black cockatoo habitat Doral has prepared an Offset Strategy that aims to address these significant residual impacts. The Offset Strategy has been provided to the OEPA for review and consideration.
277.	Busselton Dunsborough Environment Centre	Offsets are mooted to mitigate the loss of the large amount of the FCT C1 on a like for like basis. The likelihood of ecologically appropriate land, available for acquisition on the Whicher, which replicates the PEC, we would consider remote at best.	The suitability of an appropriate offset site is the responsibility of the EPA, in consultation with DPaW and other relevant government agencies.
278.	Wildflower Society of WA	The area cannot be 'offset' as there is no comparable area of native vegetation.	
279.	Individual Submission	The proposal to destroy almost 10 hectares of high quality forest should be assessed as unacceptable. It is a fatal flaw of the proposal that an offset has yet to be secured. As assessment of the environmental acceptability of the proposal should not be made in the absence of a secured offset that has been surveyed, documents and made available for public review.	The EPA publishes public advice on whether a significant proposal or scheme should be implemented, and if so, what conditions should apply. The Minister sets conditions that apply to a proposal or scheme that may be implemented following consultation and agreement with other decision-making Ministers. These conditions may include requirements for a diverse range of offsets, with multiple deliverers. Offsets range from implementation of direct actions, to contribution of funding to third parties or trusts for research or management activities. The conditions generally specify the nature, value, timing, responsibility, and governance arrangements for implementation of offsets.
280.	Individual Submission	It cannot be stated that there will be an overall net gain in Black Cockatoo foraging, breeding and roosting habitat in the absence of a secured offset.	
281.	Individual Submission	An assessment of the environmental acceptability of the proposal should not be made in the absence of a secured offset that has been surveyed, documented and made available for public review.	Doral has submitted an Offset Strategy to the OEPA for consideration, a copy of which is provided as Appendix 11-G of this document. Details of approved offset sites will be published on the Environmental Offsets Register, available for public review.

ID	Received From	Comment	Doral's Response
Integrating Factor: Offsets			
282.	Individual Submission	The submitter contends that the proposal would impact native fauna and cause destruction of fauna habitat and roosting sites for Cockatoos. Offsetting and buying more land does not add more habitat. More is just lost.	Doral's Offset Strategy is provided as Appendix 11-G of this document. Doral propose a range of offsets including land acquisition and revegetation works of degraded lands.

10 GENERAL COMMENTS NOT ASSOCIATED WITH ENVIRONMENTAL FACTORS

10.1 OVERVIEW

Comments received from the public review focus on the following areas:

- PER Documentation
- The Proposal itself
- Commercial impact of the proposal on landholders
- Community Consultation
- Transport routes utilised by the proposal
- Environmental Management System

Individual responses to each comment received from the public related to matters other than the environmental factors are provided in Section 10.4. Where a response has required an additional level of detail than can be provided for in the response table itself, further discussion has been provided in the sections below and cross-referenced in the response table.

10.2 PER DOCUMENTATION

10.2.1 Review of Data Presented in Public Environmental Review

The primary purpose of the Public Environmental Review document was to provide to the EPA information on the proposal within the local and regional framework, with the aim of emphasising how the proposal may impact the key environmental factors and how those impacts may be mitigated and managed so as to be environmentally acceptable.

The DMP provided comment that the key factors and other environmental factors as identified by the EPA appear to be adequately addressed. Further comment was made by the DMP that the PER focussed on the most significant issues identified through the Environmental Scoping Document, as such, the PER did not detail all the matters that the DMP expects to be covered via a Mining Proposal under the Mining Act 1978.

Doral acknowledge that obtaining approval from the EPA for the proposal is the first stage in obtaining regulatory approval for the proposal. Doral has initiated discussions with the DMP and DER with regard to the preparation and development of the Mining Proposal and Works Approval application respectively. The Mining Proposal and the Works Approval applications will include a more comprehensive level of detail to provide confidence to regulators that Doral are committed to operating and managing the proposed Yoongarillup Mineral Sands Mine in accordance with all regulatory requirements.

10.2.2 Amendments to the PER Document

In addressing all the submissions received, a number of amendments to the PER document have been identified.

