Amendment Report

Application for a licence amendment

Division 3, Part V *Environmental Protection Act 1986*

Licence number	L8561/2011/1
Licence holder	GMA Garnet Pty Ltd
ACN	009 344 227
File Number	DER2015/001679
Premises	Port Gregory Garnet Project 1420 George Grey Drive YALLABATHARRA WA 6535 Legal description – Tenements G70/171, M70/204, M70/259, M70/856, M70/926, M70/927, M70/968, M70/1330 and M70/1331
Date of Report	01 September 2020
Decision	Revised licence granted

Amendment description

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the existing licence issued under the EP Act for a prescribed premises as set out below.

This amendment is limited to expanding the prescribed premises boundary of the existing licence. No further changes to the aspects of the existing licence have been requested.

Purpose and scope of assessment

The licence holder has applied to expand the boundary of the Premises, to include an additional mining tenement (M70/926) located directly adjacent to the current northern boundary of the Premises.

Background

The licence holder operates the Port Gregory Garnet Project at the southern margin of the Carnarvon Basin, around 45 km south of Kalbarri and 100 km north of Geraldton.

The project incorporates two open cut alluvial garnet mines, being the 'Lynton' and 'Hose' mines. The Lynton mine has been operating since 1981 and is located around 3 km inland from the small coastal township of Gregory ('Port Gregory'). The Hose mine is located around 10 km northwest of the Lynton mine and has been operating since 1997. Primary processing of ore from both mines has been conducted at the Hose site since 1997, with the garnet concentrate product transported off-site for secondary processing at the company's Narngulu dry mill, prior to export through the Port of Geraldton.

The mining and processing operation incorporates conventional dry mining followed by wet screening and gravity separation, to produce a garnet concentrate (around 480,000 tonnes per annum). Sand tailings are dewatered and returned to the mine void, which is progressively backfilled. Clay fines are discharged into discrete solar evaporation ponds, and once dried, are returned to the mine void as backfill. Dust and sand tailings from the Narngulu dry plant are also returned to the mine site and blended with mine tailings for backfill in the mine void.

Proposed amendments

<u>Hose mine</u>

The Hose mine is covered by general lease G70/171 and mining tenements M70/859 and M70/927. Mining is currently being undertaken on M70/927 and is progressing in a northerly direction at a rate of around 100 metres per year. The licence holder proposes to expand the mining operation into the directly adjacent northern tenement, M70/926, which is not within the current prescribed premises boundary.

<u>Lynton mine</u>

The Lynton mine is covered by mining tenements M70/204, M70/259 and M70/968. Mining is currently being undertaken on M70/204 and is progressing in a northerly direction at a rate of around 100 metres per year. In order to expand this operation, the licence holder has sought and had approved, a change in the tenement type and title from the prospecting tenement P70/1372 to mining tenement M70/1331. The area subject to this tenement is included within the current prescribed premises boundary.

M70/1331 is mostly freehold land owned by the licence holder, with the exception of a small portion within Lot 58 on Plan 65334. The licence holder has in place a private lease agreement with the owner of Lot 58 regarding access for the purpose of exploration – the licence holder is currently in negotiations to alter this agreement for the purpose of mining. Based on this the licence holder has requested Lot 58 be excluded from the Premises, until such time legal access has been established.

Environmental siting

The Premises is located near the Hutt Lagoon, a former estuary of the Hutt River, which has been isolated from the sea by a barrier beach. The mine occurs on a raised bench of a remnant shoreline, rising from one to twenty metres AHD.

In the Hose mine area, Utcha Swamp (a small wetland) is located on the western edge of the wave-cut escarpment, midway along the mining lease boundary. This swamp is situated amongst other smaller wetlands and contains fresh to brackish water – these wetlands are of environmental significance and require protection from the impacts of the mining operation.

The climate is considered to be arid, with a short mild wet winter and the remainder of the year being warm to hot, dry and windy. Moderate to strong south to southwesterly winds dominate the summer period and mild northwesterly winds occur in the winter. The average annual rainfall is around 400 mm, with most rain falling during May to August. Annual evaporation in the area is around 2,500 mm.

Garnet-bearing sands are contained in beach deposits located along former shorelines in a strip about 750 m wide and abuts a wave-cut escarpment in the Tamala Limestone. Fresh/brackish groundwater in the superficial formations aquifer discharges over a saltwater wedge of hypersaline groundwater extending under the eastern edge of Hutt Lagoon.

