



Application for Works Approval Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Works Approval Number	W6584/2021/1
Works Approval Holder	GMA Garnet Pty Ltd
ACN	009 344 227
File Number	DER2021/000422
Premises	Port Gregory Garnet Mine 1420 George Grey Drive Yallabatharra WA 6535 Legal description – Mining tenements M70/856, M70/204, M70/259, M70/926, M70/927, M70/968, G70/171, M70/1330 and M70/1331(excluding Lot 58 on Plan 65344)
Date of Report	10 March 2023
Decision	Revised works approval granted

**A/MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES**

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

Table of Contents

1. Decision summary	1
2. Scope of assessment	1
2.1 Regulatory framework	1
2.2 Amendment summary	1
3. Risk assessment	2
3.1 Source-pathways and receptors	2
3.1.1 Emissions and controls	2
3.1.2 Receptors	3
3.2 Risk ratings	4
4. Consultation	7
5. Conclusion	7
5.1 Summary of amendments	7
References	8
Appendix 1: Application validation summary	9

1. Decision summary

Works Approval W6584/2021/1 is held by GMA Garnet Pty Ltd (Works Approval Holder) for the Port Gregory Garnet Mine (the Premises), located within Mining tenements M70/856, M70/204, M70/259, M70/926, M70/927, M70/968, G70/171, M70/1330 and M70/1331(excluding Lot 58 on Plan 65344).

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of the Premises. As a result of this assessment, Revised Works Approval W6584/2021/1 has been granted.

The Revised Works Approval issued as a result of this amendment supersedes the existing Works Approval previously granted in relation to the Premises.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Amendment summary

On 30/11/2022, the Works Approval Holder submitted an application to the department to amend Works Approval W6584/2021/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Amend the proposed Bioremediation Facility HDPE material liner specification, the standards and methods for destructive weld testing to meet the Geosynthetic Research Institute (GRI) Standard;
- Alter the layout of the Bioremediation facility;
- Change the location of the proposed tailings transfer station; and
- Utilise coagulant as part of the wet processing of ore within the plant.

This amendment is limited only to changes to Category 8 activities from the Existing Works Approval. There are no changes proposed to the Category 8 assessed throughput assessed in W6584/2021/1.

Bioremediation Facility

The Works Approval Holder has proposed to change the layout of the bioremediation facility, to orientate the entrance to the east instead of west as described in the original plan. The Works Approval Holder also proposes to remove the internal bunding from the design of the facility and replace it with a 1 metre earthen bund that will surround the whole facility to prevent stormwater access, giving the same level of protection from stormwater incursion as the original risk assessment. Changes will be made to condition 1 of W6584/2021/1 and Figure 6 will be replaced with Figure 1 below. The location of the bioremediation facility will remain unchanged and no additional emissions or discharges are expected from the proposed changes.

In the original assessment of W6584/2021/1, the Works Approval Holder supplied incorrect specifications and testing requirements for the liner to be installed at the bioremediation facility. The specification and testing requirements originally supplied were for a 2.0 mm thick liner. The proposed thickness of the liner at the bioremediation facility is 1.5 mm. Table 1 below shows the standard specification for high density polyethylene liners as described in the 2021 document *GRI -GM19a Standard Specification* (Geosynthetic Institute, 2021).

Geomembrane Nominal Thickness	0.75 mm	1.0 mm	1.25 mm	1.5 mm	2.0 mm	2.5 mm	3.0 mm
Hot Wedge Seams⁽¹⁾							
shear strength, N/25 mm.	250	350	438	525	701	876	1050
shear elongation at break ⁽²⁾ , %	50	50	50	50	50	50	50
peel strength, N/25 mm	197	263	333	398	530	661	793
peel separation, %	25	25	25	25	25	25	25
Extrusion Fillet Seams							
shear strength, N/25 mm	250	350	438	525	701	876	1050
shear elongation at break ⁽²⁾ , %	50	50	50	50	50	50	50
peel strength, N/25 mm	170	225	285	340	455	570	680
peel separation, %	25	25	25	25	25	25	25

