GOVERNMENT OF WESTERN AUSTRALIA

Environmental Protection Authority

Mr Jarrad Donald
Superintendent Environment
St Ives Gold Mining Company Pty Ltd
PO Box 359
KAMBALDA WA 6442

Our Ref: *DWERA-000051*
Enquiries: *Nyomi Bowers, 6364 6416*
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Dear Mr Donald

St Ives Gold Mine: Beyond 2018 Project – Assessment No: 2113

The Environmental Scoping Document (ESD) (attached) specifying the scope and content of the Environmental Review Document (ERD) for the above proposal was considered by the Environmental Protection Authority (EPA) at Meeting No. 1105 on 21 September 2017. The ESD has been approved as providing an acceptable basis for the preparation of the ERD.

During the preparation of the ERD you are encouraged to consult with the Department of Water and Environmental Regulation EPA Services assessment officer for the proposal, Nyomi Bowers, who can be contacted on telephone number 6364 6416. Please quote the above "Our Ref" on any further correspondence.

Yours sincerely

Dr Tom Hatton
CHAIRMAN

6 October 2017

Encl. Endorsed ESD 6 October 2017

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DRAFT ENVIRONMENTAL SCOPING DOCUMENT

Proposal name:	**St Ives Gold Mine – Beyond 2018 Project**
Proponent:	**St Ives Gold Mining Company Pty Ltd**
Assessment number:	**2113**
Location:	**Approximately 20 kilometres south-east of Kambalda**
Local Government Area:	**Shire of Coolgardie**
Public review period:	**Environmental Review Document – 6 weeks**

1. Introduction

The Environmental Protection Authority (EPA) has determined that the above proposal is to be assessed under Part IV of the *Environmental Protection Act 1986* (EP Act).

The purpose of the Environmental Scoping Document (ESD) is to define the form, content, timing and procedure of the environmental review, required by s. 40(3) of the EP Act. This draft ESD has been prepared by the EPA in consultation with the proponent, decision-making authorities and interested agencies consistent with the EPA's *Procedures Manual*.

Form

The EPA requires that the form of the report on the environmental review required under s. 40 (Environmental Review Document, ERD) is according to the Environmental Review Document template.

Content

The EPA requires that the environmental review includes the content outlined in sections 2 to 6 of this ESD.

Timing

Table 1 sets out the timeline for the assessment of the proposal agreed between the EPA and the proponent.

Table 1 Assessment timeline

Key assessment milestones	Completion Date
EPA approves Environmental Scoping Document	21 September 2017
Proponent submits first draft Environmental Review Document	22 December 2017
EPA provides comment on first draft Environmental Review Document *(6 weeks from receipt of ERD)*	16 February 2018*
Proponent submits revised draft Environmental Review Document	19 March 2018
EPA authorises release of Environmental Review Document for public review *(2 weeks from EPA approval of ERD)*	20 April 2018*
Proponent releases Environmental Review Document for public review for 6 weeks	30 April 2018
Close of public review period	11 June 2018
EPA provides Summary of Submissions *(3 weeks from close of public review period)*	2 July 2018*
Proponent provides Response to Submissions	3 August 2018
EPA reviews the Response to Submissions *(4 weeks from receipt of Response to Submissions)*	31 August 2018*
EPA prepares draft assessment report and completes assessment *(7 weeks from EPA accepting adequate Response to Submissions)*	22 October 2018*
EPA finalises assessment report (including two weeks consultation on draft conditions) and gives report to Minister *(6 weeks from completion of assessment)*	3 December 2018*

*indicative times

Procedure

The EPA requires the proponent to undertake the environmental review according to the procedures in the *Administrative Procedures* and the *Procedures Manual*, including requirements for public review.

This draft ESD has not been released for public review. The ESD will be available on the EPA website (www.epa.wa.gov.au) upon endorsement and must be appended to the PER document.

Matters of National Environmental Significance

The proponent has stated that species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) have previously been recorded at Lake Lefroy

and its surrounds, and have the potential to occur within the proposal area. These species include:

- *Gastrolobium graniticum* (Endangered);
- *Tecticornia flabelliformis* (Vulnerable); and
- *Leipoa ocellata* (Malleefowl) (Vulnerable).

