Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice 2

Licence Number	L8435/2010/3
Licence Holder	GSM Mining Company
ACN	165 235 030
File Number:	2011/000299
Premises	Granny Smith Gold Mine Mining tenements M38/18, M38/361, M38/161, M38/162, M38/167, M38/191, M38/205, M38/287, M38/380, M38/389, M39/397, M38/440, M38/532, M38/525, M38/690, M38/691, M38/692, M38/725, L38/50, L38/51, L38/79, L38/80, L38/87, L38/96, L38/106, L38/144, L38/145, L38/144, L38/146 and L38/209
Date of Amendment	7 March 2019

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.

Stephen Checker
Digitally signed by Stephen Checker
Date: 2019.03.07 16:21:48 +08'00'

Steve Checker

MANAGER WASTE INDUSTRIES

REGULATORY SERVICES

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
Amendment Notice	refers to this document
AS 4156.6 – 2000	Australian Standard AS 4156.6 – 2000: Determination of Dust/moisture Relationship for Coal.
BOD	Biochemical Oxygen Demand
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
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
CS Act	*Contaminated Sites Act 2003* (WA)
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
EPA	Environmental Protection Authority
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
Licence Holder	GSM Mining Company Pty Ltd
m^3	cubic metres
Minister	the Minister responsible for the EP Act and associated regulations
MS	Ministerial Statement
mtpa	million tonnes per annum
NEPM	National Environmental Protection Measure
N	Nitrogen
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Occupier	has the same meaning given to that term under the EP Act.
OWS	Oil water separator
P	Phosphorus
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.
PSI	Preliminary Site Investigation document
Risk Event	as described in *Guidance Statement: Risk Assessment*
tpa	tonnes per annum
TSS	Total Suspended Solids
TRH	Total Recoverable Hydrocarbons
UDR	*Environmental Protection (Unauthorised Discharges) Regulations 2004* (WA)
WQPN 22	*Water Quality Protection Note 22, July 2008* *-Irrigation with nutrient-rich wastewater*

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 is limited only to an amendment for Categories 5, 6, 52, 54 and 64. No changes to the aspects of the original Licence relating to Categories 33 or 73 have been requested by the Licence Holder.

The following 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

GSM Mining Company Pty Limited (GSM) initiated this Licence amendment on 30July 2018 for a number of changes to the licence. These changes include:

- The addition of discharge to land monitoring for the Wallaby Anti-Pollution (WAP) pond
- Production capacity increase for category 52
- Changes to the waste water treatment plant (WWTP) monitoring requirements.
- Two additional landfill location's
- Amendment to the landfill cover requirement
- Addition of Special Waste Type 1 to category 64
- Water transfer pond containment upgrade
- Addition of mining tenement M38/361 to the Premises Boundary.

Addition of discharge to land monitoring for Wallaby Anti-Pollution (WAP) Pond

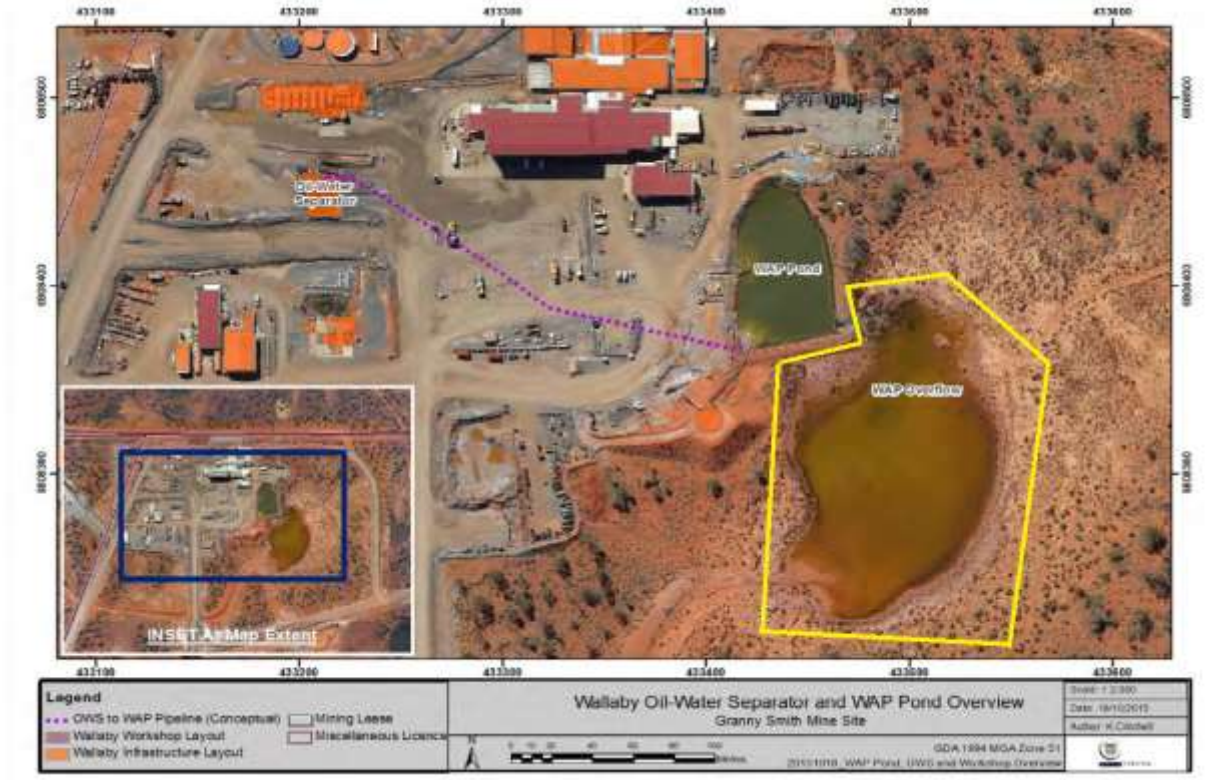
GSM request additional monitoring be added to the Licence in relation to the WAP Pond. During a compliance inspection carried out in May 2016, DWER (then Department of Environment Regulation) officers discussed the WAP pond with site personnel in regards to having it on the licence.

The pond is approximately 100m x 50m and 2m deep, constructed in the early 2000's from caprock/ laterite material to support the original Wallaby Mine construction phase. It was originally designed to capture surface runoff from across the site including the workshop, laydown area, haul roads, Go/No Go Line, offices, wash bay, fuel farm, generator bank and raw/potable water infrastructure. Evidence suggests historical discharge of hydrocarbon and sewerage contaminated water into the WAP pond has occurred. The WAP Pond currently serves as a surface runoff and rain water sedimentation pond that also receives treated wastewater from the oil water separator (OWS) at the Wallaby vehicle wash bay. As the water inputs are more than the evaporation rate of the pond, the water overflows into the adjacent clay pan as indicated on Figure 1. The historical TRH range within the WAP pond area if between 2.5 – 53mg/L with no known environmental impact resulting from the use of the pond. The haul roads surrounding the WAP pond act as a secondary bund, reducing the risk of WAP Pond

overflow reaching the nearby surface water receptors (Wallaby Pit and Lake Carey).

Figure 1 indicates the WAP pond and WAP overflow areas in association with the OWS, the yellow outline indicates the boundary of the WAP overflow area.

Figure 1: WAP Pond and WAP overflow areas



Production capacity increase to 40 MW (gas)

GSM propose to increase the approved premises production capacity for Category 52: Electric power generation, from 24 MW (gas)/25 MW (diesel) to 40 MW (gas)/ 25 MW (diesel). The Licence Holder has stated that the continued operation and expansion of the gas power station in favour of diesel generation is a key sustainability initiative to reduce greenhouse gas emissions and other fugitive emissions. The required increase is to facilitate ongoing mining of Wallaby deeps underground operation. The nearest sensitive environmental receptor is 3km away (Lake Carey), and the nearest human receptor is 5km away from the gas power station.

