# Application for Works Approval Amendment

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

| | |
|---|---|
| Works Approval Number | W6407/2020/1 |
| Works Approval Holder | Silver Lake (Deflector) Pty Ltd |
| **ACN** | 101 224 999 |
| **File Number** | DER2020/000240~7 |
| **Premises** | Gullewa Gold-Copper Operations<br>Morawa – Yalgoo Road<br>YALGOO WA 6635<br><br>Legal description –<br><br>M59/49, L59/49, L59/64, M59/68, M59/132, M59/294, M59/356, M59/391, M59/392, M59/335, M59/442, L59/35, M59/507, M59/336, M59/522, L59/71, L59/158, L59/159 and L59/160<br><br>As defined by the Premises map attached to the Revised Works Approval |
| **Date of Report** | 27 April 2023 |
| **Proposed Decision** | Intent to grant revised works approval |

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**Marko Pasalich**
**Senior Environmental Officer Waste Industries**
**REGULATORY SERVICES**

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

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# 1. Decision summary

Works Approval W6407/2020/1 is held by Silver Lake (Deflector) Pty Ltd (Works Approval Holder) for the Gullewa Gold-Copper Operations (the Premises), located at M59/49, L59/49, L59/64, M59/68, M59/132, M59/294, M59/356, M59/391, M59/392, M59/335, M59/442, L59/35, M59/507, M59/336, M59/522, L59/71, L59/158, L59/159 and L59/160 Morawa – Yalgoo Road, YALGOO WA 6635.

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 W6407 has been granted.

The Revised Works Approval issued as a result of this amendment consolidates and 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 Application summary

On 2 February 2023, the Works Approval Holder submitted an application to the department to amend Works Approval W6407/2020/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Installation of a rental containerised sludge process facility (wastewater treatment plant) adjacent to the existing Wastewater Treatment Plant (WWTP) facility at Deflector accommodation camp. The rental WWTP consists of a Return Activated Sludge (RAS) pump, an Anoxic Mixer Pump, an Aeration Blower and a Final Effluent (FE) return pump.
- Installation of electrical work and underground pipework is required to connect the existing and rental WWTP facilities. The rental WWTP will utilise the same balance tank and screened sewage feed pumps as the existing WWTP. The rental WWTP will receive Influent Feed from the Balance Transfer Pump (PU1) of the existing facility which will be treated, then the Final Effluent will be directed to the Break Tank in the existing WWTP facility.
- Increase in the size of the sprayfield on the western side from 4 hectares to 6 hectares to accommodate the increase in WWTP discharge volume. This involves installation of additional sprinklers.
- Environmental commissioning to commence immediately after completion of the construction phase for a duration of 4 weeks.
- Time limited operations to allow continuation of operations for a period of no more than 180 days.

The additional infrastructure is proposed to accommodate a planned personnel increase at the camp and will increase the WWTP assessed capacity from 60 $m^3$/day to 90 $m^3$/day.

This amendment is limited only to changes to Category 85 activities from the existing Works Approval. No changes to the aspects of the existing works approval relating to Category 5 have been requested by the Works Approval Holder. Table 1 below outlines the proposed changes to the existing works approval.

**Table 1: Proposed design or throughput capacity changes**

| Category | Current design / throughput capacity | Proposed design / throughput capacity | Description of proposed amendment |
|---|---|---|---|
| Category 5:<br>Processing or beneficiation of metallic or non-metallic ore | 760,000 tonnes per annual period | No change proposed. | No change proposed. |
| Category 85:<br>Sewage facility: premises –<br>(a) on which sewage is treated (excluding septic tanks); or<br>(b) from which treated sewage is discharged onto land or into waters | 60 $m^3$/day | 90 $m^3$/day | Expansion of the existing wastewater treatment plant (WWTP) at the premises, to increase the design capacity from 60 $m^3$/day to 90 $m^3$/day<br>Extension of the sprayfield to 6 ha to accommodate the increase in WWTP discharge volume. |

# 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, environmental commissioning and time limited operations which have been considered in this Amendment Report are detailed in Table 2 below.

Table 2 also details the proposed control measures the Works Approval Holder has proposed to assist in controlling these emissions, where necessary.

**Table 2: Works Approval Holder controls**

| Emission | Sources | Potential pathways | Proposed controls |
|---|---|---|---|
| Treated sewage effluent | Wastewater treatment plant | Seepage to soils and groundwater | Sprinklers discharging treated sewage effluent to the sprayfield to be located to avoid overlap and ponding of the treated wastewater on the surface of the sprayfield.<br>Secondary treatment of discharge effluent to meet water quality requirements as outlined in the supporting document.<br>Bunding along fence lines<br>Fencing of the WWTP area<br>Increase in sprayfield size<br>Monthly water quality testing as per DoH requirements<br>WWTP monitoring as per current licence specifications<br>The original, decommissioned WWTP remains on the premises (location shown in Schedule 1, Figure 7 of the works approval) and can be made operational if the new WWTP fails, as stated in condition 22, Table 9 of the works approval. Condition inclusion was requested by Silver Lake Resources (Appendix 1 of the 25 November 2020 Decision Report). |