Details of Amendments to the PER	Reference-This Document
Updated Chart 3-1 – Flow Chart of Mining Operations	Appendix 11-A
Updated Table 3-3 – Mining Schedule	Appendix 11-B
Updated Section 3.7.2 – Mining of State Forest Sub-Area	Appendix 11-C
Updated Section 8.2.1 – Water Balance	Appendix 11-D
Updated Section 10.5 - Noise	Appendix 11-E

Details of Amendments to the PER	Reference-This Document
New Section – Section 16 – References	Appendix 11-F
PER Appendix 16B – Offset Strategy	Appendix 11-G

10.3 ROADS / TRANSPORT

10.3.1 Overview of Submissions Received

2 respondents made comment on the impact of the proposal on the road network. These comments include:

- increase in traffic resulting from the project impacting on road safety;
- increase in traffic resulting from the project impacting on school bus routes;
- route to transport HMC to Picton impacting on native vegetation (along Railway Road, Capel)

10.3.2 Review of Data Presented in Public Environmental Review

Section 3.11 of the PER outlines the proposed route for the transport of HMC from the proposed minesite to the Picton Processing Plant. The route proposed takes vehicles north along Sues Road and Bussell Hwy, north-east along Boyanup-Capel Road, north on South Western Hwy, north-east onto Bunbury Outer Ring Road and then onto Boyanup Picton Road and Harris Road.

10.3.2.1 Route for Transport of Material – Minesite to Picton Dry Plant

In determining transport route options for the cartage of materials between the proposal and the Picton Dry Plant, Doral utilised the Main Roads WA, Restricted Access Vehicle (RAV) online RAV mapping tool. Doral has subsequently been advised by Main Roads WA that the information contained in the mapping tool may be out of date and that reference should be made to the RAV Mapping Tables published in 2012, in addition to the latest 2014 amendments to the tables available from the Main Roads WA website. Reviewing the RAV Mapping Tables has identified 2 additional routes that would allow for the cartage of materials between the minesite and the Picton Dry Plant, bringing the total number of possible routes for heavy vehicle transport between the proposed minesite and the Picton Dry Plant to three(3).

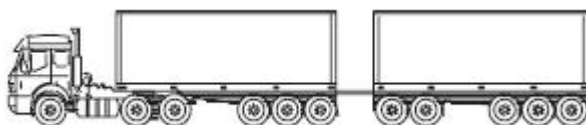
Option	Description of Route	Doral Comment
Route 1	As outlined in Public Environmental Review document. <ul style="list-style-type: none"> • From minesite, travelling along Sues Road and Bussell Highway; • Turning off Bussell Highway at Capel, travelling along Boyanup-Capel Road (which incorporates Capel Dve, Gavins Rd, Railway Rd and Trigwell Road) towards South Western Hwy 	Route Length 67.1 km The route is an established heavy vehicle route that forms part of the Main Roads WA – Restricted Access Vehicle network (Network 4). Boyanup-Capel Road is listed as a Primary Distributor Road under Main Roads WA

Option	Description of Route	Doral Comment
	<ul style="list-style-type: none"> Turning onto South Western Hwy heading towards Bunbury Outer Ring Road Turning off Bunbury Outer Ring Road onto Willinge Drive (Port Access Road) Turning onto Boyanup-Picton Road and then into Harris Road 	Functional Hierarchy. The road is under the control of Main Roads WA.
Route 2	<ul style="list-style-type: none"> From minesite, travelling along Sues Road and Bussell Highway; Turning off Bussell Highway at Gelorup, travelling along Hastie Road, Allenville Road and Lilydale Road towards South Western Hwy Turning onto South Western Hwy heading towards Bunbury Outer Ring Road Turning off Bunbury Outer Ring Road onto Willinge Drive (Port Access Road) Turning onto Boyanup-Picton Road and then into Harris Road	Route Length 63.1 km The route is an established heavy vehicle route that forms part of the Main Roads WA – Restricted Access Vehicle network (Network 4) The route that passes through Gelorup is listed as a Regional Distributor Road under Main Roads WA Functional Hierarchy. The road is under the control of the City of Bunbury.
Route 3	<ul style="list-style-type: none"> From minesite, travelling along Sues Road and Bussell Highway; Turning off Bussell Highway at Bunbury, travelling along Roberston Drive through to South Western Hwy (North) Turning off South Western Hwy(North) onto Willinge Drive (Port Access Road) Turning onto Boyanup-Picton Road and then into Harris Road	Route Length 60.8 km The route is an established heavy vehicle route that forms part of the Main Roads WA – Restricted Access Vehicle network (Network 4) This route passes through 5 sets of traffic signals and 1 major roundabout. The route through Bunbury is subject to high traffic volumes.