The increase will involve installation and replacement of the current 22 Cummins QSK60 gas fired reciprocating engines with more efficient upgraded Cummins QSK60 engines resulting in 24 engines by October 2020, increasing the stations maximum capacity to 40MW. All upgrades and new installations will occur within the existing gas power station footprint. Each stack is 2.6m high and fitted with an exhaust silencer as a means to minimise noise.

Waste Water Treatment Plant Monitoring Schedule

The Granny Smith WWTP was constructed and commissioned in 2013 under Works Approval W5268/2012/1 and Licence L8435/2010/3.

GSM has requested the following changes to their current monitoring conditions:

- Reduction of vegetation health monitoring from monthly to quarterly;
- Water monitoring reduced to quarterly; and
- Water quality limits removed.

The WWTP is operated by GSM as a sequencing batch reactor process, activated sludge system. Sewage is treated through a series of tanks which includes settling and dosing with alum and chlorine. Once final settling has occurred in the Effluent Tank, treated waste water is discharged to the sprayfield in accordance with the conditions of the Licence. The sprayfield was sized in accordance with AS/NZS 1547 for onsite wastewater treatment systems with dimensions of 340m x 230m. The sprayfield is designed to irrigate using 24 evenly spread separate sprinkler heads. Waterlogging is prevented by irrigating half of the sprayfield at a time. To prevent surface flow from the designated sprayfield footprint, the perimeter is bunded. The treated water is contained within the sprayfield area in accordance with licence conditions.

GSM presents the following justifications for amending water monitoring parameter compliance limits:

- Due to the low risk of exposure to the sprayfield as fauna access is limited with the fence and human access is restricted to essential personnel only, pathogenic risk is low and GSM therefore proposes the limit on *E.coli* be removed.
- Nutrient application criteria to control eutrophication risks set out in WQPN 22, recommends a max loading of 480kg/ha/yr of Nitrogen (N), and 120kh/ha/yr Phosphorous (P) in loamy soils like those at the wastewater treatment site. Current GSM records show total N and P at 9.08 and 1.81 kg/ha/yr respectively – both well below the recommended criteria. GSM propose DWER remove the limit on N and P.
- Biochemical Oxygen Demand (BOD) is currently limited to 20mg/L, this limit has been breached 5 times since 2015 as this is correlated to suspended solid concentrations. Total Suspended Solids (TSS) recorded by GSM are elevated at times of maintenance and during fill cycles into the final tank. The current TSS limit of 30mg/L has been breached 13 times since 2015. GSM believes as the timing of samples does not reflect the true residence time (time allowed for the disturbed water to settle before being automatically discharged), the samples are resulting in a higher TSS concentration than the true discharge concentration. GSM is proposing the removal of TSS limits and therefor BOD limits.
- The current licence pH limit of 6.5-8.5 has been breached 6 times since 2013, each breach falling below 6.5. The average recorded pH for the past year falls within the neutral range. NSW DEC (2004) recommends a pH range of 5.0-8.5 as acceptable without compromising the health of flora. As GSM has only reported a value below 5.0 once since 2013 it is proposing the pH limit be removed or amended to 5.0-8.5.

Additional Landfill Locations

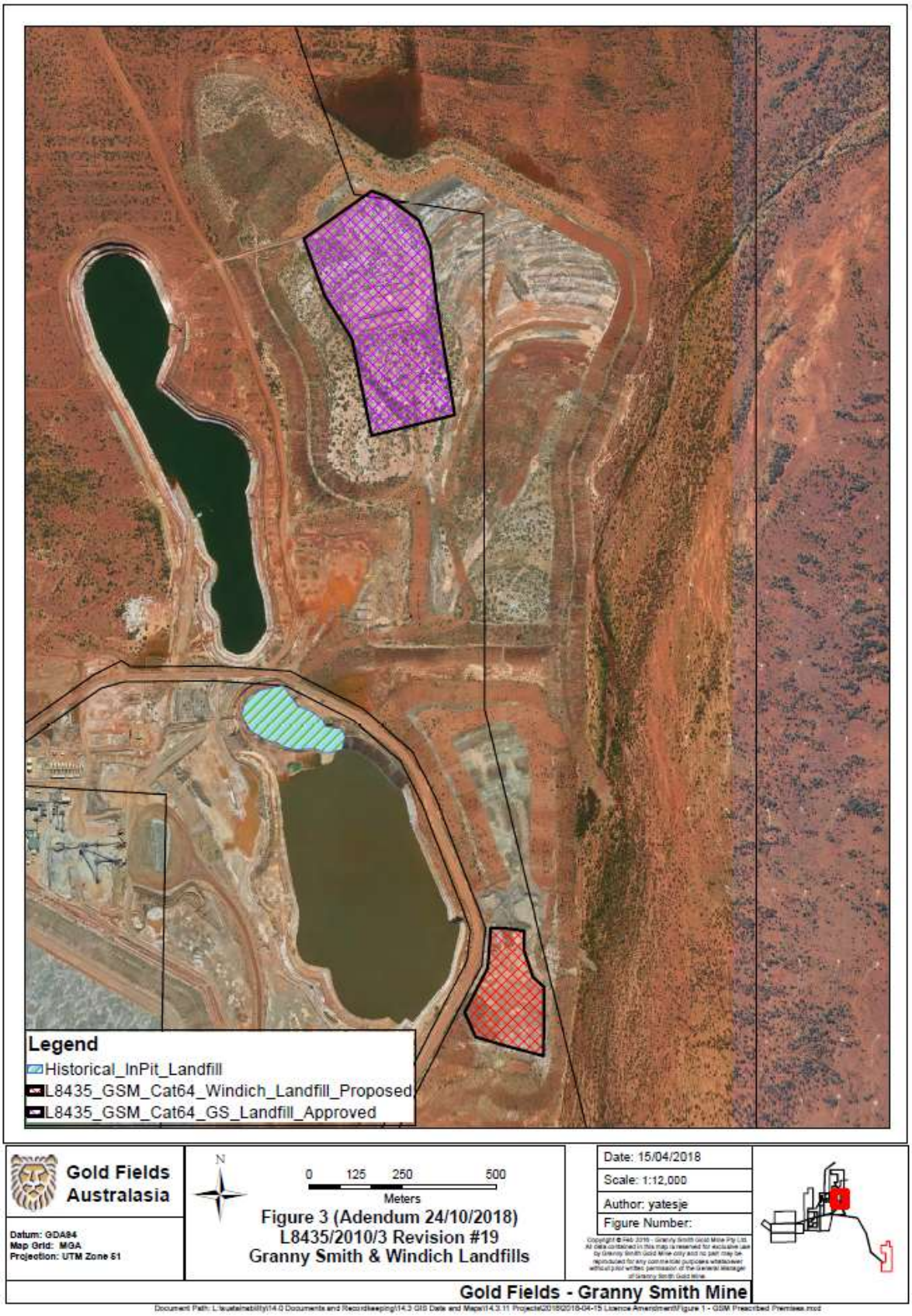
GSM has identified an on-site location which is currently used as a historical landfill for inert plastic and miscellaneous materials collected from the Granny Smith Plant trash screen. The location of the historic landfill is within the Granny Smith Pit which is no longer being mined and is currently full of water as a result of groundwater recharge, rainfall and some historical discharge from Wallaby dewatering in the early 2000s. The depth of the water is currently estimated at 100m. GSM confirmed the landfill has been active since the Granny Smith Processing Plant was commissioned in the late 1980's -1990's. Whilst the Licence includes category 64 for a Class II or III putrescible landfill site, the location of this landfill is not specified within it. GSM would like the specific location to be added to the Licence. GSM propose the design capacity of Category 64 will increase to 10,000tpa upon addition of this inert landfill location.

