Huntly Common

7 December 2020

The Hon Richard Wynne
Minister for Planning
Level 16, 8 Nicholson Street
East Melbourne VIC 3002

Dear Minister,

Re: EES Referral - Bendigo Creek Reclamation and Rehabilitation Project: Healing upside down country at Huntly

Every so often coincidence brings together commercial, community, cultural and environmental interests into perfect alignment. We believe our Project is one such occurrence of symbiosis.

The project aims to remove, process, and recycle some 4.0 million tonnes of historical mining tailings (sludge) which currently covers the surface of Huntly Streamside Reserve. Gold, mercury, and industrial sands will be recovered to fund operations and restore and rehabilitate the activity area over 4-6 years. Huntly Streamside Reserve will be restored to its original topography to return a more natural creek system, enrich the ecology, and increase biodiversity. Mining sludge will be removed from the activity area using conventional excavators and pumped to nearby private land for processing. The reclaimed area will be immediately and progressively rehabilitated. In contrast, the cost of doing nothing is significant – the soil is contaminated, the area is overrun by exotic and invasive species of flora and fauna, and the artificial creek continues to erode its banks and deepen channels, reducing access to water.

The shared benefits are many: ecology, environment, community, cultural heritage, local economy, jobs, flood mitigation, etc. It is potentially a case study onto the wider decontamination and restoration of the many environments also devastated by historical mining sludge across Victoria. It is fully supported by Dja Dja Wurrung (DDW) as it realises DDW vision to “Restore the Upside-Down Country”. It aligns with Bendigo City Council’s Reimagining Bendigo Creek Plan (June 2020) delivering substantially on its goals and objectives at no cost to the community or taxpayer.

To date, we have carried out extensive studies and assessments in Hydrology, Environmental Contamination, Ecology, Cultural Heritage and Mining/Reclamation Engineering. Furthermore, we have engaged all key agencies and authorities, including CoGB, DELWP, Parks Vic, Coliban Water, NCCMA, EPA, Road Vic, and DDW. We are buoyed by the positive reactions.

Whilst the project falls within the regulatory framework of mining, we feel the project is as much about environmental rehabilitation as it is a commercial venture. We expect the pathway to move the project forward will require an Environment Effects Statement (EES). We hope you too will share our view that this is also a restorative project to remove contaminants, recycle materials, restore country, ameliorate the environment, enrich the community, and support cultural values.

Yours Sincerely,

Bruno Campisi
Managing Director

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

# REFERRAL FORM

## PART 1 PROPONENT DETAILS, PROJECT DESCRIPTION & LOCATION

### 1. Information on proponent and person making Referral

| | |
|---|---|
| **Name of Proponent:** | **Huntly Common Pty Ltd** |
| **Authorised person for proponent:**<br>**Position:**<br>**Postal address:**<br>**Email address:**<br>**Phone number:**<br>**Facsimile number:** | Bruno Campisi<br>Director<br>Lvl 1, 55 Whitehorse Road, Balwyn 3103<br>bruno@huntlycommon.com.au<br>0411 114 731 |
| **Person who prepared Referral:**<br>**Position:**<br>**Organisation:**<br>**Postal address:**<br>**Email address:**<br>**Phone number:**<br>**Facsimile number:** | Lachlan Wilkinson<br>Principal Technical Advisor<br>JBS&G Australia Pty Ltd<br>2/155 Queen St, Melbourne 3000<br>lwilkinson@jbsg.com.au<br>0421 603 721 |
| **Available industry & environmental expertise:** (areas of 'in-house' expertise & consultancy firms engaged for project) | Huntly Common has been established specifically for this project. Directors of Huntly Common have previous experience in successfully processing of gold tailings material in the Bendigo region and gold mining in Australia and overseas.<br><br>Further information on Huntly Common can be found at www.huntlycommon.com.au.<br><br>JBS&G Australia Pty Ltd is assisting Huntly Common with environmental approvals. JBS&G has over 200 environmental professionals across Australia and 25 years of experience in managing environmental impact assessments and approvals for mining and other projects.<br><br>The following specialist environmental consultancy firms have been engaged to date:<br>- JBS&G – site contamination assessment<br>- Ecology Australia – ecological studies<br>- Australian Cultural Heritage Management – heritage studies and cultural heritage management plan<br>- Water Technology – hydrology studies |

## 2. Project – brief outline

| |
|---|
| **Project title: Bendigo Creek Reclamation and Rehabilitation Project: Healing upside down country at Huntly** |
| **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)<br><br>The project is located near Huntly, approximately 12 km north-east of Bendigo.<br><br>The project has two components:<br>- The reclamation area is within the Huntly Streamside Reserve, west of the township of Huntly. Some small areas of private land to the west of the reserve may also be included.<br>- The site for the processing area has not yet been finalised. Several sites on private land within two kilometres of the reserve are under active consideration.<br><br>The project location is shown in **Figure 1**. The area of investigation for the processing site is shown in **Figure 2**. The reclamation area, including the potential areas of private land to the west of the reserve, is shown in **Figure 3**. |
| **Short project description** (few sentences)**:**<br>Huntly Common proposes to remediate the Bendigo Creek within the Huntly Streamside Reserve by removing approximately 4 million tonnes of sludge material that has covered the natural ground surface and recovering gold, mercury and industrial sand. Following reclamation, Huntly Common proposes to restore the original topography and the ecological, cultural and hydrological values of the Bendigo Creek within the reserve.<br><br>The sludge material originates from historical upstream gold mining in the second half of the 19th century. The material will be reclaimed using a conventional excavator with initial processing on site to remove trash and the coarse sand component. The remaining material will be slurried to a processing area on adjoining private land and gold extracted through a Carbon in Pulp process.<br><br>Rehabilitation of the Huntly Streamside Reserve will be in accordance with a plan developed with the Dj Dja Wurrung. |

## 3. Project description

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

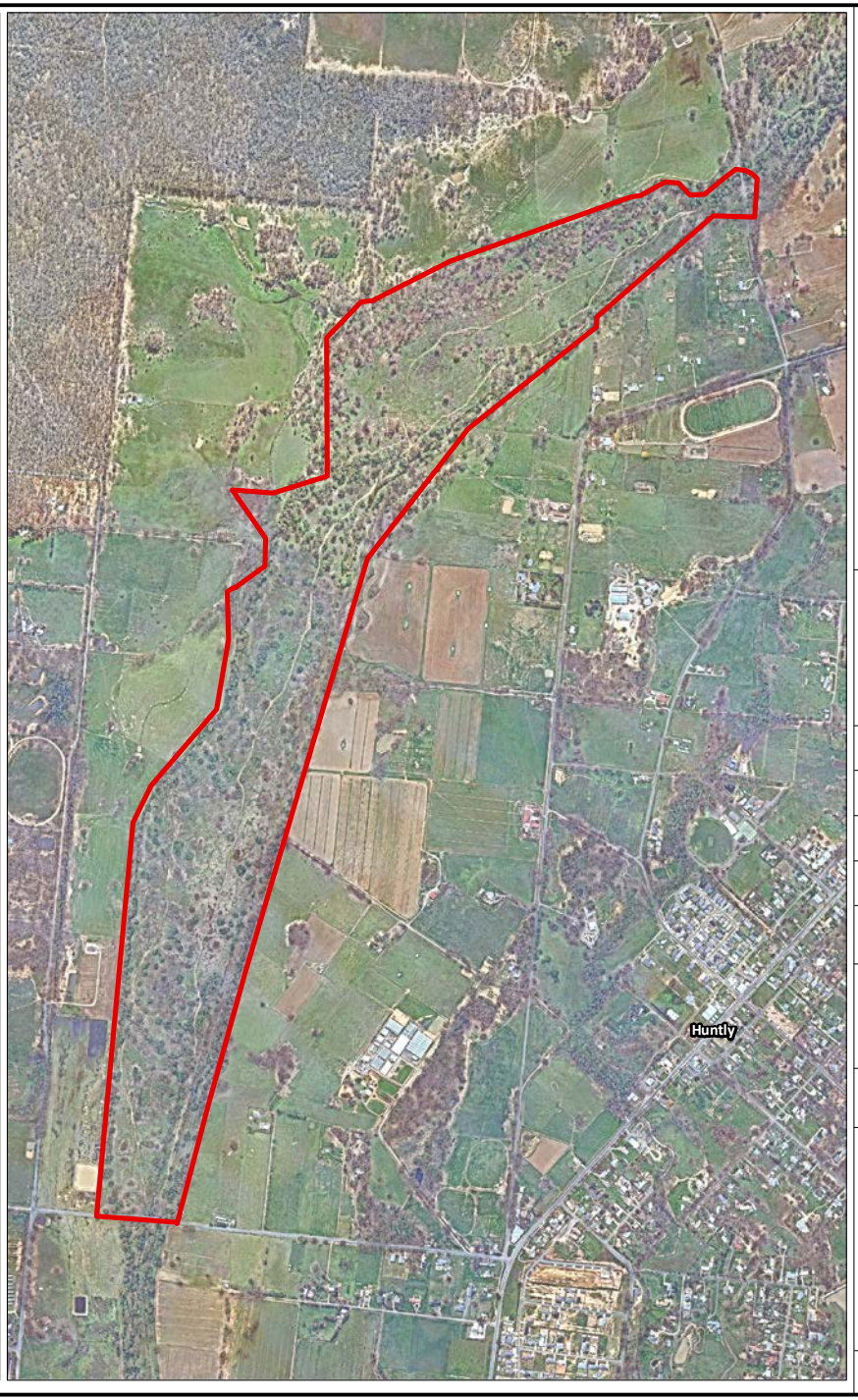
The aim of the project is to remediate, rehabilitate and regenerate the Huntly Streamside Reserve, restoring country and delivering positive environmental, ecological, commercial and community outcomes.

To achieve this aim, the objectives of the project are to:

- recover gold, mercury and industrial sand from approximately 4 million tonnes of sludge material that has covered the natural ground surface within the Huntly Streamside Reserve
- restore the original topography and water courses within the Huntly Streamside Reserve and rehabilitate the Bendigo creek and floodplain
- re-establish the ecological values of the reserve that have been diminished by clearing and grazing since European occupation
- improve flood management and reduce downstream flooding risk
- restore 'upside down country' and the cultural values held by the Dj Dja Wurrung people and reintroduce Aboriginal farming practices
- enhance recreational opportunities within the reserve
- provide local employment and commercial benefits
- make a positive contribution to implementing the 'Reimagining Bendigo Creek' plan.

Regarding the last point, the project is expected to contribute to the following Huntly precinct outcomes in Reimagining Bendigo Creek Plan (June 2020) and these will be incorporated into the rehabilitation plan:

- The cultural heritage significance of this part of the Creek to the Dja Dja Wurrung is respected and strengthened by supporting cultural practice and sharing stories, ceremony and culture through education programs, art and interpretive signs
- Walking and cycling access is improved to and within the Huntly Streamside Reserve, and its expansive area is used to create an immersive, enriching experience of nature, wildlife, water and Aboriginal cultural heritage
- The crucial ecological, cultural, educational and recreational functions of the Huntly Streamside Reserve are supported with appropriate joint-management and resourcing
- The management of vehicle access is improved
- Pest plants and animals are being effectively managed
- The Creek has a chain of ponds and riffles to support wildlife and increase amenity
- Biolinks / wildlife corridors between the Reserve and the Greater Bendigo National Park and Greater Bendigo Regional Park are protected.