Of the three routes identified for the transport of material between the proposed minesite and the Picton Dry Plant, Route 1 is Doral's preferred option for transport as it provides the route which has the least amount of interaction of vehicles through residential areas including the most favourable light/heavy vehicle mix.

10.3.2.2 Impacts on Road Safety

It has been estimated that the proposal will require 6 round-trips per day for HMC cartage to Picton and the return of sand tailings to Yoongarillup. Cartage will utilise semi-road train vehicles (shown below).



Main Roads WA has advised that the small volume of heavy vehicles generated from the proposal will not significantly contribute to existing traffic volumes. Doral has had the proposal reviewed by an accredited Road Safety Auditor (Brad Brooksby – Opus, 2012) who advised that, for heavy vehicles travelling along Sues Road, the sight distances both north and south of the proposed access point to the minesite are well within required parameters.

Furthermore, the heavy vehicle volumes on Sues Road are low and there will be ample opportunities for the vehicles exiting the minesite, turning right onto Sues Road, heading northwards towards Picton. Similarly, ample opportunities will be present for vehicles heading south on Sues Road, turning left and entering the minesite.

10.3.3 Summary of Management Commitments

No specific commitments relating to the transport of HMC to the Picton Dry plant were outlined in the PER Document.

In light of submissions received during the public comment period, Doral can clarify their commitments relating to this area as follows:

- Doral will continue to liaise with Main Roads WA to ensure any impacts from the proposed mining operation on the road network are minimised and that road safety is not compromised as a result of the proposal;
- Prior to the commencement of operations, Doral will liaise with the School Bus Service section of the Public Transport Authority in consultation with Main Roads WA to determine whether the proposed minesite will have any adverse impacts on safety or scheduling for any School Bus services operating in the vicinity of the minesite. Where adverse impacts are identified, Doral will work with School Bus Service and Main Roads WA to ensure that measures are implemented to mitigate any adverse impacts.

10.4 PUBLIC REVIEW – RESPONSES RECEIVED – GENERAL

ID	Received From	Comment	Doral's Response
Comments received that do not relate to Environmental Factors			
PER Documentation			
283.	Department of Mines and Petroleum	The key factors and other environmental factors as identified by the EPA appear to be adequately addressed.	Acknowledged
284.	Department of Mines and Petroleum	PER focussed on the most significant issues identified through the Environmental Scoping Document, as such, does not detail all the matters that DMP expects to be covered via a Mining Proposal under the Mining Act 1978. (000)	Doral has initiated discussions with the DMP regarding the development of the Mining Proposal. The draft mining proposal will be finalised in February 2015 and submitted to the DMP for review. Review of the draft Mining Proposal will take place parallel to the remaining PER approval process.
285.	Department of Environment Regulation	That a reference list is included in the PER. Without a reference list, it is not possible to identify the documents referenced in the PER. A reference list has not been provided in the PER. (000)	During the collation stage of compiling the PER – Issue 0 (Oct 2014), the reference section was accidentally left out of the final document. A copy of all the references has been provided as Section 16 and included as Appendix 11-F of this document.
286.	Department of Environment Regulation	Change the noise limits quoted in Table 10-2 to the assigned noise levels for 'Noise sensitive premises: highly sensitive area', as specified in the noise regulations. Limits for mining noise received at residences as listed in Table 10-2 are incorrect. These are the assigned noise level for any locations on the receiving premises further than 15 m from the residential building.	A data entry error has occurred when data has been transferred from the Noise Assessment Report (Table 2-1 of Noise Impact Assessment Report) to the PER document. The correct values as per the EP (Noise) Regulations 1997 have been considered in the Noise Impact Assessment. Table 10-2 of the PER will be amended with the correct values.
The Proposal			
287.	Individual Submission	The submitter contends that the proposal by Doral Sands Pty Ltd to extract ore from the Yoongarillup region has had a profound and unacceptable impact on the lives of residents that abut the proposed mine.	In dealings with landholders, Doral has tried to be transparent, open and honest in outlining our mining plans for the area. Mining tenements have been in place over the Yoongarillup site since 1993 and there have been extensive mineral sands mining throughout the southwest of WA. Doral understands the uncertainty that is faced by landholders with regard to how the minesite may impact them and can only re-iterate their commitment to working with the local community to achieve a positive outcome for all parties.
288.	Individual Submission	The submitter contends that the proposal has literally turned their world upside down over the last few years, denying them the enjoyment of their pristine properties, and clouding all aspects of their life style and current and future decision making ability.	