### 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 3 and Table 4 below provide 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 receptors and distance from prescribed activity**

| Human receptors | Distance from prescribed activity |
|---|---|
| Yalgoo townsite | Yalgoo is located 45 km northeast of Deflector Accommodation Camp and wastewater treatment plant (the premises). |
| Barnong Station homestead<br>Barnong Airstrip | Barnong Station homestead is located approximately 9.77 km away from the premises. It is unoccupied and is in a state of disrepair, therefore there are no sensitive human receptors at the site. The homestead is managed by the Department of Biodiversity, Conservation and Attractions (DBCA). DBCA advised DWER on the 28 July 2020 that there were no plans to repair the homestead for human occupation.<br>Screened out due to distance |

**Table 4: Sensitive environmental receptors and distance from prescribed activity**

| Environmental receptors | Distance from prescribed activity |
|---|---|
| Flora | Flora on the premises and surrounds consists of Acacia shrubland vegetation. No groundwater dependent ecosystems have been identified.<br><br>Gullewa vegetation complexes (banded ironstone formation) exist approximately 7 km northeast of the sprayfield (measured from the eastern edge of the sprayfield to the western border of the vegetation complex).<br><br>No threatened or priority listed flora of conservation significance have been found on the premises or in the surrounding area. |
| Surface water | The Salt River is located approximately 3.28 kilometres east-southeast from the closest emission discharge point of the WWTP (measured from the south-eastern corner of the WWTP irrigation sprayfield boundary).<br><br>Sheet flow from the surrounding catchment contributes to the Salt River during periods of heavy rainfall and it is the main drainage channel for the catchment. Water quality is highly saline (20,000 - 23,000 mg/L TDS) and alkaline (pH 8.3 - 8.4), with elevated concentrations of total nitrogen and some metals. The Salt River supports permanent pools of saline water in topographic lows. In the vicinity of the mine, the river flows in a southerly direction for approximately 15 km, before intercepting a chain of salt lakes including Burra Lake which is the local terminus.<br><br>Burra Lake is a large shallow evaporative basin that experiences high evaporation rates and shallow water depths. During flooding events, the lake is highly productive, with primary producers comprising benthic algal mats and macrophytes providing a food source for a range of aquatic invertebrates and waterbirds. The riparian zone is dominated by samphire (Tecticornia) and several chenopod species. Burra Lake has also been affected by secondary salinisation, with the addition of salts from the river and the surrounding catchment via runoff. Burra Lake is located on a working pastoral station which is currently stocked with cattle. |
| Underlying groundwater | Groundwater levels are approximately 20 m below ground level predominantly within the lower saprolite layer, flowing in a south easterly direction toward Salt River, with a velocity of approximately 1 m/day (GRM 2018), equivalent to 1.15x10-5 m/s. No groundwater-dependent ecosystems have been identified during environmental assessments (DWER Works Approval W6407/2020/1).<br><br>The geology of the TSF2 area is expected to consist of 2 m of cover/soil over a ferruginous hard cap of around 3 to 10 m. Below this, an upper saprolite area to around 25 to 30 m and a lower saprolite layer to 30 to 50 m. Saprock and fresh bedrock are located below these. Groundwater is likely to be located within the upper and lower saprolite area. The upper saprolite refers to the zone immediately beneath the ferruginous hard cap where the rock has undergone complete chemical decomposition into heavy textured clay minerals, which may display remnant rock textures. The upper saprolite is mostly unsaturated but can form a slow seepage zone where water is present. Being mostly massive heavy textured clays, the upper saprolite is expected to have very low vertical and horizontal permeability (in the order of 0.001 m/day) and a specific yield of less than 0.1%.<br><br>The transition into lower saprolite (the zone of joint oxidation) is characterised by a change from heavy textured clay to soft, decomposed, friable rock 5 to 10 m thick. The lower saprolite zone is typically the most reliable water target in a fractured rock environment; permeabilities in the Yilgarn Craton tend to vary between 0.2 and 10 m/day, with 1 m/day being a generally accepted average. Specific yield is difficult to determine accurately, but between 0.5% and 1% is conservative.<br><br>The presence of dykes, faults or other structural features in the vicinity of the premises is likely to compartmentalise groundwater in bedrock into a number of distinct flow-systems that will only have a limited degree of hydraulic interconnection. This is supported by the large variation in groundwater salinity that is observed near the premises.<br><br>Groundwater is likely to be found in two distinct settings beneath the premises: in one or more bedrock aquifers that consist of fracture zones within basalts and other basement rocks; and in shallow regolith that overlies basement rocks. The bedrock aquifers will contain small amounts of saline to hypersaline groundwater on a permanent basis, whereas the shallow regolith forms an ephemeral perched aquifer that is only likely to contain fresh-brackish groundwater for short periods after heavy rainfall events.<br><br>The rate of groundwater flow in fractured bedrock is likely to be limited by the generally low hydraulic conductivity of these materials. Additionally, the presence of dykes, faults or other structural features in the vicinity of the premises is likely to compartmentalise groundwater in bedrock into a number of distinct flow-systems that will only have a limited degree of hydraulic interconnection. This is supported by the large variations in groundwater salinity that are observed near the Premises.<br><br>Groundwater at the TSF2 area is hypersaline, with TDS levels of between 35,000 to 44,000 mg/L. The high salinity is likely associated with the saline groundwater aquifer underlying the Salt River. |