**Legend:**

- Site Boundary
- Site Location

JBS&G

| | |
|---|---|
| Job No: 58207 | |
| Client: Huntly Common | |
| Version: Final_Rev0 | Date: 03-Dec-2020 |
| Drawn By: SW | Checked By: LW |
| Scale at A4 1:25,000 | |

0 400 800

metres

Coor. Sys. GDA 1994 MGA Zone 55

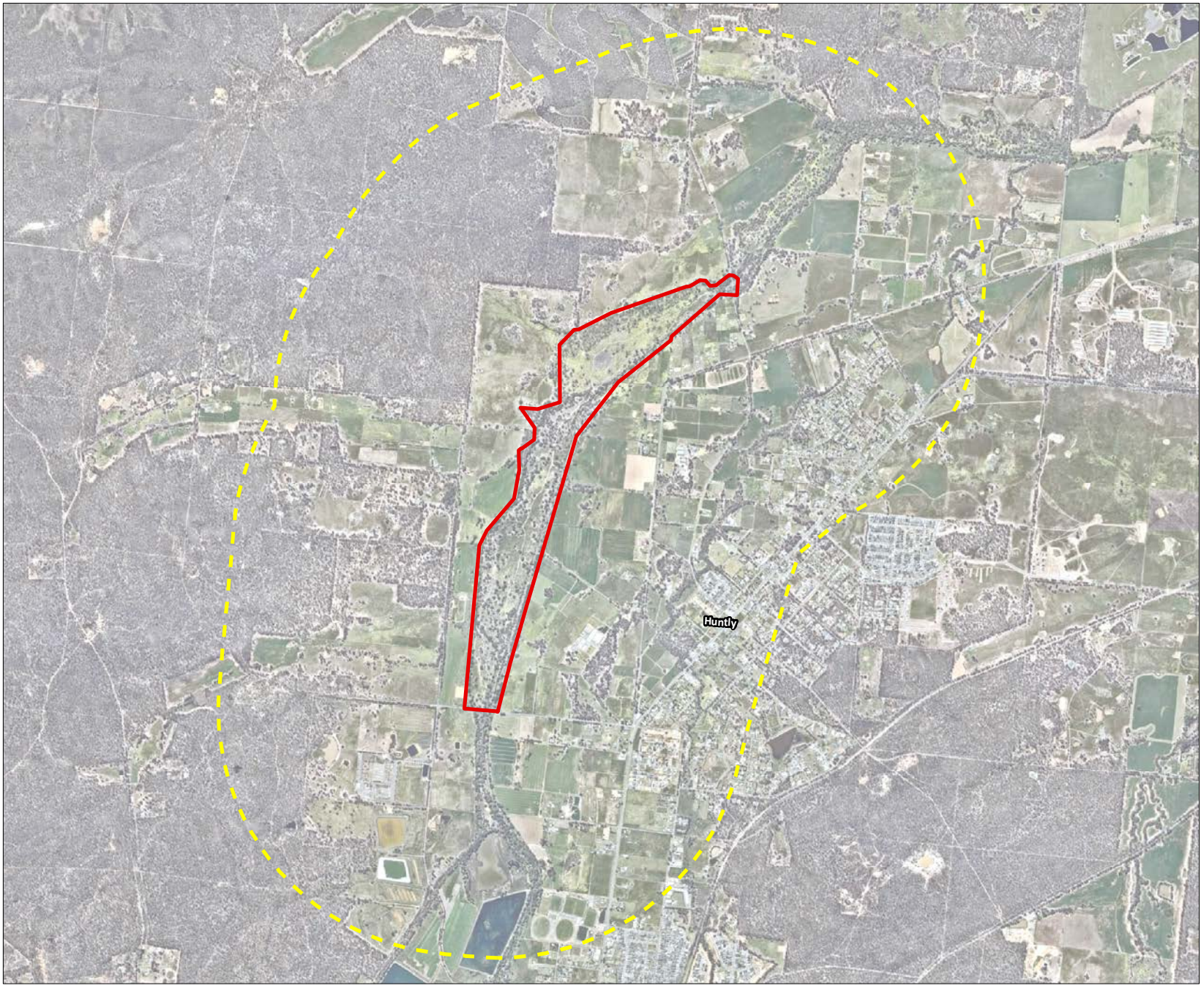
**Huntly Streamside Reserve, Leans Road**
**Huntly, Victoria**

**SITE LOCATION**

**FIGURE 1**

Document Path: V:\05 Projects\Huntly Common\58207 Huntly Work Plan - Bendigo Gold\8 - ArcGIS\01_MXD\05_EES_Referral\01_58207_Site_Location_Rev0_2020_12_03.mxd

Image Reference: www.nearmap.com© - Imagery Date: 6 May 2020 & Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community




**Legend:**

- Site Boundary
- Investigation Area for Processing Site

JBS&G

Job No: 58207

Client: Huntly Common

Version: Final_Rev0 | Date: 03-Dec-2020

Drawn By: SW | Checked By: LW

Scale at A4 1:45,000

0 1 2

Kilometers

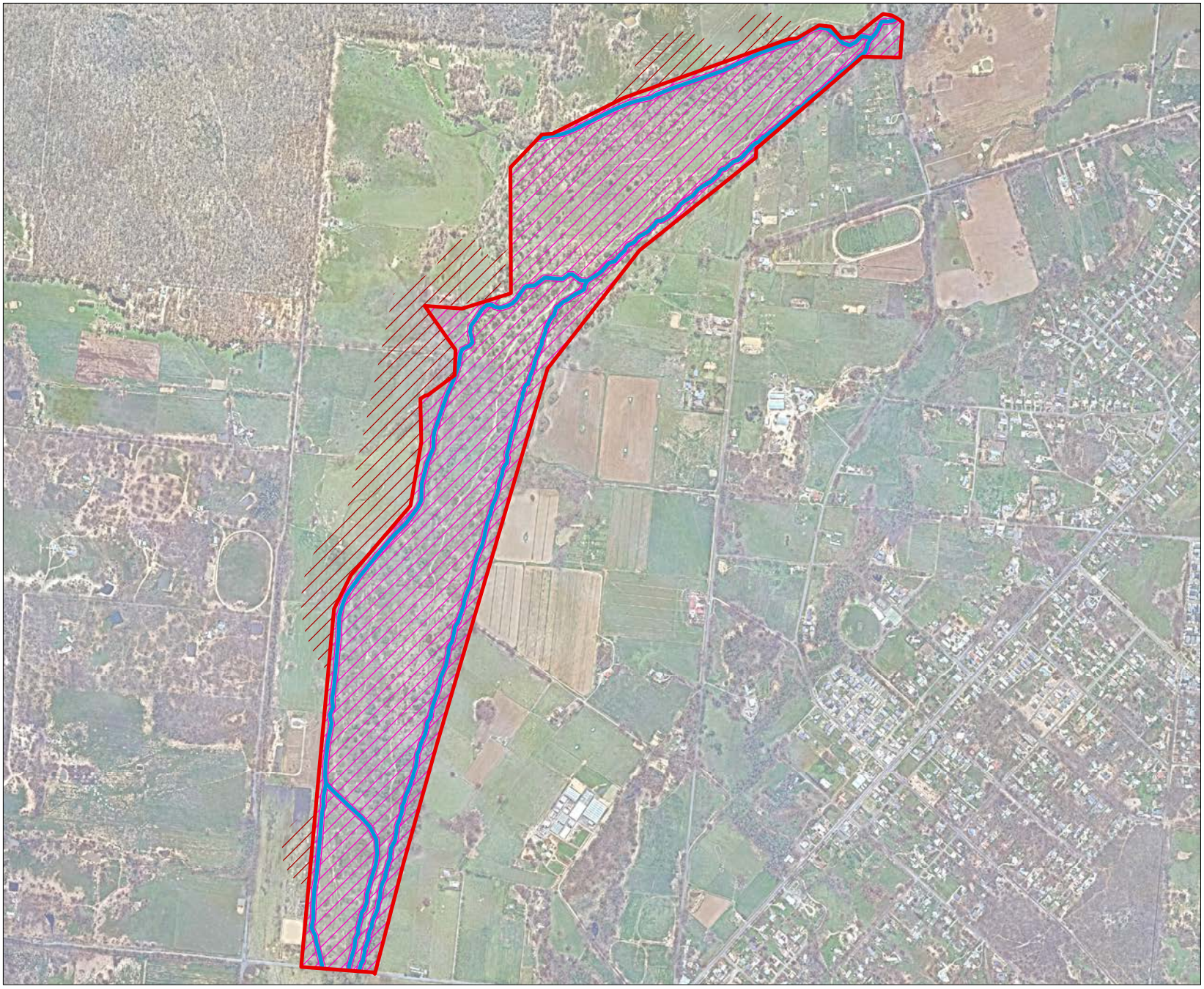
Coor. Sys. GDA 1994 MGA Zone 55

**Huntly Streamside Reserve, Leans Road**
**Huntly, Victoria**

**INVESTIGATION AREA FOR PROCESSING SITE**

**FIGURE 2**

Document Path: V:\05 Projects\Huntly Common\58207 Huntly Work Plan - Bendigo Gold\8 - ArcGIS\01_MXD\05_EES_Referral\02_58207_Processing_Investigation_Area_Rev0_2020_12_03.mxd
Image Reference: www.nearmap.com© - Imagery Date: 12 October 2020



**Legend:**

- Site Boundary
- Watercourse
- Tailings Reclaim Area (145 ha)
- Potential Future Reclaim Areas

JBS&G

Job No: 58207

Client: Huntly Common

| Version: Final_Rev0 | Date: 03-Dec-2020 |
|---|---|
| Drawn By: SW | Checked By: LW |

Scale at A4 1:20,500

0 250 500

metres

Coor. Sys. GDA 1994 MGA Zone 55

**Huntly Streamside Reserve, Leans Road**
**Huntly, Victoria**

**TAILINGS RECLAIM AREA**

**FIGURE 3**

Document Path: V:\05 Projects\Huntly Common\58207 Huntly Work Plan - Bendigo Gold\8 - ArcGIS\01_MXD\05_EES_Referral\03_58207_Reclaim_Area_Rev0_2020_12_03.mxd
Image Reference: www.nearmap.com© - Imagery Date: 6 May 2020

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

Lawrence and Davies (2014)[1] note that 'sludge' was 'the colloquial term used in the nineteenth century for the waterborne waste products of gold mining. Sludge was produced by all branches of gold mining because all mining techniques relied heavily on water in processing washdirt and ores, and all used water to carry away the unwanted sand, gravel and clay'. The sludge deposits within the Huntly Streamside Reserve originate from historical mining operations in and around the Bendigo Creek. A thematic environmental history prepared for the City of Greater Bendigo (Lovell Chen Architects & Heritage Consultants, 2013) notes the impact of these operations on soils:

> The alluvial gold mining on Bendigo Creek caused erosion. At the peak of puddling activity in the Sandhurst [now Bendigo] district in 1858, some 10,000 men and 5,000 horses worked 2,000 machines. Valleys were stripped to bedrock, their soils washed in puddlers and the unwanted residue flushed into watercourses. Complaints were received about the 'stream of mud' pouring from the machines into the gullies and creeks and onto the roads.

