

REFERRAL OF A PROJECT FOR A DECISION ON THE NEED FOR ASSESSMENT UNDER THE ENVIRONMENT EFFECTS ACT 1978

REFERRAL FORM

The *Environment Effects Act 1978* provides that where proposed works may have a significant effect on the environment, either a proponent or a decision-maker may refer these works (or project) to the Minister for Planning for advice as to whether an Environment Effects Statement (EES) is required.

This Referral Form is designed to assist in the provision of relevant information in accordance with the *Ministerial Guidelines for assessment of environmental effects under the Environment Effects Act 1978* (Seventh Edition, 2006). Where a decision-maker is referring a project, they should complete a Referral Form to the best of their ability, recognising that further information may need to be obtained from the proponent.

It will generally be useful for a proponent to discuss the preparation of a Referral with the Department of Planning and Community Development (DPCD) before submitting the Referral.

If a proponent believes that effective measures to address environmental risks are available, sufficient information could be provided in the Referral to substantiate this view. In contrast, if a proponent considers that further detailed environmental studies will be needed as part of project investigations, a more general description of potential effects and possible mitigation measures in the Referral may suffice.

In completing a Referral Form, the following should occur:

- Mark relevant boxes by changing the font colour of the 'cross' to black and provide additional information and explanation where requested.
- As a minimum, a brief response should be provided for each item in the Referral Form, with a more detailed response provided where the item is of particular relevance. Cross-references to sections or pages in supporting documents should also be provided. Information need only be provided once in the Referral Form, although relevant cross-referencing should be included.
- Responses should honestly reflect the potential for adverse environmental effects. A Referral will only be accepted for processing once DPCD is satisfied that it has been completed appropriately.
- Potentially significant effects should be described in sufficient detail for a reasonable conclusion to be drawn on whether the project could pose a significant risk to environmental assets. Responses should include:
 - a brief description of potential changes or risks to environmental assets resulting from the project;
 - available information on the likelihood and significance of such changes;
 - the sources and accuracy of this information, and associated uncertainties.
- Any attachments, maps and supporting reports should be provided in a secure folder with the Referral Form.
- A CD or DVD copy of all documents will be needed, especially if the size of electronic documents may cause email difficulties. **Individual documents should not exceed 2MB.**
- A completed form would normally be between 15 and 30 pages in length. Responses should not be constrained by the size of the text boxes provided. Text boxes should be extended to allow for an appropriate level of detail.
- The form should be completed in MS Word and not handwritten.

The party referring a project should submit a covering letter to the Minister for Planning together with a completed Referral Form, attaching supporting reports and other information that may be relevant. This should be sent to:

Postal address

**Minister for Planning
GPO Box 2392
MELBOURNE VIC 3001**

Couriers

**Minister for Planning
Level 7, 1 Spring Street
MELBOURNE VIC 3001**

In addition to the submission of the hardcopy to the Minister, separate submission of an electronic copy of the Referral via email to ees.referrals@dpcd.vic.gov.au is encouraged. This will assist the timely processing of a referral.

PART 1 PROPONENT DETAILS, PROJECT DESCRIPTION & LOCATION

1. Information on proponent and person making Referral

Name of Proponent:	Crocodile Gold Group(Crocodile Gold) Crocodile Gold is the owner of Stawell Gold Mines Pty Ltd. hereafter referred to as Stawell Gold Mines (SGM).
Authorised person for proponent: Position: Postal address: Email address: Phone number: Facsimile number:	Troy Cole General Manager P O Box 265, Stawell VIC 3380 troy.cole@crocgold.com.au Direct: 03 5358 9204 Mobile 0427 582 993 03 5358 3454
Person who prepared Referral: Position: Organisation: Postal address: Email address: Phone number: Facsimile number:	Natasha Reifschneider Senior Associate Environmental Planner URS Australia Pty Ltd Level 6, 1 Southbank Boulevard, Southbank 3001 natasha.reifschneider@urs.com Direct: 03 8699 7638 Mobile: 0400 052 298 03 8699 7550
Available industry & environmental expertise: (areas of 'in-house' expertise & consultancy firms engaged for project)	URS Australia Pty Ltd <ul style="list-style-type: none"> • Air Quality, • Greenhouse Gas; • Hazard and Risk; • Human Health; • Land Use (including Public Infrastructure); • Traffic and Transportation; • Water (including surface water and groundwater); • Community and Stakeholder Engagement and Communications; and • Project Management. Mining One <ul style="list-style-type: none"> • Geotechnical; Mine Planning and Project Design(including waste rock management); Ecology and Heritage Partners Pty Ltd <ul style="list-style-type: none"> • Flora, Fauna and Net Gain Assessment

	<p>Premier PR Pty Ltd</p> <ul style="list-style-type: none"> • Media and Public Relations <p>Seran</p> <ul style="list-style-type: none"> • Planning Consultant
	<p>Sub-consultants that are available and are pending final engagement include:</p> <ul style="list-style-type: none"> • Land Design (Visual Impact); • Ecology and Heritage Partners (Heritage); • Terraculture (Heritage); • Terrock (Blast Effects); • Public Place (Social Impact); • Marshall Day (Noise); • Contour (Planning Consultant); • Aither (Economics) • Outback Ecology (Rehabilitation Plan)

2. Project – brief outline

Project title: The Big Hill Enhanced Development Project

Project location: (describe location with AMG coordinates and attach A4/A3 map(s) showing project site or investigation area, as well as its regional and local context)

The Big Hill Enhanced Development Project (“the Project”) is located adjacent to the Stawell township in western Victoria and is confined to an area within the existing Stawell Gold Mines (SGM) licenced boundary located to the north-east of Stawell as shown in Attachment A – Project Location Plan. SGM currently operates within MIN 5260 which expires on 30 May 2020.

The Project Area is defined as being the areas where Project activities will take place as defined in section 2 ‘short project description.

The Big Hill is a ridgeline that is approximately 40-50 metres above the township of Stawell to the south-west. No natural drainage lines or waterways run through the Project Area.

The Project Area (excluding Mt Mickie) is bound by Crowlands Road to the north, Leviathan Road to the east, Albion Road and Fisher Street to the west and Main Street to the north-west. Mt Mickie is an existing waste rock stockpile from the mining of the Wonga Pit located to the south of the Project area.

The proposed Project location relative to adjacent features and existing mine infrastructure is shown in Attachment B –Big Hill Project Proposal and Attachment C – Big Hill Project Proposal in Context of Stawell Gold Mine, respectively. The Project is proposed to be located on publicly accessible Crown land which is currently occupied by a Pioneer Memorial rotunda, car park, Scenic Road, Reefs Road, DSE fire tower and communications tower, water reservoir 1, 4 and 6, water tanks , water supply system memorials as well as on land currently utilised by SGM operations (former Davis Pit).

AMG co-ordinates for the perimeter of the project area as defined on Attachment B are as follows:

Easting	Northing
658,718	5,897,738
658,836	5,897,881
659,287	5,897,686
659,669	5,897,366
660,324	5,897,091
660,207	5,896,594
659,353	5,896,873
659,173	5,597,267

AMG co-ordinates for the perimeter of the Mt Mickie project area as defined on Attachment C are as follows:

Easting	Northing
660,512	5,896,334
660,619	5,896,340
660,533	5,896,056
660,846	5,896,039
660,553	5,895,775
660,860	5,895,765

Short project description (few sentences):

The Big Hill Enhanced Development Project involves the open cut mining of two pits (North and South) on Big Hill. Ore will be trucked via existing internal roads to the licenced SGM processing facility, where tailings will be disposed to the existing tailings storage facility (TSF). Waste rock generated from the Project is proposed to be temporarily stored on adjacent disturbed land and used to progressively backfill and re-establish the former Big Hill topography within about 4.5 years from commencement of the Project. This time period is expected to include approximately 3.5 years of mining and a further 1 year to complete backfilling and rehabilitation.

The area affected by the Project scope is 36 ha and comprises the North and South Pits (15 ha), the Temporary Waste Rock Stockpile (TWRS) (6 ha), the upgraded haul roads (1 ha) (note: only segments of the existing haul roads require upgrading) and Mt Mickie (14 ha).

In the late 1990s, a proposal to mine gold at Big Hill was refused by the government of the day. The proposed new Project has been enhanced from the previous Big Hill proposal in a number of ways, the primary elements being full reinstatement of the surface topography and no loss of high value ecological vegetation class (EVC) vegetation associated with the TWRS.

The Project will improve public safety through its removal of old mining voids within the areas affected by the project scope, and also provide a fully rehabilitated site which will be a community-developed asset.

As part of the Project optimisation, SGM has restricted the ore it will access from open cut mining, and is looking to extend approved underground mining operations to access the lower portions of the ore body which make up Big Hill. Any underground operations within the licence area are already permitted and are not part of this Project.

The proposed Project would result in continued gold production after the planned closure of the mining operation in early 2014. The current operation is scheduled to close due to resource depletion at the conclusion of remnant surface stock processing in late 2013/early 2014.

3. Project description

Aim/objectives of the project (what is its purpose / intended to achieve?):

The objectives of the Project are to:

- Provide SGM with an essential source of mill feed and cash flow which will improve the mine's overall economic environment.
- Extend gold mining operations at Stawell for about 3.5 years following the conclusion of underground operations and processing of current surface stocks.
- Provide a facility to the Stawell community post closure which will be responsive to cultural heritage and gold trail considerations.

In undertaking the Project, SGM aims to achieve complementary objectives of:

- Providing a further 3.5 years of employment for 80 to 100 employees.
- Continuing to contribute to the local, regional and State economies through capital expenditure, multiplier benefits to local businesses, and employment.
- Continuing to conduct operations in an environmentally responsible manner by understanding and managing environmental impacts.
- Maintain its 30 year relationship with the local community through established and effective communication channels and ongoing involvement in the form of employment.

Background/rationale of project (describe the context / basis for the proposal, e.g. for siting):

SGM has operated at the current location for over 30 years, which has involved the progressive mining of gold in a series of above ground pits and extensive underground mining workings. The Project aims to utilise a gold resource that lies beneath Big Hill, which is immediately adjacent to the current SGM operation.

Exploration works have outlined a viable resource of approximately 169,000 oz. of gold within the Big Hill and former Davis pit area. During the late 1990s, SGM proposed a development to mine the same gold resource which is largely contained within Big Hill. The proposal was the subject of an Environment Effects Statement (EES) in 1999 and was not ultimately supported by Government at that time for several reasons, most particularly, because it was not the intent to backfill the large extracted void space and there was loss of significant vegetation.

Exploration undertaken by SGM during 1997/98 and more recently in 2008 and 2012 has delineated that, of the 169,000 oz. (indicated) between Big Hill and the former Davis Pit, approximately 121,000 oz. is located within approximately 85 m depth of the surface and is currently economically recoverable by the proposed open pit design. Extensions of mineralisation and resource beneath the designed pit will be evaluated in the near future. However, it has been determined that this resource would be extracted via underground operations to reduce surface footprint and is approved under current licencing arrangements.

The primary rationale for the Project is to fully utilise the last known commercially available gold resource in the SGM Mining Licence area, and prolong the mine life with the attendant benefits which flow to SGM and the local community through employment and regional economic flow-on effects to the State. The Project proposes to reinstate the original Big Hill topography and provide enhanced community access and facilities which offsets the original concerns of community safety and long term visual impact.

Growth in the gold price over the past decade means this significantly enhanced approach to rehabilitation is now economically viable and provides SGM with the ability to capitalise on the gold resource and address previous issues. The primary differences between the 1999 proposal and the Project are outlined in more detail below.

Main components of the project (nature, siting & approx. dimensions; attach A4/A3 plan(s) of site layout if available):

The main components of the Project are shown on Attachment B, and include free dig excavation for the majority of mining on the area of 15 ha with some blasting toward the base of two pits (North and South), transport and temporary stockpile of waste rock; transport of ore to current licenced SGM facilities and backfilling and rehabilitation of voids.