The Licence Holder also proposes the addition of Windich N site as another potential landfill area to be used as a trial in accordance with the existing licence cat 64 conditions. The Windich site is sheltered from the wind and presents an opportunity to trial a drive in/ drive out design that may be safer and impose a lower risk of windblown rubbish than the Granny Smith Landfill.

Figure 2 below replaces the Premises Map in Schedule 1 of the Existing Licence. It identifies

the historical in-pit landfill GSM has identified, the existing Granny Smith Landfill, and the proposed siting for the Windich Landfill site.

Figure 2: Granny Smith Landfill Locations



Amendment to Landfill Cover Requirement

The Licence currently requires the Wallaby landfill area to be covered weekly. GSM has proposed that DWER change this to 'as required'.

Special Waste Type 1 – Asbestos

GSM has requested Special Waste Type 1 is added to the Licence to allow for the burial of asbestos. The source of the asbestiform and suspected fibrous material is natural occurring materials GSM may encounter during site drilling activities. GSM expects a small volume of asbestiform and suspected fibrous material, approximately <5 tonne per year and the source is dependent on the mineralisation zones where the drill rigs are located. Asbestos is not likely to be encountered in the site infrastructure due to the age of the buildings.

GSM propose the following asbestos management conditions:

- Manage waste in accordance with relevant OHS regulations,
- Only dispose of Special Waste Type 1 in designated asbestos disposal area within the landfill, the material will be placed in the designated location double bagged in accordance with the GSM Fibrous Minerals Management guideline,
- GSM will not deposit Special Waste Type 1 within 2m of the final tipping surface of the

landfill, and

- Waste will be covered with >1m of uncontaminated dirt as soon as practicable and the landfill will subsequently be managed such that no waste is disturbed during or following its placement.

Water transfer pond containment upgrade

A twin cell sedimentation pond (transfer pond) currently captures and treats mine dewater prior to discharge to Lake Carey. As a result of the high levels of sediment in the water, a build-up occurs on the liner. As a part of the maintenance of the transfer pond, the sediment is required to be removed and discharged to a suitable location. GSM are proposing to utilise a borrow pit for the sediment build-up. The borrow pit is located directly adjacent to the Wallaby Dewatering southern discharge transfer sediment pond. It is approximately 2 m deep with sufficient capacity for periodic discharge from the transfer pond. Figure 3 indicates the water transfer pond containment upgrade. The site will be routinely rehabilitated in accordance with the GSM Mine Closure Plan at the time of closure.

Addition of M38/361, Keringal Pit: Category 6, Schedule 1: Amendment to prescribed premises maps.

The Licence Holder proposes to add M38/361 in accordance with category 6 conditions as support for the Hyper-saline Management Plan approved under the Existing Licence. GSM requests to include L38/313 to the prescribed premises, taking over the ground formerly held by L38/209, which is soon to be surrendered/resized. M38/361 is represented in the amended prescribed premises map, figure 4 below.

Figure 3: Water transfer pond containment upgrade

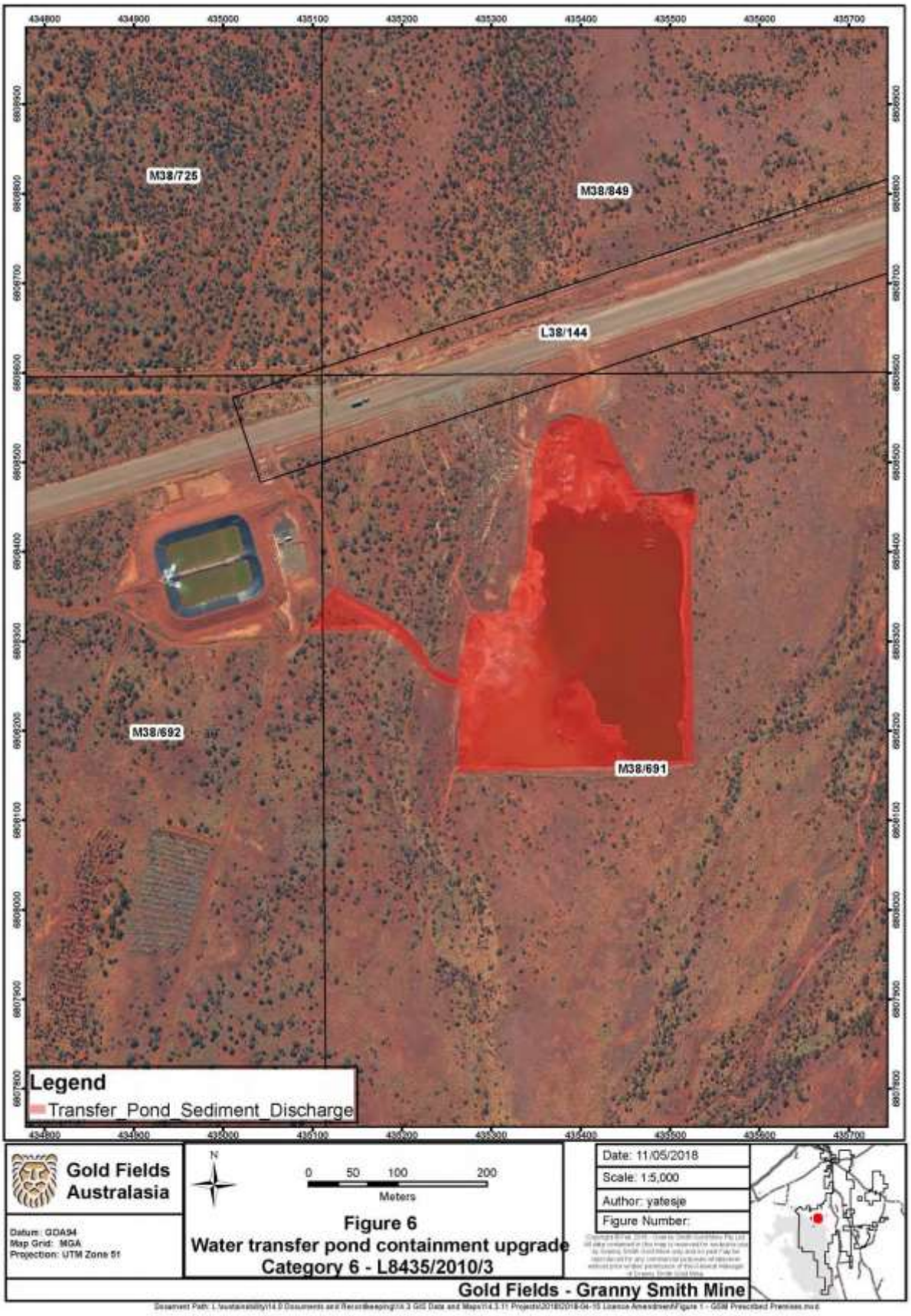
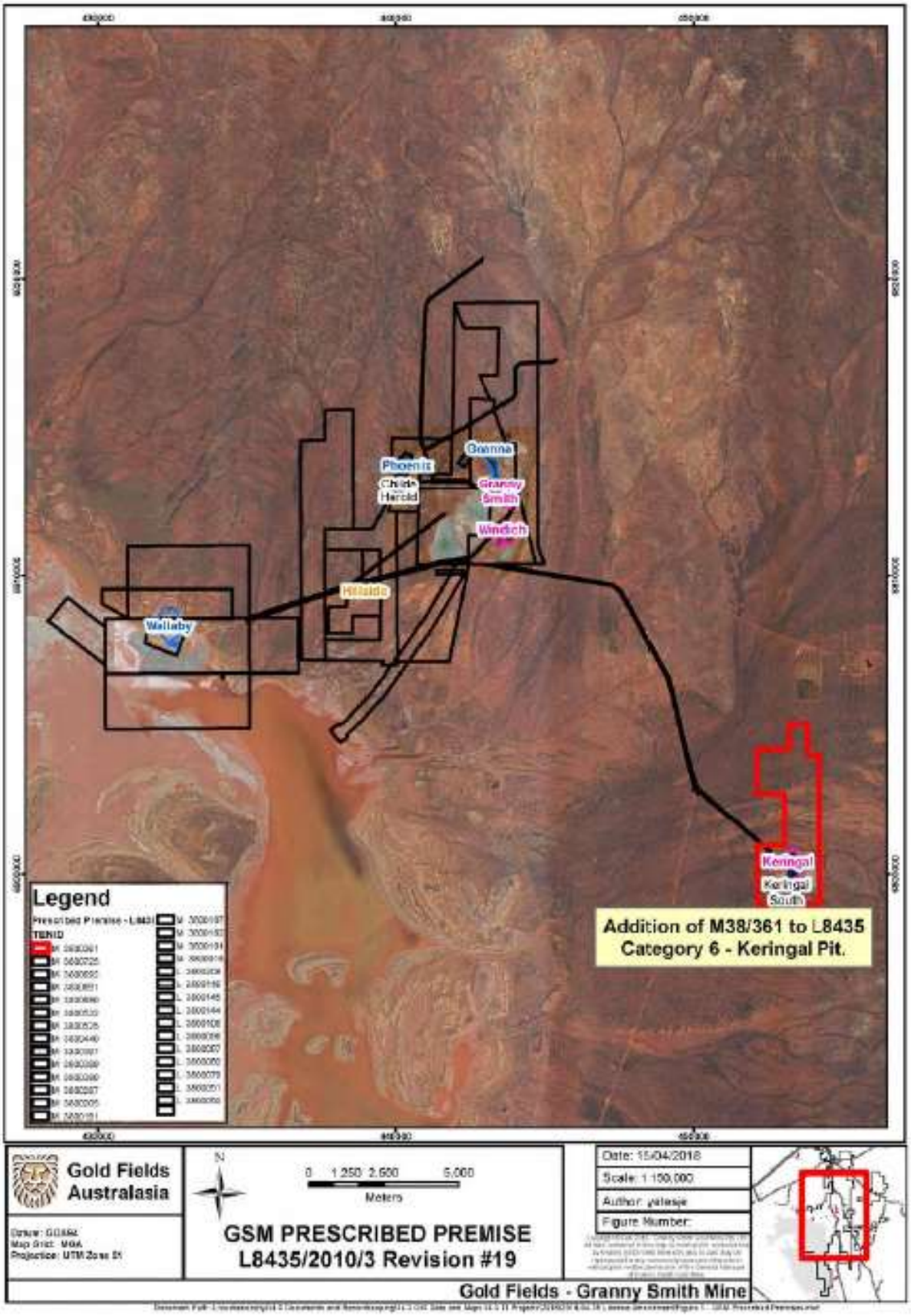