Table 1: Seam Strength and Related Properties of Thermally Bonded Smooth and Textured High Density Polyethylene (HDPE) Geomembranes

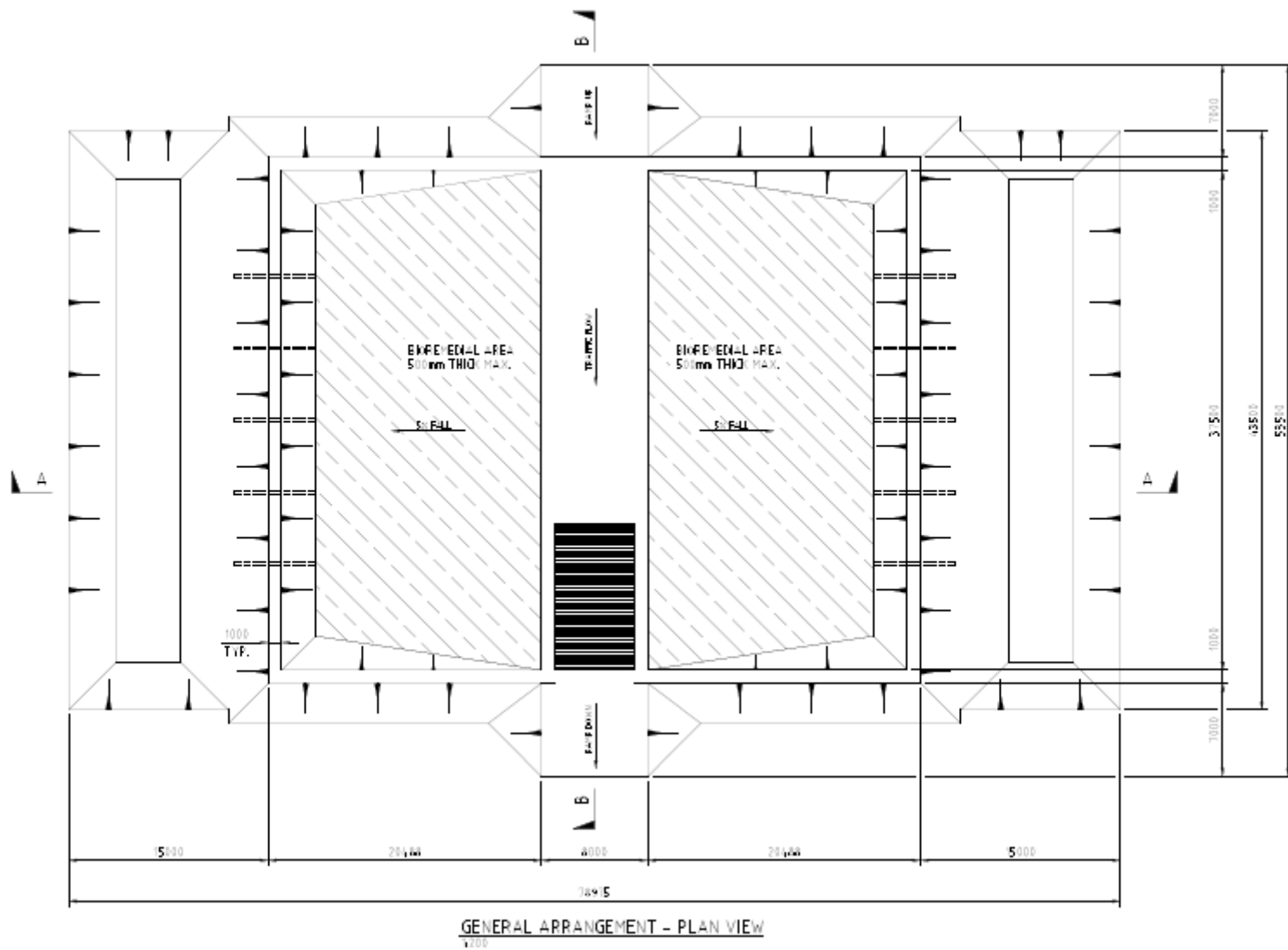


Figure 1: Bioremediation Facility Layout

Works Approval: W6584/2021/1

IR-T15 Amendment report template v3.0 (May 2021)