The other major details of the Project are summarised as follows:

- **Ore:** estimated 2.3 Mt within proposed pit extent;
- **Waste Rock:** approximately 7.8 Mt of waste rock material will be generated over the Project's life. This will ultimately be backfilled into the North and South Pits to re-contour the Big Hill ridge. Approximately 5 Mt of this waste rock material will be transported and rehandled through the Temporary Waste Rock Stockpile (TWRS) before being backfilled into North and South Pits. In addition to the 7.8 Mt directly generated, approximately 1 Mt of waste rock from an existing waste rock stockpile (known as Mt Mickie) will be hauled to North and South pits to ensure the entire void is backfilled;
- **Employment:** 80 to 100 full time employee positions will be required for the duration of mining (approximately 3.5 years).
- **Working Hours:** Hours of operation will involve a dayshift (12hrs), 5 days a week (Monday to Friday), with Saturday considerations for routine maintenance works.
- **Excavation Methods:** free dig for the majority of mining, dozer ripping when required and some blasting toward the base of the two pits.
- **Road Modifications:** Big Hill Road, Scenic Road and Reefs Road will be removed to allow for the development and the Big Hill Road will be reinstated at the conclusion of the Project.
- **Haulage:** Approximately 190 haulage truck movements per day will occur within the project area. Mobilisation and demobilisation of up to 17 mobile plant (including excavators, haul trucks and dozers) to the Project Area will be required at the beginning and conclusion of the Project.
- **Haul Roads:** The haul roads required to move material between the key facilities will utilise existing road surfaces, some sealed, with only minor modifications needed in some locations.
- **Site Access:** Site access will be through current mine site entrance points.
- **Ancillary Construction Works:** A noise attenuation barrier will be engineered and constructed on the northern and western sides of the pits. The specific design elements of the noise barrier will be an outcome of the noise impact study to ensure the optimal mitigation outcomes. There will also be construction works associated with the relocation of the DSE fire watch and telecommunications tower.

Differences between the Big Hill Enhanced Development Project and the 1999 Big Hill Proposal

The Big Hill Enhanced Development Project has many differences to that proposed in the 1999 EES. Principally, enhancements have been developed to address the primary concerns of the Independent EES Panel and the Minister which resulted in the 1999 proposal not being approved.

A gap analysis (Attachment D) has been conducted on the 1999 EES to assess the need to update existing studies and determine whether additional studies are required due to, improved technology, change in project design, legislation changes, or site changes.

The following table provides a summary of the key project component differences between the 1999 proposal and the current Project proposal.

Big Hill Proposal (1999)	Big Hill Enhanced Development Project (2013)
Open Pit Mine development of two pits (Northern and Southern) approximately 15 ha.	A total of 15 ha to be mined. This is generally the same area, with some modification in pit design to account for increased understanding of the pit area geology and voids created by historic mining operations.
Both southern and northern pit size 500m long x 200 m wide. Pit size total 11.2Mt	Enhanced design has two (2) pits (North Pit and South Pit) with an estimated combined size of 10.1 Mt and an area of 15 ha (the North pit is about 5 ha and the South pit is about 10 ha). Fully separated pits will allow for progressive backfilling during the Project. Waste rock from South Pit will be hauled directly to the North Pit and reduce rehabilitation times.
Northern pit reformed and rehabilitated from waste created from southern void. Southern pit void to remain open.	<u>All mined pit voids</u> will be backfilled and re-contoured progressively throughout the Project to current topography within about 4.5 years. This involves approximately 3.5 years for production and 1 year to complete backfilling and rehabilitation. It is also proposed to engage with the community on the final rehabilitated profile to determine whether there is potential for enhancement of the final re-contoured surface and facilities which may be included as part of the reinstatement.
Northern pit excavated to 85 metres below the crest of Big Hill and southern pit 100 metres below the crest.	Revised pit design is for the following maximum pit depths: North Pit – (-85mRL) South Pit – (-95mRL)
120,000 to 160,000 oz. recovered.	Current estimate is 121,000 oz. to be recovered from proposed pits with a further down dip potential to be considered as part of the licenced underground activities.
8 year project.	4.5 year project with approximately 3.5 years for mining, and 1 year to complete earth moving and rehabilitation projects.

The enhanced Project significantly addresses the key concerns of the Panel, with some concerns eliminated or avoided. The following provides a summary of those proposed enhancements compared to the 1999 proposal:

Project Footprint

- Big Hill will be reinstated to existing topography and there will be no southern pit void at the conclusion of the Project. The southern pit will be filled, contoured and rehabilitated which will result in the site being available for post project use as a community asset. This eliminates the primary concern of the 1999 Panel decision that the deep void was visually unacceptable and would pose a safety threat to the community.
- Reduction in footprint of waste rock emplacement. Due to the enhanced project involving progressive rehabilitation of the mined area, there is a reduced requirement to store large volumes of waste rock when compared to the 1999 proposal. The waste rock emplacement will be sited in an already disturbed area and there is no impact in this area on the high value Box Ironbark Forest. The 1999 proposal resulted in 8.7ha of forest being cleared meaning the enhanced project is a substantial improvement in terms of flora and fauna impact.
- Rehabilitation of the Wonga Pit waste rock dump (Mt Mickie) to its original topographic land form. The economics of the Project have made it possible for the Project to enhance rehabilitation of the Mt Mickie area and improve mine closure rehabilitation.

Social

- The Project will be approximately 4.5 years in material movements, and therefore is a significantly reduced period of impact on the residents immediately surrounding the site. This will be achieved via the following:
 - North and South pits will be progressively mined and backfilled. This is on the basis that mining and backfilling will progressively move away from the nearest residences. The North pit will be excavated first then backfilled with waste rock from the South pit reducing final rehabilitation times and impact on community. Importantly, a major concern of the 1999 proposal in respect of social impact is that there will not be a long term loss of visual amenity as the Southern void will be reinstated to its original topography.
 - The 1999 project involved mining of Big Hill at a lower productivity rate to supplement ore from underground mining, resulting in an 8 year mine life. By the end of 2013, underground operations will cease and this proposal will be the only source of feed to the processing plant which reduces the mine life from 8 years (1999) to approximately 4.5 years. This is a significant community benefit in terms of reduced exposure to the mining development but still allowing for the economic benefits of the mine for the community to be realised.

Flora and Fauna

- The 2013 proposal results in a substantial reduction in the amount of native vegetation clearance. The previous EES proposed clearance of 22.2ha of native vegetation while the current project proposes clearance of 8.88ha.
- The 2013 proposal results in a substantial reduction in size of waste rock emplacement resulting in an 8.7 hectare saving of Box Ironbark forest when compared to the 1999 project. The enhanced project will not require any removal of high value Box Ironbark Forest ecological community from the TWRS.
- Filling and contouring and revegetating the southern void will increase the availability of habitat for flora and fauna – post closure.

Economic

- Higher gold prices have strengthened the Project's viability. Continued mine operation will result in ongoing employment of 80 to 100 employees when compared to the no development option but similar to the 1999 project. Similarly, the enhanced project will result in 4.5 years of additional economic benefit to the local and regional communities when compared with the no development option.

Heritage

- The Big Hill rehabilitation plan is proposed to include a cultural heritage gold trail initiative and a community facility such as a mine museum which is proposed to be further developed through community and local government consultation.

General Environmental

- The 2013 project design and strong financial viability of the Project means that more rehabilitation material can be economically moved from Mt Mickie to fully rehabilitate the North and South Pits with the added benefit of enhancing the Wonga Pit area rehabilitation plan.

Ancillary components of the project (e.g. upgraded access roads, new high-pressure gas pipeline; off-site resource processing):

- Roads: Big Hill, Scenic and Reefs Road will be closed during the Project with Big Hill Road reinstated at the conclusion of the Project to meet current VicRoads and council standards. Ongoing consultation is required with stakeholders as to final road requirements post mining.
- Community Assets: The telecommunication and DSE towers require relocation. A potential location has been identified (adjacent to SGM's current stores area) and will be finalised pending the outcome of a full telecommunication investigation (e.g. optical fibre/coverage) and DSE visual investigation (line of sight to assets).
- Historic mining voids: All historic mining voids will be removed from the area affected by the project scope to allow for an overall community safety benefit.
- Monuments: The Mining Gold Reef Monument, Memorial and Rotunda will be removed and reinstated at the completion of the Project.
- Reservoirs: In consultation with GWM-Water, it is proposed that two of their containment reservoirs are taken off-line for the duration of the Project to lessen geotechnical instability and perched water risk on the closest pit wall. Ongoing consultation with GWM-Water is in progress to determine the most appropriate program of water security to the community of Stawell and re-instatement requirements following mining activity.
- Services: There is a Nextgen optical fibre duct (refer to Attachment B) that runs along Sloane St through the North pit and continues along Navarre Rd. This will be rerouted along an appropriate path after consultation with Nextgen.

Key construction activities:

As the Project is proposed on an existing and operating mine site, construction activities are limited.

The mining phase is expected to last approximately 3.5 years and will include the following key activities which will occur progressively:

- removal and temporary storage of heritage features such as the Quartz Reef discovery memorial, pioneer memorial and rotunda as required;
- infrastructure relocation, such as the telecommunication and DSE tower, picnic facilities and the Nextgen optical fibre duct;
- vegetation clearance;
- pre-stripping and stockpiling of topsoil and subsoil from the pit areas;
- preparation of temporary stockpiling areas;
- implementation and construction of drainage channels, sediment and collection dams;
- upgrade of current roads for haulage to link the existing processing area to the proposed pits;
- construction of a noise attenuation barrier as determined by the noise assessment; and
- erection of perimeter security fencing which will be integrated with the noise attenuation barrier where possible.

Key operational activities:

- Excavation of North pit, with placement of waste rock at TWRS;
- Excavation of South pit, with placement of waste rock into the North pit void;
- Placement of Mt Mickie and TWRS waste rock into remaining pit voids;
- Rehabilitation of the North pit then South pit after ore mining is completed;
- Opportunity will be explored in the final design for the progressive replacement of waste rock and the opportunity to enhance rehabilitation timeframes.
- All excavation activities will incorporate the following mobile plant:
 - Approximately 4 to 8 x 80-100t haul trucks pending stage of project
 - 1 to 2 x 80-100t Excavators pending stage of project
 - 2 x D9 or D11 Dozers for ripping and re-establishment
 - Pit floor and road maintenance equipment – Graders, Compactors and Water suppression considerations
 - Utility vehicles – Fuel and Lube Truck, Blasting Trucks, Drill Rigs, Ancillary Vehicles

Key decommissioning activities (if applicable):

The key decommissioning activities are:

- Removal of temporary infrastructure, such as fuel tanks;
- Rehabilitation of the North and South Pits and the TWRS;
- Reinstatement of the heritage sites and roads; and
- Establishment of the heritage walking trails and interpretation.

Is the project an element or stage in a larger project?

No Yes If yes, please describe: the overall project strategy for delivery of all stages and components; the concept design for the overall project; and the intended scheduling of the design and development of project stages).

Is the project related to any other past, current or mooted proposals in the region?

No Yes If yes, please identify related proposals.

As outlined earlier in this referral, the Project Area is located within mining licence MIN5260 which is the site of past and current mining operations by SGM. The Project is an enhancement to the former 'The Big Hill Development Project' which was proposed in 1999. The 1999 project proposed an open cut mine operation on Big Hill generally in the same locality as currently proposed. The major differences between the 1999 proposal and the current project are detailed in Table 1.

An Environment Effects Statement was prepared for 'The Big Hill Development Project' in October 1999. In November 2000 the Minister for Planning released his assessment which recommended against the project.

The current Project has been redeveloped to address the issues identified in the 1999 proposal.

The Project is also related to the existing, approved processing facilities and tailings storage facility in relation to existing SGM mining activities. No changes to the approvals for the processing facilities and tailings storage facility are envisaged as a result of their use in association with the Project. The environmental and social impacts of the processing facilities and tailings storage facility that would result from use of those facilities in relation to the Project have thus already been assessed and approved.

4. Project alternatives

Brief description of key alternatives considered to date (e.g. Locational, scale or design alternatives. If relevant, attach A4/A3 plans):

SGM has considered the Big Hill Enhanced Development project in the context of both a “do nothing” alternative and several design variations to the enhanced project. The “do nothing” alternative involves progressive winding down of the existing underground mining operation and effective closure of the 32 year old mining operation by the end of 2013. This option will be the outcome if the enhanced project does not receive the required approvals from Government. However, SGM has determined that the long term gold price and more detailed understanding of the gold resource at the site enables a viable and enhanced development. Accordingly, the “do nothing” option is considered an under- utilisation of an existing resource which is readily accessible and can be cost-effectively mined and processed using existing mine infrastructure.