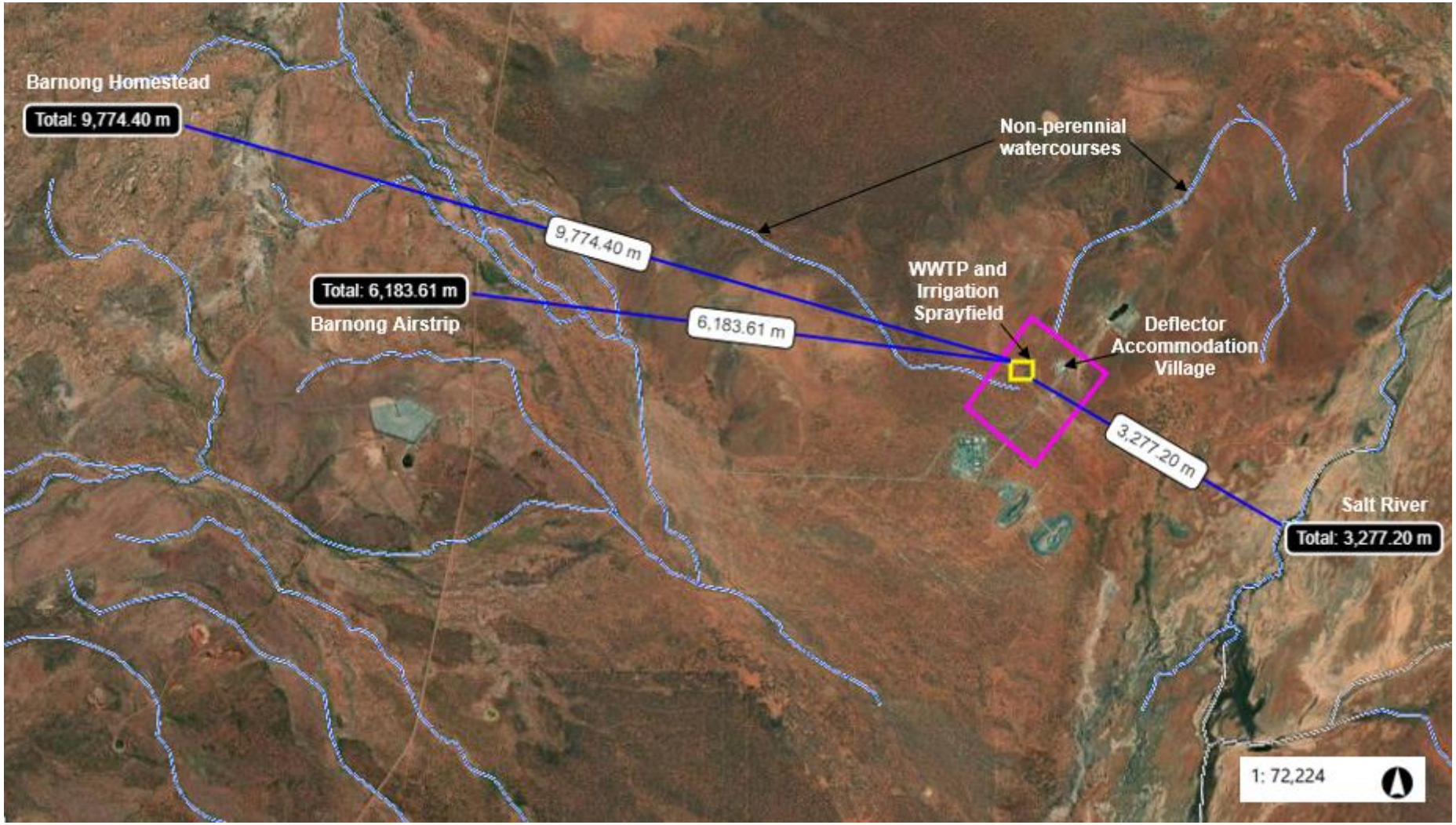


**Figure 1: Distance to sensitive receptors**

## 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. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the Works Approval Holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Works Approval Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

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 5.