The below table lists the relevant sensitive land uses and specified ecosystems in the vicinity of the Premises.

Sensitive land use	**Distance from Premises**
Residential premises	Rural dwelling – around 5 km east of M70/926
	Lynton Station homestead and caravan park (Lot 56) – around 250 m southeast of M70/1331
Industry	Port Gregory betacarotene works – adjacent to M70/1331
	Balline Garnet mine (proposed) – around 2 km northwest of M70/926
Town site	Gregory (population ~50) – around 3 km southwest of M70/1331
	Lucky Bay campground – around 4 km northwest of M70/926
Specified ecosystems	**Distance from Premises**
Directory of Important Wetlands in Australia	Hutt Lagoon – directly west of Lynton mine and proposed M70/1331. A good example of a coastal brine lake. Is of cultural significance to the local Aboriginal people and of historical significance as an early centre of European settlement in WA.
Lands managed by DBCA	Utcha Well Nature Reserve – directly adjacent to M70/926
Threatened Ecological Communities and Priority Ecological Communities	Priority 1 (P1) – Shrublands of the Northampton area, dominated by Melaleuca species over exposed Kockatea Shale. Mapped boundary of two instances of this PEC are located around 3.6 km east of M70/1331, and a second around 6 km southeast of M70/1331.
Biological component	**Distance from Premises**
Threatened/Priority Flora	A level 1 flora survey did not record any conservation significant flora within the proposed mine area within M70/926. The proposed mine area within M70/1331 is predominantly cleared.
Threatened/Priority Fauna	The Hutt Lagoon system is a wetland of national importance due to habitat values for migratory birds.
Surface water	
Hutt Lagoon Location: directly adjacent (west) to M70/1331, just north of the mouth of the Hutt River.	

Environmental value: Expansive coastal brine lake that lies a few metres below sea level. Water is naturally highly saline (150,000 mg/L); the lagoon contains the world's largest microalgae production plant, a 250 ha series of artificial ponds used to produce beta-carotene.
Hutt River Location: mouth of the river (Broken Anchor Bay) is located about 1.2 km southwest of M70/1331. Environmental value: The only non-saline perennial river in the northern Mid West, with water quality maintained by freshwater tributaries fed by sandplain seeps. The river retains significant amounts of riparian vegetation and contains the State's most northern population of wild marron.
Groundwater
Description: The main aquifer is within the superficial formations and comprises the Tamala Limestone overlying aeolian and beach sand deposits. The depth to groundwater varies significantly across the site, from 0.43 m near Utcha Swamp and along the edge of Hutt Lagoon to up to 40 m in bores adjacent to the scarp to the east. The average depth near the Hose plant site is around 30 m, and around 26 m at the Lynton site. Groundwater flows south-westwards and discharges into Hutt Lagoon, the adjoining wetlands, or the ocean. Groundwater recharge originates from rainfall during the winter months and cyclonic rainfall events. Environmental value: The natural groundwater is potable to brackish, with salinity ranging from around 530 mg/L to 1,500 mg/L. The ionic proportion groupings indicates the groundwater is of the sodium-chloride type. Fresh/brackish groundwater in the superficial aquifer discharges over a saltwater wedge of hypersaline groundwater extending under the eastern edge of Hutt Lagoon.

Modelling data

Noise assessment

Noise model

The licence holder engaged consultant GHD to undertake a basic environmental noise impact assessment for the proposed mining operation on M70/1331 (GHD, 2020a). Version 2019 of Datakustick's *CadnaA* noise prediction software was used to predict noise levels at nearby receptors during day time operations under worst case meteorological conditions, with the CONCAWE noise propagation model selected.

Results

GHD (2020a) predicts that noise levels can comply with the day time noise criterion of 45 dB(A) between 7:00 am and 7:00 pm at the closest receptors. However outside of these hours, e.g. where operations commence before 7:00 am on weekdays, Sundays and public holidays, exceedances of the night time noise criterion of 35 dB(A) are predicted.

In order to achieve noise compliance with the night time noise criterion, GHD (2020a) has suggested noise mitigation in the form of limiting the work area to no closer than 250 m from the southeastern-most edge of the mine pit, and either:

- suspending the use of dozers and graders until after 7:00 am Monday to Saturday, and 9:00 am Sundays and public holidays; or
- limiting the work area for dozers and graders to no closer than 1,800 m from the southeastern-most edge of the mine pit before 7:00 am Monday to Saturday, and 9:00 am Sundays and public holidays.