On the basis that the “do nothing” option is not under consideration by SGM, the Big Hill Enhanced Development Project is considered the most viable and environmentally and socially acceptable option for further development of the resource. Several design alternatives to the enhanced project were considered as outlined below:

- Extension of North pit to the northwest (by approximately 100m), which would have intersected Main Street in the Stawell township. While further gold extraction would be possible under this option, SGM considers the disruption to the township unacceptable in respect to this option and it was not considered further.
- Stand-off distances have been increased between Pits and Reservoirs with the intent of infrastructure preservation. Discussions are in place with GWM Water regarding alternate water delivery options for the duration of the Project. A larger pit option was given consideration as an alternative and involved creation of a significantly larger excavated pit and full removal of all infrastructure on Big Hill to extract all gold by above ground mining. The “non-optimised” pit involved a 19MT excavation and project duration of approximately 8 years. SGM gave serious consideration to the desirability of having an open cut mine life of 8 years (similar to the 1999 proposal) in the context of potential low level but prolonged amenity issues in the surrounding community. On this basis, SGM elected to consider refinement of this option to reduce the mine life, and hence, reduce the exposure of the community to the operation. This consideration resulted in the final Big Hill Enhanced Development Project where an open cut mine life of about 4.5 years has been achieved by developing the North and South Pits and potentially exploiting deeper areas of the gold reserve via a continuation of the existing underground mining operation. While some gold resource is lost in the areas between the bottom of the pits and the upper extent of the underground mining, and in retention of some of the Big Hill infrastructure (i.e. reservoirs), the enhanced option allows for viable resource extraction and a short (4.5 year) open cut mine life with attendant community benefits.

Brief description of key alternatives to be further investigated (if known):

The project alternatives which are to be further investigated include the following:

- Pending further geotechnical assessments, the area between the two pits which house the communications towers and DSE fire watch facility may be able to be retained rather than be mined which would mean that the facilities will not require relocation.
- Final rehabilitated surface profile – minimum assumed standard is to re-contour to current topography, however, it is presumed that community groups will wish to have some input to any augmentation/enhancement.
- Refinement of the proposed access to deep pit resources from the current underground decline to minimise environment and community impact.
- Extension of resources south of the South Pit (refer to Attachment F). This concept is considered to be a minor extension to allow for additional ore extraction and will have no material effect on community, environment or duration of Project.
- Extension of the TWRS into the cleared paddock land to the north east. Depending on requirements of GWM-Water reservoir holdings and airborne dust considerations, an option for the stockpiling of additional waste materials on adjacent cleared land may be considered to reduce the height of stockpiles on the TWRS. Alternatively, waste rock could be temporarily transferred to Wonga Pit. Extension of the TWRS to the north east paddock, if required, would offset the imposition of heightened materials, rehandling to Wonga and further enhance the Project economics with no impacts to environment and a commitment for rehabilitation and re-establishment of grazing grasslands post project.

5. Proposed exclusions

Statement of reasons for the proposed exclusion of any ancillary activities or further project stages from the scope of the project for assessment:

Processing plant and tailings storage facility:

The processing mill, tailings facility, workshops, and amenities buildings required to support the Project are already available on the site as shown in Attachment C. The existing facility and associated infrastructure is part of an approved work plan and is excluded from the scope of this referral. The ore mined will be processed through the existing SGM processing plant and tailings deposited in the existing tailings storage facility (TSF), all of which have the necessary capacity and required licences, which will not need to be changed to process ore or store tailings arising from the Project. The environmental effects of the construction and operation of these facilities was considered during the assessment process for the work plan.

Other than for the TSF, there is no variation, augmentation or reconfiguration required for any of these facilities as a result of the Project. The tailings dam wall is required to be raised by up to 3m to accommodate tailings from the Project. The environmental effects of the construction and operation of this additional capacity were previously identified, assessed and approved as part of the current approved work plan.

On the basis that the process plant and TSF to be used in relation to mining for the Project are already approved, constructed and operating as part of the existing operations, it is not intended that any further environmental assessment of these facilities be conducted as part of the assessment and approvals processes for the Project.

Underground mining operations:

There will be no further access to deeper resources via open pit activity due to the proximity to community and infrastructure. Residences on Main St are the limiting factors to pit size. Deeper resources can be optimised via access tunnelling from the current underground workings.

Any underground operations within the licence area are currently permitted and are not part of this Project.

6. Project implementation

Implementing organisation (ultimately responsible for project, i.e. not contractor):

Stawell Gold Mine Pty Ltd

Implementation timeframe:

The mine plan is for approximately 3.5 years of excavation activities, followed by about 1 year to complete earthmoving and rehabilitation.

Proposed staging (if applicable):

Stage 1: Mining of North pit (Year 1 – 2 Q3)

Stage 2: Mining of South pit and associated backfilling of North pit (Year 2 Q2 – 4 Q2).

Stage 3: Backfilling and profiling of South pit (Year 4 Q4).

Stage 4: Final rehabilitation including topsoil reapplication, vegetation and access road establishment (Year 5 Q2).

Opportunity will be explored in the final design for the progressive replacement of waste rock and the opportunity to enhance rehabilitation timeframes. Waste rock will be stored on the TWRS area within the existing disturbed footprint.

7. Description of proposed site or area of investigation

Has a preferred site for the project been selected?

No Yes If no, please describe area for investigation.

If yes, please describe the preferred site in the next items (if practicable).

General description of preferred site, (including aspects such as topography/landform, soil types/degradation, drainage/ waterways, native/exotic vegetation cover, physical features, built structures, road frontages; attach ground-level photographs of site, as well as A4/A3 aerial/satellite image(s) and/or map(s) of site & surrounds, showing project footprint):

Attachment B provides an aerial photo of the proposed Project Area.

The project is taking place within and adjacent to the existing SGM mine. The existing operations includes the processing plant, tailings storage, access to the underground decline, ventilation shafts, SGM water storages, and ancillary facilities including the offices and workshop.

The surface facilities of the SGM mine abut the township of Stawell to the south-west and are in close proximity to the central business area. There are residential areas to the north-west along Fisher Street and to the north along Upper Main Street and Crowlands Road.

The northern part of the site is accessible to the public as an informal recreational reserve, known as Big Hill.

The Project Area, within this context is comprised of:

- North and South Pits;
- Temporary Waste Rock Stockpile (TWRS);
- Haul roads; and
- Mt Mickie.

North and South Pits

The two pits are to be located along the Big Hill ridge. The Big Hill ridge is elevated approximately 40-50 metres above the township of Stawell to the south-west. No natural drainage lines or waterways run through the site.

A number of infrastructure assets are currently located on Big Hill. These include monuments, the most significant of which is a Pioneer Memorial erected in the 1930s which has local cultural significance and the Quartz Reef Discovery Memorial. More recent infrastructure located on the Project Area includes a telecommunications tower, DSE fire tower, picnic facilities, car park and SGM Ventilation shaft.

The former Davis Pit (as shown in Attachment B) is proposed to be expanded as part of the Project, and is located at the southern end of the ridgeline, closest to the current mine facilities.

GWM-Water has three raw water storage ponds on the north eastern flank of Big Hill. As a minimum the two smallest and most westerly of the three are proposed to be taken off-line prior to mining commencing to lessen geotechnical instability on the closest pit wall. Consultation with GWM-Water is underway to determine the strategy for Stawell water supply and post mining requirement.

Sealed roads traverse the site. These roads are known as Big Hill Road, Reefs Road and Scenic Drive and have not been gazetted.

The majority of North pit area flora is highly modified and contains a high diversity and cover of exotic species. The South pit area has an indigenous over-storey with the flora condition highly variable from high to poor quality. Poorer quality remnants are highly disturbed and contain a high cover of exotic species within the understorey.

Temporary Waste Rock Storage (TWRS)

The TWRS site is located approximately 200 metres south of town water reservoir number 7.

The site, until recently, stockpiled waste rock from the former Davis Pit and is currently waiting for rehabilitation. The Davis Pit waste rock has progressively been mined over the last 6 years and processed due to its gold grades becoming economic.

As shown in Attachment B the TWRS is located entirely on a previously disturbed site. The proposed footprint contains low quality vegetation regrowth which is proposed to be removed.

If the option to stockpile additional waste rock on adjacent cleared land was implemented, this would also be on a low quality grassed area.

Haul roads

The haul roads are located within the existing mine site. The haul roads used will be existing haul roads to the extent practicable. Some upgrades to haul roads will be required. If new sections of haul road are required, they will be designed to avoid high quality native vegetation. To access Mt Mickie Leviathan Road is crossed. No upgrades to Leviathan Road will be required.

Mt Mickie

Mt Mickie is an existing waste rock stockpile from the mining of the Wonga Pit located to the south of Leviathan Road.

Site area (if known): 36hectares

Route length (for linear infrastructure)N/A..... (km) **and width**.....N/A..... (m)

Current land use and development:

The area proposed for the Project is currently utilised for a number of land uses as shown in Attachment E - Land uses adjoining the project area including:

- Mining (SGM operations, private roads);
- Public open space;
- Memorial site and carpark; and
- Public Utilities (water storage reservoirs, telecommunications infrastructure)

Description of local setting (e.g. adjoining land uses, road access, infrastructure, proximity to residences & urban centres):

As shown in Attachment B, the proposed pit sites are located immediately adjacent to the north eastern end of the Stawell township and in close proximity to the central business area. Big Hill is adjoined by residential areas to the northwest along Fisher street and to the north along Upper Main Street and Crowlands Road. The closest residents to the proposed pit are located within 100 metres of the pit face along Upper Main Street and Fisher Street, although the vegetated public purposes reserve will provide a visual buffer between the pit face and Fisher Street.

GWM-Water own and utilise the land to the east of the proposed pit location for raw water storage prior to treatment for town supply.

Land to the south south-east is SGM leased land utilised for the mine processing plant and informal well vegetated public open space reserve.

Land to the north-east of the TWRS site is GWM-Water land and also contains a private grave site of non-indigenous cultural significance known as 'Moray Graves' which is preserved in all of the Project variation considerations.

The main access to the SGM site is on Reefs Road which is accessible via Upper Main Street or Leviathan Rd.

Planning context (e.g. strategic planning, zoning & overlays, management plans):

The Local Planning Policy Framework (LPPF) sets out the Municipal Strategic Statement (MSS) and the Local Planning Policies for a local government area and is prepared by the local council to accommodate local needs and values. The Northern Grampians Planning Scheme identifies local policy positions regarding land use and development within the Northern Grampians Shire (NGS).

LPPF and MSS

Clause 21.09 of the Northern Grampians Shire MSS states the following objective and strategy with regards to mining operations:

Objective 2

To promote and facilitate mining and extractive industry in the Shire in a responsible manner.

Strategies

- Encourage mining and extractive industry activities provided that the proposals adequately address environmental, amenity and rehabilitation issues to ensure the long term impacts of mining and extractive industry on the surrounding environment and community are minimised.
- Provide adequate separation and buffer areas between sensitive land uses and mining and extractive industry to ensure that adverse environmental effects, nuisance or exposure to hazards does not affect existing and future residents.
- Monitor and enforce land rehabilitation conditions on all mining and extractive industry Permits.

Zoning

Attachment F – Zoning Map, illustrates the zones which are applicable to the subject site which include:

- Public Park and Recreation Zone;
- Special Use Zone – Schedule 1 (Stawell Gold Mine); and
- Public Use Zone – Schedule 1 (Service and Utility).

Overlays

As shown in **Attachment G – Overlay Map**, the Bushfire Management Overlay is the only overlay which applies to the site.

Local government area(s):

Northern Grampians Shire

8. Existing environment

Overview of key environmental assets/sensitivities in project area and vicinity

(cf. general description of project site/study area under section 7):

The Project Area is located on Crown land which is currently leased to SGM. The northern part of the site is accessible to the public as informal recreational reserve, whilst the eastern portion of the site is primarily utilised by SGM.

Historic mining activities have substantially disturbed the site resulting in vegetation clearing for the majority of the site area. Since the cessation of these activities vegetation has regrown and re-established to assist in stabilising the land and improving the landscape vista. However it is in poor condition with low quality vegetation, and exotic weed species.

