Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice 3

Licence Number	L8469/2010/2
Licence Holder	Galaxy Lithium Australia Limited
ACN	130 182 099
File Number:	DER2014/001110
Premises	Mt Cattlin Project RAVENSTHORPE WA 6346 Lot 31 on Plan 224145 and Lot 127 on Plan 145763 (part of Mining tenement M74/244) Newdegate-Ravensthorpe Road RAVENSTHORPE WA 6346
Date of Amendment	20 June 2018

Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Licence in accordance with section 59 of the *Environmental Protection Act 1986* (EP Act) as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B (9) of the EP Act.

Date signed: 21 June 2018

Tim Gentle

Manager Licensing – Resource Industries

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Definitions and interpretation

Definitions

In this Amendment Notice, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
AMMP	Airborne Materials Management Plan (2010) revised on 26 September 2017
Annual period	means the inclusive period from 1 September until 31 August in the following year.
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer of the Department of Water and Environmental Regulation;
CEO	for the purpose of correspondence means; Chief Executive Officer Department Administering the *Environmental Protection Act 1986* Locked Bag 33 CLOISTERS SQUARE WA 6850 Email: info@dwer.wa.gov.au;
Delegated Officer	an officer delegated under section 20 of the EP Act
DMIRS	means Department of Mines, Industry Regulation and Safety
DWER	means Department of Water and Environmental Regulation
ENA	means Environmental Noise Assessment
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 the commencement of and during this Review
GL/yr	means Gigalitres per year
Licence Holder	Galaxy Lithium Australia Limited

Licensee	has the same meaning as Licence Holder
m^3	cubic metres
Mining Act	*Mining Act 1978* (WA)
mbgl	metre(s) below ground level
mg/L	milligrams per litre
Mtpa	Million tonnes per annum
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Occupier	has the same meaning given to that term under the EP Act.
OEPA	means the Office of the Environmental Protection Authority
ONMP	Operational Noise Management Plan (2016) revision 5 dated 12 July 2017 reference 12843-5-10196
Processing Plant	means the infrastructure related to the crushing, processing and /or beneficiation of the ore including the wet crushing circuit, wet plant and ROM pad as depicted and labelled on the Premise Map 1 in Schedule 1
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report.
Risk Event	as described in *Guidance Statement: Risk Assessment*
RL	refers to the term 'Relative Level' and is the height or elevation above the point adopted as the site datum for the purpose of establishing levels.
TSF	Tailings Storage Facility
TTSA	Temporary Tailings Storage Area

Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B (9) of the EP Act.

This notice authorises amendments to the Licence to allow construction and installation of the following infrastructure at the process plant plus commissioning of the;

- Feed upgrade circuit;
- Ultrafine Dense Media Separation (DMS) circuit;
- Secondary Floats re-liberation circuit; and,
- Product upgrade circuit.

The proposed improvements to the plant will increase ore recovery resulting in an increase in

the generation of additional product and result in a reduction in tailings discharge to the Tailings Storage Facility (TSF) by approximately 240,000 m^3. An increase in annual production capacity of Category 5, processing or beneficiation of metallic and non-metallic ore: is expected to be from 1.6 Mtpa to 2.0 Mtpa. The proposed upgrade to the process plant will enable waste material contaminated with basalt to be processed that has previously been transferred directly to the reject waste dump. The changes to the plant throughput and waste volumes resulting from the proposed upgrade are indicated in Table 2 below.

Table 2: Changes to plant throughput and waste volumes

Aspect	Material		Tonnes (t)		Sizing (mm)		Water (m^3)	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
Mining Waste Dump	All Waste Rock	All Waste Rock	5,440,000	5,040,000	-1000	-1000		
Ore to Crusher	Pegmatite	Pegmatite	1,600,000	1,800,000	-700	-700	48,000	54,000
	Basalt	Basalt	Minimal	200,000				
Total Crushing			**1,600,000**	**2,000,000**				
Total Mining			**7,040,000**	**7,040,000**				
Coarse Waste Stockpile (Floats)	Pegmatite	All Waste Rock	932,800	1,383,500	-16	-75		
TSF	Pegmatite	All Waste Rock	**480,000**	**324,000**	-1	-0.35	720,000	324,000
Product	Spodumene	Spodumene	187,200	292,500	-16	-16		
Total Waste (Waste dump/floats/tailings)			**6,852,800**	**6,747,500**				
Waste dump/Floats only			**6,372,800**	**6,423,500**				

Note 1: All Waste Rock includes Basalt and Pegmatite

Note 2: Water loss is 60% of water pumped to tailings dam

The following DWER guidance statements have informed the decision made on this amendment;

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Decision Making (February 2017)*
- *Guidance Statement: Risk Assessment (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

Amendment description

This Amendment Notice addresses upgrades to the process plant and the modular screening plant resulting in an increased production capacity for category 5 activities up to 2.0 Million tonnes per annum (Mtpa).

On 12 April 2018, Galaxy Lithium Australia Limited (Galaxy) submitted the licence amendment application which is the subject of this Amendment Notice. Supporting documents to the amendment application included proposed project description (Attachment 3A) plant schematics, process flowcharts and mass flow diagrams including an Appendix 1 that provides a detailed equipment list. Construction is expected to take 5 months with commissioning proposed for 3 months.

DWER reviewed the **Application** and **supporting documentation** and confirmed the key infrastructure and equipment proposed to be installed and commissioned at the plant are;

- Feed upgrade circuit;
- Ultrafine Dense Mass Separation (DMS) circuit including a Wet High Intensity Magnetic Separator (WHIMS) Tantalite Recovery;
- Secondary float re-liberation circuit including a Dewatering Screw Classifier; and,
- Product upgrade circuit

The infrastructure and equipment are identified into two project locations being the “Mobile Crushing Plant Installation Area” (**Unit 1**) and the “Yield Optimisation Project Area” (**Unit 2**) at the process plant. The proposed upgrades to the crushing circuit and process plant circuit is

diagrammatically shown in Appendix 3 of this assessment.

This assessment does not include the proposed mine expansion submitted to Department of Mines, Industry Regulation and Safety (**DMIRS**) and referenced as ID: 73856.

On 6 May 2018, Galaxy resubmitted a revised Environmental Noise Assessment (**ENA**) following the acquisition of two sensitive receptors (residences) and the decision to cease operating the mobile crusher located upon the ROM pad approved in Amendment Notice 2 issued on 27 March 2018.

The emissions associated with the crusher (**Unit 1**) and plant (**Unit 2**) upgrade have been risk assessed to determine their impacts upon the environment and the risk assessment is presented in Table 10.

Table 2 below outlines the proposed changes to the Licence production capacity.

Table 2: Proposed throughput capacity change.

Category	Current throughput capacity	Proposed throughput capacity	Description of proposed amendment
5 – processing and beneficiation of metallic and non-metallic ore	1,600,000 tonnes per annum	2,000,000 tonnes per annum	Increased production capacity has not changed the type of emissions nor their discharge locations. Increased production capacity will be achieved through upgrades to the crushing circuit and the process plant.

Other approvals

The Licence Holder has provided the following information relating to other approvals as outlined in Table 3.

Table 3: Relevant approvals

Legislation	Number	Approval
Mining Act 1978 (WA) *(Department of Mines, Industry Regulation and Safety)*	Registration Id: 22377 and subsequent Amendments	Ravensthorpe Spodumene Project was granted mining approval on 4 November 2009 and Mining Tenement M74/244 was granted on 24 December 2009.
Rights in Water and Irrigation Act 1914 (WA) *(Department of Water and Environmental Regulation)*	GWL167439(5) – expire 18/2/2026 CAW167437(1) - CAW169547(1) – CAW170586(1) -	Process plant – 1.095 GL/yr Construct wells Construct wells Construct wells
Environmental Protection Act 1986 (WA) *(delegated to Department of Mines, Industry Regulation and Safety)*	Native Vegetation Clearing Permit CPS #3045/5- Granted 22/08/2009 expiring on 31/07/2024.	Approval to clear 15 ha within part of Mining Tenement M74/244.