DWER technical review

DWER's review of the noise assessment (GHD, 2020a) identified the following:

- the sound power levels (SWLs) used for the modelling quotes levels from the typical mid-

point SWLs of the construction plant and equipment given by AS 2436-2010 – however the SWLs provided in this standard have quite a large range. For example, a bulldozer has a SWL range of 102 to 114 dB(A) – using the mid-point level of 108 dB(A) may underestimate the noise emission level by up to 6 dB(A) in terms of noise. An acceptable noise model needs to be based on the *actual SWL* of the plant and equipment to be used;
- the model uses meteorological conditions of 10°C and 70% relative humidity, whereas the default 'worst-case' meteorological conditions for Western Australia is 20°C and 50% relative humidity and 4 m/s wind speed for day time, and 15°C and 50% relative humidity and 3 m/s wind speed for night time. Where a different set of meteorological conditions are to be used in a noise model, it needs to be justified; and
- DWER is not convinced the proposed noise mitigation on the working areas and equipment items can ensure noise compliance at night.

Initial key findings:

1. The proposed mining operation on M70/1331 should be able to comply with the noise regulations at the closest noise sensitive premises (about 1 km away) during daytime operations, but is unlikely to comply during the night time.
2. Although there are significant shortcomings with the noise assessment provided, instead of requesting the licence holder redo the noise modelling the delegated officer has determined the risk of the operation can be acceptable if the operation on M70/1331 is limited to day time hours only, i.e. 7:00 am to 7:00 pm, unless it can be demonstrated the receptors on Lot 56 are not 'noise sensitive', i.e. private agreements are in place.

Updated noise assessment 3 August 2020

The licence holder provided to DWER on 1 May 2020 an updated noise assessment following concerns raised by DWER about certain data used in the original noise modelling assessment. The concerns raised by DWER were:

- Utilising mid-point level of sound power levels may underestimate noise levels; and
- No justification was provided for utilising certain meteorological conditions, whereas the default worst case scenario meteorological conditions should have been used.

The licence holder re-engaged GHD to revisit the initial noise assessment utilising the revised data. Worse case noise levels were predicted at each sensitive receptor for both day shift (6.00am to 6.00 pm) and night shift (6.00pm to 6.00am). Predicted noise levels are presented in the table below.

Criteria	**Day**			**Night**		
Sensitive receptor	**Predicted L_{A10} Noise Levels – Day shift 6.00am to 6.00 pm**	Assigned noise levels 0700 to 1900 Monday to Saturday	Assigned noise levels 0900 to 1900 Sunday and public holidays	**Predicted L_{A10} Noise Levels – Night shift 6.00pm to 6.00am**	Assigned noise levels - 1900 to 2200 all days	Assigned noise levels 2200 on any day to 0700 Monday to Saturday and 0900 Sunday and Public Holidays
House	**38 dBA**	45 dBA	40 dBA	**31 dBA**	40 dBA	35 dBA
Caravan park	**40 dBA**	45 dBA	40 dBA	**32 dBA**	40 dBA	35 dBA

As shown in the table above, the worst case scenario predicted day shift noise levels at the sensitive premises are at or below the assigned noise levels between the hours of 7.00 am to 7.00 pm during Monday to Saturday, and between the hours 9.00 am to 7.00 pm Sunday and public holidays. For the night shift, the worst case scenario for noise levels at the sensitive premises are below the assigned levels between 7.00 pm to 10.00 pm all days, and 10.00 pm to 7.00 am Monday to Saturday and to 9.00 am on Sundays and public holidays. However, the day shift commences at 6.00 am which occurs during the final hour of the assigned noise levels for 10.00 pm to 7.00 am Monday to Saturday, and during the final three hours to 9.00 am on Sundays and public holidays. The assigned noise level is 35 dBA for these times and predicted noise levels at the House and Caravan Park are 38 dBA and 40 dBA respectively. To comply with the assigned noise level at the two noise sensitive premises, proposed restrictions were applied to the noise model to achieve an outcome of 35 dBA. The resultant restrictions are set out below and will be applied by the licence holder as controls:

- No grader operations;
- Where one excavator is in operation, the dozer must operate at least 350 m from the south east pit boundary; and
- Where two excavators are in operation, the dozer must be at least 700 m from the south east boundary.