In 1858, a Royal Commission was appointed to 'enquire into the best method of removing the sludge from the gold fields' and reported in 1859. The Commission noted: 'Throughout the gold field the injurious consequences of choking up of the natural drainage channel, and of the want of a proper system for carrying off the sludge form the puddling mills, is everywhere apparent'. The Commission also observed impacts on agricultural land in the Huntly area and further downstream: 'in many instances, the sludge has spread over low creek banks, and ruined the most fertile portions of the farms bordering its course, rendering it necessary for the proprietors to raise dykes for the preservation of their crops'.

Drainage systems constructed over the decades following the Royal Commission report resulted in the deposition of a significant amount of the sludge material within the Huntly Streamside Reserve (**Plate 1**). Sludge deposition, creek channelling, vegetation clearance, grazing and weed invasion have all caused major damage to the reserve and resulted in an environment that is seriously degraded in comparison with its pre-European condition.

**Plate 1: Floodplain deposits (i.e. sludge) from historic mining**


The auriferous nature of the sludge was recognised in the Royal Commission report. The Commission tested the sludge and found the proportion of gold left was: 'more than equal to the yield obtained in many parts of the gold field from the puddling of old ground'. With foresight, the Commission noted:

[1] Lawrence, S. and Davies, P. (2014). The Sludge Question: The Regulation of Mine Tailings in Nineteenth-Century Victoria. *Environment and History* 20

> Although there is at present no machinery upon this gold field by means of which this auriferous silt could be worked or amalgamated so as to yield remunerative results, we entertain no doubt that at no distant time, the sandy deposit which will have to be removed by manual labour from the sludge channel, will, by the application of some cheap and expeditious process conducted on a large scale, become of considerable value and be made to contribute to some extent towards the expenses of maintenance of the channel.

In 1987, Bendigo Gold Associates Pty Ltd prepared an EES to recover approximately 800 kg of gold from the Huntly Streamside Reserve (Bendigo Gold Associates / Forsite Landscape Architects and Planners 1987). This proposal was similar to the one that is currently being proposed. Metallurgical work carried out for this project identified 3.8 million tonnes of in-situ material with an average gold concentration of 0.6 g/t.

The assessment by the Minister for Planning and Environment concluded the project should proceed subject to conditions covering matters such as 'roadworks, construction of the tailings dam, a detailed rehabilitation plan, protection of wildlife, the location of the sand stockpile, noise, the clearing of the central section of the mining site, a monitoring program and annual reporting by the company'. The Minister also concluded 'the proposal would be beneficial in removing mercury-contaminated material out of the floodplain and reducing the severity of frequent floods downstream of Huntly'.

The project did not proceed at that time. The 1987 project differed from the current project in several ways:

- The 1987 project did not seek to restore the natural landform and rehabilitate to the same extent – it retained watercourses and therefore did not address erosion problems with those watercourses. It also retained a buffer of vegetation along the watercourses.
- The processing plant was to be located in Brights Lane on an area that is now part of the Greater Bendigo National Park.
- The 1987 project did not require the approval of the Traditional Owners or a Cultural Heritage Management Plan. Planning for the current project is proceeding with the full involvement of the Dja Dja Wurrung.
- The 1987 project did not propose dry stacking of tailings
- The area in 1987 was regulated through a Tailings Licence. This is no longer available.
- There are substantial differences in environmental legislation, regulations and obligations between those that applied to the project in 1987 and those that currently apply.

Twenty Seventh Yeneb Pty Ltd was granted mining licences (MIN5512 and MIN5515) over the Huntly Streamside Reserve in November 2017. Drilling and metallurgical testing carried out in 2017 confirmed the results of the 1987 work. Following a decision in 2019 to commence the approval process for the current project, Huntly Common Pty Ltd was established to own and develop the project. Ownership of the two mining licences was transferred to Huntly Common in 2020.

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

As noted above, the project has two components:
- The reclamation area within the Huntly Streamside Reserve
- Processing on adjoining or nearby private land.

**Figure 4** provides an overview of the proposed operations. This is discussed in more detail below.

**Reclamation area activities (Huntly Streamside Reserve)**
The sludge material within the Huntly Streamside Reserve is approximately: 1/3 sand (>250 microns), 1/3 fine sand (106-250 microns), 1/3 silt and clay (<106 microns). This material will be reclaimed progressively across the reserve in a series of panels. A reclaim panel is expected to be 20m wide x 27m long. Reclamation will continue down to the natural ground surface (i.e. the ground surface that existed in 1850 prior to sludge deposition). The sludge layer is up to 3.5 m deep (average of approximately 1.7 m). The average volume of material to be excavated in each reclaim panel is 920 $m^3$. A maximum of three reclaim panels will be open at any one time.

Reclamation operations are designed to excavate 1 million tonnes of sludge material per year or 4 million tonnes over the proposed 4.5 year mine life. This corresponds to approximately two panels per day or 660 panels per year. The reclamation plant will operate 12 hours per day, 7 days per week with a design

availability of 95% at a rate of 160 tph.

The proposed sequence of reclamation activities is:

- Vegetation will be incrementally stripped as the reclaim faces advance and topsoil removed. Vegetation on the surface of the sludge, leaf litter and humus will be removed and used for rehabilitation or generating soil products. Vegetation that is growing directly in the natural surface (e.g. where the sludge layer has eroded) will remain.
- Conventional 20 tonne excavators will be used to remove the sludge layer and load the material directly onto a reclaim skid. No excavation will occur below the natural ground surface.
- The reclaim skid will consist of a hopper with trash screen and pulping tank. The skid will be positioned on sludge material adjacent to the reclaim panel (i.e. it will not be positioned on the restored natural surface). The sludge will initially be passed through the trash screen to remove organic and oversize material. It will then have water added in the pulping tank to form a slurry.
- The slurry will be fed to a cyclone separator located at each reclaim skid.
- The cyclone underflow i.e. sand (+250 microns) will be fed to a classifier, the underflow from which will form a finished washed sand product. This will then be dewatered and stockpiled on the Huntly Streamside Reserve using a radial stacker and sold over an extended period.
- The overflow from the cyclone i.e. fine sand, silt and clay will be pumped via a slurry transfer system to the off-site processing area. The slurry transfer system consists of three 125 mm polyethylene pipes: slurry pipe, slurry reserve pipe, and water return.

Once completed, panels will be progressively rehabilitated. The reclamation sequence is shown in **Figure 5**. **Figure 6** shows how reclamation and rehabilitation will occur sequentially.

As discussed below, sludge on some small areas of private land to the west of the reserve may also be reclaimed subject to agreement with landowners. This will be reclaimed in a similar manner to that described above.

**Processing activities (private land)**

Processing will use the carbon in pulp (CIP) extraction technique to recover gold. In summary, the sequence of processes is as follows (refer also to the flowsheet in **Figure 4**):

- Fine sand, silt and clay is slurried from the reclaim area to the processing area as described above.
- The slurry is dewatered and thickened before it feeds into the leach tanks
- The fine sand, silt and clay is leached by adding a low-toxicity leaching agent such as EarthGold (https://www.asias-connections.com/products/earthgold/), lime (for pH control) and caustic soda and the slurry agitated.
- The fine sand component is removed via counter-current cycloning and then dewatered and stacked at the processing site for sale
- Dissolved gold is adsorbed onto activated carbon
- Gold laden carbon particles are separated from the slurry
- Gold is reclaimed from the carbon by an elevated temperature leach comprising a heated solution of caustic soda and leaching agent
- Gold is electroplated onto steel wool
- The steel wool is smelted with sodium nitrate, borax and silica to produce a high-grade bullion
- Mercury is collected as a product in the gold room through a mercury retort
- Tails are filtered and dry-stacked in a tailings storage facility at the processing site.

The process treatment plant will operate 24 hours per day, 7 days per week at a rate of 80 tph to achieve an annualised throughput of 660,000 tonnes of fine sand, silt and clay and producing approximately 11,000 ounces of gold per year.

Tailings deposits have undergone metallurgical testing in three independent studies. In 1987, samples from 116 augur holes were collected over the full depth of tailings and checked by fire assays at two separate laboratories. In 2017, 24 samples were taken from across the site and similarly tested, and these samples were again tested in October 2020. The studies show the mean of weighted average grades to be about 0.625 g/t of gold.

**Waste streams**

Waste streams are shown in **Figure 7**. Huntly Common are aspiring to create a zero waste operation, to the extent practicable, with options being considered for reuse of all mine waste.

- Surface vegetation will be chipped, trucked to the processing site and combined with fine sand to manufacture soil products. Some material may be used in rehabilitation.

- Organic material within the sludge will be trucked to the processing site for use in manufacturing soil products
- Coarse sand (+250 microns) will be stockpiled at the reclaim site for sale to the construction industry
- Fine sand will be stockpiled at the processing site for sale to the construction industry and/or used in manufacturing soil products
- Silts and clays will be dry-stacked in the tailings facility. Reuse of this material may be difficult due to elevated levels of arsenic, but this will be further investigated.

The volume of material and waste streams at each stage of the process is shown in **Figure 7**. The expected moisture content for each waste stream is:

- Coarse sand: 10%
- Fine sand: 12%
- Silts and clays: 12%

There is a known market in the construction industry for the coarse sand. It is expected that the fine sand will also be readily saleable. If reuse of silts and clays is not possible, this material will remain in the tailings facility which will be capped and rehabilitated.