Amendment history

Table 4 provides the amendment history for L8469/2010/2.

Table 4: Licence amendments

Instrument	Issued	Amendment
W4533/2009/1	19/06/2009	New works approval for premises construction
W4533/2009/1	8/07/2010	Works approval amendment (removal of Phase 2)
W4533/2009/1	11/10/2010	Works approval amendment (removal of spill trays under conveyors)
L8469/2010/1	14/10/2010	New licence issued for premises operation
L8469/2010/1	7/07/2011	Licence amendment (noise management requirements)
L8469/2010/1	24/05/2012	Licence amendment (TSF manual revision)
W4533/2009/1	24/05/2012	Works approval amendment (extension to expiry for TSF lifts)
W4533/2009/1	17/01/2013	Works approval amendment (reflux classifier)
L8469/2010/2	3/10/2013	Licence reissue
L8469/2010/2	4/09/2014	Licence amendment (groundwater management and conversion to latest DER licence format).
L8469/2010/2	29/04/2016	Amendment Notice 1 granted to extend expiry date to 13 October 2029
L8469/2010/2	02/06/2016	Licence amendment application to include construction of temporary tailings stockpile area and inclusion of Reflux classifiers and Lithium Belt Filter into the wet process plant circuit.
L8469/2010/2	27/03/2018	Amendment Notice 2 granted to increased throughput capacity, remove construction Compliance Report requirements plus reference new acoustics reports and monitoring, minor changes to premise operation conditions, minor changes to monitoring of inputs and outputs and replace Premises maps in Schedule 1. This amendment includes the transfer of Licence from Galaxy Resources Limited to Galaxy Lithium Australia Limited.
L8469/2010/2	06/06/2018	Amendment Notice 3 granted to increase throughput capacity to 2.0 Mtpa, construct, install and commission the feed upgrade circuit, Ultrafine Dense Mass Separation (DMS) circuit including a Wet High Intensity Magnetic Separator (WHIMS) for Tantalite recovery, secondary float re-liberation circuit including a dewatering screw classifier and upgrades to the product circuit.

Works Approval W4533/2009/1 granted on 19 June 2009, was extended on 24 May 2012 with partial compliance with the works to be constructed at Ravensthorpe. On 17 January 2013, the works approval was extended to expire on 21 June 2018. The extension of expiry date was to allow for construction of the outstanding TSF lift. This works approval will remain active until it expires or, the TSF lift is constructed. Any change to the TSF lift proposal from that which was initially approved by Works Approval W4533/2009/1 will require DWER reassessment and authorization.

Location and receptors

Table 5 lists the relevant sensitive receptors in the vicinity of the primary activity with a location plan enclosed in Appendix 4 of this report.

Table 5: Receptors and distance from prescribed activity

Residential and sensitive premises	Distance from Prescribed Premises
Farm residence #1	*Located 1.850 km north west of process plant and residence being acquired by the Applicant.*
Demountable accommodation #2	*Located 2.160 km south south east of process plant*
Residence #4	*Located 3.430 km east of the process plant and residence owned by the Applicant.*
Farm residence #5	*Located 2.215 km north west of process plant*

Residence #6	*Located 2.560 km south east of process plant.*
Accommodation Camp #8	*Located 2.620 km south east of process plant.*
Farm residence #9	*Located 1.975 km south of process plant.*
Farm residence #10	*Located 2.320 km south west of process plant.*
Residential – Township of Ravensthorpe	*Located ~ 2.650 km east southeast of process plant.*

Table 6 below lists the closest relevant environmental receptors in the vicinity of the Prescribed Premises relevant to the proposed amendment.

Table 6: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises
Kondinin-Ravensthorpe Groundwater Area (GWA)	*Ravensthorpe Mt Cattlin Spodumene project is part located in the GWA*
Esperance Coastal Hydrographic Catchment	*Ravensthorpe Mt Cattlin Spodumene Project is located in the catchment*
Native Title Claims	*Ravensthorpe Mt Cattlin Spodumene Project is located in the; Single Noongar Claim (Area 1) – Cth claim* *Wagyl Kaip – NNTT registered* *Southern Noongar – NNTT registered*
Clearing Regulation - Environmentally Sensitive Areas (ESA's)	*Premises is located 5.4 km south and 8.6 km north east of restricted clearing areas.*

The area surrounding the prescribed activity contains no recorded rare or threatened flora, fauna or ecological communities. The majority of the project area is cleared agricultural land and will be managed in accordance with commitments described in the Licence Holder's Environmental Management Plan.

Risk Assessment Methodology

The risk assessment following utilizes the risk rating matrix as shown in Table 7, recently updated in accord with DER's *Guidance Statement: Risk Assessments (February 2017).* The risk criteria used in the matrix below is further defined in Table 8 and 9 below.

Table 7: Risk Rating Matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 8 following:

Table 8: Risk criteria definitions (taken from DER's Guidance Statement: Risk Assessments)

Likelihood		**Consequence**		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		**The following criteria has been used to determine the consequences of a Risk Event occurring:**		
			Environment	**Public health* and amenity (such as air and water quality, noise, and odour)**
Almost Certain	The risk event is expected to occur in most circumstances	Severe	• **onsite impacts**: catastrophic • **offsite impacts local scale**: high level or above • **offsite impacts wider scale:** mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are significantly exceeded	• Loss of life • **Adverse health effects:** high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • **Local scale impacts:** permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	• **onsite impacts**: high level • **offsite impacts local scale**: mid-level • **offsite impacts wider scale**: low level • Short-term impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are exceeded	• **Adverse health effects:** mid-level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • **Local scale impacts**: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	• **onsite impacts**: mid-level • **offsite impacts local scale**: low level • **offsite impacts wider scale**: minimal • Specific Consequence Criteria (for environment) are at risk of not being met	• **Adverse health effects:** low level or occasional medical treatment • Specific Consequence Criteria (for public health) are at risk of not being met • **Local scale impacts:** mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	• **onsite impacts**: low level • **offsite impacts local scale**: minimal • **offsite impacts wider scale**: not detectable • Specific Consequence Criteria (for environment) likely to be met	• Specific Consequence Criteria (for public health) are likely to be met • **Local scale impacts:** low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	• **onsite impact**: minimal • Specific Consequence Criteria (for environment) met	• **Local scale**: minimal to amenity • Specific Consequence Criteria (for public health) met

^ Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting.*

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines.*

"onsite**"** means within the Prescribed Premises boundary.