The licence holder has also committed to installing permanent noise monitoring equipment at the nearest noise sensitive premises to undertake continuous noise monitoring. Operations will be modified if excessive noise levels are detected.

DWER notes that noise levels experienced at the noise sensitive premises are expected to reduce as the depth of the pit increases.

Final key findings:

1. The proposed mining operation on M70/1331 is expected to comply with the noise regulations at the closest noise sensitive premises (located about 1 km away) for all hours and days except for the hours of 6.00 am to 7.00 am Monday to Saturday, and 6.00 am to 9.00 am Sunday and Public Holidays, unless controls are put in place.
2. Noise levels received at the closest sensitive premises are expected to reduce over time as the depth of the mine increases.

Dust assessment

Air quality model

The licence holder engaged consultant GHD to undertake a basic air quality assessment for the proposed mining operation on M70/1331 (GHD, 2020b). AERMOD (v. 9.5.0) was used to conduct air dispersion modelling for one operational scenario for three dust size fractions, including total suspended particulates (TSP), particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$).

Results

The predicted concentrations of TSP and dust deposition are shown in the below table. The results indicate the predicted concentrations at both sensitive receptors for all averaging periods comply with the relevant assessment criteria, being the Kwinana EPP[1] for TSP and the NSW AMMAAP[2] for deposited dust. No cumulative assessment was made as background concentrations were not available, however it has been considered unlikely that cumulative dust impacts would adversely impact on sensitive receptors due to the prevailing wind

[1] *Environmental Protection (Kwinana) (Atmospheric Waste) Policy* (EPA, 1999).

[2] *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA, 2017).

conditions of the local area.

Criteria	**Maximum 24-hour TSP (90 µg/m^3)**		**Annual TSP (90 µg/m^3)**	
Sensitive receptor	Predicted concentration	% of criterion	Predicted concentration	% of criterion
House	71	79%	1.1	1.2%
Caravan park	18	20%	0.8	0.9%
Criteria	**Maximum dust deposition increase (2 g/m^3/month)**		**Maximum total dust deposition (4 g/m^3/month)**	
House	0.005	0.3%	0.005	0.1%
Caravan park	0.003	0.2%	0.003	0.1%

The predicted concentrations of PM_{10} and $PM_{2.5}$ are shown in the below table. The results indicate the predicted concentrations at both sensitive receptors for all averaging periods comply with the relevant assessment criteria, being the Air NEPM[3].

Under worst case conditions the maximum 24-hour concentration predicted at the 'house' sensitive receptor is 26 µg/m^3 which, when added to an adopted background concentration of 26 µg/m^3, exceeds the Air NEPM by 2 µg/m^3 (4%).

No cumulative assessment was made for $PM_{2.5}$ as background concentrations were not available, however similar to TSP it has been considered unlikely that cumulative impacts from $PM_{2.5}$ would adversely impact on sensitive receptors due to the prevailing wind conditions of the local area.

Criteria	**Maximum 24-hour PM_{10} (50 µg/m^3)**		**Annual PM_{10} (25 µg/m^3)**	
Sensitive receptor	Predicted concentration	% of criterion	Predicted concentration	% of criterion
House	26	53%	0.5	2%
Caravan park	7	13%	0.4	1%
Criteria	**Maximum 24-hour $PM_{2.5}$ (25 µg/m^3)**		**Annual $PM_{2.5}$ (8 µg/m^3)**	
House	4	15%	0.1	1%
Caravan park	1	4%	0.1	1%

GHD (2020b) conclude the proposed mining operation on M70/1331 is unlikely to adversely impact on local air quality, provided the following mitigation measures are implemented:

- use of water trucks along unsealed haul and transport routes at a rate of >2 L/m^2/hour;
- continuous backfill and revegetation of the mining pit;
- limit the speed of heavy and light vehicles; and
- mine site operational from 6 am to 6 pm daily.

Legislative context and other approvals

Relevant approvals

Legislation	**Approval**
Part V of the EP Act	Licence L8561/2011/1 authorises the ongoing mining and processing operations
Mining Act 1978	DMIRS has approved a mining proposal (Reg ID 38133) for an extension of the mine into M70/926 and M70/927
	DMIRS has approved a mining proposal and mine closure plan

[3] *National Environment Protection (Ambient Air Quality) Measure* (Department of Environment, 2016).