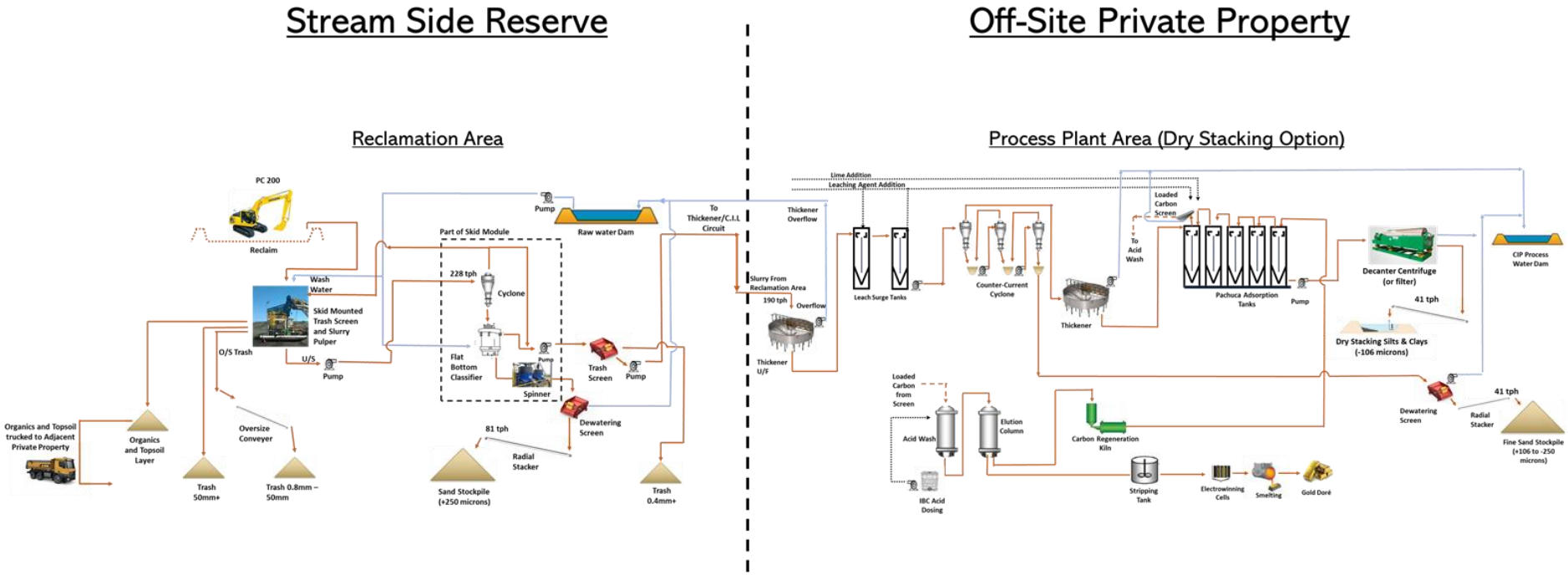



**Figure 4: Overview of reclamation and processing**

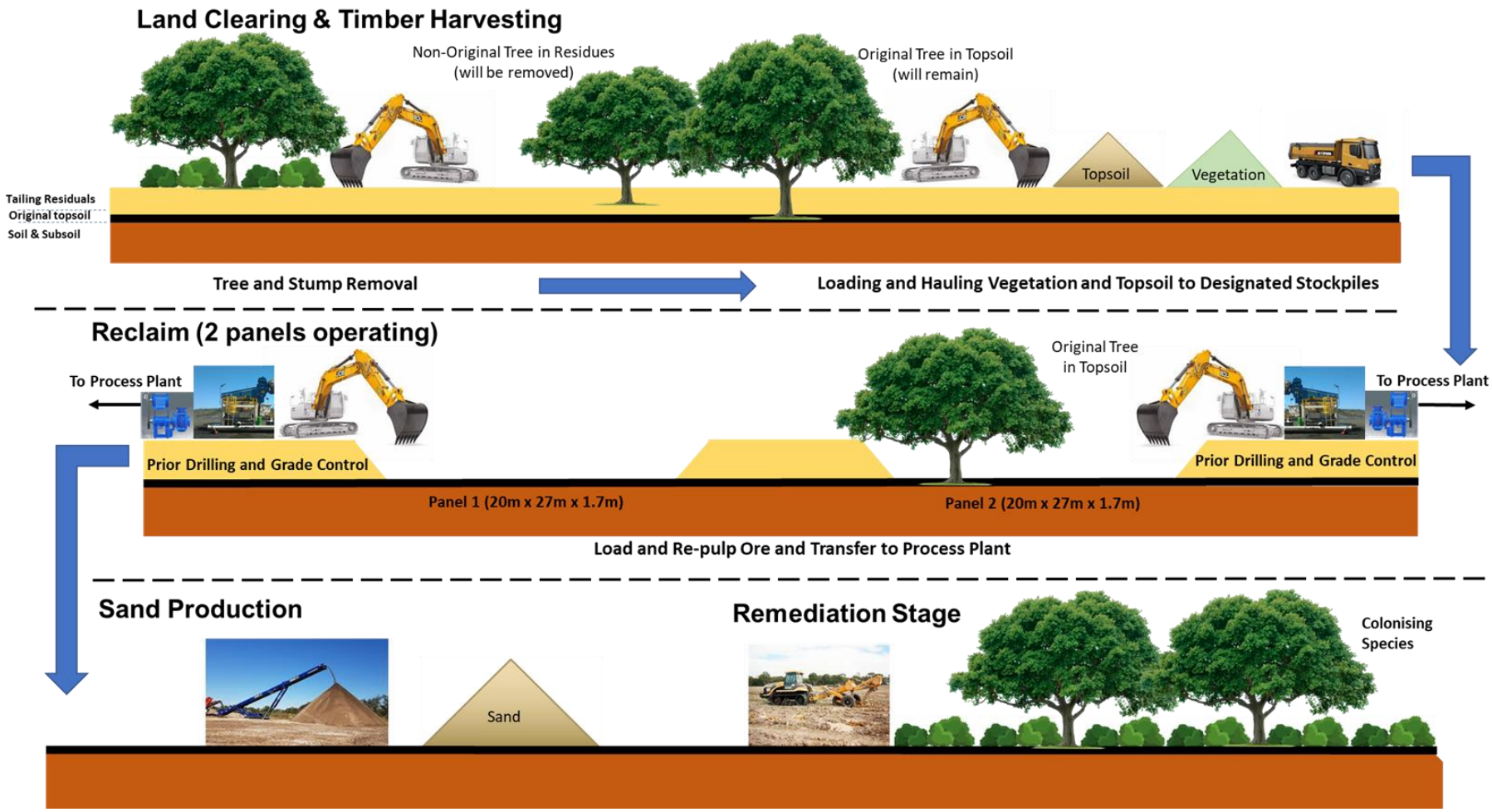



**Figure 5: Reclamation methodology**

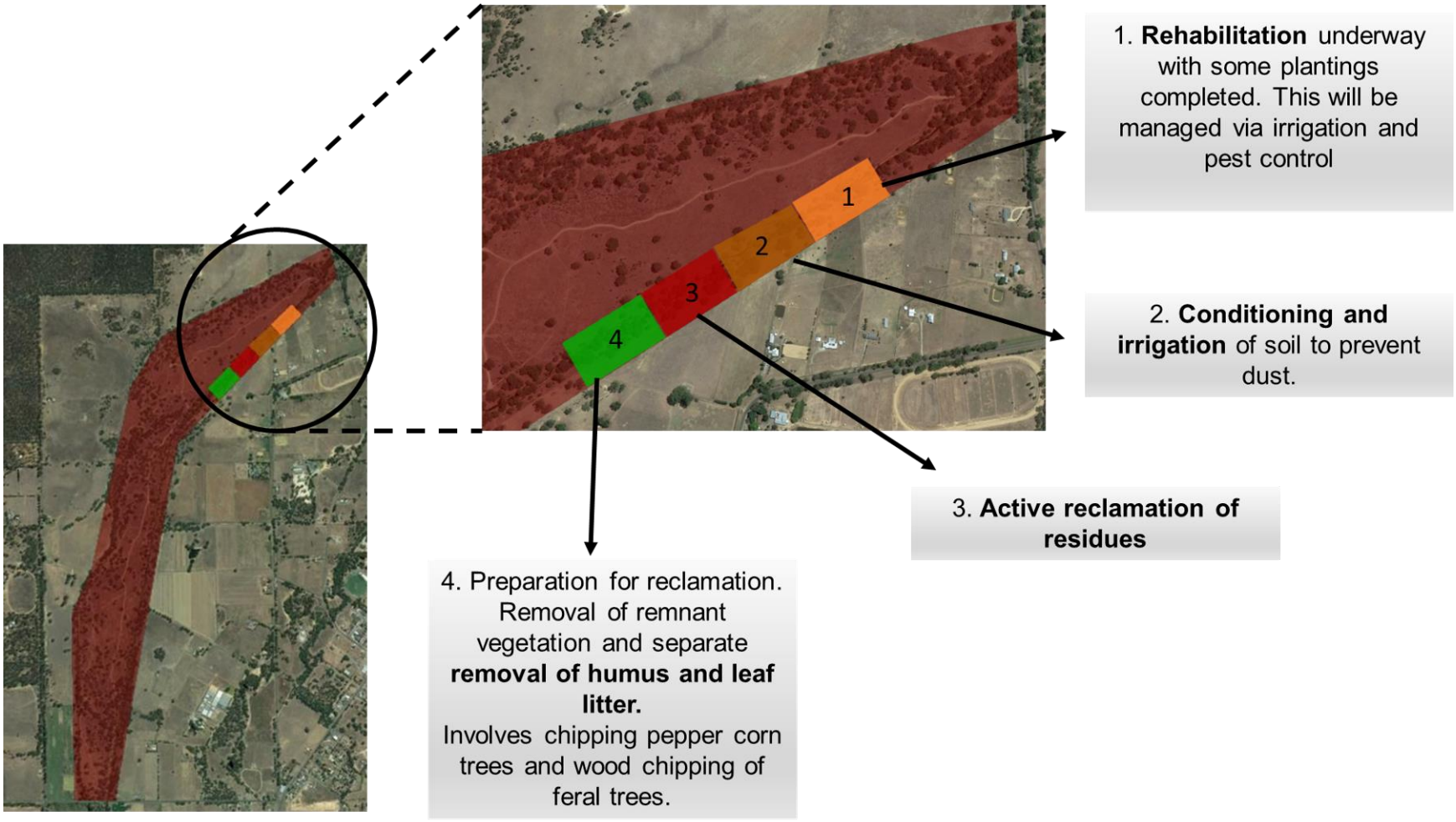



**Figure 6: Reclamation sequence**

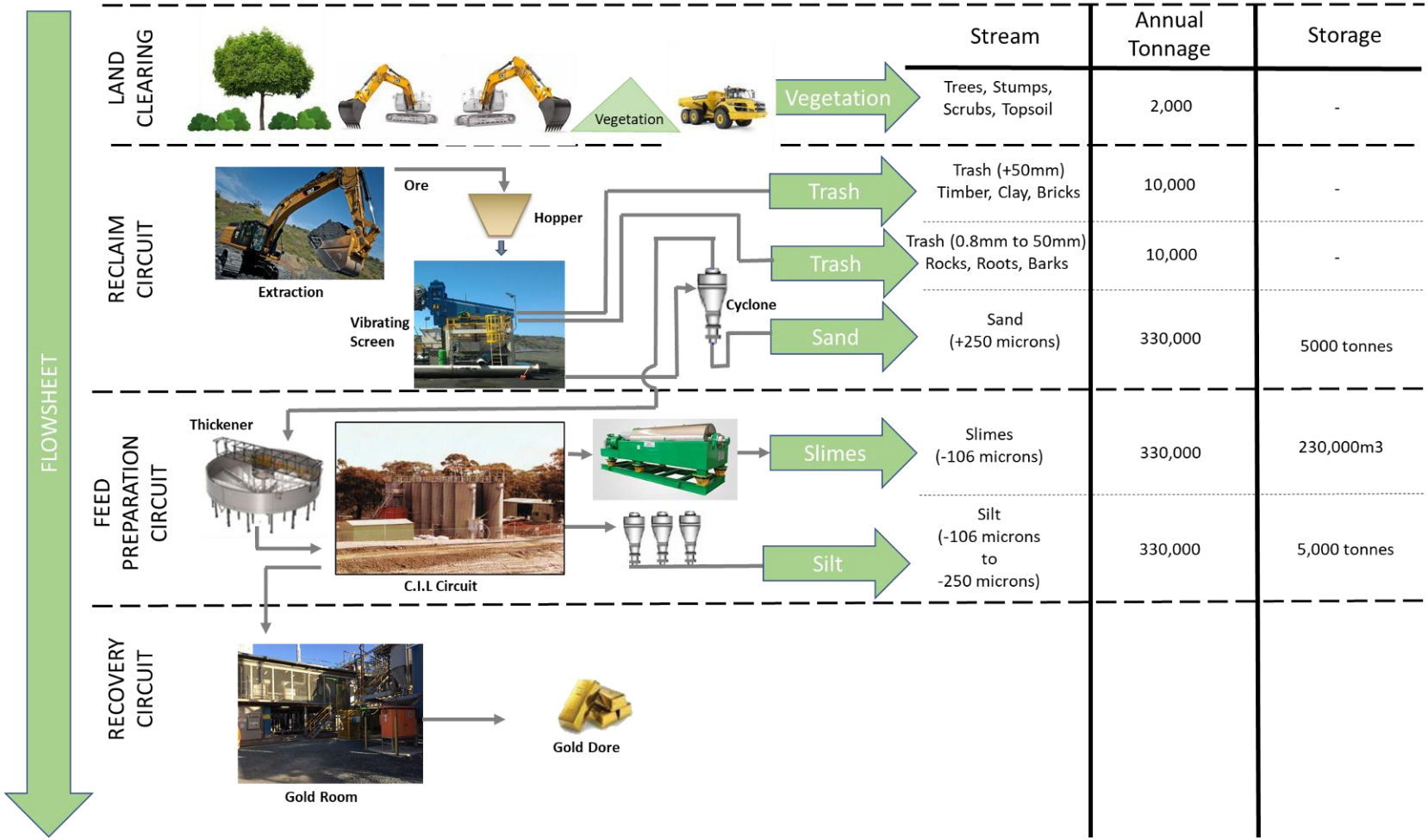



**Figure 7: Material and waste streams**

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

The significant items of non-processing infrastructure required for the project include:
- Gold recovery building
- Compressor building
- Laboratory
- Office
- Workshop
- Store
- Ablution block
- Lunchroom

The total power load required for reclaim and processing activities is approximately 500kW. Power will be supplied from grid power. A small diesel-powered generator will be provided for un-interruptible power supply, in case of grid power outages.

A raw water dam (on the reclamation area) and a process water dam (on the processing site) will be utilised to meet the water requirements of the project. The raw water will be circulated through the reclamation area and will be free of any contamination. The process water will be circulated through the process plant area and will also receive any overflow dewatering of tailings. Process water will not be discharged from the site.

Access to the site will be from Leans Road with a new access road constructed to the west of the eastern drain.

**Key construction activities:**
Construction activities at the reclamation area will include vegetation removal followed by removal of topsoil. Vegetation and topsoil will be trucked to the processing area for storage and reuse or sale.

Construction at the processing area will include construction of the processing and ancillary facilities, and the tailings storage facility.

**Key operational activities:**

Operational activities are described above.

**Key decommissioning activities** (if applicable):

A rehabilitation plan will be developed for the Huntly Streamside Reserve in conjunction with the Dja Dja Wurrung, City of Greater Bendigo, key agencies (Parks Victoria; Department of Environment, Land, Water and Planning; North Central Catchment Management Authority; Environment Protection Authority; Coliban Water; Goulburn Murray Water) and the Reimagining Bendigo Creek Steering Group. As noted above, the project is expected to contribute to the Huntly precinct outcomes in the Reimagining Bendigo Creek Plan (June 2020). This will be based on restoring and revegetating the Bendigo Creek and floodplain to its pre-European settlement state, to the extent practicable.

Rehabilitation objectives will be developed with the Dja Dja Wurrung and the above stakeholders. This will revise and expand on the project objectives noted above in section 3. Rehabilitation will occur progressively. Work on waterways will need to be sequenced so that:
- Flood flows through the reserve do not enter unrehabilitated reclamation areas during reclamation operations
- New waterways are established and stabilised before creek flow are diverted into them.

A proposed waterway design will be developed through the EES process.

Huntly Common intend to minimise disturbance to the natural ground surface once the sludge layer has been removed. It is possible that some areas may require deep ripping or other treatment to assist vegetation establishment due to soil compaction. Other minor earthworks could be required to establish the desired creek environmental and cultural values (chain of ponds and riffles). The intent is to develop a watercourse design that is stable, non-erosive and requires minimal maintenance. **Figure 8** shows the