Figure 4: Prescribed Premises Map



Other approvals

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

Table 2: Relevant approvals

Legislation	Number	Approval
Environmental Protection Act: Part IV	MS 551	Approval for the mining of Wallaby open pit (not the underground operations). The Wallaby open pit has since closed.

Amendment history

Table 4 provides the amendment history for L8425/2010/3.

Table 3: Licence amendments

Instrument	Issued	Amendment
L5108/1988/8	06/10/2003	Licence re-issue
L5108/1988/9	06/10/2004	Licence re-issue
W4395/2007/1	19/03/2008	TSF cell 2 raise from RL443m to RL450m
W4588/2009/1	17/12/2009	TSF cell 3 raise from RL424m to RL426.5m
L8435/2010/1	01/04/2010	New licence to replace L5108/1988/9 which ceased due to non-payment of annual fees
W4788/2010/1	23/12/2010	TSF cell 1 raise by 2.5m to RL445.5m
W4903/2011/1	11/08/2011	TSF cell 2 raise by 2.5m to RL448.5m
L8435/2010/2	01/10/2010	Licence re-issue
W5165/2012/1	07/06/2012	Dewatering from Granny Smith pit, Goanna pit and Windich pit into Lake Carey
W5268/2012/1	18/01/2013	New waste water treatment plant
W5398/2013/1	27/06/2013	TSF cell 3 raise to RL429.0m
L8435/2010/3	03/10/2013	Licence re-issue
L8435/2010/3	19/03/2015	Licence amendment to new format and to include new discharge points for TSF seepage water
L8435/2010/3	03/09/2015	Licence amendment to assess new LNG power station and to merge Licence with L7454/2000/9 Wallaby Project (now revoked).
L8435/2010/3	07/01/2016	Licence amendment to assess TSF Cell 1 lift and update groundwater monitoring bores
L8435/2010/3	29/04/2016	Notice of Amendment of Licence Expiry Dates. New expiry date 06/10/2034
L8435/2010/3	31/01/2018	Amendment Notice 1 for construction of a paste plant, TSF cell 3 raise to

		RL432.2m and amend the TSF groundwater monitoring regime
L8435/2010/3	07/03/2019	Amendment Notice 2 for addition of WAP pond land monitoring, increase in gas production capacity, amend WWTP monitoring schedule, addition of historical landfill site, Windich landfill site and M38/361, amend landfill cover requirements, water transfer pond containment upgrade.

Location and receptors

Table 5 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 4: Receptors and distance from activity boundary

Residential and sensitive premises	Distance from Prescribed Premises
Mount Margaret (town)	12 km west
Laverton (town)	24 km north

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

Table 5: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises
Lake Carey – a large temporary episodic playa lake – contains aquatic biota. Lake Carey forms a regional sink for surface water and groundwater. A shallow hypersaline water table (TDS 200 000 mg/L) lies below the surface of Lake Carey	**Distance to Lake Carey:** **WWTP sprayfield:** 7.5km NE **WAP:** 1km N (contained within road bunds and Wallaby Rock Dump) **Wallaby Putrescible landfill:** 800m NNW (contained within road bunds and Wallaby Rock Dump) **Granny Putrescible Landfill:** 10.8km NE **Wallaby Inert landfill (special waste):**800m NNW **Granny Inert Landfill (special waste):** 10.8km NE **Power station:** 3km NE
Native vegetation – the dominant vegetation type in the area is characterized by sparsely vegetated Mulga low woodland, Acacia burkittii scrublands and open scrublands	Within premises boundary

Groundwater

Groundwater salinity mapping from DWER's GIS database indicates the groundwater in the vicinity is moderately saline to hypersaline. Groundwater at the premises is considered not suitable for agricultural or pastoral use. The closest stock watering bore is located 5 km away up-hydraulic gradient and is hosted within a superficial aquifer. The regional flow direction of groundwater is towards Lake Carey. Lake Carey – a naturally hypersaline system, is the closest groundwater and surface water receptor to the prescribed premises.

Soil

The area is characterised by internal drainage, extensive areas of elevated red desert sandplains with minimal dune development, salt lake systems that are associated with the Palaeodrainage system, and broad plains of red-brown soils and breakaway complexes as well as red sandplains. The sub-surface profile of the area comprises of 0.2m – 0.3m clayey/silty

sand or sandy silty top soil. Alluvium comprising of silty gravel/sand. Atterberg limit tests identified the fines fraction tended to be medium to high plasticity. The medium to high plasticity of the material allows pooled water to evaporate making the infiltration of hypersaline water negligible.

Climate

The premises is located in a dry semi-arid region characterized by warm to hot summers and cool winters. High intensity storms that bring short duration, heavy rainfall to the area occur mainly in the summer months.

Risk assessment

Table 7 below describes the Risk Events associated with the amendment 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.