Legislation	Approval
	(Reg ID 54878) for an extension of the mine into M70/1331
Rights in Water and Irrigation Act 1914	Groundwater licence GWL 62130(4) allows abstraction of up to 1.0 gigalitres per year from the Gascoyne – Carnarvon-Tumblagooda aquifer for the purposes of dust suppression, mineral ore processing and other mining purposes

Risk assessment

The table below describes the risk events associated with the amendments consistent with the *Guidance Statement: Risk Assessments*. The table identifies whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Risk assessment

Risk event				Consequence rating*	Likelihood rating*	Risk*	Reasoning	Regulatory controls (refer to conditions of the granted instrument)
Source/Activities	**Potential emissions**	**Potential receptors, pathway and impact**	**Licence holder controls**					
Proposed mining operations on M70/926	Noise from continuous (24/7) mining fleet movements	Users of George Grey Drive, rural dwelling 5 km east, causing amenity impacts/health impacts	Regular maintenance and upgrading of earthmoving equipment Annual in-house noise audit	Low level impact to amenity **Minor**	Not likely to occur in most circumstances **Unlikely**	**Low** Acceptable, not subject to controls	There is sufficient separation between the proposed mining operation on M70/926 and off-site receptors (>5 km). The Delegated Officer does not reasonably foresee that noise from mining operations will impact on off-site human receptors.	None specified.
	Fugitive emissions (dust) associated with mining fleet movements		Pre-mine stripping kept to minimum practicable working area Dust suppression on haul roads and areas exposed to southerly winds during summer will include use of water carts Dust suppressant additives (mulches or polymer additives) will be used if water application is insufficient to ameliorate dust generation	Low level impact to amenity **Minor**	Will probably occur in most circumstances **Likely**	**Medium** Acceptable, subject to regulatory controls	There is sufficient separation between the proposed mining operation on M70/926 and the nearest off-site dwelling (>5 km). The proposed mine path runs directly adjacent to George Grey Drive, where road users may be impacted during prevailing strong easterly and southwesterly wind conditions, through reduced visibility and health impacts. The existing licence contains some controls regarding fugitive dust emissions, however the delegated officer considers additional controls are required to minimise the risk of off-site impacts during strong prevailing wind conditions.	Specified actions: - Topsoil stripping – scheduling; - Use of water carts and sprays; - Use of dust suppressant other than water on exposed areas; and - Cease activities causing visible dust liftoff where there is a risk of dust affecting off-site receptors
		Windblown dust causing impacts to health and condition of conservation significant native vegetation within the Premises and off-site (adjoining Utcha Well Nature Reserve)		Low level off-site impacts **Moderate**	Could occur at some time **Possible**	**Medium** Acceptable, subject to regulatory controls	The local area experiences strong prevailing on- and offshore winds (southerly winds can blow consistently over 25 km/h for several days during summer) that are likely to present significant challenges to controlling dust lift-off from exposed areas during mining operations. DBCA advises that recent observations of vegetation adjoining the existing mine site include dust deposition and vegetation decline, which appear to be linked to operations on the Premises. The delegated officer therefore considers additional controls are required to minimise the level of off-site impacts to adjoining native vegetation, including dust monitoring to validate the effectiveness of the controls.	Specified actions: - As listed above; and - Monitoring of dust using depositional gauges during mining operation on M70/926
	Groundwater acidification associated with disturbance (oxidation) of ASS	Seepage to groundwater, causing contamination (acidification)	None required.	Low level on-site impacts **Minor**	May occur in exceptional circumstances **Rare**	**Low** Acceptable, not subject to controls	Mining activities will not occur below the natural water table, therefore the risk of ASS is low. The high carbonate content of the dune sand further lowers the risk of acid generation.	None specified.
	Erosion and sedimentation from surface water runoff	Contamination of drainage lines leading to Hutt Lagoon, impacting on health and condition of native vegetation	None required.	Low level on-site impacts **Minor**	Not likely to occur in most circumstances **Unlikely**	**Low** Acceptable, not subject to controls	Due to the porous nature of the soils, it is expected the majority of surface water will rapidly infiltrate. The local area has low average annual rainfall (~400 mm/yr), however is subject to cyclonic rainfall events.	None specified.
Proposed mining operations on M70/1331	Noise from continuous (24/7) mining fleet movements	Users of George Grey Drive, dwellings 1 km south (house and caravan park), causing amenity impacts/health impacts	Prior to 7 am, limiting the work area to no closer than 250 m from the southeastern edge of the mine pit, and either: - No use of dozers and/or graders before 7 am; or - limiting use of dozers and graders to within 1.8 km of sensitive receptors **Updated 3 August 2020** Prior to 7.00 am Monday to Saturday, and prior to 9.00 am on Sundays and public holidays, applying the following restrictions:	Mid-level impact to amenity **Moderate**	Could occur at some time **Possible**	**Medium** Acceptable, subject to regulatory controls	There are two noise sensitive receptors located about 1 km south of the proposed mining pits on M70/1331. DWER has concern regarding the reliability of the noise assessment conducted to support the application, however based on the type of operation and separation distance to sensitive receptors (~1 km) considers the proposed operation should be able to comply with the noise regulations during normal day time hours, but not at night time (i.e. before 7:00 am). A condition will therefore be added to the licence to restrict operations to normal day time hours only (i.e. 7:00 am to 7:00 pm Monday to Saturday) to manage the potential impacts to receptors. It is also noted that there has been no noise complaints to date. **Updated 3 August 2020** DWER considers the proposed operations should be able to comply with the noise regulations for all times and days, but	Operation of infrastructure requirements: - Restriction of mining operations to normal day time hours only **Updated 3 August 2020** Operation of infrastructure requirements: - Restrictions on mining operations during particular times; Monitoring requirements: - Undertake noise monitoring at the nearest sensitive