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment table 9 below:

Table 9: Risk treatment table

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

Risk assessment

Tables 10 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. This table identifies whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 10: Risk assessment for proposed amendments during construction

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Cat 5 *Processing or beneficiation of metallic or non-metallic ore*	*Installation of new upgraded circuits at Unit 1 and Unit 2*	***Dust:*** *Release of particulate matter from construction activities including earthworks, vehicle movements and civil works.*	***Nearby Residents:*** *Located greater than 1.8 km north west from process and crushing plant.*	***Air:*** *Wind dispersion*	*Health and amenity impacts*	*Slight*	*Possible*	*Low*	*The overall risk rating of construction dust impacting residence and local flora is assessed as "low" because dust generated during construction will be short term and sufficient distance from receptors.* *Dust generated during construction will be managed in accordance with latest version of Airborne Material Management Plan (AMMP) conditioned by the licence (2.1.1 & 2.1.2) that includes a stop activity clause during inclement weather conditions.* *Water trucks will be utilized during construction activities plus speed limits implemented to reduce dust generation from roads.* *The general provisions of the EP Act will apply during construction activities.*
			Local Flora species *Located greater than 1km east of wet process plant*		*Impact to native vegetation health*	*Slight*	*Possible*	*Low*	
	Earth works, construction of plant and vehicle movements	***Noise:*** *Noise associated with equipment and machinery plus vehicles use during construction*	***Nearby Residents:*** *Located greater than 1.8 km north west from process and crushing plant.*	***Air:*** *Wind dispersion*	*Health and amenity impacts*	*Slight*	*Possible*	*Low*	*Noise generated during construction activities is expected to comply with the provisions of the* Environmental Protection (Noise) Regulations 1997 (WA).

Table 10: Risk assessment for proposed amendment during commissioning and operation

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Category 5 *Processing or beneficiation of metallic or non-metallic ore*	*Operation of Ravensthorpe Mt Cattlin upgraded Wet Process plant and modular crusher*	***Dust:*** *Release of particulate matter from upgraded plant production circuit*	***Nearby Residents:*** *Located greater than 1.8 km from wet process plant.*	***Air:*** *Wind dispersion*	*Health and amenity impacts*	*Moderate*	*Unlikely*	*Medium*	*The overall risk rating is assessed as "medium" because dust emissions can be controlled and monitored in accordance with the Airborne Material Management Plan by the licenses existing conditions (2.1.1a & 2.1.2).* *The modular crusher (Unit 1) and wet plant (Unit 2) are greater than 1.8km from residents and 1km from native vegetation and is not expected to release dust because dust suppression systems, using water, will be installed and maintained on screens, crushers, conveyors, material transfer points during commissioning and operation.* *Monitoring of dust at the boundary of the operations is required by the AMMP and will ensure the risk of impact does not increase to receptors*
			Local Flora species *Located greater than 1km east of wet process plant*		*Impact to native vegetation health*	*Moderate*	*Unlikely*	*Medium*	
		Noise: *Associated with upgraded crusher (Unit 1) and plant production circuit (Unit 2).*	***Nearby Residents:*** *Located greater than 1.8km from the modular crusher and plant*	***Air:*** *Wind dispersion*	*Amenity impacts*	*Moderate*	*Unlikely*	*Medium*	*Based upon DWER's assessment of the Environmental Noise Assessment dated 6 May 2018, it is concluded that noise associated with the crushing operation during the day and evening will comply with the* Environmental Protection (Noise) Regulations 1997 (WA)*. The processing plant day-time, evening and night-time noise levels will also comply with the Noise Regulations.* *Pumps, blowers, bearings, pulleys, conveyors will be managed by Licence Holder employing plant maintenance and replacement program ensuring plant and modular crusher noise emissions remain compliant with Noise Regulations.* *Acoustic barrier effects of ROM, waste dump and 12m acoustic bund on the south side of modular crusher reduces noise to the south.* *The noise due to the size from the new*

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									re-liberation crusher, is well below the quaternary ROM crusher and mobile crusher it replaces. *The optical sorter unit at the process plant will be housed in an acoustic insulation lined purpose built structure with a roof and three sides and one open end for conveyor infrastructure.* *The ONMP dated May 2017 submitted with the amendment application contains management commitments by the Licence Holder such as;* • *Verification of sound power levels of installed equipment during commissioning;* • *Monitoring key sensitive receptors during commissioning;* • *Assessment and adjustments to monitoring of key receptors during operation; and,* • *Annual noise emission monitoring.* *Therefore Condition 2.2.1 includes the latest version of Galaxy's ONMP version 5 dated 12 July 2017 plus Conditions 1.2.12, 1.2.13 & 1.2.14 will be amended to remove reference to the mobile crusher on the ROM pad which is decommissioned.*
Category 5 *Processing or beneficiation of metallic or non-metallic ore*	*Incorporation of plant upgrades into operations of the wet plant*	***Storm water runoff:*** *Contaminated storm water from process plant area.*	***Vegetation and Groundwater:*** *Soils become contaminated with infiltration of contaminants to groundwater table*	***Land & Water:*** *Overland flow and infiltration to groundwater*	*Impacts of contaminated storm water on surrounding environment and vegetation*	*Moderate*	*Rare*	*Medium*	*Further surface water information was required in Amendment Notice 2 issued on 27 March 2018, therefore an improvement condition (IR1) was applied requiring the Licence Holder to provide an updated surface water management plan to the CEO within 6 months of that Licence amendment being approved.* *IR1 management plan will incorporate the new storm water infrastructure and management controls requiring the IR1 due date to be extended to 31 January 2018.*

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Category 5 *Processing or beneficiation of metallic or non-metallic ore*									*The overall risk of contaminated storm water from Unit 1 and Unit 2 plant upgrades is rated as "medium" because storm water runoff will be captured in new sumps and recovered to process water tank.*
	Incorporation of plant upgrades into operations of the wet plant	***Process water:*** *discharge to land or water*	***Soil:*** *Vegetation adjacent to areas* *Groundwater*	***Land:*** *Soil plus infiltration to water table*	*Inhibit vegetation growth, survival and health impacts* *Contaminates groundwater with impacts to beneficial uses*	*Moderate*	*Rare*	*Medium*	*Overall risk rating is determined as "medium" because process water will not contain chemical but is saline, tanks, pipelines, pumps and visual inspection routine to alert to any leaks.* *Existing conditions will be reviewed and amended in line with new plant infrastructure*
		Spillage or discharge of product through pipelines, pumps or leaking tanks	***Soil:*** *Vegetation adjacent to areas* *Groundwater*	***Land:*** *Soil plus infiltration to water table*		*Moderate*	*Unlikely*	*Medium*	*Overall risk rating is determined as "medium" but Galaxy controls will include either a leak detection systems or visual inspection routine to alert to any spills or product discharge during operations.* *New infrastructure includes sumps that will collect spills or discharges of product for recovery or reprocessing.*
		Gaseous Air emissions	***Residence:*** *Ravensthorpe town*	***Air:*** *Wind dispersion*	*Adverse impacts to human health*	*Slight*	*Rare*	*Low*	*Overall risk rating is "low" as there is no increase in gaseous emissions anticipated as part of the crusher and plant upgrade because the process is mass separation and not chemical processing.*
	Disposal of waste material from upgraded circuits to the existing reject stockpiles	***Dust***	***Residence:*** *Ravensthorpe town*	***Air:*** *Wind dispersion*	*Adverse impacts to human health and amenity*	*Moderate*	*Unlikely*	*Medium*	*The overall risk rating of waste material from the feed upgrade optical sorters, product upgrade circuit and Ultrafine Dense Mass Separation (DMS) circuit is determined as "medium" because the moisture content of the waste material is approximately 4% and is unlikely to result in dust liftoff.* *The AMMP will be reviewed to include monitoring of waste material dust and use of suppressants on waste stockpiles.*