ID	Received From	Comment	Doral's Response
Comments received that do not relate to Environmental Factors			
289.	Individual Submission	It is the submitter's view that the mine has the potential to have a tremendously negative effect on the environment and lives of people in the area.	Doral's experience at its Dardanup operation is that a minesite can have positive impacts on both the environment and the surrounding community. At the Yoongarillup site, through rehabilitation works and the provision of environmental offsets, Doral believe a net benefit to the environment will be achieved. By building strong relationships with local landholders and community groups, Doral believe the proposal can result in positive social outcomes.
290.	Individual Submission	The submitter has requested that, if the mine does go ahead, that Doral minimise the duration of the Project from commencement to end	Section 3.5 of the PER outlines the Life of Mine and the various stages of the proposal. The PER documented an anticipated start date for construction of March 2015. The actual start date for construction will be dependent on the timing of regulatory approvals. The duration of mining operations as outlined in PER Table 3-3 – Mining Schedule has not altered. Doral has updated the schedule to show construction commencing January 2016.
291.	Individual Submission	The mine is proposed to operate for 3 years, with a further 5 years for mine closure. The operation of the mine is dependent on the mining industry generally, the economic climate at any given time and demand for products produced. The mine could close and reopen as others do, therefore it is possible that the lifespan of the mine will be much longer than suggested.	Forecasts for the Mineral Sands industry are positive. The proposed mining operations are of short duration (under 3 years), as such, Doral do not anticipate that economic conditions will result in the premature closure of the proposed operation.

ID	Received From	Comment	Doral's Response
Comments received that do not relate to Environmental Factors			
292.	Individual Submission	A further concern we, and others have is the future direction of the mine. We know Doral has test drilled on the adjacent (N) tenement (not their lease) and wish to mine it. They also have publically stated they wish to mine the block known as Catalano's on the east boundary of our property. These are not continuous. This means the mine life would be extended without the need for further public input. This extension of mining would have a very significant affect on us and our neighbours. We would ask the EPA to require that any extension of the proposal mine be subject to the same process as this application and be open to public comment & submission.	Doral has undertaken exploratory drilling in a number of areas in the vicinity of the current proposal. Geological and financial analysis of the results from these drilling programs is still being assessed. Until such time as this assessment has been completed, Doral cannot incorporate any of the additional areas into the current proposal. Doral estimate that, if any of the areas drilled were to be realised as economic projects, the anticipated mine life for the additional projects would be less than 1 year. Any changes to the current proposal after it has been approved would require Doral to prepare a submission to the EPA under Section 45C of the EP Act 1986. This submission would require consultation with relevant stakeholders and review by regulatory authorities.
293.	Individual Submission	The submitter contends that the previous experience has shown that the mine will expand or extend beyond the timeframe given in the PER. What certainty is there that the mine would not be extended.	
294.	Individual Submission	Their preferred option is that the Project not proceed.	The Yoongarillup Mineral Sands Project is an integral part of Doral's future mining operations. Doral require the proposal to proceed to ensure continued employment opportunities for its current minesite personnel and to provide a HMC feed stock for its Picton Dry Plant. Doral will continue to liaise with adjacent landholders to ensure the impacts to them from the proposal are minimised as far as is practicable.
295.	Individual Submission	In light of concerns (threat to water supply, dust, noise), we are strongly opposed to the proposed venture. We know that there will be a severe impact on our lifestyle and indeed on other neighbours.	Doral will continue to liaise with the wider community to ensure the impacts to them from the proposal are minimised as far as is practicable.
296.	Individual Submission	If the mine goes ahead, why won't the mine plant & processing equipment (and its noise) be located on the western side of Sues Road on the Haddon property near their residence? Doral advised us the mine plant location as proposed was because their mining trucks would not fit through the underpass beneath Sues Road and then admitted that this was not the case	The location of the Wet Plant has been determined on a number of grounds including: <ul style="list-style-type: none"> - Interfaces with other infrastructure (Process Water Pond, Admin Office / Workshop / SEP's) - Road Access - Mine Schedule The referenced cattle underpass does not fall within the mining tenement so cannot be utilised as part of this proposal and its location was not a contributing factor in determining the location of the Wet Plant. Noise modelling presented in the PER has taken into consideration the current proposed location for the Wet Plant.