			- No grader operations; - Where one excavator is in operation, the dozer must operate at least 350 m from the south east pit boundary; and - Where two excavators are in operation, the dozer must be at least 700 m from the south east boundary. Installation of noise monitoring equipment at the nearest sensitive premises to undertake continuous noise monitoring. Operations will be modified if excessive noise levels are detected.				not for the hours of 6.00 am to 7.00 am Monday to Saturday, and 6.00 am to 9.00 am Sunday and Public Holidays, unless controls are put in place. Conditions will therefore be included in the licence to include these controls and monitoring requirements to determine if the controls are suitable.	premises within 30 days of mining commencing on M70/1331 and compare the results from the monitoring with the noise regulations and the modelling results.
	Fugitive emissions (dust) associated with mining fleet movements		Dust suppression, etc. (see above)	Mid-level impact to amenity **Moderate**	Not likely to occur in most circumstances **Unlikely**	**Medium** Acceptable, subject to regulatory controls	Air dispersion modelling (GHD, 2020b) indicates the risk of impacts to sensitive receptors is low, due to the location of the receptors to the mine and the prevailing wind conditions. The proposed mine path runs directly adjacent to George Grey Drive, where road users may be impacted during prevailing strong easterly and southwesterly wind conditions, through reduced visibility and health impacts. The proposed mine path runs directly adjacent to George Grey Drive, where road users may be impacted during prevailing strong easterly and southwesterly wind conditions, through reduced visibility and health impacts. The existing licence contains some controls regarding fugitive dust emissions, however the delegated officer considers additional controls are required to minimise the risk of off-site impacts during strong prevailing wind conditions.	Specified actions: - Topsoil stripping – scheduling; - Use of water carts and sprays; and - Use of dust suppressant other than water on exposed areas
		Windblown dust causing impacts to health and condition of native vegetation surrounding mine pit, Hutt Lagoon		Minimal off-site impacts on a local scale **Minor**	Could occur at some time **Possible**	**Medium** Acceptable, subject to regulatory controls	The local area experiences strong prevailing on- and offshore winds (southerly winds can blow consistently over 25 km/h for several days during summer) that are likely to present significant challenges to controlling dust lift-off from exposed areas during mining operations. DBCA advises that recent observations of vegetation adjoining the existing mine site include dust deposition and vegetation decline, which appear to be linked to operations on the Premises. The delegated officer therefore considers additional controls are required to minimise the level of off-site impacts to adjoining native vegetation.	Specified actions: - As listed above
	Groundwater acidification associated with disturbance (oxidation) of ASS	Seepage to groundwater, causing contamination (acidification)	None required.	Low level on-site impacts **Minor**	May occur in exceptional circumstances **Rare**	**Low** Acceptable, not subject to controls	Mining activities will not occur below the natural water table, therefore the risk of ASS is low. The high carbonate content of the dune sand further lowers the risk of acid generation.	None specified.
	Erosion and sedimentation from surface water runoff	Contamination of drainage lines leading to Hutt Lagoon, impacting on health and condition of native vegetation	None required.	Low level on-site impacts **Minor**	Not likely to occur in most circumstances **Unlikely**	**Low** Acceptable, not subject to controls	Due to the porous nature of the soils, it is expected the majority of surface water will rapidly infiltrate. The local area has low average annual rainfall (~400 mm/yr), however is subject to cyclonic rainfall events.	None specified.