The key environmental assets of the Project area are the native vegetation, specifically the Box Ironbark forest EVC within the Project area and 'Big Hill' topography which provides views across the Stawell township.

9. Land availability and control

Is the proposal on, or partly on, Crown land?

No Yes If yes, please provide details.

SGM currently holds the mining tenement as set out in Table 2 below and illustrated in **Attachment H – Mining Tenements (Leases)**.

Table 2 – Mining Tenements

Number	Area	Expiry
MIN 5260	999.7ha	30.5.2020

Current land tenure (provide plan, if practicable):

Attachment I – Land Parcel Information Crown Allotments, illustrates the current land tenure of the site.

The Project Area is predominantly Crown land under the control of DSE, with three exceptions, namely:

- CA 11B is a Public Purpose Reserve – Committee of Management is Northern Grampians Shire Council;
- CA10A & 11A comprise a Reservoir Reserve – Committee of Management is GWM-Water; and
- CA 10F is freehold land owned by GWM-Water.

Within the Crown land, apart from the mine ventilation shaft, aboveground mine development and some memorials and a picnic facility, four small areas of land are developed for specific uses, namely:

- CA 10B a former Forest Commission Reserve, containing a DSE Fire Tower.
- CA 10C, a former Municipal Purposes Reserve leased to Shire of Stawell is now leased to Vencorp and houses the organisation's radio communication facility.
- CA 10D a former Police & Emergency Services Reserve, is leased to the Victorian Police. It houses the State Mobile Radio Network (Telstra).
- CA 10G is leased by Optus Communications and contains a mobile telephone tower and three buildings. It houses the mobile telephone facilities for Optus, Telstra and Vodaphone.

Intended land tenure (tenure over or access to project land):

The land would remain Crown Land.

Other interests in affected land (e.g. easements, native title claims):

The following underground assets have been identified:

- Telecommunications cable (Telstra) runs along Big Hill Rd to the Optus and Telstra towers.
- Telecommunications cable (Nextgen) runs from upper Sloane St through Big Hill round the GWM water tank and up Navarre Rd.
- Optical fibre (AARnet) is run in the Nextgen duct.
- Optical fibre cable (Optus) runs from parcel CA 10G towards Big Hill Rd.

10. Required approvals

State and Commonwealth approvals required for project components (if known):

The Big Hill Enhanced Development Project will require a variety of regulatory approvals at the State, Local and potentially Commonwealth level. Required approvals include:

- Planning Permit required under the local Planning Scheme as the site is located in three zones – Public Park and Recreation Zone (PPRZ), Special Use Zone 1 (SUZ1) and Public Use Zone 1 (PUZ1).
- Mineral Resources (Sustainable Development) Act – Work Plan.

Potential approvals required include:

- Flora and Fauna Guarantee Act approval – if Project involves native vegetation removal on public land.
- Environment Protection and Biodiversity Conservation Act (Commonwealth) approval – if the Project impacts on Matters of National Environmental Significance (NES). Available information confirms there are no matters of NES on the Project Area. It is therefore highly unlikely the Project will require approval through the EPBC Act. However the need for referral will be reviewed as development of the project progresses.

Have any applications for approval been lodged?

No Yes If yes, please provide details.

Approval agency consultation (agencies with whom the proposal has been discussed):

- Northern Grampians Shire Council (NGSC)
- Department of Primary Industries (DPI)
- Department of Planning and Community Development (DPCD)

Other agencies consulted:

- Department of Business and Innovation (DBI)
- GWM-Water

PART 2 POTENTIAL ENVIRONMENTAL EFFECTS

11. Potentially significant environmental effects

Overview of potentially significant environmental effects (identify key potential effects and comment on their significance and likelihood, as well as key uncertainties):

The enhanced Project has addressed the main environmental and social concerns underpinning the assessment of the previous EES for the Big Hill project and the enhanced Project offers a significantly better outcome for the community and environment in terms of a much shorter mine life (4.5 years for the current proposal compared to 8 years in 1999) and full reinstatement of the southern void.

A comprehensive review of the 1999 EES has been conducted and a Gap Analysis (Attachment D) prepared. The summary below considers the potentially significant environmental effects with reference to the "Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978" (Ministerial Guidelines).

The assessment of the Project against the Ministerial Guidelines indicates that the potentially significant environmental impacts of the project are associated with amenity and community hazards. While there is a long term community safety benefit from the removal of historic mining voids, during the project 51 residents and a local business have the potential to be impacted by noise and dust from the project. In order to avoid and minimise impacts, SGM has designed the project with a shorter timeframe of 4.5 years, and 12 hour dayshift weekday operations only, as well as a noise attenuation barrier. SGM will further develop the project, in consultation with the community, to avoid and minimise amenity and community hazard impacts in accordance with legislation, policy and guidelines.

It is not expected that the Project will have significant environmental effects, as discussed below.

Amenity

The Project activities will come within 100m of 51 dwellings and a business

Recognising the proximity of the proposal to adjacent residences, a key objective of the project is to ensure compliance with all relevant environment regulations at sensitive adjacent land uses. Studies designed to assess potential impacts associated with such amenity issues as air quality, noise and vibration will be conducted as a basis for establishing mitigation measures required to ensure that any potential impacts on the surrounding areas are considered acceptable within the regulatory framework.

It is expected that the project will comply with relevant performance standards for these key parameters. In terms of operational elements (e.g. excavators, trucks), the current proposal is similar to that proposed in the previous EES. The Minister's assessment of the previous EES accepted the conclusion of the Independent Panel that control measures are available to ensure that relevant performance standards for air quality, noise and blast vibration could be achieved. This continues to be the case. For example, a Noise Attenuation Barrier is proposed along the western and northern pit perimeter to reduce noise impacts from excavation and truck movements on nearby residents. The final design of the Barrier will be based on the noise modelling and impact assessment study proposed by SGM. Amenity impacts will also be managed through operational measures associated with the mine. For example, SGM intends to only operate 12 hour shifts on weekdays and not operate on weekends.

The 4.5 year timeframe for the project will reduce the potential amenity impacts on adjacent areas when compared with the 8 year mine life proposed under the 1999 development. More importantly however, the proposed method of progressively mining from the north to the south

and subsequently rehabilitating mined areas means that operational areas of the mine are not proximal to all adjacent residences at any one time. This, combined with meeting the regulatory requirements at adjacent residences, suggests that the mining operation can achieve acceptable amenity outcomes.

The approach proposed by SGM is to conduct detailed studies into all factors which affect amenity and incorporate management and mitigation measures into the overall Environmental Management Plan to be prepared for development, operation and rehabilitation of the site as part of the work plan. SGM will implement a Stakeholder Engagement and Community Plan and work closely with adjacent residents to identify the amenity issues of concern as a basis for developing appropriate ameliorative measures as studies and impact assessments progress.

Overall, it is contended that the project can be successfully implemented avoiding significant environmental effects as defined in the Ministerial Guidelines as statutory compliance levels can be achieved at adjacent sensitive land uses, not all residences are proximal to mining at any one time, rehabilitation to existing landform will be ongoing throughout the mining and there will be no major long term changes.

Community hazards

During the project, there is potential for an increase in particulates (dust) and noise emissions in the areas adjacent to the mine due to the mining excavation activities in close proximity to the residences on Fisher and Upper Main Street. As discussed in the previous section dealing with amenity issues, the project will be developed to comply with relevant legislation, policy and guidelines, including the *Environment Protection Act 1970*, *Public Health & Wellbeing Act 2008* and other relevant State Policies. To specifically address potential community health hazards or risks, SGM will conduct a human health risk assessment based on the outcomes of the air quality and noise modelling studies to be undertaken to ensure that the operations are compliant with the regulatory framework and that no unacceptable risks are posed to the community. Specific management and mitigation measures to meet compliance requirements will be implemented through the project Environmental Management Plan as part of the work plan.

Risks related to spills of fuels and oils will be managed through the Environmental Management Plan and associated emergency management protocols and would typically be contained within the site rather than posing any risk to the wider community.

The appropriate factors of safety will be utilised for the final design of the pit based on historic and new geotechnical investigations. Based on previous open cut mining operations at the site, no unacceptable risks are expected. It is proposed that two of GWM Water's containment reservoirs be taken off-line for the duration of the Project to lessen geotechnical instability and perched water risk on the closest pit wall. Consultation with GWM-Water is in progress to determine the most appropriate program of water security to the community of Stawell and re-instatement requirements following mining activity.

There is no risk of exposure to the community via waterways or wetlands.

Additionally, the project will remove all historic mining voids (unrelated to SGM's activities) within the affected project area providing a long term community safety improvement over that which currently exists in the area where there are old tunnels and pits scattered throughout publicly accessible areas.

Given the commitment to comply with relevant legislation, policy and guidelines, it is not expected that there will be a potential exposure of a human community to severe or chronic health or safety hazards over the short or long term, due to emissions to air, water, noise, chemical hazards or associated transport.

Displacement of non-residential land use activities

The Big Hill area is currently open to the public for recreation. During the project, the Reefs Road Scenic Drive and Big Hill Road will be closed and the public will not be able to access the viewing point and rotunda at the top of Big Hill. This will represent some level of change to the current situation for local residents and visitors but will not be a long term impact as the project involves full reinstatement of Big Hill to existing topography and at the completion of the project the public will again have access. The Big Hill rehabilitation plan is proposed to include a cultural heritage gold trail initiative and a community facility such as a mine museum which is proposed to be further developed through community and local government consultation and would represent an improvement on the facilities currently found on Big Hill.

A number of infrastructure assets are expected to be relocated, including the telecommunications tower and the DSE fire watch tower, in consultation with the infrastructure owners.

SGM proposes to provide interpretation of the proposed open cut site for the public during the mining operations.

While there will be some short to medium term disruption to use of Big Hill and the need to temporarily or permanently relocate some public infrastructure, overall, there are not expected to be any long term major effects on social or economic well-being due to direct or indirect displacement of non-residential land use activities, as defined in the Ministerial Guidelines.

Displacement of residences

There will be no impact on the access of adjacent residences to community resources. While access to Scenic Drive will be removed and Big Hill Road will be temporarily unavailable, this will not affect residential access. The residents of two properties located to the west of the proposed pit outline located on Main Street will be displaced by this Project. SGM is currently in discussions with these property owners.

While the impact on the two affected properties is significant, no potential extensive displacement of residences or severance of residential access to community resources is expected, as defined in the Ministerial Guidelines.

Landscape

The topographic feature known as 'Big Hill' is not recognised by a planning scheme overlay and it is not within or adjoining land reserved under the National Parks Act 1975. However, part of the proposed project area will impact on existing public open space used for recreational purposes for the duration of the Project.

Big Hill will be excavated, processed and backfilled as part of this Project. This will result in a temporary change in the landscape that will be visible from Stawell township and the surrounding local area for the 4.5 year duration of the Project.

During the project, the visual impact will be minimised wherever possible, and progressive backfilling and rehabilitation works will be undertaken as the Big Hill landform is reinstated. Where required, a noise attenuation wall will be installed between Fisher Street and Main Street and the pit, with the purpose of vegetation and visual amenity / screening, as well as noise reduction.

Big Hill will be reinstated to its original topography and there will be no southern pit void at the conclusion of the Project as was proposed in the 1999 mining project. The southern pit will be filled, contoured and rehabilitated which will result in the site being available for post project use as a community asset. The community will have the opportunity to be involved in developing the final landscape form of Big Hill.

The project is therefore not expected to have potential extensive or major effects in the long term on landscape values of regional importance, as defined in the Ministerial Guidelines.

Native Vegetation

Removal of 8.88 ha of remnant Box Ironbark Forest and five scattered trees is required to allow for the pit excavation, modification of existing tracks for haulage and on the outskirts of the Temporary Waste Rock Stockpile (TWRS). The TWRS is a non-natural land form that was created for previous Davis open pit waste rock stockpiling. Box Ironbark Forest (EVC 61) is listed as depleted. None of the vegetation is of very high conservation significance based on the results of survey work undertaken.

The footprint of the area of disturbance is not expected to change significantly. An Offset Management Plan will be prepared to comply with the Native Vegetation Management Framework.