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Category 5 *Processing or beneficiation of metallic or non-metallic ore*		***Contaminated storm water from reject stockpile***	***Soil:*** *Vegetation adjacent to areas* *Groundwater*	***Land:*** *Soil plus infiltration to water table*	*Inhibit vegetation growth, survival and health impacts.* *Contaminates groundwater with impacts to beneficial uses*	*Moderate*	*Unlikely*	*Medium*	*The overall risk rating of contaminated storm water from reject stockpile impacting soil and groundwater is determined as "medium".* *The surface water management plan required by improvement condition IR1 will be reviewed to ensure surface water runoff from the new infrastructure areas has been designed to contain a 72 hour 1 in 100 year storm event with management controls described and implemented in the site operations.*
		Leachate with soluble metals/metalloids	*Soil and vegetation adjacent to areas* *Groundwater*	***Land:*** *infiltration to water table*		*Slight*	*Rare*	*Low*	*The overall risk rating of leachate being contaminated with metals and metalloids is determined as "low" as there is no change to compositions of waste material as result of the plant upgrade.*
	Tailings deposition	***Dust:*** *Generated as a result of finer tailings being deposited*	*Soil and vegetation adjacent to areas* *Groundwater*	***Air:*** *Wind dispersion*	*Adverse impacts to vegetation health*	*Moderate*	*Rare*	*Medium*	*The overall risk rating of dust being generated as a result of finer tailings being deposited is determined as "medium" as the tails will be wet during operations. Also, any dry tailings will be suppressed using water or suppression products during dry high wind weather conditions. Daily inspections will be completed during operation and commissioning phases as required by condition 2.1.2 and current AMMP.* *Also the AMMP will be reviewed to include management controls for fine tailings material deposition following plant upgrade.*
		Waste: *Release of tailings caused by leaks or failure of new tailings pipe/pump*	***Terrestrial ecosystems:*** *local soils, vegetation and surface water*	***Land:*** *Direct discharge from pipe or pump causing infiltration into the soil*	*Inhibit vegetation growth, survival and health impacts.* *Contaminates groundwater with impacts*	*Moderate*	*Unlikely*	*Medium*	*Daily visual inspections of pipes and pumps for spills, leaks or failures during commissioning and operations will occur.* *Existing licence condition 1.2.11 manages the tailings pipelines and pumps and will be amended to include new product pipelines plus, existing conditions 5.2.1 adequately controls reporting of environmental incidents, failures or malfunctions that occur during the annual*

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
					to beneficial uses				*reporting period.* *Given these controls, the overall risk of tailings or decant water release in the event of a pipeline failure is deemed to be "medium" and is consistent with similar industries licence conditions modified to require 12 hourly inspections with an inspection log to be maintained for purpose of compliance auditing.*
Category 5 *Processing or beneficiation of metallic or non-metallic ore*	*Tailings deposition*	***Waste:*** *Tailings seepage*	***Groundwater:*** *Local shallow (4.5- 5 mbgl) aquifer is saline (salinity equivalent to seawater or greater ~ 36,000 uS/cm to 49,000 uS/cm) (AER 2015 - 2016).*	***Land:*** *infiltration through the base of the TSF to soil profile and groundwater*	*Contamination of groundwater with metalloid.* *Groundwater mounding or lateral seepage with negative impacts on roots of vegetation.*	*Moderate*	*Possible*	*Medium*	*The overall risk rating is "medium" as is managed by existing Licence conditions 1.2.7, 3.4.1, 3.4.2, & 5.2.1 requiring TSF groundwater monitoring and reporting.* *Groundwater quality is saline and unacceptable for domestic and livestock uses. Decant water is recycled back to the raw water dam for reuse in the wet plant.* *The Licence Holder has completed the reinstatement of TSF drainage collection system that capturers and diverts decant water back into the wet plant water circuit. The TSF drainage system is a Licence Holder commitment as an alternative impermeable TSF liner. Now the drainage system has been repaired it is expected that the overall risk rating remains unchanged and will be reviewed from the annual monitoring results provided to DWER.*
	Tailings overtopping of TSF.	***Waste:*** *Uncontrolled release of tailings/ decant water*	***Terrestrial ecosystems:*** *local soils, vegetation and surface water*	***Land:*** *Direct discharge from overtopping of TSF.*	*Contamination of surrounding soils with metals and metalloids, affecting soil and vegetation*	*Slight*	*Rare*	*Low*	*The overall risk rating is "low" based on application of existing controls. Tailings disposal is limited by existing licence condition 1.2.6 requiring 300 mm freeboard during operations. Tailings deposition will also decrease following the plant upgrades.* *Existing condition 3.3.1 Table 3.7.1 ensures routine inspection of TSF is completed and provides adequate control to manage overtopping.* *It is noted the Licence Holder has a*

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									current Works Approval to complete TSF wall lifts that expires on 21 June 2018.
	TSF deposition and storage of tailings and decant water	***Waste:*** *Tailings and decant pond*	***Local fauna*** *Birds and other Wildlife*	***Land:*** *Direct ingestion (birds or fauna drinking the water)*	*Fauna sickness or death from drinking water.* *Entrapment / death of fauna in the tailings*	*Moderate*	*Possible*	*Medium*	*The overall risk of fauna entrapment is "medium". The process/decant water in the TSF and water storage facilities is saline, similar to seawater and is unattractive to local birds and animals for drinking purposes.* *The Licence Holder controls include;* • *Recycling TSF decant water back into the process water circuit;* • *Management of dams to reduce supernatant pond sizes;* • *Maintaining fauna egress at the raw water and turkey nest dams (to allow fauna to escape).* *Given these controls, the overall risk of fauna impacts is "medium" and licence condition 3.3.1 and Table 3.7.1 adequately address the risk to fauna for Galaxy's containment infrastructure.*

Decision

The potential emissions associated with the construction of Unit 1 and Unit 2 upgrades at the Galaxy Ravensthorpe Spodumene project are;

- noise from screening and crushing and the wet process plant;
- fugitive dust from conveyors, screening and crushing plant, wet plant processes, (it is a wet plant) TSF, product stockpiles, waste dumps and from vehicle movements;
- TSF seepage or spillage of tailings from pipes and pumps; and,
- Process plant wastes from upgraded areas stored at rejects waste dumps.

The Delegated Officer has considered the overall risk of the emissions upon local receptors together with Galaxy's proposed management controls and determined, the proposed amendments will not result in emissions which are unacceptable to public health or the environment and therefore grants the Licence amendment.

The Licence is amended by;

- Add definitions for 'Unit 1', 'Unit 2', 'DMS', WBMS', and 'WHIMS';
- New condition 1.2.15 is an administrative condition explaining the infrastructure that will be constructed at Unit 1 (the modular crusher) and Unit 2 (the process plant). New condition 5.1.6 requires a Compliance Certificate for the constructed infrastructure one month after completion.
- Amend Improvement Condition number 4.1.1 IR1 by adjusting the completion date for the submission of the surface water management plan and delete IR2 & IR3 in their entirety following the decision to cease operation of the mobile crusher located on the ROM pad.
- The Licence conditions 1.2.11 is amended to address new product pipelines constructed as part of the upgraded infrastructure; and,
- Licence conditions 1.2.12, 1.2.13 & 1.2.14 are amended following the decision to cease operations with the mobile crusher located on ROM pad.

Changes to the Licence have been made in accordance with DWER administrative changes including the name, logo and contacts for the Department and redefining terms in the licence.

The Delegated Officer has determined the Galaxy Premises risk remains unchanged following the completion of the upgrades to the modular crusher and process plant circuits, increased production throughput and the operation of the modular crushing plant.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 28 May 2018. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

Amendment

1. New definitions

   Definitions of the Licence are amended by the deletion of the text shown in strikethrough and the insertion of new definitions shown in red text underline below:

   'Unit 1' means the "Mobile crushing plant installation area" as indicated in Schedule 2.

   'Unit 2' means the "Yield Optimisation Project Area" as indicated in Schedule 2.

'DMS' means ultrafine Dense Mass Separation (DMS) process plant circuit to recover finer fractions of Spodumene.