**Consequence ratings, likelihood ratings and risk descriptions are detailed in the Department's Guidance Statement: Risk Assessments (February 2017).*

Decision

The delegated officer has determined that expanding the prescribed premises boundary to include an additional mining tenement to the north (M70/926), and authorising mining operations in the southern-most tenement (M70/1331), increases the overall risk profile of the Premises and therefore additional controls are required on the licence to address this risk.

Noise controls

Updated 3 August 2020

For mining operations on M70/1331, an additional condition has been imposed restricting some operations from 10.00pm on all days to 7.00 am Monday to Saturday and to 9.00 am on Sundays and public holidays. These restrictions include the following:

- No grader operations;

- Where one excavator is in operation, the dozer must operate at least 350 m from the south east pit boundary; and

- Where two excavators are in operation, the dozer must be at least 700 m from the south east boundary.

Conditions have also been included requiring the licence holder to, engage and retain the services of a noise professional to undertake noise assessment work at the nearest premises within 30 days of mining commencing on M70/1331, and compare the results of the noise assessment with the Noise Regulations and the predicted noise modelling results. A condition has also been included that requires the licence holder to prepare and submit a plan that identifies actions that will be undertaken with timeframes, to ensure compliance with the Noise Regulations if the results of the survey show non-compliance.

Dust controls

Existing conditions relating to fugitive dust have been expanded upon, to require additional controls to minimise the risk of fugitive dust emissions causing off-site impacts to both human and environmental receptors. Monitoring of dust deposition levels whilst mining on M70/926 has also been imposed, in order to demonstrate the effectiveness of dust management on the Premises.

Other changes

As part of this amendment package, the CEO has:

- updated the premises boundary map, to include M70/926 and M70/1331 and to exclude exploration tenements E70/3055 and E70/5160 that do not relate to the prescribed activity;
- updated the format and appearance of the licence;
- deleted the redundant AACR form set out in schedule 1 of the previous licence and advise the licence holder to obtain the form from the Department's website;
- revised licence condition numbers, and removed any redundant conditions and realigned condition numbers for numerical consistency; and
- corrected any clerical mistakes or unintentional errors.

Consultation

The application was advertised on DWER's website in January 2020. No public submissions were received within the specified timeframe.

DMIRS advises the proposed amendment is broadly in line with existing mining approvals, which includes provision for mining on tenements M70/926 and M70/1331.

The Department of Biodiversity, Conservation and Attractions (DBCA) advises the proposed extension to the north (M70/926) is likely to impact on the adjacent Utcha Well Nature Reserve, land it manages for the purpose of conservation of flora and fauna under the

Conservation and Land Management Act 1986. This reserve has significant biodiversity conservation value due to the vegetation within this reserve consisting of an under-represented vegetation association, *Low forest, Acacia rostrellifera: association 371*, which has less than 10% of the pre-European extent remaining.

In addition, vegetation adjoining the reserve in M70/926 also consists of this association and provides an important buffer against potential edge effects including dust deposition, weed infestation, soil erosion and hydrology changes. Recent observations of the adjacent vegetation association by DBCA indicates vegetation decline and dust deposition, which appear to be linked to the GMA operation.

The licence holder was provided with a draft licence amendment on 20 March 2020. The draft included restricting mining operations on M70/1331 to day time operations only. The licence holder revised the amended licence and wished to undertake further noise modelling to determine if night time mining could occur. DWER agreed to further noise modelling.

The licence holder provided to DWER on 1 May 2020 a revised noise assessment for the proposal. The noise assessment concluded that night time mining operations on M70/1331 could comply with the noise regulations as long as certain restrictions were applied.

Following a review by DWER of the submitted revised noise assessment, the licence holder was provided with an updated draft licence amendment and draft updated amendment report on 10 August 2020. The updated licence and amendment report included revised noise restrictions and monitoring requirements.