The clearing of native vegetation is therefore not considered to be a potentially significant effect as defined in the Ministerial Guidelines.

Flora and Fauna

The majority of the Project Area is highly modified and contains a high diversity of exotic species mixed with indigenous over-storey. Flora and fauna surveys were conducted for the Project Area, and have concluded the following:

Flora

- One Ecological Vegetation Class (EVC) is present within the Project Area, Box Ironbark Forest - which is listed as depleted within the Goldfields bioregion
- One state significant species is present in the Project area Clasping Goodenia *Goodeniabenthamiana* – which is rare in Victoria

Fauna

- No nationally significant fauna species were recorded during the survey, however 14 nationally significant fauna species have previously been recorded in the local area including the Swift Parrot *Lathamus discolor* and the Australian Painted Snipe *Rostratula australis* which may utilize the woodlands and dams onsite on rare occasions. However the area is unlikely to provide permanent and/or important habitat for these species.
- One species of state significance Brown Treecreeper *Climacteri spicumnus victoriae*, and one of regional significance Bearded Dragon *Pogona barbata* were identified during survey. Suitable habitat exists for both of these species within the Project Area.

EPBC Act listed species

No listed flora or fauna species under the EPBC Act 1999 are considered likely to occur within the area, as there is no suitable habitat present.

FFG Act listed species

In addition to Clasping Goodenia, several flora species including Hedge Wattle *Acacia paradoxa*, Fireweeds *Senecio spp.*, Drooping Cassinia *Cassinia arcuata* and Common Everlasting *Chrysocephalum apiculatum* which are listed as protected were recorded during the field assessment.

The primary effects to flora and fauna which would occur as a result of the vegetation and habitat removal include:

- Loss of nesting and foraging habitat
- Potential removal of significant flora
- Removal or modification of habitat for significant flora species.

The project is not expected to result in the potential long-term loss of a significant proportion of known remaining habitat or population of a threatened species within Victoria. No listed ecological communities or genetically important populations are affected by the project. No loss of critical

habitat is anticipated. No wetlands are affected by the project.

The project is therefore not expected to have a potentially significant effect on flora and fauna, as defined in the Ministerial Guidelines.

Wetlands, waterways and groundwater

There are no natural wetlands or waterways in the vicinity of the Project area. Based on the experience of the underground mining operations, the regional groundwater table is expected to be below the base of the pits. Therefore it is not anticipated that groundwater will be affected. As noted above, the additional impacts of the Project in utilising the TSF have already been assessed and approved.

The project is therefore not expected to have a potentially significant effect on the beneficial uses of water bodies, aquatic ecosystems or wetlands, as defined in the Ministerial Guidelines.

Land stability and soils

The Project will improve public safety through its removal of old mining voids. In addition to backfilling the north and south pit, the project will remove all historic mining voids (unrelated to SGM's activities) to allow for an overall community safety benefit. Removal of these voids through pit excavation and backfilling will provide an opportunity for safer public reserve (post closure) which has removed the element of public risk from entering or falling down mining voids.

No acid generating material has been identified. A geotechnical investigation is yet to be conducted. However, it is noted that there has previously been open cut mining on the site which has been effectively managed geotechnically.

Therefore no potential extensive or major effects on land stability, acid sulphate soils or highly erodible soils are expected, as defined in the Ministerial Guidelines.

Greenhouse gas emissions

The greenhouse gas emissions associated with the project's operation are expected to be approximately 1800 tCO₂-e per year. Therefore the project is not expected to have a potentially significant effect on greenhouse gas emissions, as defined in the Ministerial Guidelines.

Aboriginal cultural heritage

The conclusion of the cultural heritage assessment from 1998/1999 was 'no evidence of Aboriginal use of the area was discovered. The lack of evidence is considered a consequence of mine developments over many years and the settlement of the town of Stawell.

Therefore potential extensive or major effects on Aboriginal cultural heritage, as defined in the Ministerial Guidelines, are not expected.

Non-Aboriginal Cultural Heritage

No sites listed on the Heritage Register are affected by the project. There are three sites listed on the Heritage Inventory within the project area. Where feasible, the sites will be protected. The memorial sites associated with the Heritage Inventory sites will be recorded, removed for the duration of the project and reinstated decommissioning of the Project

The Project will result in removal of historic mining voids located within the pit footprint. Removal of these voids through pit excavation and backfilling will improve public safety.

To acknowledge and document the mining history of the site, the rehabilitation plan for the Project is proposed to include a cultural heritage gold trail initiative and may include establishment of a community facility such as a mine museum.

Potential extensive or major effects on cultural heritage places listed on the Heritage Register or the Archaeological Inventory under the *Heritage Act 1995*, as defined in the Ministerial Guidelines, are not expected.

12. Native vegetation, flora and fauna

Native vegetation

Is any native vegetation likely to be cleared or otherwise affected by the project?

NYD No Yes If yes, answer the following questions and attach details.

8.88 ha of remnant native vegetation clearance is required to allow for the pit excavation, modification of existing tracks for haulage and the Temporary Waste Rock Stockpile (TWRS). The TWRS area is a non-natural land form that was created for previous Davis open pit waste rock stockpiling.

What investigation of native vegetation in the project area has been done? (briefly describe)

Ecology and Heritage Partners Pty Ltd (EHP) undertook a flora, fauna and net gain assessment in January 2012 and January 2013 of the proposed Project Area and surrounding areas. These assessments have been consolidated into the following report titled as follows:

- 'Flora, Fauna and Net Gain Assessment of the Big Hill and Davis sites, Temporary Waste Rock Storage area and future Haulage Road for the proposed extension of the Stawell Gold Mine, Stawell, Victoria.' (January 2013)

The aims of these assessments were to identify the type, quality and quantity of native vegetation and fauna habitat present within the Project Area.

Note: The Study Area as defined in EHP's report is broader than the Project Area. The Project Area includes the following areas defined in the assessment report:

- Big Hill (North Pit);
- Davis Pit (South Pit);
- TWRS; and
- Haulage Road (Haul Roads).

The EHP Study Area includes areas outside the Project Area, which has been defined in the report as 'Additional Areas' and has not been included in native vegetation estimates or flora and fauna discussions.

Attachment J– Flora and Fauna Survey Result Map, provides the findings of the flora and fauna survey undertaken for the Project Area.

A copy of this report is included in Attachment K.

One Ecological Vegetation Class (EVC), Box Ironbark Forest (EVC61) was recorded within the Project Area, which is listed as 'depleted' within the Goldfields bioregion. The conservation significance of the Box Ironbark Forest has been identified as:

Conservation Significance	Vegetation Area to be removed within the Project Area (ha)	Vegetation Area to be removed within the Project Area (Habitat ha (Hha))
Very high	0	0
High	1.98	1.14
Medium	4.33	1.64
Low	2.57	0.59
Total	8.88	3.37

North Pit

In general, vegetation south of Scenic Road in the North Pit area is of fairly poor quality, with higher quality remnants restricted to the areas north/ above Scenic Road. Areas south of Scenic Road vary substantially and include an arboretum planted in the early 1950s to help cover the scars from previous mining practices. In addition to exotic trees, the arboretum includes a number of planted trees from around Australia, as well as some that are indigenous to the local area (e.g. Red Ironbark *Eucalyptus tricarpa*). Several unnatural ravines also occur within the North Pit area both above and below Scenic Road and are most likely old mining shafts or excavations. Vegetation within these ravines is highly modified, especially the large ravine south of Scenic Road.

High quality Box Ironbark Forest habitat zones were recorded above Scenic Road which generally contained stony soils, soil crusts and bryophytes, indicating soil disturbance has been limited since European settlement. Box Ironbark Forest has an open overstorey to 20 metres tall and often includes one of the Ironbark species.

Lower quality zones were, for the most part, located at the base of the slope. Compared to the top of the slope where Red Ironbark dominated the overstorey, at the base of the slope, Yellow Gum tended to dominate, with only occasional occurrences of Red Ironbark. These lower quality zones contained a moderate to high cover (>25%) of weed species.

South Pit

The majority of the South Pit area has an indigenous overstorey, with the condition of the vegetation highly variable, ranging from poor to high quality. Remnant vegetation is of poorer quality at the base of the hill, with vegetation quality gradually improving as the slope increases, with the highest quality vegetation on the northern aspects. Whilst retaining an intact overstorey and a small number of species reflective of the Box-Ironbark Forest EVC, poorer quality remnants were highly disturbed and contained a high cover of exotic species within the understorey, some of which are listed as noxious.

In total, thirteen patches Box-Ironbark Forest were recorded in the South Pit area along with five scattered trees.

TWRS

Approximately three quarters of the Temporary Waste Rock Stockpile (TWRS) area is currently devoid of all vegetation and approximately one quarter has been replanted in distinct rows with a small selection of native understorey shrubs and trees, primarily Golden Wattle. The large bare area forms part of the disused Davis open cut mine and in its current state is suitable only to the growth of opportunistic weeds species such as Stinkwort.

Haul Roads

The future haulage road alignment consists of several thin patches of Box Ironbark on the roadside, which are in moderate condition. Yellow Gum is the dominant tree species, and the shrub layer is relatively dense in this area, with moderate species diversity, however, the distribution and abundance of understorey species is relatively low.

What is the maximum area of native vegetation that may need to be cleared?

NYD Estimated area8.88 hectares (or 3.37 Hha)

The flora and fauna survey undertaken concludes that the Project Area (including the pits, haul roads and the TWRS area) contains a total of 8.88 hectares of remnant vegetation.

How much of this clearing would be authorised under a Forest Management Plan or Fire Protection Plan?

N/A approx. percent (if applicable)

Which Ecological Vegetation Classes may be affected? (if not authorised as above)

NYD Preliminary/detailed assessment completed. If assessed, please list.

The Ecology and Heritage Partners survey identified one EVC within their assessment area - Box Ironbark Forest (EVC 61).

The location and/or modification of existing Haul Roads has been selected so as to minimise impacts. Disturbed areas will provide the majority of the area required for the Haul Roads.

Have potential vegetation offsets been identified as yet?

NYD Yes If yes, please briefly describe.

Other information/comments? (e.g. accuracy of information)

This assessment has been informed by the report '*Flora, Fauna and Net Gain Assessment of the Big Hill and Davis sites, Temporary Waste Rock Storage area and future Haulage Road for the proposed extension of the Stawell Gold Mine, Stawell, Victoria.*' (January 2013) which included an assessment of Project impacts on Ramsar sites. It was concluded that no Ramsar sites would be affected by this proposal. Refer to Attachment K.

Flora and fauna

What investigations of flora and fauna in the project area have been done?

(provide overview here and attach details of method and results of any surveys for the project & describe their accuracy)

Ecology and Heritage Partners Pty Ltd undertook a flora, fauna and net gain assessment in January 2013 based on surveys from January 2012 and January 2013. The January 2012 flora and fauna assessment included the majority of the pit areas. An additional survey including the remaining pit footprint to the south, TWRS and haul road footprints was undertaken in January 2013. Survey data indicates that the Project impacts on flora and fauna are unlikely to be significant.

The assessment report is titled: '*Flora, Fauna and Net Gain Assessment of the Big Hill and Davis sites, Temporary Waste Rock Storage area and future Haulage Road for the proposed extension of the Stawell Gold Mine, Stawell, Victoria*' (January 2013)

The aims of the assessments were to identify the type, quality and quantity of native vegetation and fauna habitat present within the Project area.

Note: The Study Area as defined in EHP's report is broader than the Project Area. The Project Area includes the following areas defined in the assessment report:

- Big Hill (North Pit);
- Davis Pit (South Pit);
- TWRS; and
- Haulage Road (Haul Roads).

The EHP Study Area includes areas outside the Project Area, which has been defined in the report as 'Additional Areas' and has not been included in native vegetation estimates or flora and fauna discussions.

Flora

North Pit

A total of 82 plant taxa (36 indigenous, 46 exotic) were recorded during the assessment. No threatened flora species or communities were recorded within the North Pit area and none are expected to occur within the North Pit area. No state significant flora species were recorded during the current assessment.

South Pit

A total of 92 plant taxa (57 indigenous, 35 exotic) were recorded within the South Pit area. Flora species and soil types are representative of the Ecological Vegetation Class (EVC), Box-Ironbark Forest (EVC 61), which is listed as 'depleted' within the Goldfields bioregion.