The revised works approval W6407/2020/1 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. Category 85 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 5. 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 rental WWTP and associated underground pipework installation<br>Earthworks for rental WWTP laydown area (low permeability oxide material base covered with a Non-Acid Forming waste rock wearing course)<br>Earthworks for irrigation sprayfield pipework and fence construction | Noise | Air/windborne pathway causing impacts to health and amenity | No receptor in vicinity | No controls proposed | N/A | Y | N/A | The general provisions of the EP Act are considered sufficient to manage dust emissions.<br>Noise emissions will be regulated under the *Environmental Protection (Noise) Regulations 1987.*<br>The construction is of limited duration and there are no pathways to receptors, therefore additional regulatory controls are not required. |
| | Dust | | | | | | N/A | |
| Irrigation sprayfield size expansion – addition of sprinklers to cover the additional area | Dust | | | | | | N/A | |
| Clearing of native vegetation and topsoil to allow for the placement of the containerised WWTP | Dust | | | | | | N/A – Clearing is approved | |
| | Noise | | | | | | | |
| **Commissioning** | | | | | | | | |
| Commissioning of Rental Wastewater Treatment Plant (WWTP) | Raw sewage, sludge or treated sewage discharge due to tank overtopping, failure of containment infrastructure (tanks and pipework) or spillage of poor quality wastewater after treatment, leading to possible emissions of sediment, bacteria and excess nutrients | Direct discharge to land – overland runoff potentially impacting native vegetation, soil chemistry and surface water quality<br>Infiltration through soil into groundwater via direct discharge to land and migration to surface water<br>Excess nutrients causing growth of weed species | Surface water - Salt River 3.28 km east-southeast (measured from the south-eastern corner of the WWTP irrigation sprayfield boundary)<br>Underlying groundwater ~20 mbgl | Bunding along fence lines<br>WWTP monitoring as per current licence specifications<br>30 KLD WWTP facility to be located on a low permeability oxide material base covered with a Non-Acid Forming waste rock wearing course<br>Original, decommissioned WWTP available as back-up if current WWTP fails. | C = Minor<br>L = Unlikely<br>**Moderate Risk** | N | **Condition 1**, 5, 6, 10, 11 and 14. | Condition 1 - Prevention of stormwater entering storage infrastructure will minimise the risk of tank overtopping. Rental 30 KLD containerised WWTP facility design and construction requirements added.<br>Placement of the containerised 30 KLD WWTP on a compacted base with low permeability assists containment of spills and minimises the risk of emissions impacting environmental receptors. |
| | Odour | Air/windborne pathway causing impacts to health and amenity | Town of Yalgoo is 45 km away<br>Barnong homestead 9.77 km northwest and Barnong Airstrip 6.18 km west northwest (measured from north-western corner of the WWTP irrigation sprayfield). | No controls proposed | C = Rare<br>L = Insignificant<br>**Low Risk** | Y | Condition 1, 5, 6, 11, 10 and 14 | Human receptors screened out due to distance. The nearest town of Yalgoo is 45 km northeast of the premises. |
| Commissioning of the irrigation sprayfield with additional sprinklers and expanded irrigation area | Excess discharge of treated wastewater to land | Infiltration through soil into groundwater via direct discharge to land and migration to surface water. Impact on groundwater and surface water quality<br>Waterlogging and pooling on irrigation sprayfield - overland flow impacting surface water quality | Surface water - Salt River 3.28 km east-southeast (measured from the south-eastern corner of the WWTP irrigation sprayfield boundary)<br>Underlying groundwater ~20 mbgl | Sprinklers discharging treated sewage effluent to the sprayfield to be located to avoid overlap and ponding of treated wastewater on sprayfield surface<br>Increase in sprayfield size<br>Bunding along fence lines<br>WWTP monitoring as per current licence specifications | L = Rare<br>C = Minor<br>**Low Risk** | N | **Condition 1, 11,** 14 and 15 | Additional controls added within condition 1 and 11 ensure irrigated wastewater is applied evenly to the sprayfield surface to minimise the risk of waterlogging and pooling and to minimise surface runoff to nearby water courses and Salt River.<br>The geology and heavy clay soils beneath the sprayfield are expected to restrict vertical movement of groundwater. Depth to groundwater is sufficient to allow soil filtration and vegetation on the sprayfield allows nutrients to be converted into biomass; therefore, the risk of eutrophication is low. |

| Risk Event | | | | | Risk rating[1]<br>C = consequence<br>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** | | | | |
| | | | | | | | | A minimum irrigation sprayfield size of 2.74 ha has been determined by the Works Approval Holder according to WQPN22 (i.e. 120 kg/ha/year for Phosphorus) for soil type D, with P nutrient loading being the limiting factor. The sprayfield size of 6 ha is therefore deemed appropriate given the soil type of the area described in Table 4, the low risk of groundwater or surface water eutrophication and the distance to sensitive receptors. |
| | Discharge of treated wastewater that does not meet required effluent quality leading to possible emissions of sediment, bacteria and excess nutrients | Infiltration through soil into groundwater via direct discharge to land and migration to surface water. Impact on groundwater and surface water quality | Surface water - Salt River 3.28 km east-southeast (measured from the south-eastern corner of the WWTP irrigation sprayfield boundary)<br>Underlying groundwater ~20 mbgl | Monthly water quality testing as per DoH requirements<br>Secondary treatment of discharge effluent to meet water quality requirements as outlined in the supporting document<br>Resizing of irrigation sprayfield according to WQPN22 Category D soils<br>Original, decommissioned WWTP available as back-up if current WWTP fails | L = Unlikely<br>C = Minor<br>**Moderate Risk** | Y | Condition 1 and Condition 15 | The Delegated Officer considers the controls proposed by the Works Approval Holder and existing works approval conditions sufficient to manage treated wastewater emissions and impacts to nearby environmental receptors.<br>The geology and heavy clay soils beneath the sprayfield are expected to restrict vertical movement of groundwater. Depth to groundwater is sufficient to allow soil filtration and vegetation on the sprayfield allows nutrients to be converted into biomass; therefore, the risk of eutrophication is low.<br>A minimum irrigation sprayfield size of 2.74 ha has been determined by the Works Approval Holder according to WQPN22 (i.e. 120 kg/ha/year for P and discharge throughput volume of 75 $m^3$/day) for soil type D, with P nutrient loading being the limiting factor. The sprayfield size of 6 ha is therefore deemed appropriate given the soil type of the area described in Table 4, the low risk of groundwater or surface water eutrophication and the distance to sensitive receptors. |
| **Operation (including time-limited-operations operations)** | | | | | | | | |
| Operation of Rental Wastewater Treatment Plant (WWTP) | Raw sewage, sludge or treated sewage discharge due to tank overtopping, failure of containment infrastructure (tanks and pipework) or spillage of poor quality wastewater after treatment, leading to possible emissions of sediment, bacteria and excess nutrients | Direct discharge to land – overland runoff potentially impacting native vegetation, soil chemistry and surface water quality<br>Infiltration through soil into groundwater via direct discharge to land and migration to surface water<br>Excess nutrients causing growth of weed species | Surface water - Salt River 3.28 km east-southeast (measured from the south-eastern corner of the WWTP irrigation sprayfield boundary)<br>Underlying groundwater ~20 mbgl | 30 KLD WWTP facility to be located on a low permeability oxide material base covered with a Non-Acid Forming waste rock wearing course<br>Bunding along fence lines<br>WWTP monitoring as per current licence specifications<br>Original, decommissioned WWTP available as back-up if current WWTP fails. | L = Rare<br>C = Minor<br>**Low Risk** | Y | **<u>Condition 1</u>**<br>Conditions 19, 22, 23, 28 and 33. | Condition 1 - Prevention of stormwater entering storage infrastructure will minimise the risk of tank overtopping. Rental 30 KLD containerised WWTP facility design and construction requirements added.<br>Placement of the containerised 30 KLD WWTP on a compacted base with low permeability assists containment of spills and minimises the risk of emissions impacting environmental receptors. |
| | Odour | Air/windborne pathway causing impacts to health and amenity | Town of Yalgoo - 45 km northeast of the premises<br>Barnong homestead 9.77 km northwest and Barnong Airstrip 6.18 km west northwest (measured from north-western corner of the WWTP irrigation sprayfield). | No proposed controls<br>The rental WWTP operates within a containerised facility reducing the impact of odour emissions | L = Rare<br>C = Insignificant<br>**Low Risk** | Y | Conditions 1, 19, 22, 23, 28 and 33. | Human receptors screened out due to distance. The nearest town of Yalgoo is 45 km northeast of the premises and odour generated is not expected to reach the nearest sensitive human receptors. |