The licence holder advised DWER on 28 August 2020 that they had no objections to the proposed amendments and agreed to waiver the rest of the consultation period.

Conclusion

Based on the assessment in this amendment report, the delegated officer has determined that a licence amendment will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Summary of amendments

The below table provides a summary of the amendments and will act as a record of implemented changes. All proposed changes have been incorporated into the revised licence as part of the amendment process.

Condition no.	Proposed amendment
Definitions	Definition for ‘CEO’ updated
	Definitions removed: ‘AS/NZS 1940’, ‘code of practice for the storage and handling of dangerous goods’, ‘dangerous goods’, ‘environmentally hazardous material’, ‘fugitive emissions’, ‘hardstand’, ‘licensee’, ‘Schedule 1’, ‘Schedule 2’ – conditions which contained these references have been removed as part of this amendment
	Definitions replaced: ‘Act’ with ‘EP Act’, ‘Licensee’ with ‘licence holder’
	Definitions added: ‘AACR’, ‘AS 2922-1987’ , ‘AS 3580.10.1’, ‘books’, ‘condition’, ‘Department’, ‘discharge’, ‘emission’, ‘EP Regulations’, ‘normal day time hours’ ‘prescribed premises’
1.1.3	Redundant condition, has been removed and now forms part of ‘interpretation’
1.1.4	Redundant condition, has been removed and now forms part of ‘interpretation’
1.2.1	Redundant condition, has been removed (paraphrases EP Act)
1.2.3	Redundant condition, has been removed (duplicates existing legislation)
2.1.1	Redundant condition, has been removed
2.6.1, 2.6.2	Fugitive dust conditions – replaced by new condition 15
5.1.1	Books condition – replaced by conditions 20 & 21

5.1.2	Redundant condition, has been removed
5.1.3	AACR condition – replaced by condition 23
5.1.4	Complaint condition – replaced by condition 22
5.2.1, 5.2.2	AER conditions – replaced by conditions 24 & 25
5.3.1	Redundant condition, has been removed (duplicates existing part of EP Act)
12	Noise controls
13	Dust controls
17	Dust monitoring requirements
18, 19,20 and 21	Noise monitoring requirements
Schedule 1	Premises map updated – boundary inclusive of M70/926 and M70/1331, exclusive of E70/3055 and E5160
	Maps removed as no longer necessary: Premises layout – active areas, Map of monitoring locations, Map of storage locations
Schedule 2	AACR template removed (now available on DWER website), L1 and N1 forms removed (notification requirements removed)

Alana Kidd

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Date: 2020.09.01 13:38:18 +08'00'

Alana Kidd
MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES

An officer delegated by the CEO under section 20 of the EP Act

Definitions

In this amendment report, the terms in the below table have the meanings defined.

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
amended licence	the licence issued under Part V, Division 3 of the EP Act following this amendment
amendment report	refers to this document
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the *Environmental Protection Act 1986* Locked Bag 10 JOONDALUP DC WA 6919 info@dwer.wa.gov.au
delegated officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987 (WA)*
existing licence	the licence issued under Part V, Division 3 of the EP Act and in force prior to this amendment
licence holder	GMA Garnet Pty Ltd
Noise Regulations	*Environmental Protection (Noise) Regulations 1997*
prescribed premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this amendment report applies, as specified at the front of this amendment report.

Appendix 1: Key documents

Document title	In text ref	Availability
GMA, January 2020. Port Gregory Garnet Mine – Proposed amendments to Licence L8561/2011/1	Application	DWER records (DWERDT237559)
GHD, February 2020. GMA Garnet Noise Assessment. Prepared for GMA Garnet by GHD Pty Ltd	GHD, 2020a	DWER records (A1876918)
GHD, February 2020. GMA Garnet Dust Modelling. Prepared for GMA Garnet by GHD Pty Ltd	GHD, 2020b	DWER records (A1876919)
GMA Garnet Pty Ltd, July 2013. Dust Management Plan.	GMA, 2013.	DWER records (A1876920)
DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER, 2015a	accessed at www.der.wa.gov.au
DER, October 2015. *Guidance Statement: Setting Conditions.* Department of Environment Regulation, Perth.	DER, 2015b	
DER, February 2017. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	DER, 2017a	
DER, February 2017. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	DER, 2017b	
Licence L8561/2011/1 – Port Gregory Garnet Mine.	Existing licence	

Attachment 1: Amended Licence L8561/2011/1