chain of ponds concept. This is provided for illustrative purposes only and will be subject to change as further hydrological assessments are completed.

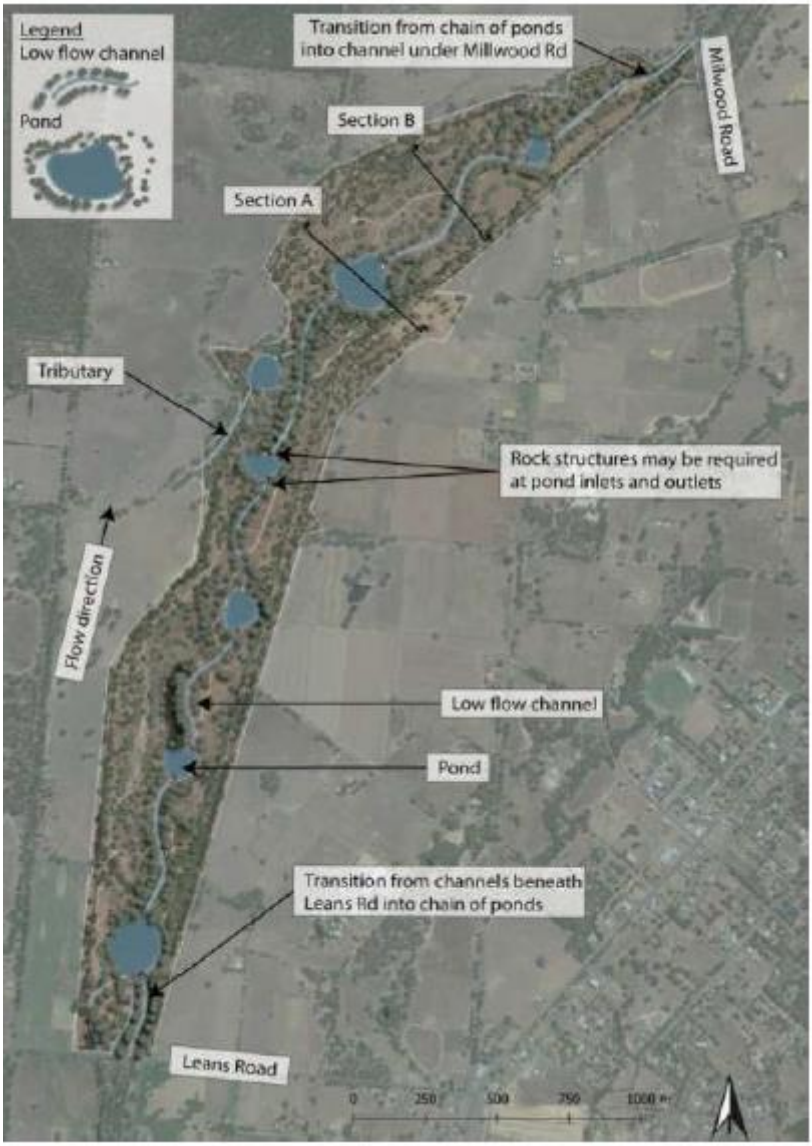



**Figure 8: Conceptual drawing of chain of ponds**

Rehabilitation on the reclamation area will occur progressively in stages as shown indicatively below. This will be refined through ecological restoration studies during the EES process. The initial focus will be on dust prevention before moving to ecological plantings once soil is sufficiently stabilised.

| **Stage/Months** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conditioning and irrigation of soil (1 month) | | | | | | | | | | | | |
| Establishment of initial vegetation cover to minimise dust (up to 3 months) | | | | | | | | | | | | |
| Ecological planting to mee ecological objectives (up to 6 months) | | | | | | | | | | | | |
| Ongoing | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| maintenance to ensure satisfactory vegetation establishment (up to 3 years) | | | | | | | | | | | | |
| Area undergoing rehabilitation (ha) | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 |

If reclamation occurs on private land adjoining the reserve, these areas will be rehabilitated and returned to agricultural use.

All equipment will be removed from the processing site. Roads and hardstand areas will be removed and rehabilitated and the areas returned to agricultural use (unless an alternative land use is agreed with stakeholders). Some facilities may be retained if requested by the relevant landowner and arrangements agreed with Huntly Common.

Huntly Common are investigating the option of ameliorating the dry stacked tailings, potentially using some of the sand and trash from the reclaim area, to produce a saleable topsoil. If this is viable, it will occur over an extended period following rehabilitation and result in no tailings remaining on the site. Otherwise, the tailings storage facility will remain as a landform and be covered to allow pasture to be re-established on the site.

**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).

The sludge layer extends onto private land to the west of the Huntly Streamside Reserve. Huntly Common has commenced discussions with those landowners with the intent to also reclaim that material and restore the natural surface. However, no agreements have yet been reached and Huntly Common has not undertaken any investigations in these areas to confirm sediment depth and viability. These areas are notionally shown on **Figure 3**. As they may proceed in the life of this project, they have been included in the scope of this referral.

Huntly Common holds an Exploration Licence over an area north of the Huntly Streamside Reserve (**Figure 9**). No investigations have been completed over this area and are unlikely to be completed during the preparation of the EES for the current project. Huntly Common is unable to determine at this stage whether a potentially viable project could result. As any discussion on reclamation activities within this area would be purely speculative, this has not been included in the scope of this referral.

Huntly Common's vision is that the project could become a model for remediation of other areas in the Bendigo Creek that have been devastated by mining sludge, where land restoration is funded by gold recovery.