The Development Envelope also lies within the 'medium priority area for survey' for the Night Parrot (*Pezoporus occidentalis*), as defined in May 2017 by the Department of Parks and Wildlife (now the Department of Biodiversity, Conservation and Attractions). This species is listed as Endangered under the EPBC Act.

The proponent has not elected to submit a referral under the EPBC Act to the Commonwealth Department of the Environment and Energy for this proposal.

2. The proposal

Background

St Ives Gold Mining Company Pty Limited (SIGMC), which forms part of Gold Fields Limited (GFL), currently operates the St Ives Gold Mine at Lake Lefroy, located approximately 20 kilometres (km) south-east of Kambalda. The St Ives Gold Mine involves both open cut and underground gold mining activities on the lake-surface and adjacent land.

There is a long history of gold and nickel mining on Lake Lefroy extending back to the late 1800's. Western Mining Corporation (WMC) operated the mine from 1981 to 2001. In November 1998 WMC referred a proposal for gold mining developments on Lake Lefroy to the EPA. Ministerial Statement 548 was issued on 13 July 2000.

In November 2001, ownership of the St Ives mine changed to GFL, and is currently operated by SIGMC. In 2009, SIGMC referred the Beyond 2010 mining proposal to the EPA. The proposal involved an increase of the mining area by 440 hectares (ha) to a total of 1,713 ha of disturbance, and an increase in discharge from 20 gigalitres (GL) to 30 GL of dewater into Lake Lefroy. This proposal was assessed at a PER level of assessment and reported in EPA Report 1411 in August 2011. Ministerial Statement 879 was issued in November 2011.

In 2013, the then Minister for Environment requested that the EPA inquire into and report on removing the implementation conditions and proponent commitments of Ministerial Statement 548. This was approved and reported in EPA Report 1493 in November 2013.

To date there have been two modifications under section 45C of the EP Act to the proposal approved under Ministerial Statement 879. The first change was for an increase of 348 ha to develop the Invincible Mine, resulting in a total disturbance area of 2,061 ha. This change was approved in March 2014. The second change – referred to as the Beyond 2016 Project – included an increase to the proposal Development Envelope, realignment of the layout of the approved disturbance area (with no increase in clearing), and removal of dewatering discharge volume. This change was approved in December 2016.

In addition to the 2,061 ha of lake-based development in Statement 879, the mine site includes approximately 2,085 ha of land-based development from previous approvals sought through the *Mining Act 1978*.

Revised Proposal

The subject of this ESD is for the St Ives Gold Mine – Beyond 2018 Project, located at Lake Lefroy. The Beyond 2018 Project by SIGMC is a revised proposal and requires an expansion of the current area of disturbance approved under Ministerial Statement 879; which covers the current lake-based mining operations only.

Other emissions to the environment from the land-based operations, and some of the lake-based components of the mine, are regulated under the Part V licence (L8485/2010/2). The Licence regulates dewatering discharges to the surface of Lake Lefroy and to mine voids on land and within the lake under category 6 to a total volume of 30 gigalitres per annum (GL/a). Ore processing and tailings disposal are regulated under category 5 to a capacity of 9 million tonnes of tailings per annum.

This revised proposal is for development of new lake-based and land-based gold mining areas for a ten year period (i.e. 2018 – 2028).

SIGMC proposes a delineated approach with a set disturbance limit based on location; either land-based or lake-based. The maximum proposed disturbance is 5,000 ha which consists of the following:

- Lake-based disturbance of up to 200 ha per year over a ten year period with a total maximum of 2,000 ha; and
- Land-based disturbance of up to 300 ha per year over a ten year period with a total maximum of 3,000 ha.

On 5 July 2017, SIGMC provided its complete application for a Change to Proposal via section 43A of the EP Act. The proposed change was an alteration of the Development Envelope (with no increased impacts), and for an increase in dewatering discharge from 30 GL/a to 40 GL/a. The EPA approved the section 43A Change to Proposal on 21 July 2017.

The change to the proposal boundary is not considered significant as the proposed scale, location and type of disturbance is the same as what was provided in the referral documentation. Additionally, this approach provides greater clarity by having a single area in which the assessment will be undertaken, but still allows flexibility for the proponent in regard to placement of required linear infrastructure. The change in dewatering discharge is not considered significant as the proponent is undertaking hydrological studies for the proposal and the impacts associated with dewatering will be assessed during the PER assessment.