| Risk Event | | | | | Risk rating[1]<br>C = consequence<br>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** | | | | |
| Operation of the irrigation sprayfield with additional sprinklers and expanded irrigation area | Excess discharge of treated wastewater to land | Infiltration through soil into groundwater via direct discharge to land and migration to surface water. Impact on groundwater and surface water quality<br><br>Waterlogging and pooling on irrigation sprayfield - overland runoff into surface water, impacting surface water quality | Surface water - Salt River 3.28 km east-southeast (measured from the south-eastern corner of the WWTP irrigation sprayfield boundary)<br><br>Underlying groundwater ~20 mbgl | Sprinklers discharging treated sewage effluent to the sprayfield to be located to avoid overlap and ponding of the treated wastewater on the surface of the sprayfield<br><br>Bunding along fence lines<br><br>Resizing of irrigation sprayfield according to WQPN22 Category D soils<br><br>WWTP monitoring as per current licence specifications | L = Rare<br>C = Minor<br>**Low Risk** | N | **<u>Condition 1</u>**<br><br>Conditions 19, **<u>22</u>**, 23, 24(a), 24(b) and **<u>28</u>**. | Additional controls added within conditions 1, 22 and 28 ensure treated wastewater is applied evenly to the sprayfield surface to minimise waterlogging and pooling and to minimise surface runoff to water courses and Salt River.<br><br>The geology and heavy clay soils beneath the sprayfield are expected to restrict vertical movement of groundwater. Depth to groundwater is sufficient to allow soil filtration and vegetation on the sprayfield allows nutrients to be converted into biomass; therefore, the risk of eutrophication is low.<br><br>A minimum irrigation sprayfield size of 2.74 ha has been determined by the Works Approval Holder according to WQPN22 (i.e. 120 kg/ha/year for P and discharge throughput volume of 75 $m^3$/day) for soil type D, with P nutrient loading being the limiting factor. The sprayfield size of 6 ha is therefore deemed appropriate given the soil type of the area described in Table 4, the low risk of groundwater or surface water eutrophication and the distance to sensitive receptors. |
| | Discharge of treated wastewater that does not meet required effluent quality leading to possible emissions of sediment, bacteria and excess nutrients | Infiltration through soil into groundwater via direct discharge to land and migration to surface water. Impact on groundwater and surface water quality | Surface water - Salt River 3.28 km east-southeast (measured from the south-eastern corner of the WWTP irrigation sprayfield boundary)<br><br>Underlying groundwater ~20 mbgl | Monthly water quality testing as per DoH requirements<br><br>Secondary treatment of discharge effluent to meet water quality requirements as outlined in the supporting document<br><br>Resizing of irrigation sprayfield according to WQPN22 Category D soils<br><br>Original, decommissioned WWTP available as back-up if current WWTP fails | L = Unlikely<br>C = Minor<br>**Moderate Risk** | Y | Conditions 1, 19, 33 and 34 | The Delegated Officer considers the controls proposed by the Works Approval Holder and existing works approval conditions sufficient to manage treated wastewater emissions and impacts to nearby environmental receptors.<br><br>The geology and heavy clay soils beneath the sprayfield are expected to restrict vertical movement of groundwater. Depth to groundwater is sufficient to allow soil filtration and vegetation on the sprayfield allows nutrients to be converted into biomass; therefore, the risk of eutrophication is low.<br><br>A minimum irrigation sprayfield size of 2.74 ha has been determined by the Works Approval Holder according to WQPN22 (i.e. 120 kg/ha/year for P and discharge throughput volume of 75 $m^3$/day) for soil type D, with P nutrient loading being the limiting factor. The sprayfield size of 6 ha is therefore deemed appropriate given the soil type of the area described in Table 4, the low risk of groundwater or surface water eutrophication and the distance to sensitive receptors. Note: A design/throughput capacity of 90 $m^3$/day requires a sprayfield size of 3.29 ha for P; therefore 6 ha is still deemed sufficient. |