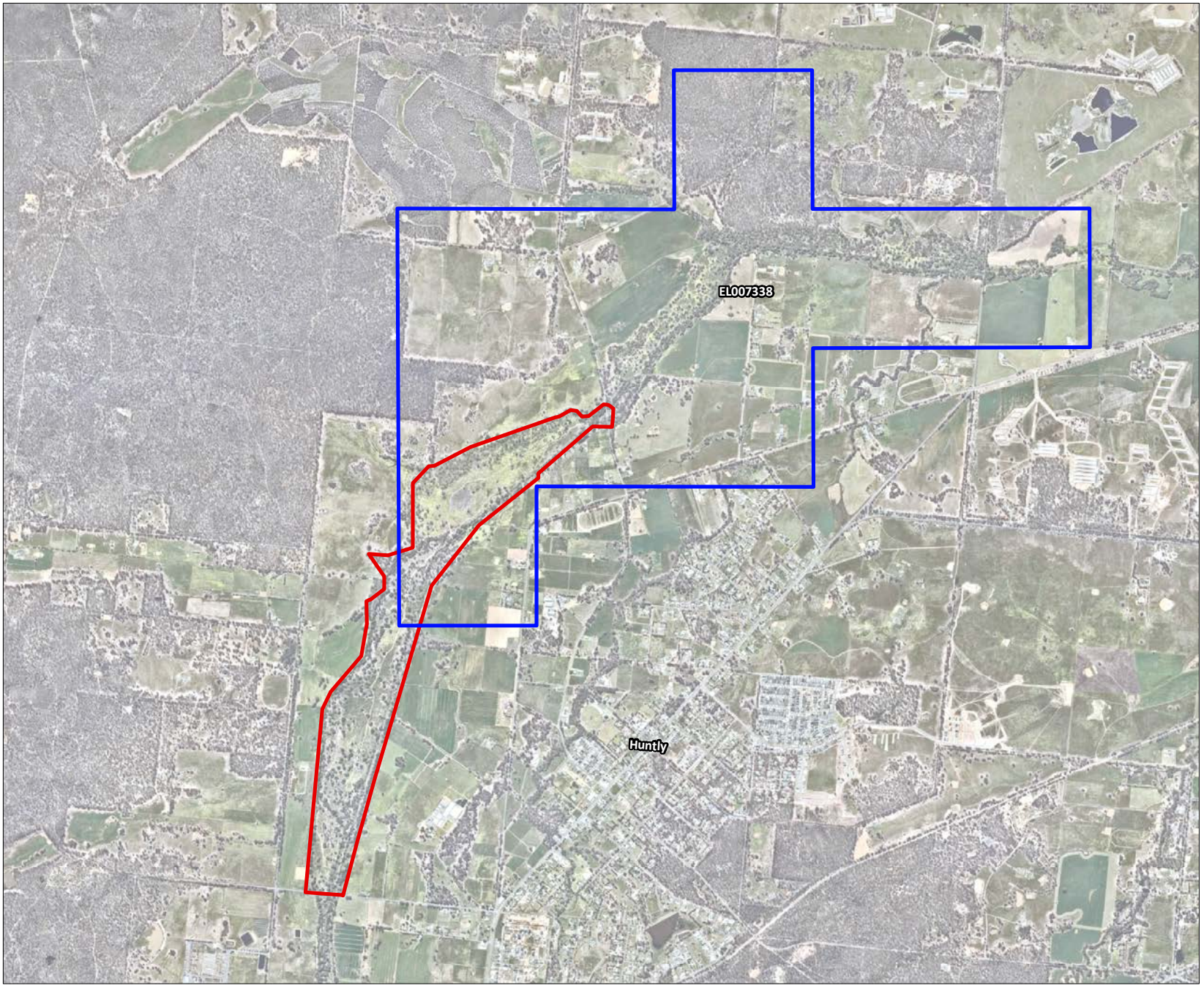
**Is the project related to any other past, current or mooted proposals in the region?**

☐ No ☒ Yes If yes, please identify related proposals.

A similar project for this site was assessed by EES in 1987. As noted above, the project did not proceed.

**What is the estimated capital expenditure for development of the project?**

$10 m




**Legend:**

- Site Boundary
- Exploration Licence Area (EL007338)

JBS&G

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| Job No: 58207 | |
| Client: Huntly Common | |
| Version: Final_Rev0 | Date: 03-Dec-2020 |
| Drawn By: SW | Checked By: LW |
| Scale at A4 1:40,000 | |

0 0.5 1
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**Huntly Streamside Reserve, Leans Road**
**Huntly, Victoria**

**EXPLORATION LICENCE AREA**

**FIGURE 9**

Document Path: V:\05 Projects\Huntly Common\58207 Huntly Work Plan - Bendigo Gold\8 - ArcGIS\01_MXD\05_EES_Referral\09_58207_Exploration_Licence_Area_Rev0_2020_12_03.mxd
Image Reference: www.nearmap.com© - Imagery Date: 12 October 2020

## 4. Project alternatives

**Brief description of key alternatives considered to date** (eg. locational, scale or design alternatives. If relevant, attach A4/A3 plans):

- On-site processing of the sludge material was rejected (other than trash and sand removal) as the site is subject to inundation.
- Slurrying of all of the sludge material to the processing area was rejected due to the additional water and energy use that would be required. The sand fraction contains minimal gold.
- Off-site processing at existing (third party) mining/processing sites was rejected due to the economics of trucking and rehandling and the traffic movements that would be generated.
- Thickening and storage of tailings in a tailings dam was rejected due to the potential for seepage, reduced capacity to reuse water, risk of dam wall failure and greater long-term management costs.
- Partial reclamation of the sludge within the Huntly Streamside Reserve (i.e. leaving some areas within the reserve undisturbed to minimise vegetation clearance and/or concentrate on the deeper sediments) was rejected as this would not meet the rehabilitation objectives to restore the floodplain and cultural values for the Dj Dja Wurrung.
- The 'do nothing' option was rejected as it would not reverse the current degradation of the reserve and repair upside down country in the foreseeable future. Current investment in restoration of the reserve is very limited and inadequate to achieve the aims of *Reimagining Bendigo Creek*. Investment from the project will allow restoration to occur within a decade. The do nothing option would also mean the loss of employment and other economic benefits from the project.
- The do nothing option would mean the Bendigo Creek within the reserve continues to erode. Davies et al in an article titled 'Mining modification of river systems: A case study from the Australian gold rush' (Geoarchaeology, December 2019), based on a case study in north-east Victoria, notes that the following problems exist with these channels:
    - Reduced flows to floodplains and wetlands
    - Changes to riverside vegetation
    - Steep banks are highly erodible; channel precludes formation of meanders or billabongs
    - Reduction of geomorphic diversity
    - Increased channel slope and hydraulic efficiency, conveys water more quickly
    - Removal of vegetation reduces resistance of channels to erosion
    - Decline of river substrates and deterioration of in-channel pools
    - Shortening stream length and stream bank complexity reduces availability and diversity of native habitat.
- These problems are evident in the Bendigo Creek within the reserve and are discussed further in section 13 and in the hydrology baseline report (**Attachment B**).

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

The following alternatives will be further investigated:

- Water supply options: These include use of water from the Bendigo Creek, sewer discharge or irrigation water from Coliban Water or extraction of groundwater
- Potential for producing soil or other products for sale using silt and clay waste from processing. This will reduce or remove the need for long-term storage of tailings material. Huntly Common has an aspirational aim for the reclamation and processing to be a zero-waste operation.
- Alternatives to the use of cyanide as a leach in processing.

## 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:**

Site investigations needed to inform the EES and approval processes are excluded from this project.

Huntly Common hold an Exploration Licence (EL007338) over areas to the north, south and east

of the northern section of the Huntly Streamside Reserve (**Figure 9**). Exploration activities under that licence are outside the scope of this referral. Such activities would be low-intensity and unlikely to have a significant impact on the environment.

## 6. Project implementation

**Implementing organisation** (ultimately responsible for project, ie. not contractor)**:**
Huntly Common Pty Ltd

**Implementation timeframe:**
Early 2022: Commence construction
Mid 2022: Commence reclamation operations and progressive rehabilitation
Mid 2026: Completion of reclamation
Late 2026: Rehabilitate processing site
It is expected that rehabilitation of reclaim areas will take around 2-4 years to achieve rehabilitation objectives. However, this will be confirmed through monitoring of rehabilitation on the initial reclaim panels.

**Proposed staging** (if applicable): Reclamation will proceed progressively along the Huntly Streamside Reserve as described above. No decision has been made yet as to whether to commence reclamation at Leans Road and proceed progressively to the north, or whether to commence at Millwood Road. This will be confirmed through further hydrological studies.

## 7. Description of proposed site or area of investigation

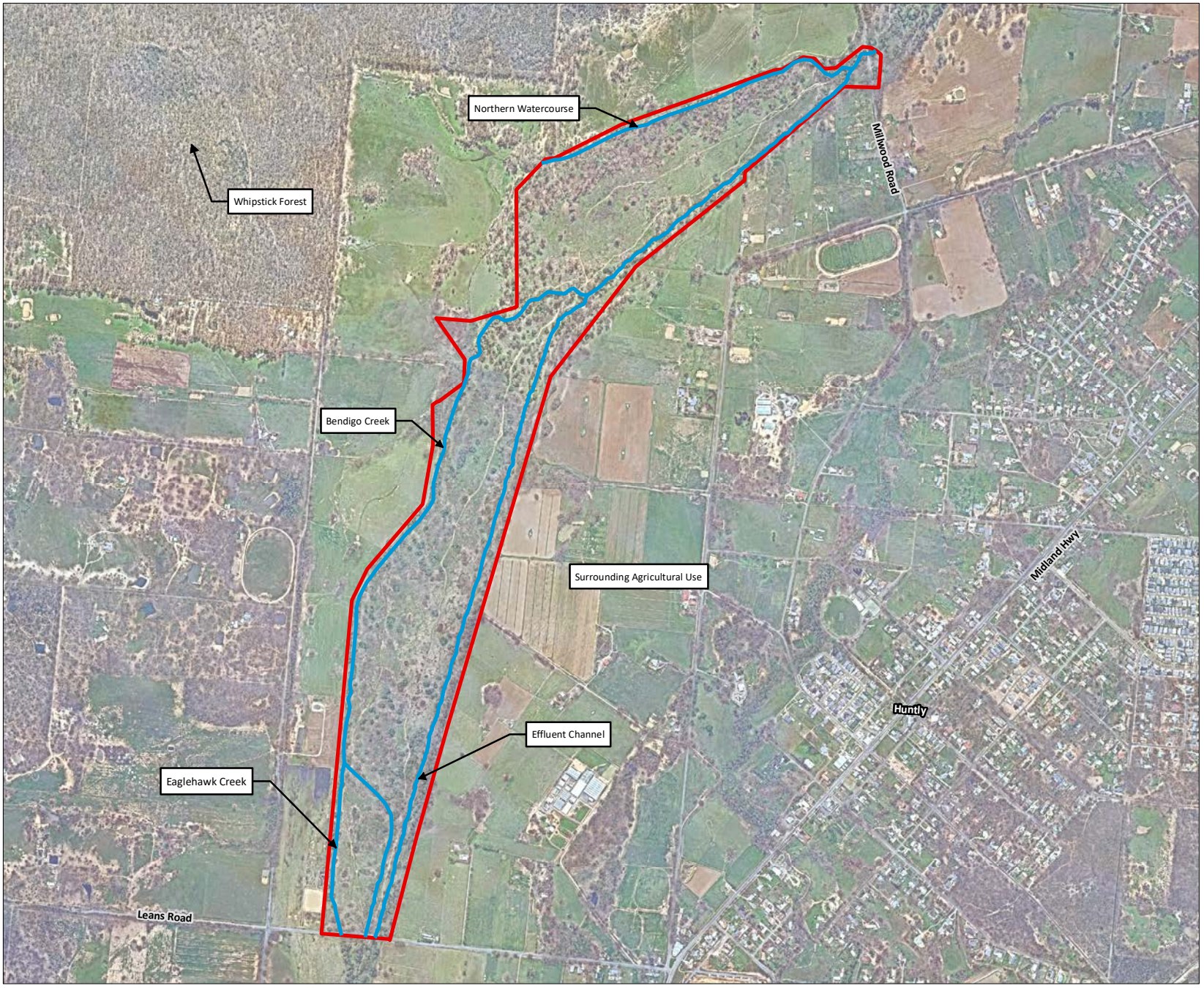
**Has a preferred site for the project been selected?**

☐ No ☒ Yes If no, please describe area for investigation.
If yes, please describe the preferred site in the next items (if practicable).