ID	Received From	Comment	Doral's Response
Comments received that do not relate to Environmental Factors			
297.	Individual Submission	The alternatives considered section fails to identify and assess alternative mine locations from an environmental and public amenity perspective. On this basis it cannot be determined if a better alternative exists and this section fails to meet the requirements of the EIA process.	Doral believe they have adequately addressed the assessment of proposal alternatives in Section 3.2 of the PER. Doral seeks to continue mining operations in the South West and the Yoongarillup proposal is the most developed option available within Doral's tenement holdings that will enable a transition from mining at the existing Dardanup operation to a new minesite. No other alternatives are available within the current Doral tenement holdings that would enable a minesite to be operational within a short duration of the closure of its Dardanup operations.
298.	Individual Submission	The project overview should note that the development envelope extends for several kilometres and abuts the Whicher Scarp.	Figure 1-1 of the PER shows the regional location of the project, being located adjacent to the Whicher National Park. Figure 1-2 of the PER provides a Site Layout which shows the extent of the operation. Doral do not believe that any omission in the description of the proposal has been made.
299.	Individual Submission	The submitter considers that the cumulative risk to the environment, community and water must be deemed a critical mass for rejecting the proposal	Doral believes that it has addressed the requirements to meet the EPA objectives for the Preliminary Key Environmental Factors identified by the Office of the EPA in their Environmental Scoping Document (Appendix 2 of the PER). Through the Works Approval process (Department of Environment Regulation) and the Water Licencing process (Department of Water) Doral believe that the proposal can address all regulatory requirements to ensure that the risk to the environment, community and water resources are minimised.
300.	Individual Submission	It is the submitters view that farmers and people are themselves a valuable resource. Their farms are also their and at the end of their working day they cannot leave the continuous pollution, dust and noise of a working mine.	Doral has operated in close proximity to farms and residences for the past 12 years at its Dardanup operation and has had good relationships with its neighbours and hopes to establish good relationships with its neighbours at the Yoongarillup minesite. Through the implementation of a comprehensive Environmental Management System (including management plans for noise and dust) and compliance with regulatory licencing conditions, Doral believe that the impacts on the community can be minimised.
301.	Individual Submission	The submitter has expressed the view that that the long term negative impact of this mine would have virtually no gain	Doral acknowledge that the clearing of 8.68ha of native vegetation will result in a significant residual impact on the environment in the short-term, however, through a comprehensive rehabilitation program and the provision of environmental offsets, Doral believe that the proposal will not result any long term negative impacts on the environment. Socially, the proposal will result in the direct employment of 32 people and economic input into the Busselton and greater south-west economy.