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. **<u>Bold and underline text</u>** depicts additional regulatory controls imposed by department

# 4. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

**Table 6: Consultation**

| Consultation method | Comments received | Department response |
|---|---|---|
| Shire of Yalgoo advised of proposal | No response received. | No action taken. |
| Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal | No response received. | No action taken. |
| Department of Health (DoH) advised of proposal (*31 March 2023).* | DoH has no objection to the WWTP upgrade. DoH noted that if there are changes to the approved wastewater volume, a new DoH application submission is required. | The Department of Health's response has been noted. |
| Works Approval Holder was provided with draft amendment on 20/4/23 | Response received on 27/4/23. Refer to Appendix 1. | Refer to Appendix 1 |

# 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 7 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 7: Summary of works approval amendments**

| Condition no. | Proposed amendments |
|---|---|
| N/A | Works approval updated to September 2022 works approval template |
| N/A | Spelling, spacing and grammatical errors corrected. |
| N/A | Assessed production capacity on title page changed from 60 to 90 cubic metres per day. |
| N/A | 'Works approval and licence history' table updated to include changes made by this amendment |
| Condition 1<br>Table 1<br>Item 3 | 'New WWTP installed designed to process up to 60 kL/day' amended to 'WWTP installed and designed to process up to 90 KLD'.<br>Insertion of Figure 5, Figure 6 and Figure 7 to 'Infrastructure location' column in Table 1.<br>'Design and construction requirements' column in Table 1: |

| | |
|---|---|
| | Insertion of 'water quality probes, flow meters, float switches and transmitter', 'process train' and 'water sump transfer station.'<br><br>'4 ha treated effluent sprayfield' changed to '6 ha treated effluent sprayfield.'<br><br>Insertion of 'A rental containerised 30 KLD containerised Activated Sludge Process facility comprised of the following: RAS/WAS pump and anoxic mixer pump, Aeration blower, Final effluent return pump'.<br><br>'All wastewater storage components of the WWTP will be impermeable' amended to 'All wastewater storage components, transfer pipelines and conveyance infrastructure of the WWTP will be impermeable and free of leaks and defects.'<br><br>Insertion of '30 KLD containerised WWTP facility to be located on a low permeability oxide compacted base covered with a Non-Acid Forming (NAF) rock wearing course' and insertion of 'stormwater prevented from entering the sewage treatment system and storage infrastructure.'<br><br>Insertion of 'Bunds located around WWTP infrastructure'.<br><br>'Flowmeter to monitor discharge to existing irrigation field' amended to 'flowmeter to monitor discharge to 6 ha irrigation sprayfield.' |
| Condition 1<br>Table 1<br>Item 4 | Removal of 'existing' in 'existing 4 ha area to be furnished with at least 16 sprinklers' and insertion of 'Additional 2 ha irrigation area to be furnished with at least 8 sprinklers.'<br><br>Insertion of 'sprinklers must be positioned to ensure even distribution of wastewater', 'sprinkler spray zones to be capable of isolation and rotation to prevent/manage waterlogging and pooling', 'pipelines must be impermeable and free of leaks or defects', 'fence installed around irrigation sprayfield to deter access'. |
| Condition 11<br>Table 5 | Insertion of 'and irrigation sprayfield' to column 1 of Table 5. Insertion of 'irrigation managed to prevent waterlogging and pooling of effluent on the surface of the sprayfield', 'not more than 90 $m^3$ per day of treated effluent to be discharged to the irrigation sprayfield' and '30 KLD WWTP facility to be hydrostatically tested with potable water prior to accepting sewage' to Table 5. |
| Condition 14<br>Table 7 | 'and Figure 7' added to 'Discharge point location' column in Table 7. |
| Condition 21 | Updated to current revised condition and revised wording. The revised condition limits time limited operations to 180 calendar days. |
| Condition 22<br>Table 9<br>Item 2 | Insertion of 'irrigation managed to prevent waterlogging and pooling of effluent on the surface of the sprayfield' and 'not more than 90 $m^3$ per day of treated effluent to be discharged to the irrigation sprayfield' to the 'Operational requirement' column of Table 9.<br><br>'Existing WWTP to be decommissioned and kept onsite as backup in case of failure of the new WWTP' changed to 'Original decommissioned WWTP to be kept onsite as backup in case of failure of the new WWTP' to clarify which WWTP is the back-up WWTP.<br><br>'Figure 5', 'Figure 6' and 'Figure 7 in Schedule 1' added to 'Infrastructure location' column in Table 9. |
| Condition 23<br>Table 10 | 'and Figure 7' added to 'Discharge point location' column in Table 10. |
| Condition 28<br>Table 12<br>Row 2 | Added 'Irrigation sprayfield' to 'Infrastructure' column and 'to ensure sprinkler spray is evenly distributed and to confirm whether any waterlogging or pooling is occurring' to 'Type of inspection column' and 'Daily' in 'Frequency' column of Table 10. |
| Condition 38 | Changed 'shall' to 'must'. |
| Definitions | kL/day changed to KLD |