The preferred site and surrounding land uses are shown in **Figure 10**.

The reclamation area comprises the area under Mining Licence (MIN) 5515 and 5512 (Huntly Streamside Reserve).

The processing site has not yet been secured. Several parcels of land near Huntly Streamside Reserve are under active consideration and discussions are occurring with relevant landowners. The desired land area will be 30 – 40 hectares, located outside of the 1 in 100 flood level, a minimum 500 meters from houses, and within 2000 meters of the reclamation area. This will contain the plant, administration & mechanical building, water ponds, tailings dam. As the sludge material is pumped from the reclamation area, there needs to be a permissible line of travel for slurry pipes. The area under investigation for the site is shown in **Figure 2**.




**Legend:**

- Site Boundary
- Watercourse

JBS&G

Job No: 58207

Client: Huntly Common

| Version: Final_Rev0 | Date: 03-Dec-2020 |
|---|---|
| Drawn By: SW | Checked By: LW |

Scale at A4 1:22,000

0 400 800

metres

Coor. Sys. GDA 1994 MGA Zone 55

**Huntly Streamside Reserve, Leans Road**
**Huntly, Victoria**

**SITE FEATURES**

**FIGURE 10**

Document Path: V:\05 Projects\Huntly Common\58207 Huntly Work Plan - Bendigo Gold\8 - ArcGIS\01_MXD\05_EES_Referral\10_58207_Site_Features_Rev0_2020_12_03.mxd
Image Reference: www.nearmap.com© - Imagery Date: 6 May 2020

**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):

The site is an irregular elongated channel shape that extends from Leans Road to Millwood Road 4.2 km north east. It is approximately 1.2 km west of the township of Huntly and surrounded on all sides by agricultural land used for grazing purposes. There are no built structures on the site and it is mainly accessed from Leans Roads. Several unsealed and rough tracks traverse the site. **Figure 10** shows the site context and features.

The site landscape is considered flat with a gradual north-easterly slope that ranges in elevation between approximately 167 to 180 metres above Australian Height Datum (mAHD). The site is slightly elevated above the surrounding plain, especially to the east. There is minimal overall east to west topographical pattern as the site is relatively flat. A high levee has been constructed along the eastern margin of site to protect Huntly from inundation. A smaller levee bank is present on the western side of site.

The site is covered by a layer of sludge material comprised of coarse silty sand and very fine loose sandy silt. The natural material underlying the sludge is comprised of Quaternary aged non-marine sedimentary prior stream deposits and minor alluvium of the Shepparton Formation and consists of orange/red sandy silt with mottled clayey inclusions.

Three watercourses enter the Huntly Streamside Reserve at Leans Road. The primary Bendigo Creek channel is a straight, artificially constructed channel that has been positioned against the eastern edge of the reserve. The channel extends for approximately 4.2 km in length between Leans Road at the upstream extent and Millwood Road at the downstream end. This channel conveys low flows in Bendigo Creek.

A secondary channel enters the reserve on the western side of the primary Bendigo Creek channel. This channel runs parallel with, and approximately 40m from, the primary channel for approximately 500m downstream of Leans Road. The channel subsequently changes direction towards western side of the reserve where it enters the Eaglehawk Creek.

Eaglehawk Creek runs for approximately three kilometres along the western boundary of the reserve before entering the Bendigo Creek primary channel.

A small tributary stream, originating within the Greater Bendigo National Park, enters the reserve from the western side towards the downstream end of the reach. This tributary subsequently joins Bendigo Creek approximately 140 m upstream of Millwood Road.

There are no wetlands on the site but water may remain briefly in depressions on the site following flood events.

A flora and fauna assessment of the site (Ecology Australia 2020) found that, while there were a range of flora and fauna recorded onsite, the vegetation was considered degraded as large areas of the site have little remaining native understory and are dominated by exotic vegetation. A total of 109 vascular flora taxa were recorded to occur on the site. Of these 41 % were indigenous species and 59% were exotic species.

There are two main Ecological Vegetation Communities (EVCs) onsite, both of which are endangered. These are EVC 68 Creekline Grassy Woodland (101.7 ha with 577 large old trees) and EVC 175_61 Low Rises Grassy Woodland (4.1 ha with 25 large old trees). The large trees are mostly comprised of Red and Yellow Box with numerous large invasive Peppercorns. Many have established in the sludge material since it was deposited and some are up to 150 years old. Large portions of the site, typically the centre, do not contain any trees and support invasive groundcover comprised of Sharp Rush and exotic grasses such as Barely Grasses (*Hordeum spp.*), Great Brome and Barbed Oat.

There were some patches of indigenous groundcover that consisted of shrubs such as Lightwood (*Acacia implexa)*, Wallaby Grasses (*Rytidosperma spp.*) and Spear Grasses (*Austrostipa spp.*).

The site was found to support three main fauna habitats: woodland habitat, waterways and wetland habitats and exotic vegetation. A total of 49 fauna species were recorded onsite during the assessment. These comprised 41 species of birds (all native), three species of mammal (two introduced species), two species of reptile and two species of frog and one aquatic invertebrate. No threatened species were recorded during the site visit.

The environment within waterways on the reserve has been heavily modified since European settlement. The flora and fauna assessment noted that, despite these changes, the creeks provide some habitat for a range of fauna including fish, decapod crustaceans, reptiles, frogs and aquatic birds.

Potential processing sites are also flat to undulating. Huntly Common is seeking sites that are predominantly cleared farmland to minimise the need for any further vegetation clearance and are 30 – 40 hectares, located outside of the 1 in 100 flood level, a minimum 500 meters from houses, and within 2000 meters of the reclamation area. This will contain the plant, administration and mechanical building, water pond and the tailings storage facility. As the sludge material is pumped from the reclamation area, there needs to be a permissible line of travel for slurry pipes. The investigation area for the processing site is shown on **Figure 2**.

**Site area** (if known): The reclamation site is 168 ha. The processing site and tailings facility will require approximately 30 – 40 ha of land.

**Route length** (for linear infrastructure) ……. (km) **and width** …….. (m)

**Current land use and development:**

The current land use of the site is as a streamside reserve managed by Parks Victoria. The site provides a scenic landscape for recreational activities and is frequented by a local Landcare group that has undertaken planting onsite and established nesting boxes. The site is a popular local area used for bike riding, drone flying, four-wheel driving, horse riding and other general recreational purposes.

The potential processing sites currently under consideration are used for agricultural purposes.

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

Leans Road forms the southern boundary of site and Millwood Road is the northern boundary. The site is immediately surrounded on the east and west by private farmland. The site is entirely fenced and there are three access points from existing roads, two along Leans Road and one from Millwood Road. The infrastructure onsite comprises unsealed tracks and overhead powerlines. Initial subsurface desktop investigations indicate there are no subsurface infrastructure present on site.

The properties surrounding the site are mostly rural residences, including small farms and horse properties. The closest residence is within 200 m of the site boundary. Most of the structures along the edge of site boundary are sheds. The Greater Bendigo National Park is 600 m west of the site. The Coliban Water Treatment Facility is approximately 1 km south of Leans Road. Huntly is 1.2 km east of the site.

**Planning context** (eg. strategic planning, zoning & overlays, management plans):

The Huntly Streamside Reserve is in a Public Conservation and Resource Zone under the Greater Bendigo Planning Scheme. The purpose of this zone is:

- To implement the Municipal Planning Strategy and the Planning Policy Framework.
- To protect and conserve the natural environment and natural processes for their historic, scientific, landscape, habitat or cultural values.
- To provide facilities which assist in public education and interpretation of the natural environment with minimal degradation of the natural environment or natural processes.
- To provide for appropriate resource based uses.

The land is also covered by a Land Subject to Inundation Overlay. The purpose of this overlay is:

- To implement the Municipal Planning Strategy and the Planning Policy Framework.
- To identify land in a flood storage or flood fringe area affected by the 1 in 100 year flood or any other area determined by the floodplain management authority.
- To ensure that development maintains the free passage and temporary storage of floodwaters, minimises flood damage, is compatible with the flood hazard and local drainage conditions and will not cause any significant rise in flood level or flow velocity.
- To reflect any declaration under Division 4 of Part 10 of the Water Act, 1989 where a declaration has been made.
- To protect water quality in accordance with the provisions of relevant State Environment Protection Policies, particularly in accordance with Clauses 33 and 35 of the State Environment Protection Policy (Waters of Victoria).
- To ensure that development maintains or improves river and wetland health, waterway protection and flood plain health.

Mapping for the Land Subject to Inundation Overlay is based on the Bendigo Urban Flood Study, November 2013.

The watercourses on the Huntly Streamside Reserve and a buffer either side are also covered by an Environmental Significance Overlay, specifically Schedule 1 (Watercourse protection). The environmental objectives to be achieved in this overlay area are:

- To maintain the water quality.
- To contribute to the enhancement of water quality throughout the Murray -Darling Basin.
- To maintain the ability of streams and watercourses to carry natural flows.
- To prevent erosion of banks, streambeds and adjoining land and the siltation of watercourses,
- drains and other features.
- To protect and encourage the long term future of flora and fauna habitat in and along watercourses.
- To ensure development does not occur on land liable to flooding and minimise the potential for damage to human life, buildings and property caused by flood events.
- To prevent pollution, elevated nutrients and increased turbidity in natural watercourses.
- To prevent increased surface run-off or concentration of surface water run-off leading to erosion or siltation of watercourses.
- To conserve existing wildlife habitats close to natural watercourses and, where appropriate, to allow for generation and regeneration of habitats.
- To restrict the intensity of use and development of land and water to activities which are sensitive to environmental values and which are compatible with potential drainage or flooding hazards.