One state significant species, Claspig Goodenia *Goodeniabenthamiana*, was recorded during the assessment. This species is considered rare in Victoria. There are currently 74 records for this species across Victoria. This species is generally scattered across western Victoria in an area bounded by Bendigo in the east, Big Desert to the north, Mt Arapiles to the south. The species was only recorded from one location within the South Pit area, along the artificial embankment which is adjacent to the storage yard.

No other threatened species or communities were recorded within the South Pit area.

TWRS Area

The majority of this area is currently devoid of vegetation, however, 20 flora species (10 natives and 10 exotics) were located in and around the revegetation zone.

Haul Roads

A total of 48 flora species (25 native and 23 exotic) were identified in the future haulage road alignment.

Fauna

North and South Pits

A total of 78 terrestrial fauna species comprising eight mammals (three introduced), 64 birds (four introduced), five reptiles, and one native frog species were recorded during the assessment of the North and South Pit areas.

TWRS

A total of five fauna species were located within the Temporary Waste Rock Stockpile area. All species were commonly occurring birds that often take advantage of highly modified open spaces, such as Australian Magpie and Australian Raven.

Haul Roads

At the time of survey, no fauna species were recorded within the future Haul Road area. The proposed haulage road is directly adjacent to an existing dirt road extensively used by heavy machinery. The road was in use on the day of survey, which may explain the absence of fauna species.

199 fauna species have been documented within 10 km of the Project Area. The majority of these are birds, with relatively low numbers of mammals, reptiles, frogs and fish. Several significant species have been recorded in proximity to the Project Area, however very few of these records are recent. This suggests the local area contains a broad range of fauna species, many of which are expected to use the Project Area either as residents, or visitors on a regular or irregular basis.

The Project Area currently supports five broad fauna habitat types: secondary grassland, remnant woodland, dams/artificial waterbodies, an arboretum/planted trees, and introduced grassland. Fauna habitat quality varies from high, for remnant woodland, to low, for introduced grassland.

Have any threatened or migratory species or listed communities been recorded from the local area?

NYD No Yes If yes, please:

- List species/communities recorded in recent surveys and/or past observations.
- Indicate which of these have been recorded from the project site or nearby.

Flora

One state significant species Claspine Goodenia *Goodeniabenthamiana*, listed as rare, was recorded in the survey undertaken by Ecology and Heritage Partners at the South Pit site. This species is rare in Victoria.

Several flora species including Hedge Wattle *Acacia paradoxa*, Fireweeds *Senecio sp.*, Drooping Cassinia *Cassinia arcuata* and Common Everlasting *Chrysocephalum apiculatum* which are listed as protected under the *Flora and Fauna Guarantee Act 1988*, were recorded during the field assessment.

Eleven nationally listed flora species have previously been recorded within 10 km of the Project Area. An additional six species, not previously documented within the local area, also have habitat potentially occurring within the vicinity of the Project Area. A further 45 state significant flora species have previously been recorded in the local area. None are likely to occur in the Project Area.

Fauna

Of the 78 fauna species recorded, one, the Brown Treecreeper *Climacteris picumnus victoriae*, is of state significance and another, the Bearded Dragon *Pogona barbata*, is of regional significance.

No additional fauna species of national, state or regional significance were recorded during the survey. No listed fauna species listed under the *Environment Protection and Biodiversity Conservation Act 1999 Cth* are considered likely to occur within the Project Area, as no suitable habitat is present. The nationally-listed Swift Parrot *Lathamus discolor* may visit the woodland areas within the Project Area, while Australian Painted Snipe *Rostratula australis* may utilise the dam/artificial waterbody on rare occasions. However, these areas are unlikely to provide permanent and/or important habitat for these species.

One state significant fauna species were recorded during the present survey, Brown Treecreeper, *Climacteris picumnus victoriae*. A total of 19 state significant fauna have previously been documented within 10 km of the Project Area. Other than the Brown Treecreeper, the rest of these are considered unlikely to occur within the Project Area. Of these, the woodland-dependent birds (Hooded Robin *Melanodryas cucullata cucullata*, Diamond Firetail *Stagonopleura guttata*, and Speckled Warbler *Chthonicola sagittatus*) may visit the Project Area on occasion, however it is unlikely to provide permanent and/or important habitat for these species.

Black Falcon *Falco surniger* may fly over, or forage, within the Project Area on rare occasions, however it is considered unlikely that this species would utilise the Project Area other than as a vagrant visitor.

Communities

No listed communities were identified.

If known, what threatening processes affecting these species or communities may be exacerbated by the project? (e.g. Loss or fragmentation of habitats) Please describe briefly.

The Ecology and Heritage Partners assessment (Attachment K) lists the following threatening processes under the *Flora and Fauna Guarantee Act 1988* which are applicable to the proposed mining operation:

- Loss of hollow-bearing trees from Victorian forests and woodlands;
- The invasion of native vegetation by environmental weeds; and
- Habitat fragmentation as a threatening process for fauna in Victoria.

Are any threatened or migratory species, other species of conservation significance or listed communities potentially affected by the project?

NYD No Yes If yes, please:

- List these species/communities:
- Indicate which species or communities could be subject to a major or extensive impact (including the loss of a genetically important population of a species listed or nominated for listing) Comment on likelihood of effects and associated uncertainties, if practicable.

One state significant species Claspine Goodenia *Goodeniabenthamiana*, was recorded in the survey undertaken by Ecology Partners in the South Pit area. This species is rare in Victoria.

The Brown Treecreeper *Climacteris picumnus victoriae* was also identified which is of state significance and the Bearded Dragon *Pogona barbata* of regional significance at the South Pit and North Pit localities.

The potential impact of the Project on these species is not likely to be major or extensive.

Is mitigation of potential effects on indigenous flora and fauna proposed?

NYD No Yes If yes, please briefly describe.

SGM has designed the Project to minimise impact on vegetation and habitat to the maximum extent possible. The TWRS has been designed to be contained within an existing cleared and highly modified area to avoid the need for high quality vegetation clearance. Haul roads have also been routed to avoid impact on vegetation wherever possible, and the pit has been reduced to the smallest footprint possible. To mitigate the impact of flora clearance on the locality, SGM commits to ensuring the rehabilitation of the site (post closure) involves planting of locally indigenous species where possible and as accepted by the community. This commitment will be reflected in the Environment Management Plan and Rehabilitation Plan for the Project under the *Mineral Resources (Sustainable Development) Act*.

The following more general measures (as proposed by Ecology & Heritage Partners) are also proposed to mitigate/ameliorate impacts to significant flora and fauna species and ecological communities. These measures will be reviewed upon completion of investigations into location of the noise attenuation barrier and access requirements:

- The proposed development footprint should clearly demonstrate the first two principles of three-step approach of 'the Framework'. That is, to 'avoid' and 'minimise' impacts to remnant native vegetation, which reduces the requirement for vegetation removal;
- Targeted flora surveys should be undertaken in higher quality remnant vegetation if they are proposed to be disturbed for roads or infrastructure;
- Develop a Native Vegetation Offset Management Plan to ensure that the proposed any remnant vegetation removed adheres to the three step approach outlined in 'the Framework';
- Inform contractors and staff of the importance of remnant native vegetation that has been identified for retention;
- Consideration should be taken to relocate habitat which is to be removed such as hollow logs and other large, dead or fallen debris for rehabilitation purposes;
- Instead of felling, trees can be trimmed to provide access for vehicles or machinery;
- If possible, trees approved for felling can be cut at a height approximately equal to the diameter of the tree to facilitate coppicing instead of uprooting (DPI 2008);
- Use indigenous plants associated with the relevant Ecological Vegetation Class (Box Iron Bark Forest) as part of any landscaping works to increase habitat for native fauna; and
- Monitoring of flora and fauna populations, especially significant species over a sufficient duration and during appropriate times of the year, both prior to and after mining.

Other information/comments? (e.g. accuracy of information)

13. Water environments

Will the project require significant volumes of fresh water (e.g.> 1 GL/yr.)?

NYD No Yes If yes, indicate approximate volume and likely source.

The only anticipated water requirements for the Project will be for dust suppression. Based on the length and type of haul roads, it is anticipated that up to 15 ML/year of water will be utilised. This will be sourced from onsite water harvesting and raw water from GMW-Water.

Will the project discharge waste water or runoff to water environments?

NYD No Yes If yes, specify types of discharges and which environments.

No off-site stormwater discharge is anticipated. Stormwater runoff will be managed through:

- Collection, management and containment of surface water within the site
- Control of stormwater inflows to open pits;
- Integrated erosion control and sediment management;
- Separation of clean water and dirty water, treatment of dirty water to best practice standards; and
- Recycling and reuse of collected water.

A Surface Water Management Study will develop the detailed approach to water management for the project. It will address the stages of the project life, including filling the voids.

Are any waterways, wetlands, estuaries or marine environments likely to be affected?

NYD No Yes If yes, specify which water environments, answer the following questions and attach any relevant details.

No natural waterways are located in proximity to the Project Area.

Are any of these water environments likely to support threatened or migratory species?

NYD No Yes If yes, specify which water environments.

Are any potentially affected wetlands listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'?

NYD No Yes If yes, please specify.

Could the project affect stream flows?

NYD No Yes If yes, briefly describe implications for stream flows.

Could regional groundwater resources be affected by the project?

NYD No Yes If yes, describe in what way.

Based on the experience of the underground mining operations, it is anticipated that the regional groundwater table is below the base of the pits and therefore 'dewatering' will not be necessary. This will be confirmed through a groundwater assessment which will also determine any potential long term risks to groundwater.

Could environmental values (beneficial uses) of water environments be affected?

NYD No Yes If yes, identify waterways/water bodies and beneficial uses (as recognised by State Environment Protection Policies)

None are anticipated, however, this will be confirmed through the groundwater and surface water assessment studies.

Could aquatic, estuarine or marine ecosystems be affected by the project?

NYD No Yes If yes, describe in what way.

Is there a potential for extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems over the long-term?

No Yes If yes, please describe. Comment on likelihood of effects and associated uncertainties, if practicable.

Is mitigation of potential effects on water environments proposed?

NYD No Yes If yes, please briefly describe.

It is not anticipated that any of the water environments will need mitigation measures, given the Project pits are above the groundwater table and no surface water systems flow through the Project area. There are a number of minor drainage features across the site.

Other information/comments? (e.g. accuracy of information)

14. Landscape and soils

Landscape

Has a preliminary landscape assessment been prepared?

No Yes If yes, please attach.

Is the project to be located either within or near an area that is:

- **Subject to a Landscape Significance Overlay or Environmental Significance Overlay?**

NYD No Yes If yes, provide plan showing footprint relative to overlay.

Environmental Significance Overlay – Schedule 1 (Significant Ridge Environs) is located approximately 3-4 kilometres to the east of the SGM site.

The area affected by the Project is not covered by a significant landscape overlay in the Northern Grampians Shire Planning Scheme.

- **Identified as of regional or State significance in a reputable study of landscape values?**

NYD No Yes If yes, please specify.

- **Within or adjoining land reserved under the *National Parks Act 1975*?**

NYD No Yes If yes, please specify.

- **Within or adjoining other public land used for conservation or recreational purposes?**

NYD No Yes If yes, please specify.

The Project Area is adjoining Crown land used for recreational purposes located to the south and south-west of the proposed pit location as shown on Attachment E.

Is any clearing vegetation or alteration of landforms likely to affect landscape values?

NYD No Yes If yes, please briefly describe.

Removal and backfilling of Big Hill will result in a visual impact, as will the placement of waste at the site of the TWRS site.

Is there a potential for effects on landscape values of regional or State importance?

NYD No Yes Please briefly explain response.

Big Hill is proposed to be excavated, processed and backfilled as part of this Project. This will result in a temporary change in the landscape that will be visible from Stawell township and the surrounding local area for the duration of the Project.

Big Hill will be reinstated to as close as possible to its original topography.

A landscape study for the Project will be conducted as part of the further development of the Project.

Is mitigation of potential landscape effects proposed?

NYD No Yes If yes, please briefly describe.

The North and South Pits are proposed to be progressively backfilled to minimise the period of time which there is a visual impact as a result of the Project.