The regional location of the proposal is shown in Figure 1 and the Development Envelope encompassing the physical elements of the proposal is delineated in Figure 2.

The key characteristics of the proposal are set out in Tables 2 and 3. The key proposal characteristics may change as a result of the findings of studies and investigations conducted and the application of the mitigation hierarchy by the proponent.

Table 2 Summary of the proposal

Proposal title	St Ives Gold Mine – Beyond 2018 Project
Proponent name	St Ives Gold Mining Company Pty Ltd
Short description	The revised proposal is for an expansion of the existing open cut and underground mining at Lake Lefroy, approximately 20 km south-east of Kambalda. The proposed includes disturbance to the lake playa with up to 2,000 ha of new lake-based development, and clearing of native vegetation with up to 3,000 ha of new land-based gold mining areas and associated infrastructure.

Table 3 Location and proposed extent of physical and operational elements

Element	Existing Approval (MS 879)	Other Approval	Proposed Change (this approval)	Proposed Extent
Physical elements				
Lake-based mine pits and infrastructure	2,061 ha	N/A	2,000 ha	4,061 ha
Land-based mine pits and infrastructure	N/A	2,085 ha	3,000 ha	5,085 ha
Operational elements				
Mine dewatering and discharge	N/A	30 GL/a	Additional 10 GL/a	Up to 40 GL/a
Area of direct riparian zone disturbance	Up to 90 ha	N/A	Additional 20 ha	Up to 110 ha
Waste rock disposal	A minimum of 95 Mt	Approximately 118 Mt	Approximately 450 Mt	Approximately 663 Mt
Height of waste rock dumps	Up to 40 m	N/A	No change	Up to 40 m

Tailings disposal	N/A	Pt V approval for three existing TSF and five in-pit tailings disposal	Upgrade to TSF or new in-pit tailings disposal	New tailings disposal facility to fully contain increased tailings
Ore processing	N/A	Pt V approval for 9 Mt/a – current capacity at 4.8 Mt/a	Upgrade to the mill to increase capacity to 7 Mt/a	7 Mt/a

Key

GL/a – gigalitres per annum
ha – hectare
m – metres
Mt – million tonnes
Mt/a – million tonnes per annum
TSF – tailings storage facility

3. Preliminary key environmental factors and required work

The preliminary key environmental factors for the environmental review are:

1. Flora and Vegetation;
2. Terrestrial Fauna;
3. Subterranean Fauna;
4. Hydrological Processes; and
5. Inland Waters Environmental Quality.

Table 3 outlines the work required for each preliminary key environmental factor and contains the following elements for each factor:

- EPA factor and EPA objective for that factor.
- **Relevant activities** – the proposal activities that may have a significant impact on that factor.
- Potential **impacts** and **risks** to that factor.
- **Required** work for that factor.
- **Relevant policy** and guidance – EPA (and other) guidance and policy relevant to the assessment.

Table 4 Preliminary key environmental factors and required work

Flora and Vegetation	
EPA objective	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.
Relevant activities	Clearing of up to 3,000 ha of native vegetation for the development of mine pits and access roads.
Potential impacts and risks	Removal of vegetation and flora species directly for construction of mine pits, other mining infrastructure, and linear infrastructure, and potential indirect impacts to surrounding flora and vegetation and riparian vegetation.
Required work	1. Identify and characterise flora and vegetation in the proposal area in accordance with the requirements of EPA Guidance. The survey needs to include all areas that are likely to be directly or indirectly impacted (including by changes to groundwater) as a result of the proposal. 2. Provide an analysis of the vegetation and significant flora species present and likely to be present within the Development Envelope. 3. Identify any areas in the Development Envelope where flora and vegetation surveys have not previously been undertaken, and undertake field surveys in these areas in accordance with EPA guidance. 4. Survey effort needs to be greater for *Chenopodiaceae* (saltbush) family within areas influenced by Lake Lefroy. The vegetation surveys must be a 3m by 3m or equivalent area, succession of quadrats from playa edge to terrestrial vegetation assemblages (transect), recording species zonation and collecting voucher specimens following a methodology that allows recollection of the same individual at a later date. 5. A large number of *Tecticornia* species have been identified in the proposal survey area and surrounds. To optimise the identification of *Tecticornia* taxa, two sampling events are required for each quadrat in the lake edge survey: the first sampling event to occur between August and October when winter-flowering taxa are in fruit and spring-flowering taxa are in late flower, and a second in December or January if voucher specimens are unable to be identified from the first sampling and/or if it is recommended by relevant experts at the WA Herbarium, when spring-flowering taxa are in fruit. All *Tecticornia* specimens are to be identified by relevant experts at the WA Herbarium. 6. Provide a weed species list, and maps showing weed species occurrence in the proposal area, with a focus on areas likely to be directly or indirectly impacted by the proposal. 7. Provide figures of the proposed clearing and predicted indirect impact to vegetation and significant flora species including threatened/priority