ID	Received From	Comment	Doral's Response
Comments received that do not relate to Environmental Factors			
Regulation			
302.	Individual Submission	Poor enforcement of conditions after mining approval given. Conditions that apply to mining are usually well thought out, but if they are not followed by the mining companies then they are of little value.	The Proponent is seeking approval for the Proposal in accordance with all legal requirements. The Proponent is not accountable for the establishment or enforcement of legislation.
Approvals			
303.	Wildflower Society of WA	If the EPA accepts this proposal it will set a precedent for many future proposals	Doral note that the area of State Forest No. 33 to be cleared is 8.90ha, of which 8.68ha is native vegetation. The area proposed to be cleared under the Happy Valley proposal was 146ha, approx. 17 times the size of the Yoongarillup proposal. EP Bulletin No. 6 – The Natural Values of the Whicher Scarp states: <i>"The EPA will, as required under the Environmental Protection Act 1986, continue to consider proposed developments for this area on an individual basis"</i> In accordance with due process, Doral request the EPA considered this proposal on its individual merits.
304.	Busselton Dunsborough Environment Centre	The BDEC makes comparison between the proposed Yoongarillup Mineral Sands Project and the proposed Happy Valley Titanium Minerals Project	
305.	Individual Submission	The EPA was strongly opposed to the Happy Valley project and I believe that this part of the proposal should be opposed also.	
Commercial Impacts			
306.	Individual Submission	We are concerned that the value of our property will be significantly affected by the mine. We would not expect to suffer any financial penalty due to the operation of the mine and would expect Doral to make good any subsequent loss if incurred as a result of sale or rental.	Doral will continue to liaise with adjacent landholders to ensure the impacts to them from the proposal are minimised as far as is practicable. Where applicable, this may include discussions of a commercial nature.
307.	Individual Submission	The submitter has significant financial investment in the property. Their future financial security is invested in their Lot. The monetary value of the Lot is related to the amenity of the surrounding land. Any reduction in amenity is likely to affect the monetary value of the Lot.	Doral also has a significant investment in the proposal, not only financial, but social, seeking to provide continuing direct employment for 32 people. With reference to the proposal resulting in property devaluations, advice received by Doral from independent property valuers – Herron Todd White states: "Once the land has been rehabilitated, it is expected that the value will return within a short term to similar levels for rural properties in the locality depending of course on the standard of the rehabilitation." Doral propose a comprehensive rehabilitation program that is required to meet completion criteria developed in consultation with the DPaW and DMP, as such, Doral do not believe any long-term impacts to property valuation will result from the proposal. Doral will continue to liaise with adjacent landholders to ensure the impacts to them from the proposal are minimised as far as is practicable.
308.	Individual Submission	The submitter contends that given the proximity of the mine it will devalue their property	
309.	Individual Submission	The submitter contends that the mine will devalue properties in the region.	
310.	Individual Submission	Loss of Property Value: We are concerned that being in such close proximity to a mine site will adversely affect the property value of both our and our neighbour's properties	

ID	Received From	Comment	Doral's Response
Comments received that do not relate to Environmental Factors			
311.	Individual Submission	Loss of Sellability: We are concerned that the ability to attract anyone to buy our property, which will have a visible minesite from its front door will be seriously diminished. It is unlikely that people looking for a lifestyle differing tree-change would deliberately choose a property so close to a mine site to live out their hopes and dreams.	Refer Response No. 308.
312.	Individual Submission	The submitter owns a rental property nearby the proposal. It will be difficult to re-rent a house next to a mineral sands mine leaving us out of pocket. We will also be unable to sell our farm (should we make that decision) as long as the mine is there so who will compensate us?	
313.	Individual Submission	The submitter contends that the proposal would devalue surrounding properties.	
314.	Individual Submission	The submitter runs a business where one of the main attractions is the nearby bushland, pines and Yoongarillup Forest. The submitter contends that the mine will affect business as the close proximity and easy access to the Yoongarillup forest will be impacted by the mine. The submitter also contends that as they are in close proximity to the mine businesses will be impacted for the duration of mining.	The statement provided does not provide sufficient information as to the nature of the business that may potentially be affected by the proposed minesite, so Doral are unable to comment on the specifics of the submitter's business. Doral welcome contact from local businesses located near the minesite to discuss their specific concerns and to work with them to address any potential impacts of the proposal on their business operations.
315.	Individual Submission	The submitter contends that the mine would prevent tourist based businesses being started up and affect existing businesses in the area	
Community Consultation			
316.	Forest Products Commission	As a neighbour of the proposed mine, the FPC requests some meaningful involvement in the consultation process.	Doral consulted with FPC as outlined in Table 4-1 of the PER. Doral will continue to liaise with FPC during the development of the proposal and during its implementation.