'WBMS' means Wet Belt Magnetic Separator to remove magnetic material from product stream.

'WHIMS' means Wet High Intensity Magnetic Separator (WHIMS) process circuit extracts basalt and mica from the Tantalite product stream.

2. New Licence conditions

Conditions 1.2.15 and 5.1.6 are administrative conditions explaining what will be constructed 5 months after authorization is granted at the upgraded modular crusher (Unit1) and plant (Unit 2) plus requires a compliance certificate for what is constructed.

1.2.15 The Licensee shall complete an upgrade of the modular crusher (Unit 1) and the process plant (Unit 2) in accordance with the documentation listed in Table 1.2.15 and in the location depicted in Schedule 2 titled "Constructed Infrastructure April 2018":

Table 1.2.15: Construction requirements[1]

Document	Parts	Date of Document
Application to amend the Ravensthorpe Spodumene Project prescribed Premise Licence L8469/2010/2 plus Attachment 3A supporting document part; **1. Attachment 3A - Section 1.2.1 project overview;** **2. Key infrastructure and equipment;** **3. Feed Upgrade Circuit;** **4. Ultrafine DMS Circuit;** **5. Secondary Floats Re-Liberation Circuit;** **6. Product Upgrade Circuit;** **7. Commissioning** **8. Equipment to be installed including an optical sorter acoustic lined purpose built structure.**	**Attachment 3A** **Figures 2, 3 & 4** **Section 1.2.2** **Section 1.2.3** **Section 1.2.4** **Section 1.2.5** **Section 1.2.6** **Section 1.6** **Appendix 1**	**11 April 2018**
"Galaxy Lithium Australia Ltd, Environmental Noise Assessment – Mt Cattlin Operations – Crusher System Noise Emissions in combination with optical sorter systems modular crusher" dated 6 May 2018 reference 22914-3-17171 part; **1. Noise Mitigation Measures;** **2. Sound Power levels**	**Attachment 5A, Appendix 2** **App 2 - Section 4** **App 2 – Appendix A**	**6 May 2018**

Note 1: Where the details and commitments of the documents listed in condition 1.3.6 are inconsistent with any other condition of this licence, the conditions of this licence shall prevail.

5.1.6 The Licensee must submit a compliance document to the CEO within one month following the completion of the works under condition 1.2.15 as described in table 1.2.15.

3 Amend Improvement Condition

Amend Improvement Condition number 4.1.1 IR1 by adjusting the completion date and delete IR2 & IR3 in its entirety following the decision to cease operation of the mobile crusher in the ROM pad.

4.1.1 The Licensee shall complete the improvements in Table 4.1.1 by the date of completion in Table 4.1.1.

Table 4.1.1: Improvement program

Improvement reference	Improvement	Date of completion
IR 1	The Licensee shall submit an updated Surface Water Management Plan to the CEO. The plan shall include details relating to: (a) Assessment of capacity of existing storm water infrastructure to contain runoff from the processing plant, stockpiles, concentrate storage, and laydown areas so that there is zero discharge of contaminated storm water from the site for a 1 in 100 annual exceedance probability (AEP) storm event over 72 hours; (b) Surface water drainage map of the site showing contours, flow paths and containment cells; (c) If (a) finds existing infrastructure is insufficient, identification of additional infrastructure/operational controls required to ensure no discharges of contaminated storm water during a 1 in 100 annual exceedance probability (AEP) storm event over 72 hours; and (d) Provision of schedule for constructing additional infrastructure and/or implementing operational controls, if required. (e) Determining impacts of seepage from the temporary tailings stockpile on groundwater quality and groundwater levels.	~~Within 6 months of the amendment date of this licence.~~ **31 January 2019**
~~IR 2~~	~~The Licensee shall construct a noise bund on the ROM stockpile zone with dimensions and location sufficient to ensure compliance with the *Environmental Protection (Noise) Regulations1997*.~~	~~Within 2 months of the amendment date of this licence.~~
~~IR 3~~	~~The Licensee shall undertake a noise monitoring trial of the ROM crusher to measure night time noise emissions received by the noise sensitive receptors. The trial will be conducted when the winds are from the West, North West and North quadrants and following construction of the ROM stockpile noise bund. The measurements report shall be submitted to the CEO. The report shall include details relating to:~~ ~~(a) The ROM crusher production throughput during the night time monitoring trial;~~ ~~(b) The type, location and number of mine equipment and mine vehicle operating during the monitoring trial;~~ ~~(c) The weather conditions at the time the monitoring trial was conducted;~~ ~~(d) An environmental assessment of the night time noise impacts recorded during the trial monitoring;~~ ~~(e) Provide justification how night time operations will comply with the *Environmental Protection (Noise) Regulations 1997*.~~	~~Within 6 months of the amendment date of this licence.~~

4. Amend Licence Condition - pipelines

The Licence conditions 1.2.11, is amended as shown by amending the red text to address new product pipelines constructed as part of the upgraded infrastructure

1.2.11 The Licensee must ensure that pipelines containing tailings **and product** have either;
- (a) secondary containment sufficient to contain any spill for a period equal to the time between routine inspections; or, :
- (b) equipped with telemetry systems and pressure sensors along pipelines to allow the detection of leaks and failures; or
- (c) equipped with automatic cut-outs in the event of a pipe failure.

5. Amend Licence Conditions – Mobile Crusher on ROM pad

The Licence conditions 1.2.12 & 1.2.14 are amended as shown by amending the red text and deleting the black strikethrough and condition 1.2.13 is deleted in its entirety

following the decision to cease operations with the mobile crusher located on the ROM pad below;