	ecological communities, threatened/priority flora, and significant flora and significant vegetation as defined by EPA guidance. 8. Discuss, and determine significance of, potential direct and indirect impacts to significant flora and vegetation as a result of the proposal at a local and regional level. 9. Discuss cumulative impacts and demonstrate that all practicable measures have been taken to reduce both the area of the proposed disturbance footprint and the Development Envelope based on proposal design and understanding of the environmental impacts. 10. Demonstrate that the proposal has been designed to avoid and minimise impacts including the placement of any access roads and infrastructure within vegetated areas, and that placement has had regard to utilising existing areas of disturbance. 11. Discuss proposed management, monitoring and mitigation methods to be implemented demonstrating that the proposal has addressed the mitigation hierarchy, and ensure residual impacts (direct and indirect) are not greater than predicted. 12. Discuss the residual impacts, if any, including as appropriate, monitoring programmes to measure residual impacts, and management programmes to further mitigate these residual impacts and to deal with circumstances where outcomes fall short of intended objectives. 13. Describe the proposed rehabilitation methodology, including but not limited to: • physical and chemical characteristics of soil and soil profile; • topsoil management; • retention or reuse of vegetative material; • return of species and communities (where feasible) consistent with the pre-existing composition of the affected area; and • timeframes for rehabilitation, including sequencing of excavation and progressive rehabilitation. 14. Prepare a Rehabilitation and Closure Plan consistent with the DMP and EPA (2015) Guidelines for Preparing Mine Closure Plans. The Plan should include but not be limited to: • closure objectives and completion criteria (quantitative or qualitative) addressing post mining landforms and soil profile reconstruction, native vegetation and habitat for conservation significant flora and fauna; and • establish and where possible measure, vegetation and fauna reference and analogue sites, to inform completion criteria.

	15. Demonstrate and document in the PER how the EPA's objective for this factor can be met.
Relevant policy and guidance	***EPA policy and guidance*** Environmental Factor Guideline – Flora and vegetation (EPA 2016); Technical Guide – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA and Department of Parks and Wildlife, 2015); and Guidance Statement No. 6 – *Rehabilitation of Terrestrial Ecosystems* (EPA 2006). ***Other policy and guidance*** *Guidelines for Preparing Mine Closure Plans* (DMP & EPA, 2015); WA Environmental Offsets Policy (Government of Western Australia, 2011); and WA Environmental Offsets Guidelines (Government of Western Australia, 2014).

Terrestrial Fauna and Subterranean Fauna	
EPA objective	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained. To protect subterranean fauna so that biological diversity and ecological integrity are maintained.
Relevant activities	Clearing of up to 3,000 ha of native vegetation for the development of mine pits and access roads. Disturbance of up to 2,000 ha of lake playa for lake-based development of pits and access roads.
Potential impacts and risks	Loss of native vegetation surrounding the lake which is potential habitat for conservation significant fauna species. Disturbance of the lake playa has the potential to impact aquatic fauna that use the lake as habitat.
Required work	16. Conduct a desktop study, including a literature review, in accordance with EPA guidance. The desktop study needs to address terrestrial vertebrate fauna, short range endemic (SRE) invertebrate fauna and aquatic invertebrate fauna in the Development Envelope. 17. Using the desktop study, identify any areas in the Development Envelope which have not previously been subject to fauna surveys that meet the requirements of EPA guidance, and undertake the required field surveys in these areas in accordance with EPA guidance. Ensure that the historical and new survey data will collectively be sufficient to place the impacts of the proposal, into local and regional contexts.