Tailings Transfer Station

The Works Approval Holder has proposed to change the location of the Tailings Transfer Station and tank to be closer to the processing wet plant instead of within one of the existing evaporation ponds. The proposed location is within the disturbed mining footprint of the operations, similar to the original assessed location. The design of the station will be the same as originally assessed and no additional emissions or discharges are expected from the proposed changes.

Coagulant

The Works Approval Holder has proposed to include an additional reagent within the wet plant. The wet plant processes will use Magnafloc 1425 Coagulant (Magnafloc). Magnafloc will be absorbed into suspended solids calcareous slimes and removed from the water phase. The calcareous slimes are discharged in solar drying ponds and allowed to dry before being backfilled.

The United States Environmental Protection Agency (USEPA) has determined that the chemicals found in Magnafloc are of low toxicity to wildlife and humans and do not require any specific management when utilised as described by the manufacturer (USEPA, 2015).

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction which have been considered in this Amendment Report are detailed in Table 2 below. Table 2 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

This amendment report will accompany the original decision report for W6584/2021/1.

Table 1: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Earthworks and vehicle movements	Air/windborne pathway	<ul style="list-style-type: none"> Dust management plan to be implemented including: Use of water trucks and/or water cannons to dampen areas identified as being potentially dust generating Reduce speed limits to minimise dust generation as required Topsoil stripping to be scheduled to avoid periods of high winds from unfavorable directions Topsoil stripping operations will be suspended during high wind conditions if there's a risk of dust sensitive receptors Dust suppressant applied proactively to overburden/topsoil stockpiles
Noise		Air/windborne pathway	<p>No controls proposed</p> <p>Current operating licence has noise management conditions to mitigate noise emissions</p>
Commissioning			
Spill/leak of tailings	Hydrotesting of pipes and associated infrastructure for tailings delivery to solar drying ponds.	Direct discharge to soil	HDPE pipeline will be located within a containment bunding

Emission	Sources	Potential pathways	Proposed controls
Operation			
Discharge of slimes or tails water due to pipeline spill or overflow of transfer tank	Transfer of tailings to Solar Drying Ponds	Direct discharge to soil	<ul style="list-style-type: none"> Pipeline constructed in containment bund Routine Daily inspections of the pipeline by trained personnel Transfer tank to be placed within a contained area (utilising existing solar drying pond) Level indicators to monitor transfer tank levels and alarm if freeboard level is breached and turn off pumps feeding tailings from the wet plant to the tank Tank will be covered to prevent rainfall infiltration
Changed chemistry of seepage from tailings	Addition of Magnafloc 1425 Coagulant to process	Seepage from unlined mine voids	<ul style="list-style-type: none"> Non-hazardous, flocculant recirculated through the plant Remaining Flocculent will be absorbed onto suspended solids and removed from the water phase.

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Works Approval Holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental siting* (DWER 2020)).

Table 3: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Town of Port Gregory	Approximately 3 km south-west of the Premises
Residential Premises	5.4 km north-east of premises
Lynton Station homestead and Caravan Park	Approximately 250 m south-east of premises boundary and approximately 13km south from proposed works
Lucky Bay campground	Approximately 8 km north-west of the premises
Environmental receptors	Distance from prescribed activity
Utcha Well Nature Reserve – (microscale elongate sumpland, Registered Aboriginal Heritage Site)	Approximately 1000m north of the proposed Bioremediation facility and approximately 1800m northwest of the proposed solar drying ponds
Hutt Lagoon system (Specified ecosystem: Important wetlands, Western Australia; Environmental Sensitive Area)	Approximately 1000m west of the proposed solar drying ponds and approximately 2300m southwest of the proposed bioremediation facility. During winter, the lagoon is partly or wholly filled with

	hypersaline water and during summer the lagoon is mostly empty.
Groundwater Area – RIWI Act 1914 proclaimed area	Gascoyne Groundwater Area - Intersects the premises Groundwater levels within the proposed project area is approximately 35 mbgl. The salinity within the project area generally varies from about 800 mg/L to 1500 mg/L. Groundwater flows south-westwards and discharges into Hutt Lagoon, the adjoining wetlands, or the ocean.