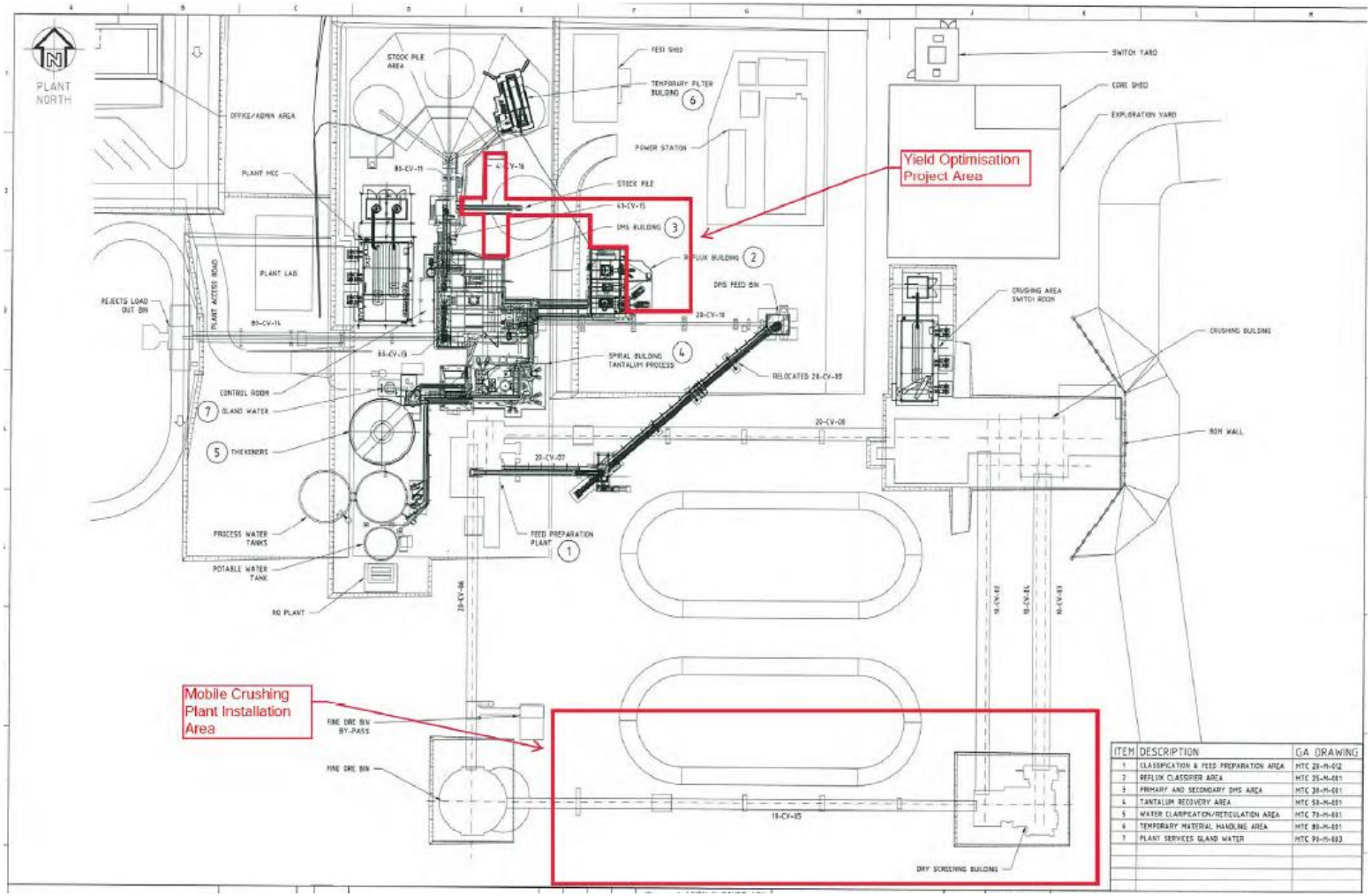
1.2.12 The Licensee shall ensure the ~~two mobile~~ **modular** crushing units do not operate between 10:00 pm till 7:00 am.

~~1.2.13 The Licensee shall ensure only one mobile crushing units will be operated during the evening period (7:00 pm till 10:00 pm) during worst-case weather conditions. (Temperature inversions and/or light winds from the south-east).~~

1.2.14 The Licensee must ensure the ~~two mobile~~ **modular** crushing unit~~s~~ **is** ~~are~~ located on the southern side of the processing plant ~~and the ROM Stockpile~~ within acoustics barriers.

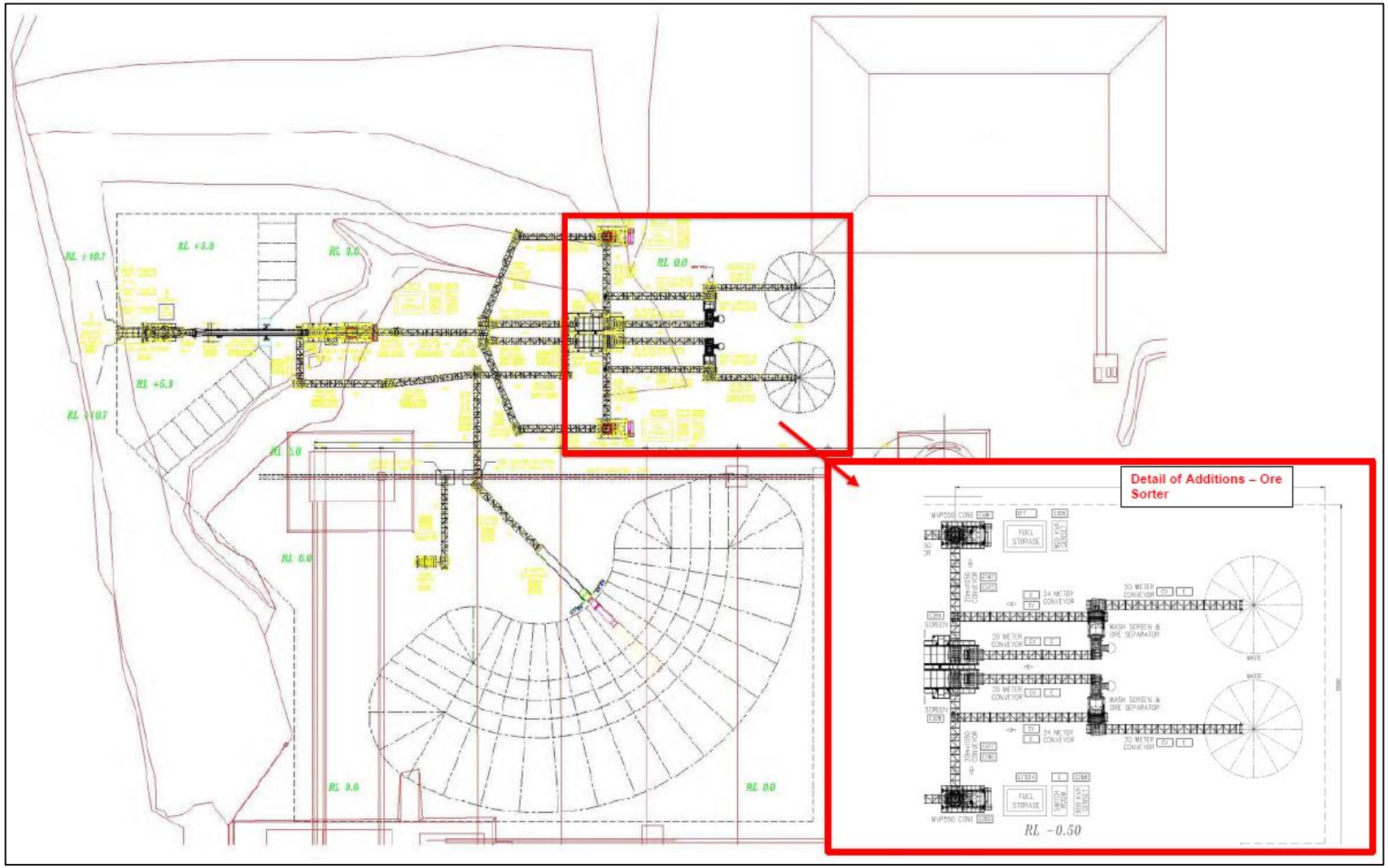
Schedule 2 – Constructed Infrastructure April 2018

The location of new plant infrastructure is Unit 1 titled "Mobile Crushing plant installation area" and Unit 2 titled "Yield Optimisation Project Area".