18. Ensure that in addition to the other survey requirements prescribed by EPA guidance, the field surveys address fauna and fauna assemblages that are known to, or are likely to occupy, restricted habitats: including SRE invertebrates, aquatic invertebrates and reptiles in samphire habitats. The surveys need to be completed at an appropriate time of year by zoologists who have experience with these habitats, and familiarity with species that might look morphologically similar. The WA Museum should be consulted prior to field surveys to identify any requirements for specimen collection.
19. Conduct a targeted Malleefowl survey in accordance with EPA and Commonwealth guidance.
20. Conduct a targeted Night Parrot habitat survey in consultation with, and on advice of, the Department of Biodiversity, Conservation and Attractions (DBCA) and as per current guidelines. Provide a detailed evaluation of the need for any follow-up targeted Night Parrot survey, based on the results of the habitat survey and in consultation with, and on the advice of, the Department of Water and Environmental Regulation (DWER) and DBCA.
21. If the evaluation of the results of the Night Parrot habitat survey determine that a targeted Night Parrot survey is warranted, conduct a targeted Night Parrot survey in consultation with, and on the advice of, the DWER and DBCA and as per current guidelines.
22. Based on the outcomes of the desktop study and field surveys, list and evaluate the likelihood of occurrence of all other significant vertebrates and SRE invertebrates potentially occurring in the Development Envelope and conduct additional targeted significant species surveys as warranted. Map the occurrence of significant species within the Development Envelope and the surrounding area.
23. Provide justification that the completed desktop study and field surveys have addressed all baseline knowledge gaps, are representative of the current conditions in the Development Envelope, provide suitably current information on populations and locations of significant fauna, and have been carried out using methods consistent with EPA guidance.
24. Map and discuss the cumulative impacts of past, current and approved exploration and mining activities on Lake Lefroy and the surrounding area, with respect to salt lake habitats, other significant habitats, significant fauna and fauna that are known or likely to occupy restricted habitats (including SRE invertebrates and reptiles in samphire habitats). This should be based on quantitative data from relevant local and regional surveys.
25. Assess direct and indirect impacts on fauna, significant fauna and fauna habitats. Provide figures showing the likely extent of loss of habitat types and the extent of habitat areas expected to recover from both direct and indirect impacts.

	26. Assess the likelihoods of the habitats supporting SRE invertebrate species. Provide figures clearly showing impacts to SREs. 27. If disturbance associated with the proposal will intersect areas of prospective troglofauna habitat, including but not limited to quaternary alluvial deposits in the south-east of the Development Envelope and islands within Lake Lefroy, conduct a troglofauna desktop assessment and pilot field survey to characterise the troglofauna values of the area. 28. In consultation with and on the advice of the DWER, conduct a comprehensive troglofauna survey if the results of the desktop study and pilot field survey indicate that range-restricted troglofauna would potentially be impacted by the proposal. 29. Demonstrate that the proposal has been designed to avoid and minimise impacts including the placement of any access roads and infrastructure within fauna habitat areas and that placement has had regard to utilising existing areas of disturbance. 30. Discuss proposed management, monitoring and mitigation methods to be implemented demonstrating that the proposal has addressed the mitigation hierarchy, and ensure residual impacts (direct and indirect) are not greater than predicted. 31. Demonstrate and document in the PER how the EPA's objective for these factors can be met.
Relevant policy and guidance	***EPA policy and guidance*** Environmental Factor Guideline – Terrestrial Fauna (EPA 2016); Technical Guide – *Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA 2010); Technical Guide – Subterranean Fauna Survey (EPA, December 2016); and Guidance Statement No. 20 – *Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia* (EPA 2009). ***Other policy and guidance*** *Interim guideline for preliminary surveys of night parrot (Pezoporus occidentalis) in Western Australia* (Department of Biodiversity, Conservation and Attractions, May 2017); *Survey guidelines for Australia's threatened* birds (Commonwealth Department of the Environment, Water, Heritage and the Arts, 2010); WA Environmental Offsets Policy (Government of Western Australia, 2011); and WA Environmental Offsets Guidelines (Government of Western Australia, 2014).