ID	Received From	Comment	Doral's Response
Comments received that do not relate to Environmental Factors			
317.	Individual Submission	To date our communication with Doral has been very poor. As we adjoin their proposed mine boundary (east side) we would expect to be kept fully informed of the project and progress of its implementation. This has not been the case.	Doral undertook consultation with a number of landholders during the development of the PER as outlined in Table 4-1 of the PER. Additional communications were held between Doral and a number of landholders relating to the exploration of their land, at which time, an overview of the Yoongarillup proposal was discussed. Consultation of the wider community was undertaken through the release of the Public Environmental Review document. The PER contained all relevant data required to inform the wider community of the proposal. Landholders in close proximity to the proposal were contacted by Doral to advise the public review was open and to provide a hardcopy of the document for them to review. Until such time as the PER document was approved for release, Doral would not have been able to provide the wider community the full details of the proposal, so a decision was taken by Doral to liaise only with landholders whose land was within mining tenements M70/0458 and M70/0459.. Doral acknowledge that limiting the initial consultation has resulted in an increased level of concern from the wider community about the impact of the proposal on their daily lives.
318.	Individual Submission	Doral claim to have very good relationship with their Dardanup/Burekup neighbours. At a meeting held on Tue 11 Nov of local residents the lack of trust and lack of provision of information was clearly demonstrated. Doral has not kept local residents informed at any stage.	Moving forward, and subject to the proposal gaining regulatory approval, Doral has committed to the development and implementation of a Stakeholder Management Plan that will document future consultation processes and mechanisms for the community to provide feedback on the proposal during its operation. Doral does have a strong working relationship with its neighbours at its current operation at Dardanup/Burekup and is committed to working with the community at Yoongarillup to ensure strong, positive working relationships are established for this proposal.
319.	Individual Submission	It is fatal flaw of the project and the PER that the stakeholder consultation did not include the local community beyond landholders within which the project is located.	
320.	Individual Submission	The submitter contends that Doral has not consulted land owners until seven day before the close of submissions on the PER	
321.	Individual Submission	The submitter is aware of media presented from both Doral's and the residents perspective	Acknowledged.

ID	Received From	Comment	Doral's Response
Comments received that do not relate to Environmental Factors			
Land Access			
322.	Individual Submission	The submitter outlined a number of requirements relating to accessing land within the Development Envelope.	These comments do not relate to the PER document itself, however, Doral acknowledges the comments made by the landholder and will ensure that these requests are taken into consideration in ongoing land access discussions with the landholder.
Transport			
323.	Individual Submission	Trucks will compound normal traffic dilemmas. I have land along Sues Road. Since 1996 there has been at least one accident per month on Sues Road/Vasse Highway intersection.	Doral has liaised with Main Roads WA who have provided advice that the anticipated volume of traffic to be generated by the proposal will not have significant impacts on the adjacent road network. It is estimated that 6 round trips (Yoongarillup to Picton) of a semi-road train will be generated as a result of the proposal. Main Roads WA have provided Doral data that shows only 2 crashes have been reported at the intersection of Vasse Hwy / Sues Road for the 5 year period between 2009 – 2013.
324.	Individual Submission	The submitter contends that the mine would cause traffic issues.	
325.	Individual Submission	Our concern that when the mineral is transported to Doral's main refinery, that school bus hour restrictions should be in place and the point that any movement of mineral is in daylight hours so that the noise of traffic, both arriving and leaving the mine site, does not create a problem to families and residents of the location	Prior to the commencement of operations, Doral will liaise with the School Bus Service section of the Public Transport Authority in consultation with Main Roads WA to determine whether the proposed minesite will have any adverse impacts on safety or scheduling for any School Bus services operating in the vicinity of the minesite. Where adverse impacts are identified, Doral will work with School Bus Service and Main Roads WA to ensure that measures are implemented to mitigate any adverse impacts.
326.	Department of Parks and Wildlife	In Section 3.11 and Figure 1.3 of the PER, reference is made to a proposed haulage route via Railway Road. Significant conservation values are found on the roadside (including DRF and the Busselton Ironstone threatened ecological community) and with the road being narrow with minimal shoulders, it may require upgrade for haulage use. It is recommended that details are sought on any proposed upgrades to this road, and if upgrades are proposed, the impact of those upgrades to roadside conservation values should be addressed.	Main Roads WA has confirmed the presence of Declared Rare Flora (DRF) at a number of locations along Railway Road, Capel (part of Route 1 defined above). In addition 2 sites along the road have been identified as containing a Threatened Ecological Communities (TEC). Main Roads WA has advised the DRF and TEC occurs within the road reserve but outside the road formation and outside the vehicle travelled path. Main Roads WA has advised that the low volume of traffic (6 round trips per day of a Class 10-Class 12 vehicle) that will be generated as a result of this proposal will not necessitate any road upgrade to the Boyanup-Capel Road. As such, the DRF and TEC located along Railway Road within the road reserve (but outside the road formation and vehicle travelled path) will not be impacted as a result of the proposal.