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| Schedule 1: Maps, Figure 1 | Title added to Figure 1 ‘Premises map. The boundary of the prescribed premises is shown in the map below (Figure 1).’ |
| Schedule 1: Maps, Figure 2 | Title added to Figure 2 ‘CIP circuit map. The CIP circuit is shown in the map below (Figure 2).’ |
| Schedule 1: Maps, Figure 3 | Figure 3 replaced with an updated map. Title added to Figure 3 ‘Wastewater Treatment Plant (WWTP) tank upgrade’. The Wastewater Treatment Plant and 6 ha irrigation area is shown in the map below (Figure 3)’. |
| Schedule 1: Maps, Figure 4 | Title added to Figure 4 consistent with new template format ‘Wastewater Treatment Plant (WWTP) tank upgrade. The first upgrade of the Wastewater Treatment Plant is shown in the diagram below (Figure 4)’. |
| Schedule 1: Maps, Figure 5 | Figure 5 added – Wastewater Treatment Plant (WWTP) 30 KLD upgrade map. |
| Schedule 1: Maps, Figure 6 | Figure 6 added - Detailed Wastewater Treatment Plant (WWTP) expansion map. |
| Schedule 1: Maps, Figure 7 | Figure 7 added – Current and upgraded WWTP and irrigation sprayfield infrastructure map. |
| Schedule 1: Maps, Figure 8 | Figure 5 relabelled Figure 8 and references to Figure 5 within the document have been changed to Figure 8. Title added to Figure 8 consistent with revised template format. |
| Schedule 1: Maps, Figure 9 | Figure 6 relabelled Figure 9 and references to Figure 6 within the document have been changed to Figure 9. Title added to Figure 9 consistent with revised template format. |
| Schedule 1: Maps, Figure 10 | Figure 7 relabelled Figure 10 and references to Figure 7 within the document have been changed to Figure 10. Title added to Figure 10 consistent with revised template format. |
| Schedule 1: Maps, Figure 11 | Figure 8 relabelled Figure 11 and references to Figure 8 within the document have been changed to Figure 11. Title added to Figure 11 consistent with revised template format. |
| Schedule 1: Maps, Figure 12 | Figure 9 relabelled Figure 12 and references to Figure 9 within the document have been changed to Figure 12. Title added to Figure 12 consistent with revised template format. |
| Schedule 1: Maps, Figure 13 | Figure 10 relabelled Figure 13 and references to Figure 10 within the document have been changed to Figure 13. Title added to Figure 13 consistent with revised template format. |

# 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.

# Appendix 1: Summary of Works Approval Holder's comments on risk assessment and draft conditions

| Condition | Summary of works approval holder's comment | Department's response |
|---|---|---|
| Condition 1<br>Table 1<br>Bullet point 4 | Bunding was only proposed for the WWTP infrastructure (via email correspondence on 3/4/23).<br>Additional clearing would be required in order to construct bunding inside the fence due to the existing fence having been installed with an access track on the outside perimeter only.<br>The prevention of waterlogging / pooling on the irrigation sprayfield under condition 6 would control the flow of treated wastewater from the area.<br>The works approval holder requests that bunding requirements be transferred to Table 1 Item 3. | The Delegated Officer considers the works approval holder's response reasonable and the WWTP infrastructure bunding requirement has been moved to Table 1 Item 3. |
| Condition 23<br>Table 9<br>Item 5 | Formatting error | Formatting error noted and corrected. |
| Schedule 1 | Formatting error | Formatting error noted and corrected. |

# Appendix 2: Application validation summary

| SECTION 1: APPLICATION SUMMARY | | | | | |
|---|---|---|---|---|---|
| **Application type** | | | | | |
| ~~Works approval~~ | ☐ | | | | |
| ~~Licence~~ | ☐ | ~~Relevant works approval number:~~ | | ~~None~~ | ☐ |
| | | ~~Has the works approval been complied with?~~ | | ~~Yes ☐ No ☐~~ | |
| | | ~~Has time limited operations under the works approval demonstrated acceptable operations?~~ | | ~~Yes ☐ No ☐ N/A ☐~~ | |
| | | ~~Environmental Compliance Report / Critical Containment Infrastructure Report submitted?~~ | | ~~Yes ☐ No ☐~~ | |
| | | ~~Date Report received:~~ | | | |
| ~~Renewal~~ | ☐ | ~~Current licence number:~~ | | | |
| Amendment to works approval | ☒ | Current works approval number: | W6407/2020/1 | | |
| ~~Amendment to licence~~ | ☐ | ~~Current licence number:~~ | | | |
| | | ~~Relevant works approval number:~~ | | ~~N/A~~ | ☐ |
| ~~Registration~~ | ☐ | ~~Current works approval number:~~ | | ~~None~~ | ☐ |
| Date application received | | 2 February 2023 | | | |
| **Applicant and premises details** | | | | | |
| Applicant name/s (full legal name/s) | | Silver Lake (Deflector) Pty Ltd | | | |
| Premises name | | Gullewa Gold-Copper Operations | | | |
| Premises location | | M59/49, L59/49, L59/64, M59/68, M59/132, M59/294, M59/356, M59/391, M59/392, M59/335, M59/442, L59/35, M59/507, M59/336, M59/522, L59/71, L59/158, L59/159 and L59/160 Morawa – Yalgoo Road, YALGOO WA 6635. | | | |
| Local Government Authority | | Shire of Yalgoo | | | |
| **Application documents** | | | | | |
| HPCM file reference number: | | DER2020/000240~7 | | | |