Hydrological Processes	
EPA objective	To maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.
Relevant activities	Disturbance of up to 2,000 ha of lake playa for lake-based development of pits and access roads.
Potential impacts and risks	Changes in the hydrological and hydrogeological regimes at the lake and on the surrounding land.
Required work	32. Provide a detailed description of the design and location of the parts of the proposal with the potential to impact surface water or groundwater, including new bores. 33. Develop a conceptual model of the hydrogeological system including recharge and discharge mechanisms, water chemistry and aquifer connectivity (surface/ground water interaction), and the potential for winter rainfall storage at Lake Lefroy. 34. Characterise baseline surface, hydrological and hydrogeological regimes, flood risks and water quality - including description of surveys undertaken, baseline and monitoring data collected, and environmental values identified. 35. Undertake a H3 assessment – detailed hydrogeological assessment including drilling, pump testing and a groundwater model. 36. Characterise the lake's hydroperiod, and estimate the extent including depth of the salt crust. 37. Characterise lake inundation extent in dry and flooded conditions as a result of dewatering discharge and 1:20 average recurrent interval (ARI) rainfall with the 1:100 ARI rainfall to be considered as an upper limit sensitivity scenario. 38. Identify, analyse and discuss surface water and groundwater impacts. The analysis must include: • changes in groundwater levels and changes to surface water flows associated with the proposal (abstraction and dewatering); • the nature, extent and duration of the impacts; and • changes in water quality (including modelling plumes where relevant) associated with the proposal. 39. Identify any mine waste-water discharges in the site water balance and identify potential impacts on the environment.

	40. Model the impact of different flooding scenarios during operations and post-closure in mining areas, infrastructure and final landforms. 41. Discuss the proposed management, monitoring and mitigation to minimise groundwater and surface water impacts as a result of implementing the proposal. 42. Outline the outcomes/objectives, management, monitoring, trigger and contingency actions, within environmental management plans, to ensure impacts (direct and indirect) are not greater than predicted. 43. Demonstrate how the mitigation hierarchy of avoid, minimise, mitigate has been applied during the mine planning and design stages of the Beyond 2018 Project. 44. Demonstrate and document in the PER how the EPA's objective for this factor can be met.
Relevant policy and guidance	***EPA policy and guidance*** Environmental Factor Guideline – Hydrological Processes (EPA 2016). ***Other policy and guidance*** Department of Water and Department of Environment and Conservation – *Wetland, Waterways and Estuary Agreement* (June, 2008); Operational policy No. 1.02 - *Policy on water conservation/efficiency plans* (Department of Water, 2009); Operational policy No. 5.12 - *Hydrogeological reporting associated with a groundwater well licence* (Department of Water, November 2009); and *Western Australian water in mining guidelines* (Department of Water, 2013); Australian Government National Water Commission - *Australian Groundwater Modelling Guidelines* (2012). WA Environmental Offsets Policy (Government of Western Australia, 2011); and WA Environmental Offsets Guidelines (Government of Western Australia, 2014).

Inland Waters Environmental Quality	
EPA objective	To maintain the quality of groundwater and surface water so that environmental values are protected.
Relevant activities	Increased dewatering discharge from 30 GL/a to 40 GL/a to the lake surface. Disturbance of up to 2,000 ha of lake playa for lake-based development of pits and access roads.