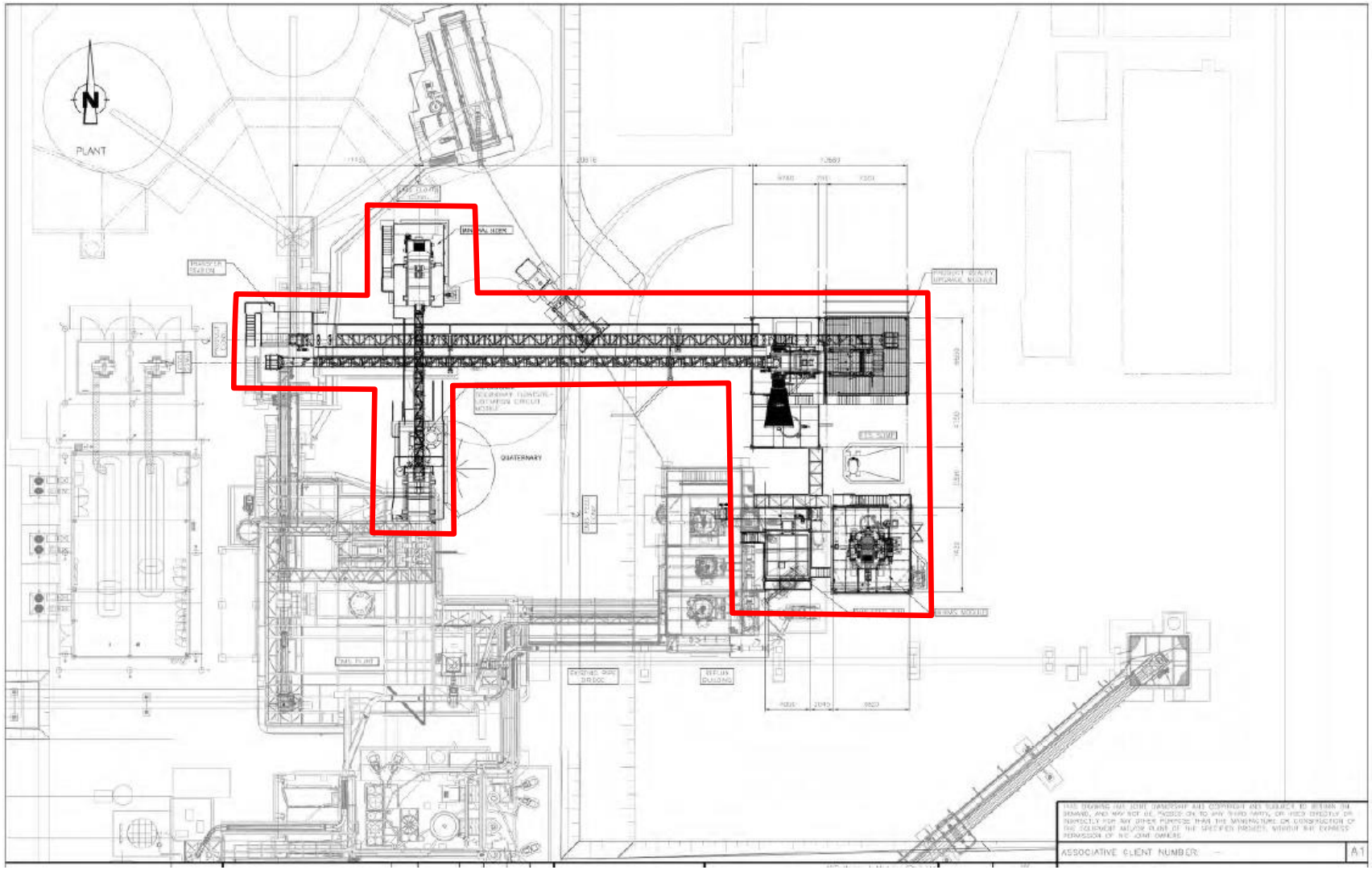
Schedule 2 – Constructed Infrastructure April 2018

Constructed infrastructure at Unit 1 is indicated in the red highlighted box.



Schedule 2 – Constructed Infrastructure April 2018

Constructed infrastructure at Unit 2 is indicated in the red highlighted box.



Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L8469/2010/2 – Ravensthorpe Spodumene Project amended 2 June 2016	L8469/2010/2	accessed at www.der.wa.gov.au
2	Works Approval W4533/2009/1 – Ravensthorpe Spodumene Project amended 24 May 2012	W4533/2009/1	accessed at www.der.wa.gov.au
3	Application for amendment of Licence L8469/2010/2 dated 11 April 2018	Application	DWER records (A1658320)
4	Supporting documentation to the application to amend Licence L8469/2010/2 dated 11 April 2018 Attachments 2, 3A, 4, 5A, 6, 7.1 & 7.2	ONMP & AMMP	DWER records (A1658318) DWER records (A1658319)
5	Galaxy Lithium Australia Limited – Operational Noise Management Plan - May 2017 – revision 5	ONMP	DWER record (A1507469 & A1658318)
6	Galaxy Lithium Australia Limited – Environmental Noise Assessment – Mobile Crusher System - May 2017 – revision 2	Previous Noise Assessment	DWER record (A1507471)
7	Environmental Noise Assessment (Ref: 22846-2-17171) Mt Cattlin Operations: Crusher system Noise emissions – Modular Crusher and ROM Crusher – Herring Storer Acoustics – February 2018.	Previous Noise Assessment	DWER record (A1629347)
8	Galaxy Lithium Australia Limited – Environmental Noise Monitoring – February 2017 (reference 21791-1-16219)	February 2017	DWER record (A1507462)
9	Galaxy Lithium Australia Limited – Environmental Noise Monitoring – May 2017 (reference 21792-1-16219)	May 2017	DWER record (A1507464)
10	"Galaxy Lithium Australia Ltd, Environmental Noise Assessment – Mt Cattlin Operations – Crusher System Noise Emissions in combination with optical sorter systems modular crusher" dated 6 May 2018 reference 22914-3-17171	Noise Assessment	DWER record (A1676147)
11	Galaxy Lithium Australia Limited - Mt Cattlin Spodumene Project - Annual Environmental Report for Prescribed Premises Licence 8469/2010/2 – category 5 - 1 September 2016 to 31	AER 2016 – 2017	DWER record (A1557200)

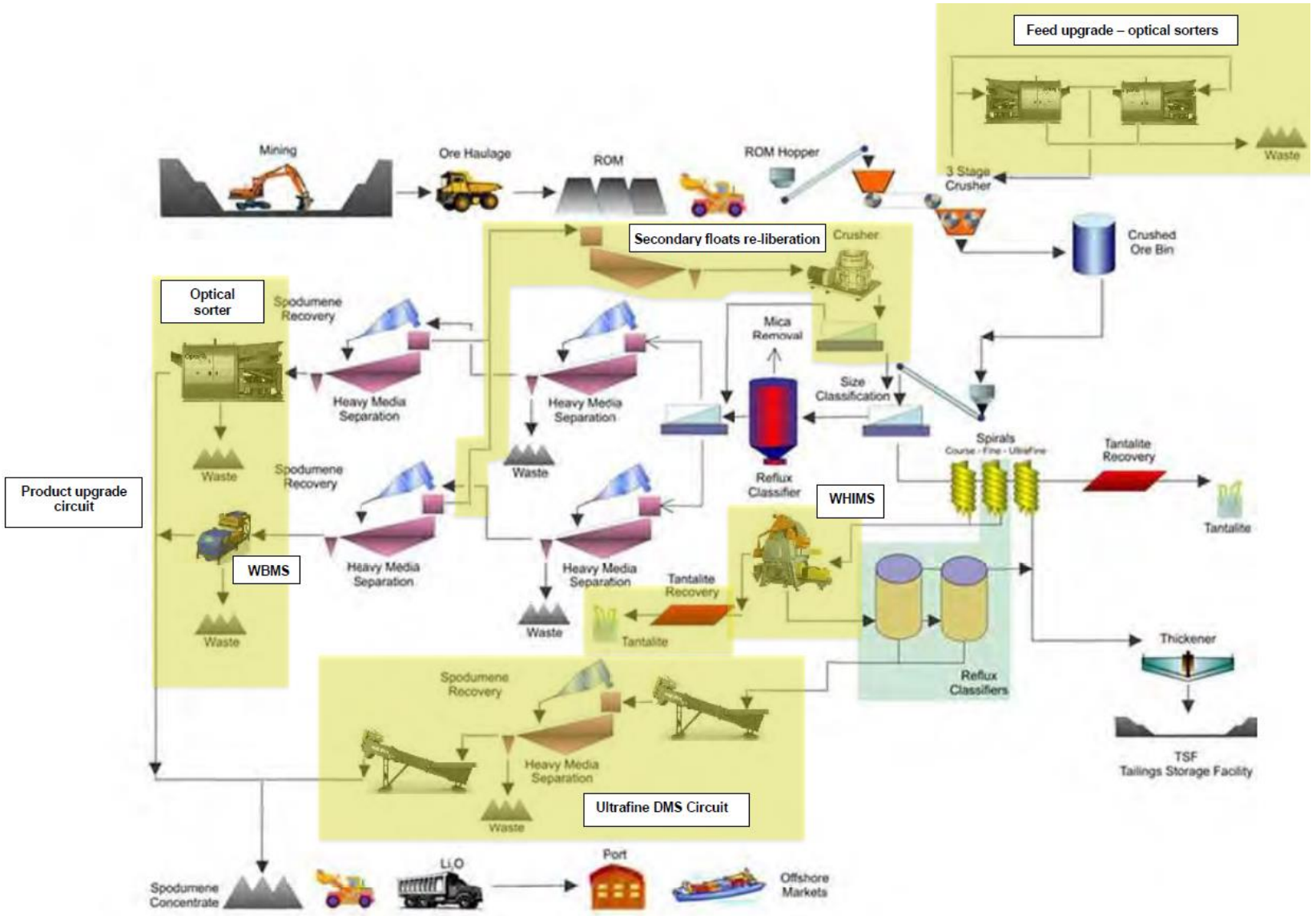
	August 2017 dated October 2017		
12	Memorandum to Executive Director EPA Services from Regulatory Services request advise on increased production from 1.0 Mtpa to 1.6 Mtpa dated 13 September 2017	A1521947	DWER record (A1519036 & A1521947)
13	EPA services response 13 September 2017 memo dated 18 October 2017.	EPA	DER record (A1543280)
14	26 September 2017 e-mail from Galaxy submitting the AMMP that was enclosed	AMMP	DER records (A1529443 and AMMP is A1529444)
15	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	accessed at www.der.wa.gov.au
16	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DER 2015b	
17	DER, November 2016. *Guidance Statement: Environmental Siting.* Department of Environment Regulation, Perth.	DER 2016a	
18	DER, February 2017. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	DER 2017a	
19	DER, February 2017. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	DER 2017b	