Other information/comments? (e.g. accuracy of information)

Note: A preliminary landscape assessment is a specific requirement for a referral of a wind energy facility. This should provide a description of:

- The landscape character of the site and surrounding areas including landform, vegetation types and coverage, water features, any other notable features and current land use;
- The location of nearby dwellings, townships, recreation areas, major roads, above-ground utilities, tourist routes and walking tracks;
- Views to the site and to the proposed location of wind turbines from key vantage points (including views showing existing nearby dwellings and views from major roads, walking tracks and tourist routes) sufficient to give a sense of the overall site in its setting.

Soils**Is there a potential for effects on land stability, acid sulphate soils or highly erodible soils?**

NYD No Yes If yes, please briefly describe.

A range of studies have been undertaken across the mine site over the last 10 years and none have suggested there are land stability issues, acid sulphate soils or highly erodible soils. The 1999 EES identified that potentially acid forming material may be encountered near the floor of the south void, but subsequent work generated from the data gathered during underground operations has found the same geological units are not acid generating.

Are there geotechnical hazards that may either affect the project or be affected by it?

NYD No Yes If yes, please briefly describe.

A comprehensive geotechnical investigation is planned for the Project, which aims to be compliant with DPI's guidelines: **Guidance Material for the Assessment of Geotechnical Risks in Open Pit Mines and Quarries** (dated November 2012). However, it is noted that there has previously been open cut mining on the site which has been effectively managed geotechnically.

Other information/comments? (e.g. accuracy of information)

The studies for the mine have included assessment of the materials needed for tailings embankment construction, capping and revegetation and processing plant stockpile management.

A large body of information and analysis has been collated on the rock material that is immediately adjacent and beneath the proposed pits, over the last 30 years of SGM operations. Given the geology is the same, it is anticipated that the assumptions made with regards to preliminary pit design and waste rock (and soil) management will be verified in a project specific assessment and there will be no material change.

15. Social environments

Is the project likely to generate significant volumes of road traffic, during construction or operation?

NYD No Yes If yes, provide estimate of traffic volume(s) if practicable.

The Project will result in a reduction in traffic compared with what is currently generated from the operation of existing underground mine. Truck movements during the operation of the mine will be contained within the SGM site. Mobilisation and demobilisation of up to 17 mobile plant (including excavators, haul trucks and dozers) to the Project Area will be required at the beginning and conclusion of the Project.

Is there a potential for significant effects on the amenity of residents, due to emissions of dust or odours or changes in visual, noise or traffic conditions?

NYD No Yes If yes, briefly describe the nature of the changes in amenity conditions and the possible areas affected.

The Project activities will come within 100m of 51 dwellings and a business (Attachment E). Furthermore, Big Hill forms a natural lookout over the town of Stawell and is utilised by locals and tourists.

The estimated 4.5 year timeframe for the Project will assist with minimising potential amenity impacts. Similarly, as the Project will operate during 12 hour dayshifts, this will also minimise the potential for impacts. The progressive movement of the Project from north to south is expected to limit the time that any individual resident is affected by the Project.

However, the Project has the potential to temporarily affect the amenity of residents. The Project will be further developed to comply with the relevant legislation, policy and guidelines, thus avoiding and minimising the potential impact on residents.

Potential impact on amenity of residents	Comment
Traffic	There will be no disruption of access for residents to community resources. While access to Scenic Drive will be removed and Big Hill Road will be temporarily unavailable, this will not affect residential access.
Visual amenity	<p>Big Hill will be excavated, processed and backfilled as part of this Project. This will result in a temporary change in the landscape that will be visible from Stawell township and the surrounding local area for the estimated 4.5 year duration of the Project.</p> <p>During the Project, the visual impact will be minimised wherever possible, and progressive backfilling and rehabilitation works will be undertaken as the Big Hill landform is reinstated. Where required, a noise attenuation wall will be installed between Fisher Street and Main Street and the pit, with the purpose of visual amenity / screening, as well as noise reduction.</p> <p>Big Hill will be reinstated to its original topography and there will be no southern pit void at the conclusion of the Project. Therefore there will be no long term impact on visual amenity.</p>

Air quality	<p>There is the potential for particulates (dust) in the areas adjacent to the mine due to the mining excavation activities in close proximity to the residences on Fisher and Upper Main Street. The project will operate during 12 hour dayshifts, minimising the potential for impact on residents.</p> <p>The Project will be further developed to comply with the:</p> <ul style="list-style-type: none"> • Environment Protection Act 1970 • Protocol for Environmental Management – Mining and Extractive Industries • State Environment Protection Policy (Ambient Air Quality) 1999 • State Environmental Protection Policy (Air Quality Management) 2001. <p>Specific management and mitigation measures will be implemented through the Environmental Management Plan to avoid and/or minimise any impacts on residents.</p>
Noise	<p>There is the potential for noise emissions in the areas adjacent to the mine due to the mining excavation activities in close proximity to the residences on Fisher and Upper Main Street. The Project will operate during 12 hour dayshifts, minimising the potential for night-time impact on residents.</p> <p>As shown on Attachment B, a Noise Attenuation Barrier is proposed along the western and southern pit perimeter to reduce noise impacts from excavation and truck movements on nearby residents.</p> <p>The Project will be further developed to comply with the</p> <ul style="list-style-type: none"> • <i>Environment Protection Act 1970</i> • EPA Publication 1411 – Guidelines – Noise From Industry in Regional Victoria –Recommended Maximum Noise Levels from Commerce, Industry & Trade Premises in Regional Victoria (October 2011) • EPA Publication 1254 – Noise Control Guidelines (October 2008) • Department of Natural Resources & Environment (now Department of Primary Industries) Ground Vibration and Airblast Limits for Blasting in Mines and Quarries(2001) <p>Specific management and mitigation measures will be implemented through the Environmental Management Plan to avoid and/or minimise any impacts on residents.</p>
Blasting	<p>It is envisaged that blasting requirements will be limited to the deeper sections of the pit. Rock zones which may require blasting present at -80mRL to -95mRL. Blasting will be further developed to comply with Ground Vibration and Airblast Limits for Blasting in Mines and Quarries (2001) and Australian Standards AS2187.2-2006 “Explosives – Storage, Transport and Use”.</p> <p>Specific management and mitigation measures will be implemented through the Environmental Management Plan to avoid and/or minimise any impacts on residents.</p>
Light	<p>The Project will operate during 12 hour dayshifts. Therefore light spill at night is not expected to be an issue.</p> <p>Lux spill will be mapped by the light manufacturer during selection of lighting. Most of the lighting will be temporary mobile lighting and there is the ability to angle it away from sensitive areas.</p>
Access to Big Hill lookout	<p>The Big Hill area is currently open to the public for recreation. During the Project, while the public will not be able to access the site, SGM proposes to provide interpretation of the proposed open cut site and a viewing platform for the public. Following completion of the Project, the public will again have access.</p>

Is there a potential for exposure of a human community to health or safety hazards, due to emissions to air or water or noise or chemical hazards or associated transport?

NYD No Yes If yes, briefly describe the hazards and possible implications.

Wetlands and waterways

There are no wetlands or waterways in the vicinity of the pits, and no groundwater is anticipated to be encountered. There is no identified pathway by which the community could be exposed to hazards due to emissions to water.

Chemical hazards

There is limited chemical use associated with the mining operations, generally including diesel and oils associated with the use of mining equipment. The risk of spills during transportation or use on site will be managed through the Environmental Management Plan and associated emergency management protocols. The reduced amount of traffic, compared with current operations, means that there is expected to be a reduced risk.

There is potential for an increase in particulates (dust) and noise emissions in the areas adjacent to the mine due to the mining excavation activities in close proximity to the residences on Fisher and Upper Main Street.

Air quality and noise

The project will operate during 12 hour dayshifts, minimising the potential for night-time exposure to the residents. The project will be further developed to comply with relevant legislation, policy and guidelines (see above), including the *Environment Protection Act 1970*, *Public Health & Wellbeing Act 2008* and State Policies. Specific management and mitigation measures will be implemented through the Environmental Management Plan.

The previous EES considered the proposal's ability to comply with the air quality objectives and goals set out in the *State Environment Protection Policy (Air Quality) 1999*. In addition the assessment considered emissions of antimony and arsenic at the Department of Human Services' request. The assessments concluded that with stringent controls the proposed mine could be operated and achieve compliance with the air quality criteria. Controls proposed included surface treatment of all haul roads, the use of bag filters on drills, the extensive application of water for dust suppression, the use of mats or overburden material to suppress dust and eliminate flyrock from blasting operations and the use of real time dust monitoring to enable work practices to be restricted or relocated should there be a risk that acceptable standards for PM₁₀ will be exceeded.

The previous EES also considered the proposal's ability to comply with the *Interim Guidelines for Control of Noise from Industry in Country Victoria (N3/89)*. (Note that these guidelines were superseded by the *Noise from Industry in Regional Victoria guideline (EPA publication 1411)* in October 2011). Noise level limits were determined according to the *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) (SEPP N-1)*. The predictive noise assessment indicated that, with appropriate noise controls, it would be possible to develop and carry out mining work at the designated site in a manner complying with the appropriate noise limits.

The noise control features included a continuous noise barrier wall or earth berm (up to 7m high) strategically positioned around a major portion of the site perimeter and special additional noise controls added to major items of mobile plant. The additional features would include high performance exhaust silencing and noise control baffles and sound absorbing materials around engine enclosures.

The Minister's assessment of the previous EES accepted the conclusion of the Panel that control measures are available to ensure that relevant performance standards for air quality, noise and blast vibration could be achieved by the proposed Big Hill mining operations. Some loss of amenity to adjoining residents would still be involved, since mining operations on the overlooking hill would at least involve a significant visual impact and some increase in dust, noise and vibration. The Minister's concern related to establishing public confidence that the environmental control measures would be rigorously implemented.

Given that the mining activities for the current proposal involve similar equipment to the previous proposal, and that modern technology includes improved emissions control, it is expected that the project will comply with the relevant legislation, policy and guidelines. SGM is also committed to rigorously implementing its environmental control measures and to implementing a thorough and effective Stakeholder Engagement and Communications Plan, in order to maintain public confidence.

Geotechnical stability

Additional geotechnical investigations are planned for the Project. However, it is noted that there has previously been open cut mining on the site which has been effectively managed geotechnically. The appropriate factors of safety will be utilised to ensure that there are no unacceptable geotechnical risks to local residents.

Is there a potential for displacement of residences or severance of residential access to community resources due to the proposed development?

NYD No Yes If yes, briefly describe potential effects.

The residents of two properties located to the west of the proposed pit outline located on Main Street will be displaced by this Project. SGM is currently in discussions with these property owners.

Are non-residential land use activities likely to be displaced as a result of the project?

NYD No Yes If yes, briefly describe the likely effects.

Within the Project Area as shown in Attachment B, the following land use activities are proposed to be displaced:

- Crown land currently used as a public reserve including informal vehicle access is provided through the reserve.
- Reefs Road, Scenic Road and Big Hill Road (Big Hill Road will be reinstated at the Project conclusion).
- Pioneer Memorial, Quartz Reef Discovery Memorial, and Rotunda (will be reinstated at the Project conclusion).
- Telecommunications tower.
- DSE fire watch tower.
- GWM Water raw water storage facilities. SGM have entered discussions with GWM Water regarding water storage and supply requirements for both the duration of the Project and post mining activity.

Do any expected changes in non-residential land use activities have a potential to cause adverse effects on local residents/communities, social groups or industries?

NYD No Yes If yes, briefly describe the potential effects.

Is mitigation of potential social effects proposed?

NYD No Yes If yes, please briefly describe.

SGM is implementing an ongoing community consultation program. This consultation will help identify mitigation measures. Specific management and mitigation measures will be addressed through the Stakeholder Engagement and Communications Plan.

Other information/comments? (e.g. accuracy of information)**Community Project Benefits**

The Project will result in rehabilitation of the affected Project areas (including the 15ha comprising the North and South pits) at the completion of the Project. Of this, a substantial proportion of the land includes SGM active mine sites as well as rehabilitated mine sites currently located on public land. It is proposed that the rehabilitated open space could include a heritage walking trails which provides interpretation key mining sites and mining history. This Project will be developed in consultation with the community.