Table 7: Risk assessment for proposed amendments during operation

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	Storage of water from OWS within WAP Pond and overflow into adjacent clay pan	**Hydrocarbon contaminated water from OWS**	Surrounding vegetation and ecosystem including Lake Carey	**Infiltration to groundwater.**	Excess hydrocarbons in the environment can cause vegetation death/damage; adverse impacts to Lake Carey ecosystem	**Moderate**	**Unlikely**	**Medium**	The WAP pond receives surface water runoff as well as treated water containing hydrocarbons from the WAP. The WAP overflows into an adjacent bunded clay pan which is bordered by road bunds, effectively forming a second containment area. Whilst permeability of the WAP pond and clay pan is unknown, the heavy soil in the vicinity of the WAP pond is expected to minimise groundwater infiltration. The heavier hydrocarbon fractions associated with OWS discharge are not expected to significantly migrate through a heavy soil profile. Paleochannels are known to occur in the vicinity of the minesite. It is not clear whether there is potential for accelerated discharge to Lake Carey via a paleochannel or other geological conduit. GSM's most recent PSI states that detectable concentrations of hydrocarbons were reported in the surface water in the WAP pond bund at 16.3mg/L. No known environmental impact has occurred from the historical use of the WAP pond and

									discharge into the overflow area. Taking into consideration the low permeability of the soil, low quality of groundwater in the area and the historical TRH range of 2.5-53mg/L, the Delegated Officer has decided to permit use of the WAP pond and clay pan overflow subject to monitoring requirements for TRH with a limit of 50mg/L and containment of any overflow within the WAP overflow area.
Cat 6 Mine dewatering	Excess sediment build up from hypersaline water in the transfer pond to be discharged into nearby borrow pit.	**Waste**: hypersaline sediment	Surrounding vegetation and ecosystem including Lake Carey	**Direct discharge:** through uncontrolled discharge or overtopping	The uncontrolled discharge of sediment can smother surrounding vegetation inhibiting survival and growth	**Minor**	**Rare**	**Low**	GSM propose to use the borrow pit as secondary containment for emergency discharges of built up sedimentation from the transfer pond. This is aimed to provide opportunity for maintenance of the pollution control infrastructure. The borrow pit is considered a contained and ecologically disconnected location. There will be an extremely low frequency of emergency discharge into the borrow pit. As per condition 1.2.3 of the Existing Licence, GSM are required to implement a freeboard of 300 mm in the borrow pit and the pipeline to the pit will be located within a v-drain to capture any spillage. A flow meter will be installed to monitor the proposed discharge.

									The borrow pit will be added to the Licence as a discharge point for category 6. GSM's management commitments will be adopted through conditions. Inspections of the pipeline and maintenance of freeboard will be required.
Cat 52 Power station	Operation of additional generators	**Noise**	The closest human receptor (other than the mine camp) is the Mount Margaret community located 12 km to the west and the town of Laverton, located 24 km north east of the site	**Air**	Human health and amenity	**N/A**	**N/A**	**N/A**	The power station is and will continue to be operated in accordance with the *Environmental Protection (Noise) Regulations 1997*. Given the separation distance to the nearest human receptor, the Delegated Officer considers there is no risk of impact to offsite sensitive receptors from noise emissions. General provisions of the *Environmental Protection Act 1986* apply.
	Operation of additional generators	**Air emissions**: oxides of nitrogen, carbon monoxide, volatile organic compounds and particulate matter	The closest human receptor (other than the mine camp) is the Mount Margaret community located 12 km to the west and the town of Laverton, located 24	**Air**	Reduced air quality as a result of air emissions – human health and amenity	**N/A**	**N/A**	**N/A**	There will be no change to the original design capacity which is 40 MW per annum for the gas power station. Currently, however only 24 MW of gas is required and GSM will be installing additional generators to reach the design capacity. GSM has stated the increase in gas generators will be managed as per current methods to minimize greenhouse gases. This includes: • Estimating and

			km north east of the site						reporting gas emissions as required under National Greenhouse Energy Reporting and NEPM-NPI reporting; • Exhaust stacks to be 2.6 m to minimize ground level contaminant concentrations. Aggreko leak detection procedures will be adhered to; • Continue to investigate ways to improve efficiencies and further reduce greenhouse gases and other exhaust emissions; • Operation of gas engines in accordance with the manufacturers specifications and conduct regular scheduled maintenance, audits and inspections; • Operate the power station in accordance with Aggreko safety standards to protect human health of on-site personnel and GSM visitors. Winds within the operational area are predominantly moderate to strong from the east to southeast. The Delegated Officer considers the separation distance to offsite human receptors to be a sufficient to inform the risk of

									impacts from power station. emissions as not foreseeable. General provisions of the *Environmental Protection Act 1986* apply.
Cat 54 Sewage Facility	Irrigation of treated effluent (reductionl of photo monitoring requirement)	**Nutrient rich Wastewater**: Treated effluent to land	Vegetation within discharge area	**Direct discharge**	Vegetation death/damage.	**Moderate**	**Possible**	**Medium**	The Licence currently requires monthly vegetation photo monitoring to identify any adverse effects caused by irrigation. The results of this monitoring has shown no negative impacts to native vegetation has occurred to date. GSM has requested this monitoring requirement be reduced to quarterly which is deemed acceptable by DWER. The original works approval for the WWTP stated that monthly photo monitoring would occur during the start of operation to identify whether any stress to vegetation is occurring. If no stress identified, the monitoring frequency would be reduced. Quarterly photo monitoring will allow for any impacts to vegetation to be identified. Therefor the condition will be amended to require quarterly photo monitoring.
	Irrigation of treated effluent (removal of parameter limits)	**Nutrient rich Wastewater**: irrigated to land **Wastewater**: Contamination to surface runoff	Vegetation within discharge area Surrounding vegetation and	Direct discharge I Direct dscharge (runoff)	Vegetation death/damage	**Minor**	**Possible**	**Medium**	GSM has requested current monitoring relating to the discharge of waste water is amended to remove limits for the following parameters: • pH • Nitrogen

			ecosystem including Lake Carey Groundwater dependent ecosystems	Infiltration to Groundwater					• Phosphorous • Total Suspended Solids • Biochemical Oxygen Demand; and • *E.coli* Irrigation is applied to the designated irrigation area (340m x 230m) via 24 evenly spaced sprinklers. Half of the sprayfield is used at a time to allow drying and prevent waterlogging. Groundwater in the vicinity of the irrigation field is shallow, generally located between 4 and 6 meters below ground level. It is considered to be brackish. The water is considered non-potable and as per Department of Health guidelines, the use of non-potable recycled water classifies the re-use of wastewater in non-food crops and areas of unlikely human exposure as 'extra low risk'. GSM Considers that there is a low risk of pathogenic exposure as fauna access is eliminated with a fence and human access is restricted to essential personnel only. WQPN 22 recommends max loading of 480 kg/ha/yr N and 120 kg/ha/yr P in loamy soils with low risk to surface water to control eutrophication risk. GSM records total P at 1.81 Kg/ha/yr and total N at 9.08 Kg/ha/yr, both well below the recommended criteria.