ID	Received From	Comment	Doral's Response
Comments received that do not relate to Environmental Factors			
327.	Individual Submission	The submitter notes that Sues Road is a major thoroughfare for the region. It is the submitter's view that the diversion of the Sues Road would cause major disruption and asks will Doral fund repairs to the road from their increased use.	Doral will continue to liaise with Main Roads WA to ensure that the proposal does not result in major disruptions to road users. Doral has liaised with Main Roads WA who has provided advice that the anticipated volume of traffic to be generated by the proposal (an estimated 6 round trips of a semi road-train) will not have significant impacts on the adjacent road network.
Environmental Management Systems			
328.	Individual Submission	Ensure both sides of Goulden Road, from Yoongarillup Road up to the forest to be slashed due to additional traffic and people movement.	Doral will implement a comprehensive Environmental Management System (EMS) for this proposal. A component of the EMS is Fire Management. Section 6.5.5 of the PER provides details of the Fire Management Plan to be developed by Doral for the site. The plan will be based on the existing Fire Management Plan in place for the current Dardanup operation, amended to suit the local conditions, environment and neighbours/stakeholders at the Yoongarillup site. Doral will consult with adjacent landholders and other relevant stakeholders in the development of this plan to ensure their concerns are captured and addressed.
329.	Individual Submission	The submitter requests that Doral establish fire breaks along minesite boundaries (within paddock areas).	
330.	Individual Submission	The submitter requests that vegetation be controlled by regular slashing within paddock areas of the Development Area.	
331.	Individual Submission	The submitter is concerned that the Project will affect their access and escape routes to and from their property, especially in the case of fire or other similar emergencies. An analysis of fire exits is required, and consideration of the impact of the Project on the submitter is required.	
332.	Individual Submission	The submitter contends that Doral's expectations regarding the overall project are not iron clad commitments.	
			The PER document and the Response to Submissions document outline a number of management commitments to be implemented by Doral during the operation of the proposal. Doral are committed to implementing these management plans to ensure that the impacts of the proposal on the environment and the community are minimised as far as is practicable.

11 CONCLUSION

The Yoongarillup Mineral Sands Project seeks to clear 8.68ha of native vegetation from State Forest No. 33. This represents less than 0.09% of the remaining 9,200ha of native vegetation remaining within the Whicher Scarp soil landscape system. The PER and this response to submissions acknowledges the significance of the Whicher Scarp and Doral has developed the proposal to minimise the impact on this conservation significant area.

The proposal will provide economic benefits to the State of WA through the provision of employment opportunities and injection of expenditure into the local and State economy.

Doral believe that the proposal will result in a net environmental benefit for the State of WA through the implementation of a comprehensive:

- Environmental Management System;
- Mine Closure Plan, incorporating rehabilitation and revegetation of the cleared area within State Forest No. 33; and
- Environmental Offset Strategy;

Doral has invested significant time, effort and resources into the development of this proposal and is committed to ensuring a positive outcome for all sectors of the community in the delivery of the proposal.

Through the information presented in the Public Environmental Review and the Response to Submission document, Doral has demonstrated that the EPA objectives for the Preliminary Key Environmental Factors applicable to this proposal can be achieved and that the proposal can be delivered in a way that is environmentally acceptable to the State of WA.

Doral

YOONGARILLUP Mineral Sands Project

Public Environmental Review

Response to Public Submissions BOOK 2 – Appendices (Refer Separate PDF File)



Final Issue - 01 July 2015

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Doral

Doral Mineral Sands Pty Ltd ABN 18 096 342 451 ACN 096 342 451 Lot 7 Harris Road, Picton WA 6229
Tel:+61 8 9725 5444 Fax:+61 8 9725 4557 Email: admin@doral.com.au Website: www.doral.com.au