The Project proposes to fill all voids within the pit area and re-establish Big Hill topography which will significantly improve the status of the site in preparation for mine closure and handing the site back to the community.

The Project is committed to retention and protection of significant heritage sites and interpretation of historical features.

Cultural heritage

Have relevant Indigenous organisations been consulted on the occurrence of Aboriginal cultural heritage within the project area?

No If no, list any organisations that it is proposed to consult.

Yes If yes, list the organisations so far consulted.

As part of the 1999 EES investigations the Goolum-Goolum Aboriginal Cooperative was consulted. Aboriginal Affairs Victoria was also notified of the project.

Recent consultation with relevant Indigenous organisations has not been undertaken for the current proposal.

What investigations of cultural heritage in the project area have been done?

(attach details of method and results of any surveys for the project & describe their accuracy)

An archaeological and heritage impact assessment of the proposed project was undertaken for the former Big Hill Development Project in 1998 by R.G Gunn and A. Burns. The study area of the assessment covered the site of the current proposal and therefore can be utilised as background information for the current proposal. The study involved a review of previous surveys of the area, predictive modelling and an archaeological survey of the project area and surrounds.

The conclusion of the cultural heritage assessment from 1998/1999 was '*no evidence of Aboriginal use of the area was discovered. The lack of evidence is considered a consequence of mine developments over many years and the settlement of the town of Stawell.*' EES, Main Report page 5-43.

Is any Aboriginal cultural heritage known from the project area?

NYD No Yes If yes, briefly describe:

- Any sites listed on the AAV Site Register
- Sites or areas of sensitivity recorded in recent surveys from the project site or nearby
- Sites or areas of sensitivity identified by representatives of Indigenous organisations

No sites were identified through the 1999 investigations which covered the site area proposed for this Project.

Are there any cultural heritage places listed on the Heritage Register or the Archaeological Inventory under the *Heritage Act 1995* within the project area?

NYD No Yes If yes, please list.

Heritage Inventory Sites within the Project Area include:

- Stawell District Memorial (H7423-0057)
- Big Hill Mine Site (H7423-0058)
- Davis Open Cut (H7423-0059)

Big Hill is a cultural landscape that is characterised by its historical associations with gold mining, the supply of fresh water to the township, remembrance of the town's pioneers and the ongoing recreational activities of the community. Significant elements of the western portion of Big Hill comprise the hill itself, the Pioneer Memorial, all the remnants of the 1875-1881 water supply system, the Pioneer plantation, the Apex Arboretum and gates and the Quartz Reef Discovery monument.

Is mitigation of potential cultural heritage effects proposed?

NYD No Yes If yes, please briefly describe.

SGM proposes the following mitigation measures for cultural heritage sites affected by the proposal:

- Protection of heritage sites, where feasible;
- Recording and removal of memorial sites and reinstatement during decommissioning of the Project;
- Recording of heritage sites likely to be removed by the Project;
- Interpretation of the proposed open cut site during mining works; and

Protection and interpretation of significant cultural heritage sites not affected by the development proposal.

Other information/comments? (e.g. accuracy of information)

An archaeological and heritage impact assessment of the project was undertaken by R.G Gunn and A. Burns (1998) to inform the 1999 EES. The findings of this report have informed the assessment of cultural heritage impacts for this Project. Since the 1998 assessment, the *Aboriginal Heritage Act 2006* has come into force, and non-indigenous sites have been listed on the Victorian Heritage Register. As part of this Project the cultural heritage assessment will be revisited to address changes in legislation and to confirm site significance. The new study will utilise the survey work undertaken in the 1999 study. No substantial change in the assessment is anticipated.

16. Energy, wastes & greenhouse gas emissions

What are the main sources of energy that the project facility would consume/generate?

- Electricity network. If possible, estimate power requirement/output
- Natural gas network. If possible, estimate gas requirement/output
- Generated on-site. If possible, estimate power capacity/output
- Other. Please describe.

Please add any relevant additional information.

Energy requirements for the project would be;

Fuel	Estimated annual energy use	Estimated greenhouse gas emissions (tCO ₂ -e)
Diesel	1,500 kL	1,800
Total		

What are the main forms of waste that would be generated by the project facility?

- Wastewater. Describe briefly.
- Solid chemical wastes. Describe briefly.
- Excavated material. Describe briefly.
- Other. Describe briefly.

Please provide relevant further information, including proposed management of wastes.

Tailings will include wastewater, processed ore and chemical additives generated through the gold extraction process. Tailings will be retained in the approved tailings storage facility where wastewater will then be decanted and returned and reused in the process.

Excavated materials will include uneconomical overburden removed from the operational area and stored within approved stockpile areas. This material will then all be used to backfill the excavated pits.

General site waste includes solid inert and putrescible waste and is collected by a registered waste removal contractor and deposited into an appropriate regional waste repository.

What level of greenhouse gas emissions is expected to result directly from operation of the project facility?

- Less than 50,000 tonnes of CO₂ equivalent per annum
- Between 50,000 and 100,000 tonnes of CO₂ equivalent per annum
- Between 100,000 and 200,000 tonnes of CO₂ equivalent per annum
- More than 200,000 tonnes of CO₂ equivalent per annum

Please add any relevant additional information, including any identified mitigation options.

Based on the energy outlined in the previous section (electricity, natural gas, and diesel) the level of greenhouse gas emissions is estimated to be 1,800 tonnes of CO₂ equivalent per annum.

Additional emission will be assessed as the Project is refined and fleet operations are optimised.

17. Other environmental issues

Are there any other environmental issues arising from the proposed project?

No Yes If yes, briefly describe.

18. Environmental management

What measures are currently proposed to avoid, minimise or manage the main potential adverse environmental effects?(if not already described above)

Siting: Please describe briefly

Design: Please describe briefly

Project duration and operational hours

The Project has been designed to have a 4.5 year timeframe, rather than an 8 year time frame. In addition, operating hours are limited to 12 hour dayshifts. Both of these are in order to minimise community impacts.

Project siting

The footprint of the pits has been designed to avoid encroaching on residences and adjacent roads.

Noise Attenuation Barrier

As shown on Attachment B, a Noise Attenuation Barrier is proposed along the western and southern pit perimeter to reduce noise impacts from excavation and truck movements on nearby residents. The final location and design of the sound barrier will be determined on the outcome of detailed noise attenuation and visual amenities studies.

Blast Design

It is envisaged that blasting requirements will be limited to the deeper sections of the pitting activity as free dig and ripping techniques become restrictive to transitional zone rock types. The adjacent historic Davis Pit was free dig and rip as an example of achieving this intent with the majority of excavation in oxidised rock zones to approximately -60MRL. The proposed pits are approximately -90MRL deep with transitional rock zones which may require blasting presenting at -80mRL to -95mRL.

Mining Methodology

The two pits are proposed to be progressively backfilled to minimise the length of time of open pit exposure and associated impacts on the surrounding community. Using this methodology, North pit is proposed to have backfilling beginning in the second year of mining. This methodology will minimise residents' exposure to dust, noise and fly rock as well as long term re-establishment of Big Hill as a visual feature in the landscape.

Avoidance of Vegetation Removal

The site of the TWRS has been chosen to avoid the need for large areas of vegetation clearance. The site of the TWRS is a cleared, highly modified site that will have minimal, if any impact on vegetation. Haul roads for the Project have also been sited to avoid the need for vegetation removal where possible.

Siting of Ancillary Infrastructure

Haul roads have been sited to the north of the pits to minimise the impact of truck haulage noise and dust on residents located within the 100 metre buffer on Fisher Street and Albion Road.

The Project has also been designed to utilise existing plant equipment, amenities and road networks where possible to minimise additional works.

Environmental management: Please describe briefly.

An Environmental Management Plan (EMP) consistent with ISO 14001 will be developed for the Project which will provide a mechanism for recording the procedures, practices and documentation required to achieve an appropriate level of environmental management for this project.

The EMP will include management measures to manage:

- Dust deposition;
- Noise;
- Blast and vibration;
- Visual Amenity;
- Heritage Sites;
- Surface and groundwater;
- Waste;
- Pit slope stability;
- Erosion and Sediment control; and
- Flora and Fauna.

Other: Please describe briefly

19. Other activities

Are there any other activities in the vicinity of the proposed project that have a potential for cumulative effects?

NYD No Yes If yes, briefly describe.

20. Investigation program

Study program

Have any environmental studies not referred to above been conducted for the project?

No Yes If yes, please list here and attach if relevant.

Has a program for future environmental studies been developed?

No Yes If yes, briefly describe.

Risk Based Environmental Assessment Approach

SGM proposes to adopt a risk based approach to inform the environmental studies.

The risk assessment and management will be a continuous and iterative process within the Project. However a formal integration of the key project activities and risk assessment will occur once all the technical studies have been completed.

Assessment and management of the risk that the Project would pose to the wider environment (natural, social, economic) will be directly applied to understand the impacts and the project's potential for impacts (risks) to community assets and to communicate those impacts and risks to stakeholders.

The risk assessment will follow the RISQUE method, use best available information, involve a continuous improvement process and facilitate comparison of impacts and risk events on an even basis. The approach is consistent with the AS/NZ ISO 31000:2009 (Risk Management Standard).

The process will follow the semi-quantitative approach similar to the one applied to the Port Phillip Bay Channel Deepening Project. The environmental risk management process will:

- Identify environmental, social and economic impacts, and potential for impacts (risk)
- Analyse the risk
- Develop risk mitigation strategies
- Provide feedback to project design and on-going risk management
- Inform and guide development of the Project Environment Management Plan
- Enable the risk assessment outputs to help stakeholder assessment of impacts and risks.

These studies include:

- Air Quality;
- Noise;
- Blast Effects;
- Visual Impact;
- Update to the 1999 Heritage studies;
- Socio-Economics;
- Public Infrastructure;
- Traffic and Transport;
- Water Management;
- Hazard and Risk;
- Health Effects;
- Social Impact Assessment;
- Flora and Fauna – further survey work and Net Gain calculations;
- Land Use; and
- Greenhouse Gas Assessment.

An Environmental Management Plan would also be required to be prepared for the Project.

Consultation program

Has a consultation program conducted to date for the project?

No Yes If yes, outline the consultation activities and the stakeholder groups or organisations consulted.

Has a program for future consultation been developed?

NYD No Yes If yes, briefly describe.

A detailed Engagement and Communications Strategy has been developed as required under the *Mineral Resources Sustainable Development Act (1990)* and this Strategy accords with the DPI Community Engagement Guidelines for Mining and Mineral Exploration in Victoria (2008) and includes the following elements:

- Engagement and Communications Strategy:
 - Relevant stakeholders including agencies and approval authorities.
 - Level of engagement of each stakeholder.
 - The engagement tools appropriate for each stakeholder group.
 - Ongoing monitoring and update of the Strategy will be undertaken at key project milestones.

The Strategy is a live document that will be monitored and updated at key project milestones to ensure effective implementation.

Following completion of the Engagement and Communications Strategy, a number of other consultation activities are proposed including:

- Engagement activities
 - Community information centre or point of contact
 - Community Open Days/Public Displays in community venues during early information gathering/technical investigations and follow up Community Open Days/Public Displays once results are available to report on later in the year.
 - One-on-one interviews/discussions with residents surrounding the site.
 - One-on-one targeted meetings with key stakeholder representatives including approval agencies.
 - Employee consultation/meetings.
 - Response to written submissions/completed feedback forms including a Summary of Submissions Report.
- Communications activities

At key project milestones prepare:

- 'What is the Project About?' leaflet/handout
- Study Bulletins/Newsletters (electronic and printed)
- Q&As and agreed response lines to common queries
- Display material for Community Open Days/Information Sessions
- Feedback Form template
- Local newspaper advertising and articles when required
- Provision of information to Council for website and newsletters

Museum of Active Mine Site

SGM is committed to the development of an interpretive centre (in consultation with the community) post closure and a temporary viewing tower over the mine site during operation of the mine.

Authorised person for proponent:

I, ...Troy Cole.....(full name),

...Stawell Gold Mines, General Manager...(position), confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature  _____

Date: 23 January 2013

Person who prepared this referral:

I, ...Natasha Reifschneider.....(full name),

...URS, Senior Associate Environmental Planner...(position), confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature  _____

Date: 23 January 2013