									TSS are higher during active maintenance and fill cycles into the final tank. The Licence limit of 30mg/L has been breached 13 times since 2015. The automatic discharge system allows several hours residence time for the disturbed water to settle. TSS in samples may not reflect the true residence time, resulting in higher concentrations than that being discharged to the sprayfield. The current pH Licence limit 6.5-8.5 has been breached 6 times since 2013, falling below the lower limit. The average discharge is recorded within the neutral range in the past year. NSW DEC (2004) recommends 5.0-8.5 as acceptable without compromising plant health. GSM WWTP has recorded a pH value below 5.0 once. Once compliance documents were submitted for the works approval, target parameters were imposed on the Licence. In January 2016 the Licence was amended and in line with policy at the time, the targets were changed into limits due to several breaches. The breaches have been investigated by GSM and DWER. DWER's investigation findings support the removal of the limits from the Licence due to no negative environmental impacts having occurred and the

									improvements GSM has made to ensure the WWTP runs efficiently. The Delegated Officer considers the effluent discharge as low risk due to the poor quality of the groundwater in the area, relatively low nutrient loading in the discharge area, no evidence of vegetation impacts from the photo monitoring to date, and lack of human offsite receptors. The Delegated Officer agrees to remove the licence limits for the following parameters • pH • Nitrogen • Phosphorous • Total Suspended Solids • Biochemical Oxygen Demand; and • *E.coli* Monitoring on a quarterly basis is still required with results to be submitted through the AER.'
Cat 64 Landfill	Landfill location for plastic milling trash screen waste. This waste includes uniform plastic, wood, steel scrap material (vent bag, pallets, ear	**Leachate**	Groundwater dependent vegetation	**Seepage to ground and infiltration to groundwater.**	Contaminated groundwater may inhibit vegetation growth and survival.	**Slight**	**Possible**	**Low**	GSM has confirmed the historic landfill containing the trash screen waste is inert/non-hazardous. Sampling was carried out of the stockpile waste material for any potential contaminants with no levels of concern being identified, including cyanide. The location of this facility is within the existing Granny Smith pit, where mining is no longer occurring. The pit is currently full of approximately 100m water.

	plugs, glove fragments etc). The screen is rinsed with process water which may contain residual cyanide.								A geotechnical assessment was carried out by GSM to determine stability of the landfill (within the Granny Smith Pit). Results indicated the location is stable with low risk of any failure. The new landfill location adjacent the existing Granny Smith Pit will be added to the licence, subject to conditions for Cat 64 on the Existing Licence. The design capacity of the category will increase from 9,500 tonnes to 10,000 tonnes per year.
	Landfill location for plastic milling trash screen waste. This waste includes uniform plastic, wood, steel scrap material (vent bag, pallets, ear plugs, glove fragments etc). The screen is rinsed with process water which may contain residual cyanide.	**Surface runoff**	Surrounding vegetation and ecosystem including Lake Carey	**Surface runoff**	Potential for contaminants from waste material to enter the environment through surface runoff.	**slight**	**possible**	**Low**	GSM has confirmed the landfill containing the trash screen waste is inert/non-hazardous. Sampling was carried out of the stockpile waste material for any potential contaminants with no levels of concern being identified, including cyanide. A geotechnical assessment carried out by GSM determined that the location of the landfill is a stable location with low risk of any failure. The Delegated Officer considers the separation distance to sensitive receptors as sufficient to include the site on the Licence, subject to conditions for Cat 64 on the Existing Licence.

	Addition of Windich Landfill as a potential trial drive in/ drive out site	**Fly away litter/ odour**	Surrounding ecosystem	**Wind/Air**	Waste may be dispersed via wind outside of the designated landfill area which may negatively impact on the surrounding environment and contaminate the surface water.	**Slight**	**unlikely**	**Low**	Windich landfill proposed site is directly adjacent the existing Granny Smith Pit (figure 2). GSM will manage the potential landfill site in accordance with the Existing Licence category 64 conditions. The Windich site is sheltered from the wind and presents an opportunity for GSM to trial a drive in/ drive out design that may be safer and presents a low risk of windblown rubbish The Delegated Officer considers the separation distance to sensitive receptors as sufficient therefore, the request to add Windich as a potential landfill site will be granted subject to the conditions of the Licence.
	Addition of Windich Landfill as a potential trial drive in/ drive out site	**Leachate/ Surface Runoff**	Surrounding vegetation and ecosystem including Lake Carey. Groundwater	**Seepage to ground and infiltration to groundwater.**	Potential for contaminants from waste material to enter the environment through surface runoff	**Minor**	**Possible**	**Medium**	Windich landfill proposed site is directly adjacent the existing Granny Smith Pit. (figure 2) GSM will manage the landfill site in accordance with the Existing Licence category 64 conditions.
	Landfilling of putrescible waste in the Goanna waste rock dump	**Fly away litter/ odour**	Surrounding ecosystem	**Wind dispersal**	Waste may be dispersed via wind outside of the designated landfill area causing which could negatively impact on surrounding environment and	**Slight**	**Possible**	**Low**	GSM has requested the cover requirement for the landfill to be reduced from weekly to 'when required'. GSM considers the putrescible waste disposed to the landfill is negligible and weekly cover is unnecessary. The landfill is currently managed and maintained in accordance with Licence conditions and is progressively filled with waste

					contaminate the surface water. Reduced air quality as a result of odour - human health and amenity				and covered. The landfill is located on the Goanna waste rock dump. The landfill is fenced and following from the most recent DWER Compliance Inspection, the landfill is managed sufficiently. The Delegated officer considers the separation distance to the nearest human receptor and GSM management as sufficient to manage odour and fly-away waste impacts. The request to reduce the frequency of cover requirements will be granted.
	Asbestos burial	**Asbestos and fibrous emissions**	Human receptors. Employees.	**Wind /air dispersal**	Asbestos has been identified as the causal agent in many lung diseases including cancers and often as a result of relatively low exposure. Public health risk arises if the fibres contaminate materials or areas where the public may be exposed to them.	**Moderate**	**Possible**	**Medium**	GSM has requested that 'Special Waste Type 1' be added to category 64 of the licence to allow for the burial of asbestos (including fibrous rocks/minerals). GSM propose to manage the burial of this waste by: • Managing the waste in accordance with relevant OHS regulations; • Only disposing of waste into a designated asbestos area within the landfill; • No deposition to occur within 2 m of the final tipping surface of the landfill; • The material will be placed in the designated location double bagged in accordance with the *GSM Fibrous Minerals*

									Management guideline; and • Waste will be covered with >1m of uncontaminated dirt as soon as practicable and the landfill will subsequently be managed such that no waste is disturbed during or following its placement. The source of asbestiform and suspected fibrous material is naturally occurring minerals encountered during site drilling activities. GSM expects the volume of special waste to be minimal, not exceeding 5tpa. The Delegated officer considers this request subject to adoption of proposed controls into conditions to ensure any Special Waste Type 1 is buried appropriately.

Decision

The Delegated Officer has determined that the following amendments will not result in emissions which are unacceptable to public health or the environment and are therefore granted.

Addition of WAP Pond land monitoring (Cat 5):

The Delegated Officer has determined that the discharge to the WAP overflow area is acceptable subject to Licence Holder's controls in conjunction with the conditions of the Licence. The Licence will require that discharge is restricted to the WAP overflow area and require monitoring of TRH with a limit of 50mg/L.

Increase to Power Production Capacity (Gas) to 40MW (Cat 52):

The Delegated officer has determined that given the separation distances to offsite receptors, there is no foreseeable receptor that may be impacted by the proposal and therefore negligible risk associated with this proposed amendment. Currently, only 24 MW of gas power is required and GSM will be installing additional generators with improved efficiency to reach the amended design capacity of 40MW. The Delegated Officer has determined that conditions currently on the Licence remain appropriate for the operation of the increase in gas generators.

Reduce WWTP monitoring schedule (Cat 64):

The Delegated Officer considers the effluent discharge as low risk due to the poor quality of the groundwater in the area, relatively low nutrient loading in the discharge area, no evidence of vegetation impacts from the photo monitoring to date, and lack of human offsite receptors. Requirements for photo monitoring have been reduced from monthly to quarterly and licence limits have been removed. Monitoring will still be required to be undertaken quarterly and reported in the AER.

Additional landfill locations (Historical and Windich proposed site) (Cat 64):

The Delegated Officer has determined that the addition of the historical in-pit and Windich proposed landfill sites to the Licence do not significantly increase the risk profile. To accommodate the additional landfill locations, the Delegated Officer has increased the design capacity of category 64 from 9,500 to 10,000 tonnes per year. The additional sites will be managed under the Existing Licence conditions for category 64.

Reduce landfill cover requirements (Cat 64):

The Delegated Officer has determined that the reduction of landfill cover requirements from weekly to as required is acceptable and has amended the condition as such.