Potential impacts and risks	Inundation of the riparian zone and changes in water and sediment quality as a result of dewatering discharge. Impact to surface water movement on the land and lake surfaces due to development and new infrastructure.
Required work	45. Characterise the lake environment and surrounding wetlands (chemical, physical and biological processes) within the Development Envelope, in a local and regional context. 46. Characterise the surface water and groundwater quality in a local and regional context. 47. Describe surveys undertaken to establish water and sediment quality, the biological data collected, and the environmental values identified. 48. Undertake ecological surveys of the lake (and peripheral wetlands), and identify and describe the impacts from this proposal to ecological values, including both direct and indirect impacts. 49. Describe the impacts from this proposal on the associated inland water and sediment quality and groundwater quality, including direct and indirect impacts. 50. Assess the nature, extent and duration of potential impacts of groundwater abstraction and dewatering, including potential impacts on surrounding wetlands. 51. Undertake waste characterisation studies of waste rock and other materials, and carry out an acid and metalliferous drainage risk assessment for the proposed development within the Development Envelope, both on land and on the lake surface. 52. Discuss the proposed management, monitoring and mitigation to ensure impacts on inland water quality and ecological values are not greater than predicted as a result of implementing the proposal. 53. Demonstrate how the mitigation hierarchy of avoid, minimise, mitigate has been applied during the mine planning and design stages of the Beyond 2018 Project. 54. Demonstrate and document in the PER how the EPA's objective for this factor can be met.
Relevant policy and guidance	***EPA policy and guidance*** Environmental Factor Guideline – Inland Waters Environmental Quality (EPA 2016). ***Other policy and guidance*** Preventing acid and metalliferous drainage – *Leading practice sustainable development program for the mining industry*

	(Commonwealth Department of Industry, Innovation and Science, September 2016); *Western Australian water in mining guidelines* (Department of Water, 2013); Water Quality Protection Note 15 - *Extractive Industries near sensitive water resources* (Department of Water, 2013); Water Quality Protection Note 44 - *Roads near sensitive water resources* (Department of Water, 2006); Water Quality Protection Note 51 - *Industrial wastewater management and disposal* (Department of Water, 2009); Water Quality Protection Note 52 - *Stormwater management at industrial sites* (Department of Water, 2010); Water Quality Protection Note 81 - *Tracks and trails near sensitive water resources* (Department of Water, 2006); Water Quality Protection Note 83 - *Infrastructure corridors near sensitive water resources* (Department of Water, 2007). WA Environmental Offsets Policy (Government of Western Australia, 2011); and WA Environmental Offsets Guidelines (Government of Western Australia, 2014).

4. Other environmental factors or matters

The EPA has identified the following other environmental factors or matters relevant to the proposal that must be addressed during the environmental review and discussed in the Environmental Review Document:

- **Social Surroundings (Heritage)** – the Department of Aboriginal Affairs (DAA) advised that there are four known heritage places within the Beyond 2018 Project study area. These areas are not proposed to be disturbed by the proposal, however there is an artefact scatter in close proximity to proposed disturbance areas. There is the potential for new Aboriginal heritage sites to be located within the proposed disturbance area, and it is the proponent's responsibility to ensure it takes measures to avoid Aboriginal heritage places.
- **Social Surroundings (Amenity)** – it is noted that the western most area proposed for lake-based mining would occur within the vicinity of a recreational land sailing club. This needs to be a consideration in the mine planning stage, to ensure that both direct and indirect impacts to the land sailing club are minimised, and avoided where practicable.
- **Air Quality (Greenhouse Gas Emissions)** – an estimate of the annual GHG emissions as a result of the proposal, and any mitigation measures committed to by the proponent.

It is also important that the proponent be aware that other factors or matters may be identified during the course of the environmental review that were not apparent at the time that this ESD was prepared. If this situation arises, the proponent must consult with the EPA to determine whether these factors and/or matters are to be addressed in the ERD, and if so, to what extent.

5. Stakeholder consultation

The proponent must consult with stakeholders who are affected by, or are interested in the proposal. This includes the decision-making authorities (see section 6), other relevant state government agencies and local government authorities, the local community and environmental non-government organisations.

The proponent must document the following in the ERD:

- identified stakeholders;
- the stakeholder consultation undertaken and the outcomes, including decision-making authorities' specific regulatory approvals and any adjustments to the proposal as a result of consultation; and
- any future plans for consultation.

6. Decision-making authorities

At this stage, the EPA has identified the authorities listed in Table 5 as decision-making authorities (DMAs) for the proposal. Additional DMAs may be identified during the course of the assessment.