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1 of the original decision report. Where linkages are incomplete, they have not been considered further in the risk assessment.

Additional regulatory controls may be imposed where the Works Approval Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table .

The Revised Works Approval W6584/2021/1 that accompanies this Amendment Report authorises construction and time-limited operations. The conditions in the Revised Works Approval have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the Premises i.e. mineral sands processing activities. A risk assessment for the operational phase has been included in this Amendment Report, however licence conditions will not be finalised until the department assesses the licence application.

Table 4. Risk assessment of potential emissions and discharges from the Premises during construction, commissioning and operation

Risk Event					Risk rating ¹ C = consequence L = likelihood	Works Approval Holder's controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Works Approval Holder's controls				
Construction								
Construction of tailings transfer station and tank at new location Earthworks and vehicle movements.	Dust	Air / windborne pathway causing impacts	Native vegetation, including the Hutt Lagoon ESA	Refer to Section 3.1.1	C = Minor L = Rare Low Risk	Y	N/A	No change to risk rating given during original risk assessment
	Noise		Separation distance to residential sensitive receptors is sufficient to avoid any potential impacts from construction phase.	Refer to Section 3.1.1	No pathway to receptor. Further risk assessment not needed	N/A	N/A	No change to risk rating given during original risk assessment
Commissioning								
Tailings transfer station (at new location) and associated pipeline	Tailings	Direct discharge to soil	Localised vegetation, soils and groundwater Hutt Lagoon ESA - approximately within 1km	Refer to Section 3.1.1	C = Minor L = Possible Medium Risk	Y	Conditions 1, 9, 10 and 11	No change to risk rating given during original risk assessment No additional regulatory controls required.
Operation (including time-limited-operations operations)								
Operation of the tailings transfer station at it's new location	Tailings	Direct discharge to land - resulting soil degradation, contamination of surface water or	Localised vegetation, soils and groundwater Hutt Lagoon ESA - approximately within 1km	Refer to Section 3.1.1	C = Moderate L = Unlikely Medium Risk	Y	Conditions 14, 15 and 18	No change to risk rating given during original risk assessment No additional regulatory controls required.

Works Approval: W6584/2021/1

Risk Event					Risk rating ¹ C = consequence L = likelihood	Works Approval Holder's controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Works Approval Holder's controls				
		impacts to native vegetation						
Addition of Magnafloc 1425 Coagulant to process	Magnafloc 1425 Coagulant	Seepage from unlined solar drying ponds	Groundwater	Refer to Section 3.1.1	C = Slight L = Unlikely Low Risk	Y	Conditions 14, 15 and 18	Magnafloc is non-hazardous and will be absorbed onto suspended solids and removed from the water phase. Additional regulatory conditions are not required.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

Note 2: Proposed Works Approval Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

Table provides a summary of the consultation undertaken by the department.

Table 5: Consultation

Consultation method	Comments received	Department response
Works Approval Holder was provided with draft amendment on 10/02/2023	Comments received 15/02/2023 waiving the 21 day period with no additional comments.	Noted.

5. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Works Approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Works Approval as part of the amendment process.