Water transfer pond containment upgrade (Cat 6):

The Delegated Officer has determined that the incorporation of the borrow pit as overflow for the water transfer pond poses low risk due to the low frequency of emergency discharge, and the Licence Holders proposed management methods. The Licence Holders controls will be conditioned into the Licence.

Addition of M38/361 to licence prescribed premises maps (Cat 6):

The Delegated Officer has determined that the addition of M38/361 to the premises boundary and prescribed premises map on the Licence does not increase the risk profile of the site and has granted the amendment.

Addition of Special Waste 1 (Cat 64):

The Delegate Officer has determined that the Licence Holders controls are sufficient in managing the risk of asbestos and fibrous material management and will be conditioned in the Licence.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 01 March 2019. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

Amendment

1. The Licence prescribed premises location on Page 1 of the Licence is amended by the deletion of the text shown in strikethrough and the insertion of the red text shown in underline below:

   Granny Smith Gold Mine

   Mining tenements M38/18, M38/361, M38/161, M38/162, M38/167, M38/191, M38/205, M38/287, M38/361, M38/380, M38/389, M39/397, M38/440, M38/532, M38/525, M38/690, M38/691, M38/692, M38/725, L38/50, L38/51, L38/79, L38/80, L38/87, L38/96, L38/106, L38/144, L38/145, L38/144, L38/146, ~~and~~ L38/209 and L38/313.

2. The Prescribed premises category Table of Page 1 of the Licence is amended by the deletion of the text shown in strikethrough and the insertion of the red text shown in underline below:

Category number	Category description	Category production or design capacity	Approved Premises production or design capacity
5	Processing or beneficiation of metallic or non-metallic ore	50 000 tonnes or more per year	4 500 000 tonnes per annual period
6	Mine dewatering	50 000 tonnes or more per year	10 219 614 kL per annual period
33	Chemical blending or mixing	500 tonnes or more per year	4 000 tonnes per year
52	Electric power generation	10 MW or more in aggregate (using a fuel other than natural gas) 20 MW or more in aggregate (using natural gas)	25 MW diesel ~~24~~ 40 MW using LNG
54	Sewage facility	100 m^3 or more per day	360 m^3 per day
64	Class II or III putrescible landfill	20 tonnes or more per year	~~9 500~~ **10,000** tonnes per year
73	Bulk storage of chemicals, etc	1 000 m^3 in aggregate	3 004 m^3

3. Condition 1.2.2 of the Licence is amended by the insertion of the red text shown in underline below:

   1.2.2 The Licensee shall ensure that tailings, decant water, dewatering water and effluent are only discharged into containment, cells, dams or ponds with the relevant infrastructure requirements and at the locations specified in Table 1.2.1.

Table 1.2.1: Containment Infrastructure

Containment point reference	Material	Infrastructure requirements
TSF 1, 2 and 3	Tailings	Lined with in-situ clay to limit seepage to groundwater Embankment grade maintained at 1V:2H or less
RTSF	Reclaimed tailings	1.5 m bunding of the entire perimeter

Process water pond	Return water	Lined with HDPE
Lagoons 1 and 2	Waste activated sludge; and Emergency treated wastewater	Compacted clay lined – waste activated sludge to be discharged into one lagoon at a time to allow drying before being appropriately disposed of by landfilling. Approval from CEO to be sought prior to use in emergency situations
Water transfer pond	Mine dewater	HDPE lined embankment foundations and base of water transfer pond are maintained. Embankment level of 4 meters above ground.
Borrow pit	Excess sediment built up from water transfer pond	Nil.
Wallaby anti-pollution pond (WAP pond)	Surface runoff, rain water and treated waste water from the OWS at the Wallaby vehicle wash bay.	Constructed from caprock/ laterite material approximately 100m x 50m and 2m deep.

4. Condition 1.2.5 of the Licence is amended by the insertion of the red text shown in underline below:

1.2.5 The Licensee shall:
(a) undertake inspections as detailed in Table 1.2.2;
(b) where any inspection identifies that an appropriate level of environmental protection is not being maintained, take corrective action to mitigate adverse environmental consequences as soon as practicable; and
(c) maintain a record of all inspections undertaken.

Table 1.2.2: Inspection of infrastructure

Scope of inspection	Type of inspection	Frequency of inspection
Tailings pipelines	Visual integrity	Twice daily
Return water lines	Visual integrity	Twice daily
Water transfer pond	Visual integrity	Daily
Dewatering pipeline	Visual integrity	Daily
Embankment freeboard	Visual to confirm required freeboard capacity is available	Daily
Decant pond	Visual to confirm the size is less than 15% of the surface of each TSF	Daily
Granny pit Goanna pit	Visual to confirm required freeboard capacity is available Visual checks for avifauna deaths	Daily
RTSF Runoff Pond	Visual to confirm required freeboard capacity is available	Weekly
Borrow pit	Visual to confirm required freeboard capacity is available	Daily when discharge occurs
WAP pond	Visual to confirm required freeboard capacity is available (to ensure any overflow is directed only to the WAP overflow area via the single spillway)	Daily

5. Condition 1.2.9 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

1.2.9 The Licensee shall monitor ~~monthly~~ quarterly the health and condition of vegetation located at the irrigation area. An annual report is to be submitted within the Annual Environmental Report on the condition of the vegetation cover at the irrigation area.

6. Condition 1.2.10 of the Licence is amended by the insertion of the red text shown in underline below:

1.2.10 The Licensee shall ensure that wastes accepted onto the landfill are only subjected to the process(es) set out in Table 1.2.3 and in accordance with any process limits described in that Table.

Table 1.2.3: Waste processing

Waste type	Process(es)	Process limits[1, 2]
Inert Waste Type 1	Disposal of waste by landfilling	All waste types Disposal of waste by landfilling shall only take place within the landfill areas shown on the Landfill Area Maps in Schedule 1. No waste shall be temporarily stored or landfilled within 35 metres of the boundary of the premises. The separation distance between the base of the landfill and the highest groundwater level shall not be less than 2m.
Putrescible waste		
Clean Fill		
Used tyres	Storage and burial	Not more than 1 000 tyres shall be stored at the premises at any one time; Used tyre stacks shall not exceed 100 m^2 in area and 4 metres in height; Used tyres must be stacked on their side walls or if stored on their treads, area baled with a securing device made from a non-combustible material.
Special Waste Type 1	Asbestos and fibrous material burial	Must be disposed of in designated asbestos disposal area; Must be deposited at least 2m below the final tipping surface of the landfill; No works shall be commenced on that landfill that has potential to release asbestos fibres; The material will be placed in the designated location double bagged in accordance with the GSM Fibrous Minerals Management guideline.
Sewage	Biological and physical treatment	360 m^3 per day

Note 1: Requirements for landfilling tyres are set out in Part 6 of the *Environmental Protection Regulations 1987*.
Note 2: Additional requirements for the acceptance and landfilling of controlled waste (including asbestos and tyres) are set out in the *Environmental Protection (Controlled Waste) Regulations 2004*.

7. Condition 1.2.11 of the Licence is amended by the insertion of the red text shown in underline below:

1.2.11 The Licensee shall ensure that cover is applied and maintained on landfilled wastes in accordance with Table 1.2.4 and that sufficient stockpiles of cover are maintained on site at all times.

Table 1.2.4: Cover requirements[1]

Waste Type	Cover requirements

Putrescible wastes	To be covered ~~weekly~~ as required with sufficient quantities of Type 1 inert waste, clean fill or other appropriate cover material to prevent the spread of fire and harbouring of disease vectors.
Inert Waste Type 1	No cover required
Inert Waste Type 2	A minimum depth of 500 mm of clean fill is maintained over the buried tyres following disposal.
Special Waste Type 1	To be covered as required with >1m of uncontaminated soil as soon as practicable, no later than the end of the working day in which the waste was deposited..