Table 5 Decision-making authorities

Decision-making authority	Relevant legislation
1. Minister for Water	*Rights in Water and Irrigation Act 1914*
2. Minister for Environment	*Wildlife Conservation Act 1950*
3. Minister for Aboriginal Affairs	*Aboriginal Heritage Act 1972*
4. Minister for Mines and Petroleum	*Mining Act 1978*
5. Department of Mines, Industry Regulation and Safety	*Mining Act 1978* *Dangerous Goods Safety Act 2004* *Mines Safety and Inspection Act 1994*
6. Department of Water and Environmental Regulation	*Environmental Protection Act 1986*

Figure 1 – Regional location

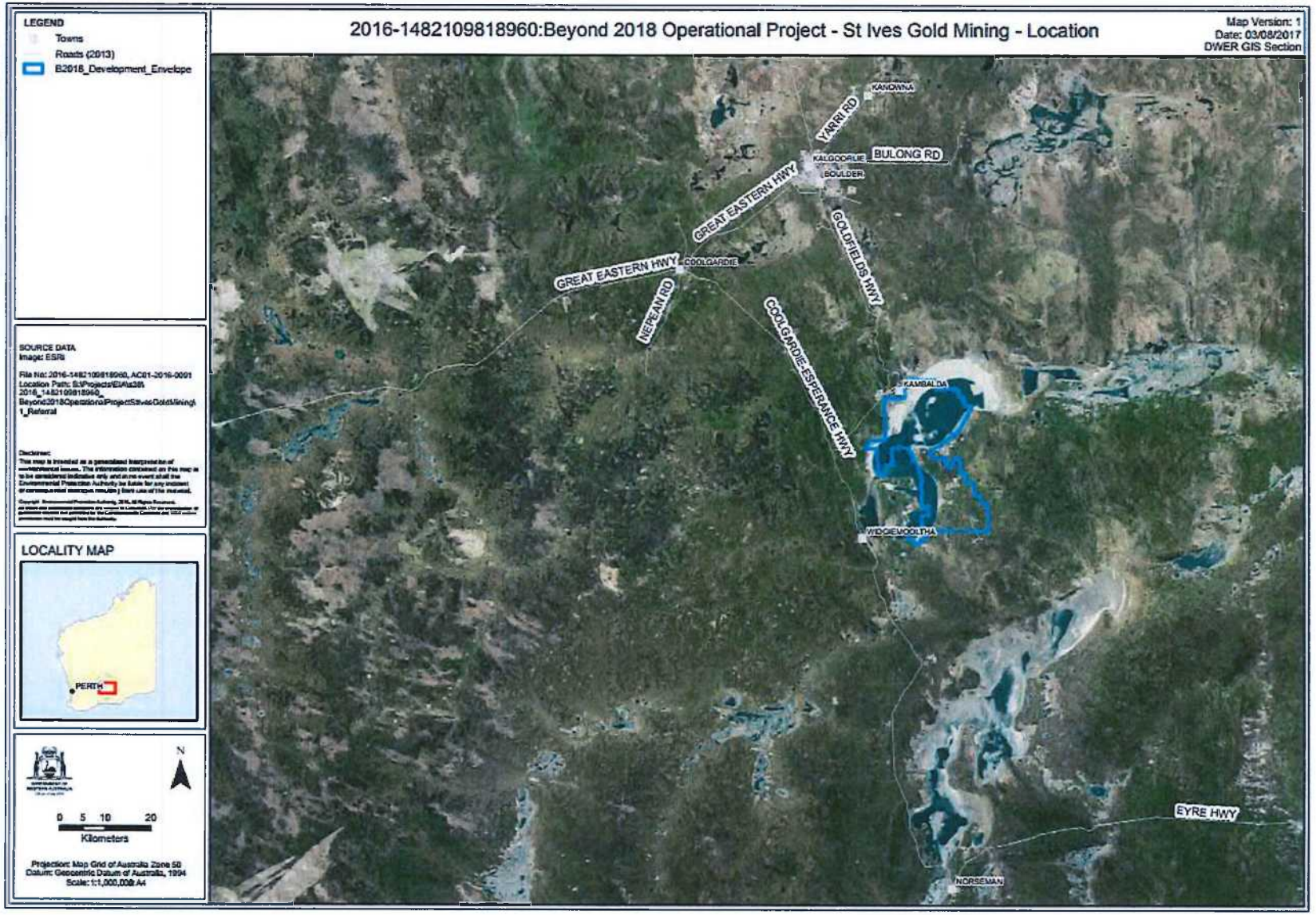

Figure 2 – Development Envelope