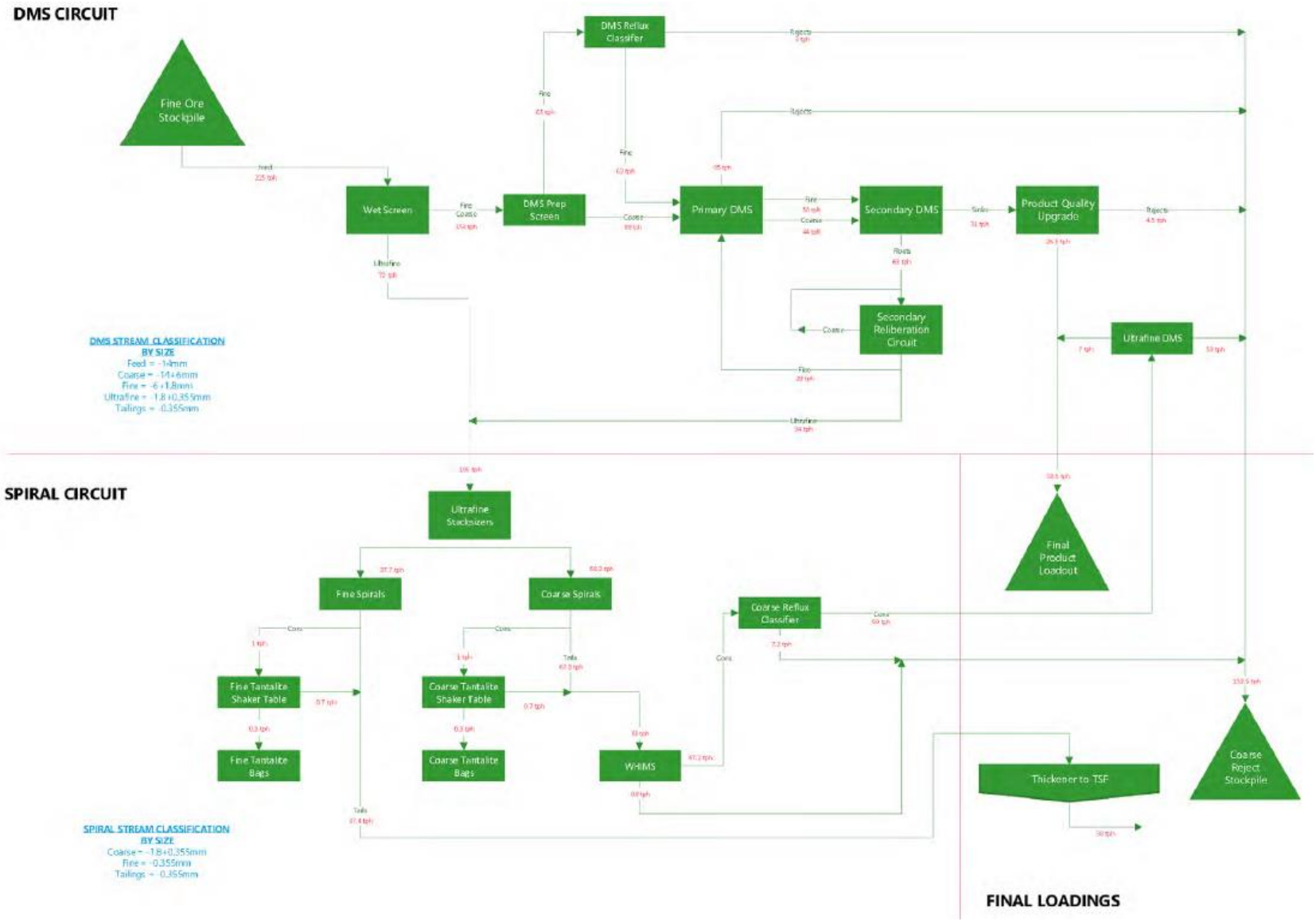
Appendix 2: Summary of Licence Holder comments

The Licence Holder was provided with the draft Amendment Notice on 28 May 2018 for review and comment. The Licence Holder responded on 5 June 2018 without providing comments and requested to waive the comments periods.

Condition	Summary of Licence Holder comment	DER response
	Nil	

Appendix 3: Diagram of Galaxy plant process April 2018




DMS CIRCUIT
Fine Ore Stockpile
DMS Reflux Classifier
Wet Screen
DMS Prep Screen
Primary DMS
Secondary DMS
Product Quality Upgrade
Secondary Reliberation Circuit
Ultrafine DMS
DMS STREAM CLASSIFICATION BY SIZE
Feed = -14mm
Coarse = -14+6mm
Fine = -6+1.8mm
Ultrafine = -1.8+0.355mm
Tailings = -0.355mm
SPIRAL CIRCUIT
Ultrafine Stacksizers
Fine Spirals
Coarse Spirals
Coarse Reflux Classifier
Fine Tantalite Shaker Table
Coarse Tantalite Shaker Table
Fine Tantalite Bags
Coarse Tantalite Bags
WHIMS
Final Product Loadout
Thickener to TSF
Coarse Reject Stockpile
SPIRAL STREAM CLASSIFICATION BY SIZE
Coarse = -1.8+0.355mm
Fine = -0.355mm
Tailings = -0.355mm
FINAL LOADINGS

Appendix 4: Closest relevant sensitive receptors