Table 6: Summary of works approval amendments

Condition no.	Proposed amendments
Table 1: Design and construction/installation requirements	<ul style="list-style-type: none"> Infrastructure location description has been changed to align with the wording in the maps in Schedule 1 Wording of point 3 changed to allow for the change in location of the tailings transfer station. Minimum requirements have been changed for the HDPE liner at the Bioremediation Facility
Table 5: Infrastructure and equipment requirements during time limited operations	<ul style="list-style-type: none"> Infrastructure location description has been changed to align with the wording in the maps in Schedule 1 Magnafloc 1425 coagulant has been added to allow usage of the flocculant during time limited operations
Table 7: inspections of infrastructure during time limited operations	<ul style="list-style-type: none"> Infrastructure location description has been changed to align with the wording in the maps in Schedule 1
Schedule 1 – Figure 2: Location of the proposed Solar drying ponds and Bioremediation pads	<ul style="list-style-type: none"> Updated map showing indicative location of the Tailings transfer station
Schedule 1 – Figure 6: Bioremediation layout	<ul style="list-style-type: none"> Updated design map of the layout of the Bioremediation facility showing the change of design to the stormwater bunding

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. Geosynthetic Institute 2021: *GRI -GM19a Standard Specification*, Folsom, Pennsylvania.
5. United States Environmental Protection Agency (USEPA) 2015, Federal Register :: 2-Propen-1-Aminium, N,N-Dimethyl-N-Propenyl-, Chloride, Homopolymer; Exemption From the Requirement of a Tolerance.

Appendix 1: Application validation summary

SECTION 1: APPLICATION SUMMARY			
Application type			
Amendment to works approval	<input checked="" type="checkbox"/>	Current works approval number:	W6584/2021/1
Date application received		30/11/22	
Applicant and Premises details			
Applicant name/s (full legal name/s)		GMA Garnet Pty Ltd	
Premises name		Port Gregory Garnet Mine	
Premises location		M70/856 and G70/171	
Local Government Authority		Shire of Northampton	
Application documents			
HPCM file reference number:		DER2021/000422	
Key application documents (additional to application form):		Attachment 1A Attachment 2 Attachment 3B Attachment 6A Attachment 7	
Scope of application/assessment			
Summary of proposed activities or changes to existing operations.		<p><u>Works approval amendment</u></p> <p>The works approval is for the Construction of bioremediation facility, solar drying ponds and use of coagulant.</p> <p>General changes to the original works approval are being requested under this amendment application</p> <p>The scope of this works approval amendment application is to seek approval under Part V of the Environmental Protection Act 1987 (EP Act) to undertake the following:</p> <ul style="list-style-type: none"> • Amend the proposed Bioremediation Facility HDPE material liner specification, the standards and methods for destructive weld testing to meet the Geosynthetic Research Institute (GRI) Standard. • Alter the layout of the Bioremediation facility. • Change the location of the proposed tailings transfer tank. • Utilise coagulant as part of the wet processing of ore within the plant. 	

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity
Category 8: Mineral sands mining or processing	3,000,000 tonnes per annual period.	No change

Legislative context and other approvals

Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision No: Managed under Part V <input type="checkbox"/> Assessed under Part IV <input type="checkbox"/>
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Ministerial statement No: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Mining lease / tenement <input checked="" type="checkbox"/> Expiry: 11/10/2037
Has the applicant obtained all relevant planning approvals?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	Approval: Expiry date: If N/A explain why?
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	CPS No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: N/A Licence/permit No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: Licence/permit No: Licence / permit not required.
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Name: N/A Type: Proclaimed Groundwater Area/Surface Water Area Has Regulatory Services (Water) been consulted? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Regional office: Swan Avon / Mid-

<p>Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>Name: N/A Priority: P1 / P2 / P3 / N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to <u>WQPN 25</u>)? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/></p>
<p>Is the Premises subject to any other Acts or subsidiary regulations (e.g. <i>Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx</i>)</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>If Yes include details here.</p>
<p>Is the Premises within an Environmental Protection Policy (EPP) Area?</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>If Yes include details of which EPP(s) here.</p>
<p>Is the Premises subject to any EPP requirements?</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>If Yes, include details here, e.g. Site is subject to SO₂ requirements of Kwinana EPP.</p>
<p>Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i>?</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>If Yes include details here. Classification: N/A / possibly contaminated – investigation Date of classification: N/A</p>