Note 1: Additional requirements for final cover of tyres are set out in Part 6 of the *Environmental Protection Regulations 1987.*

8. The Existing Licence is amended by the insertion of the following Condition 1.2.15:

1.2.15 The Licence Holder shall ensure that discharge of wastewater from the WAP overflow area (as shown in Schedule 1) does not occur.

9. Condition 2.5.1 of the Licence is amended by the insertion of the red text shown in underline below:

2.5.1 The Licensee shall ensure that where waste is emitted to land from the emission points in Table 2.5.1 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this Licence.

Table 2.5.1: Emissions to land

Emission point reference	Emission point reference on Map of emission point	Description	Source including abatement
L1	Spray field	Pipe feeding irrigation 72 ha of native vegetation	Treated wastewater from sewage plant
NA (Identified in Schedule 1)	WAP	Pond constructed out of caprock/laterite to capture surface runoff. Overflow area adjacent to pond- clay pan.	Treated wastewater from OWS.

10. Condition 2.5.2 of the Licence is amended by the deletion of the text shown in strikethrough and the insertion of the red text shown in underline below:

2.5.2 The Licensee shall not cause or allow emissions to land that do not meet the limits listed in Table 2.5.2.

Table 2.5.2: Emission limits to land

Emission point reference	Parameter	Limit (including units)	Averaging period
~~L1~~	~~Biochemical oxygen demand (BOD)~~	~~<20 mg/L~~	~~Spot sample~~
	~~Total suspended solids (TSS)~~	~~<30 mg/L~~	
	~~Total nitrogen (TN)~~	~~<50 mg/L~~	
	~~Total phosphorous (TP)~~	~~<12 mg/L~~	
	~~Thermotolerant coliforms (including *E.coli*)~~	~~<1000 cfu/100mL~~	
	~~pH~~	~~6.5 – 8.5~~	
WAP WAP Overflow Area	TRH	50mg/L	Spot sample

11. Condition 3.5.1 of the Licence is amended by the deletion of the text shown in strikethrough and the insertion of the red text shown in underline below:

3.5.1 The Licensee shall undertake the monitoring in Table 3.5.1 according to the specifications in that table.

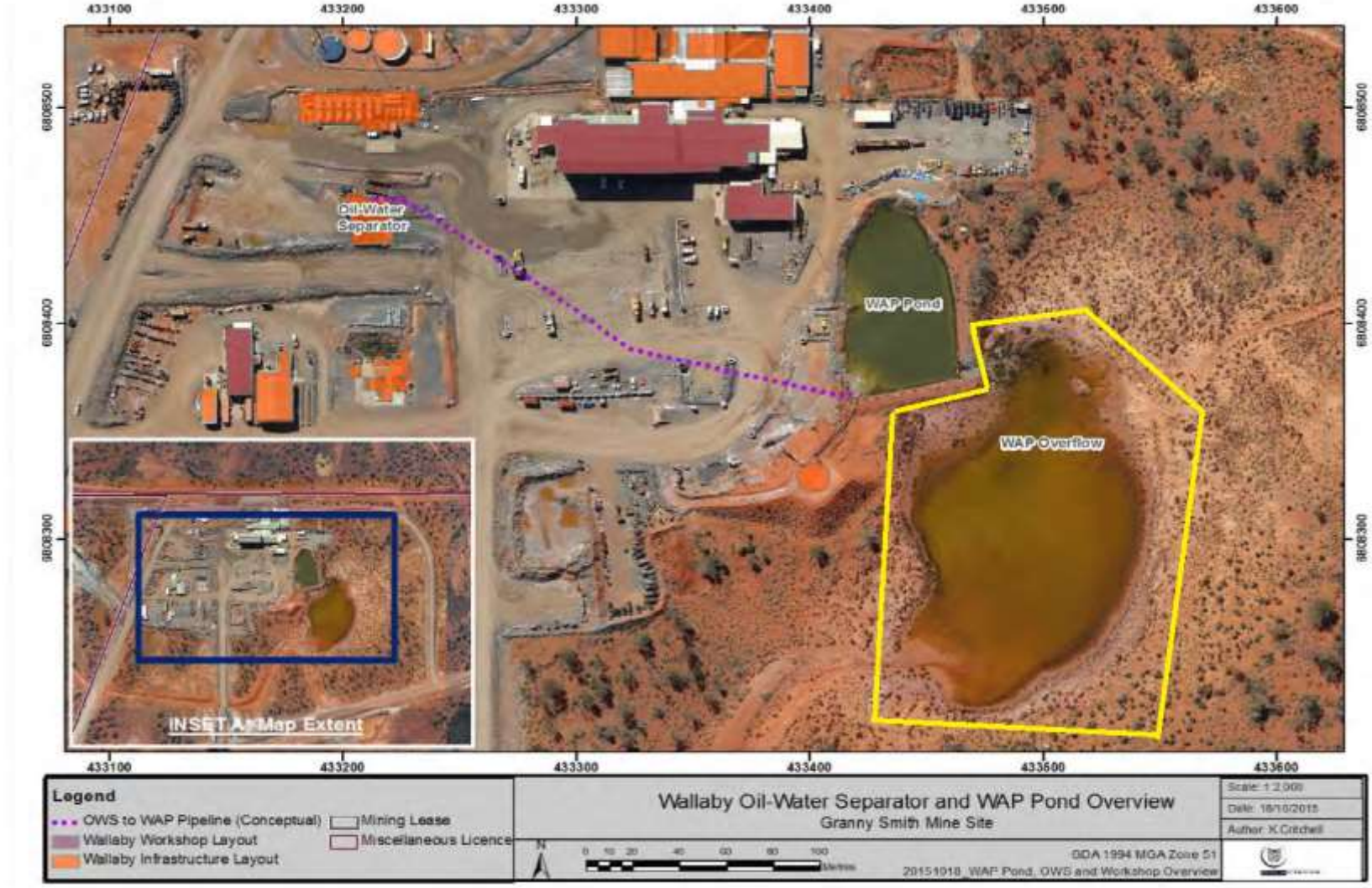
Table 3.5.1: Monitoring of emissions to land			
Emission point reference	**Parameter**	**Units**	**Frequency**
L1	Biochemical oxygen demand	mg/L	~~Monthly~~ Quarterly
	Total suspended solids	mg/L	
	Total nitrogen	mg/L	
	Total phosphorous	mg/L	
	Thermotolerant coliforms (including *E.coli*)	cfu/100mL	
	pH[1]	-	
	Effluent flow rate	kL/day	Continuous
WAP WAP Overflow Area	TRH	mg/L	Quarterly

Note 1: In-field non-NATA accredited analysis permitted

12. Schedule 1 of the Licence is amended by the insertion of the map shown over.

Map of WAP Overflow Area

The boundary of the WAP overflow area as defined in Condition 1.2.15 is shown in yellow below



Licence: L8435/2010/3

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L8435/2010/3 – Granny Smith Gold Mine	L8435/2010/3	accessed at www.dwer.wa.gov.au
2	Works Approval W5268/2012/1 – Granny Smith Gold Mine	W5268/2012/1	DWER records (A591228; A686116)
4	Ministerial Statement 551	MS 551	accessed at www.epa.wa.gov.au/
5	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
6	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DER 2015b	accessed at www.dwer.wa.gov.au
8	DER, November 2016. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	DER 2016b	
9	DER, November 2016. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	DER 2016c	

Appendix 2: Summary of Licence Holder comments

The Licence Holder was provided with the draft Amendment Notice on 01 March 2019 for review and comment. The Licence Holder responded on 01 March 2019 waiving the remaining comment period (until 25 March 2019). The following comments were received on the draft Amendment Notice.

Condition	Summary of Licence Holder comment	DWER response
1.2.5	The WAP Pond freeboard is designed to overflow hence the discharge limit. Requesting the following clarification to Table 1.2.2: - Visual to confirm required freeboard capacity is available – *to direct any overflow through the single spillway.*	Table 1.2.2 amended to clarify the overflow of freeboard through the single spillway.