| | |
|---|---|
| Key application documents (additional to application form): | Attachment 8 – Additional Information WWTP Upgrade:<br>• Premises map (Figure 1 Attachment 2) showing emission / discharge points for the Wastewater Treatment Plant (WWTP), Deflector accommodation village and WWTP sprayfield<br>• Proposed activities (Part 4, Attachment 3B)<br>• Figure 2 - Deflector WWTP proposed site plan<br>• WWTP Schematic showing Deflector village WWTP 30kL/day extension<br>• Environmental Commissioning Plan (Part 4, Attachment 3A)<br>• WWTP Emissions (Part 9, Attachment 6A)<br>• Appendix A – Aquatech Engineering Services Commissioning Plan for 30kL/day WWTP Deflector village |
| **Scope of application/assessment** | |
| Summary of proposed activities or changes to existing operations. | Construction of additional Wastewater Treatment Plant (WWTP) infrastructure at the Deflector Accommodation Camp to accommodate a planned personnel increase (to 240 personnel).<br>Proposal to include the addition of a rental WWTP adjacent to the existing WWTP. The rental WWTP is a containerised activated sludge process facility. With the addition of the rental WWTP the capacity will increase from the assessed capacity of 60 kL/day to 75 kL/day.<br>The rental WWTP will utilise the same balance tank and screened sewage feed pumps as the existing WWTP. The rental WWTP will receive Influent Feed from the Balance Transfer Pump (PU1) of the existing facility which will be treated then the Final Effluent will be directed to the Break Tank in the existing WWTP facility. This will require pipework installation and electrical work.<br>The rental WWTP consists of a Return Activated Sludge (RAS) pump, an Anoxic Mixer Pump, an Aeration Blower and a Final Effluent (FE) return pump.<br>Proposal to increase the size of the sprayfield (on the western side) to 6 hectares to accommodate the increase in discharge volume.<br>Environmental commissioning is proposed - to commence immediately after completion of the construction phase for 4 weeks.<br>Time Limited Operations are proposed to allow continuation of operations while a licence amendment is under assessment.<br>Time Limited Operations are to continue for no more than 180 days. |

**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 5:<br>Processing or beneficiation of metallic or non-metallic ore | 760,000 tonnes per annual period | No changes proposed |
| Category 85:<br>Sewage facility: premises –<br>(c) on which sewage is treated (excluding septic tanks); or<br>(d) from which treated sewage is discharged onto land or into waters | 60 cubic metres per day | 75 cubic metres per day |

**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 ☐ No ☒ | Referral decision No:<br>Managed under Part V ☐<br>Assessed under Part IV ☐ |
| Does the applicant hold any existing Part IV Ministerial Statements relevant to the application? | Yes ☐ No ☒ | Ministerial statement No:<br>EPA Report No: |
| Has the proposal been referred and/or assessed under the EPBC Act? | Yes ☐ No ☒ | Reference No: |
| Has the applicant demonstrated occupancy (proof of occupier status)? | Yes ☒ No ☐ | Certificate of title ☐<br>General lease ☐ Expiry:<br>Mining lease / tenement<br>M 59/356 ☒ Expiry: 05/12/2036 Held by Gullewa Gold Project Pty Ltd (verified in Minedex).<br>Other evidence ☐ Expiry: |
| Has the applicant obtained all relevant planning approvals? | Yes ☒ No ☐ N/A ☐ | Approval: The applicant has checked yes in the application form, but evidence of approvals is not included. RFI for Attachment 5 is requested<br>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 ☒ No ☐ | CPS No: 5128/4. This is an existing permit that allows <1 ha of native vegetation to be cleared. |
| Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal? | Yes ☒ No ☐ | Application reference No: N/A<br>Licence/permit No: CPS 5128/4 |
| Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal? | Yes ☒ No ☐ | Application reference No: N/A<br>Licence/permit No: GWL 18757(6) is existing |
| Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)? | Yes ☒ No ☐ | Name: Gascoyne<br>Type: Proclaimed Groundwater Area<br>Has Regulatory Services (Water) been consulted?<br>Yes ☐ No ☒ N/A ☐<br>Regional office: Mid-West Gascoyne |
| Is the premises situated in a Public Drinking Water Source Area (PDWSA)? | Yes ☐ No ☒ | Name: N/A<br>Priority: P1 / P2 / P3 / N/A<br>Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)?<br>Yes ☐ No ☐ N/A ☐ |
| Is the premises subject to any other Acts or subsidiary regulations (e.g. *Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx*) | Yes ☒ No ☐ | *Mining Act 1978* |
| Is the premises within an Environmental Protection Policy (EPP) Area? | Yes ☐ No ☒ | |
| Is the premises subject to any EPP requirements? | Yes ☐ No ☒ | |

| | | |
|---|---|---|
| Is the premises a known or suspected contaminated site under the *Contaminated Sites Act 2003*? | Yes ☐ No ☒ | Classification: N/A<br>Date of classification: N/A |