The processing area is expected to be within a Farming Zone. The purpose of this zone is:

- To implement the Municipal Planning Strategy and the Planning Policy Framework.
- To provide for the use of land for agriculture.
- To encourage the retention of productive agricultural land.
- To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture.
- To encourage the retention of employment and population to support rural communities.
- To encourage use and development of land based on comprehensive and sustainable land
- management practices and infrastructure provision.
- To provide for the use and development of land for the specific purposes identified in a schedule to this zone.

Under clause 52.08 (Earth and Energy Resources Industry) of the Greater Bendigo Planning Scheme, a permit is not required for mining if it complies with section 42(7) of the *Mineral Resources (Sustainable Development) Act 1990*, i.e:
(a) an Environment Effects Statement has been prepared under the *Environment Effects Act 1978* on the work proposed to be done under the licence; and
(b) an assessment of that Statement by the Minister administering the *Environment Effects Act 1978* has been submitted to the Minister.

If an EES is not required for the project, section 42(6) of the Mineral Resources (Sustainable Development) Act over-rides any prohibitions in the Greater Bendigo Planning Scheme and allows the project to proceed subject to the grant of a permit.

**Local government area(s):**
Greater Bendigo City Council

## 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)**:**

Despite the presence of the sludge layer, hundreds of large trees and other vegetation have established on the site supporting a range of introduced and invasive fauna. The open and flat character of the site with surface water features and established vegetation has contributed to it having scenic and recreational value to the public.

As indicated by the LSIO overlay, the site is subject to inundation and flooding, A levee bank has been constructed on the eastern edge of the site to protect the Huntly township from flooding. Extensive areas to the west of the site are also prone to flooding.

The processing site is likely to be on cleared farmland.

## 9. Land availability and control

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

☐ No ☒ Yes If yes, please provide details.

The area comprises the following Crown parcels:
19A, Section 20, Parcel P127194, Parish of Huntly
8A, Section 17, Parcel P127192, Parish of Huntly
4F, Section 17, Parcel P127190, Parish of Huntly
10B, Section 14, Parcel P127189, Parish of Huntly
2G, Section 16, Parcel P127188, Parish of Huntly.

**Current land tenure** (provide plan, if practicable):

The project area is public land managed by Parks Victoria as a Streamside Reserve (Huntly Streamside Reserve) in accordance with recommendations of Victorian Environmental Council Box-Ironbark Forests & Woodlands Investigation 2001 (recommendation H4). This recommended that all existing streamside areas be used:

a) in accordance with the general recommendations for natural features reserves
b) to provide opportunities for more intensive recreation such as camping at the discretion of the land manager if this does not conflict with the maintenance of the water quality in the adjacent stream.

The general recommendations for natural features reserves are that they, according to their specific characteristics, be used to:

a) protect natural features and values
b) provide opportunities for:

(i) education and passive recreation such as picnicking, walking and where relevant, fishing,
(ii) more intensive recreation such as camping where specified.

c) conserve indigenous flora and fauna
d) protect areas with remnant vegetation or habitat value
e) provide protection for historic and Aboriginal cultural values and sites
f) preserve features of geological or geomorphological interest
g) maintain scenic features and the character and quality of the local landscape
h) commercial timber harvesting not be permitted
i) some firewood may be available from thinning for ecological management, subject to research and the approval of the land manager
j) exploration for minerals be permitted, and mining, subject to decisions on particular cases
k) prospecting and apiculture be generally permitted
l) grazing generally not be permitted, unless required for short periods by the land manager
m) unused road reserves adjoining natural features reserves be added to those reserves where appropriate
n) they be permanently reserved under the *Crown Land (Reserves) Act 1978,* and managed by the Department of Natural Resources and Environment.

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

No change is proposed to land tenure of the Huntly Streamside Reserve or the private land to be acquired for processing.

**Other interests in affected land** (eg. easements, native title claims):

The Dja Dja Wurrung are the Traditional Owners of the Huntly Streamside Reserve and broader region. Under the Recognition and Settlement Agreement (2013) between the Dja Dja Wurrung people and the State of Victoria, the Dja Dja Wurrung agreed to withdraw all Native Title claims in the Federal Court and both parties recognised this to be a full and final settlement on this matter. The Recognition Statement recognised the Dja Dja Wurrung as the Traditional Owners of Central Victoria.

The Dja Dja Wurrung Clans Aboriginal Corporation is the Traditional Owner entity.

The reclamation area is bisected by three unused road reserves.

## 10. Required approvals

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

- Approval of a mine work plan under the *Mineral Resources (Sustainable Development) Act 1990* (expected to cover both the reclaim area and the processing/tailings site)
- Consent from the Crown land Minister under section 44(1) of the *Mineral Resources (Sustainable Development) Act 1990* to do work on restricted Crown land
- Approval of a planning permit under the *Planning and Environment Act 1987*, if an EES is not required
- A licence will be required to take water – details will depend on selection of water source(s)
- Permit from North Central Catchment Management Authority for works on designated waterways
- Approval of a cultural heritage management plan by the Dja Dja Wurrung (under assessment)
- Permit under the *Flora and Fauna Guarantee Act 1988* to take listed species and/or vegetation communities
- The need for referral under the *Environment Protection and Biodiversity Conservation Act 1999* is still being assessed

Approval requirements will be confirmed during the assessment process.

**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):
The proposal was discussed at a meeting coordinated by the Bendigo City Council on 20 October 2020. Attendees included Bendigo City Council, DELWP, EPA, Parks Victoria, North Central CMA, Earth Resources Regulation, Coliban Water, VicRoads and the Dja Dja Wurrung Clans Aboriginal Corporation.

**Other agencies consulted:**
In addition to the meeting above, several meetings have been held with the Dja Dja Wurrung Clans Aboriginal Corporation.

## 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 project seeks to restore the Bendigo Creek to its natural alignment and rehabilitate the adjoining floodplain. The project will have significant potential environmental benefits through:

- Enhancing Dja Dja Wurrung cultural values within the Huntly Streamside Reserve
- Reducing flood risk to surrounding land including the Huntly Township and downstream from the site
- Enhancing biodiversity values in the long-term through restoration of the site and control of pest plants and animals
- Providing enhanced recreation and education opportunities within the Huntly Streamside Reserve
- Removing contaminated sludge material from the Huntly Streamside Reserve.

The project will, however, require clearance of approximately 100 ha of native vegetation including vegetation in two ecological vegetation classes (EVC 68 Creekline Grassy Woodland and EVC 175_61 Low Rises Grassy Woodland) identified as endangered by DELWP. Consequently, it meets the referral criteria in the *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978*. The final clearance area will depend on the extent of waterway alteration that will be required, which will be subject to further hydrological studies. The project area provides habitat for 22 significant fauna species including:

- Four listed as threatened under the Environment Protection and Biodiversity Conservation Act (EPBC Act)
- Ten listed under the Flora and Fauna Guarantee Act (FFG Act)
- Seven listed under the Victorian Threatened Species Advisory Lists
- One listed under the Migratory and Marine Overfly schedules of the EPBC Act.

The flora and fauna assessment did not identify any ecological communities listed under the EPBC Act or FFG Act.

There are 51 residential receptors within 1 km of the boundary (and six within 250 m). Consequently, the project has the potential to cause noise and nuisance dust impacts for surrounding residents. Traffic generated by the project could also cause amenity impacts.

While the project will alleviate flooding on adjoining land, if not well-designed, there is potential for the project to exacerbate flooding in some areas.

Impacts on groundwater are expected to be minor but require further investigation.

The project will result in a major transformation of the Huntly Streamside Reserve. While this will be positive in the medium and long term, it will reduce the amenity of the area for users in the short-term.

## 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.

**What investigation of native vegetation in the project area has been done?** (briefly describe)
Ecology Australia has completed a desktop and field study (see **Attachment A**)

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

☐ NYD Estimated area …100 (hectares)

**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.
EVC 68 Creekline Grassy Woodland and EVC 175_61 Low Rises Grassy Woodland

**Have potential vegetation offsets been identified as yet?**

☒ NYD ☐ Yes If yes, please briefly describe.

**Other information/comments?** (eg. accuracy of information)
The proposed area of clearance is shown in **Figure 3**.

An initial offsets scenario indicates clearance would generate offsets for 388 large trees and the following species offsets:
55.614 species units of habitat for Bush Stone-curlew, *Burhinus grallarius*
38.426 species units of habitat for Superb Parrot, *Polytelis swainsonii*
51.604 species units of habitat for Swift Parrot, *Lathamus discolor*
53.352 species units of habitat for Grey-crowned Babbler, *Pomatostomus temporalis temporalis*
55.700 species units of habitat for Squirrel Glider, *Petaurus norfolcensis*
53.377 species units of habitat for Southern Pygmy Perch (Murray-Darling lineage), *Nannoperca australis* (Murray-Darling lineage)
50.900 species units of habitat for Ausfeld's Wattle, *Acacia ausfeldii*
50.912 species units of habitat for Long Eryngium, *Eryngium paludosum*
50.900 species units of habitat for Erect Peppercress, *Lepidium pseudopapillosum*
50.900 species units of habitat for Yellow-tongue Daisy, *Brachyscome chrysoglossa*
50.900 species units of habitat for Southern Swainson-pea, *Swainsona behriana*

Further avoidance of clearing will compromise the ability to achieve the cultural and hydrological objectives for the project. i.e. it will not achieve the Dja Dja Wurrung's desire to restore the natural surface and may prevent establishing a stable waterway design based on a chain of ponds.

Clearance of vegetation will be offset in the longer term by the proposed revegetation of the reserve which will result in a more diverse ecology. Huntly Common is also investigating offsets within the region. Priority will be given to offsets that could contribute to the Reimaging Bendigo Creek Plan and/or improve connectivity between the reserve and the Greater Bendigo National Park and/or provide other strategic conservation benefits within the region. An offsets proposal will be provided in the EES.

NYD = not yet determined

### 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)

A flora and fauna assessment was undertaken by Ecology Australia, including a field assessment

in April 2020. The objectives of the assessment were:

a) to undertake desktop and field surveys of flora and fauna onsite to determine the condition of native vegetation and assess the habitat suitability for rare or threatened flora, fauna and ecological communities
b) to calculate the losses and offsets associated with vegetation removal, identify impacts to threatened species, and outline the implications and approvals required under relevant legislation and policy.

The desktop assessment included a review and interpretation of available flora and fauna records for the site. The field assessment included a Vegetation Quality Assessment (Habitat Hectare Assessment) and a survey of all flora and fauna species encountered. The field data was used to undertake an assessment of the likelihood of occurrence of rare or threatened species or communities and an assessment of terrestrial fauna habitat values and potential to support threatened terrestrial fauna species.

The flora field survey recorded 109 different vascular flora taxa comprised 41% of indigenous species and 59% of exotic species. The desktop study identified a total of 29 rare or threatened plant species that have previously been recorded or have habitat modelled within 5 km of the study area. Of these, only one rare or threatened species, the Whirrakee Wattle (*Acacia williamsonii*) classified as Rare on the Advisory list of rare or threatened plants in Victoria, was recorded within the site during the field surveys, however, this appeared to have been recently planted (i.e. within the last 5 years) by the Landcare group. No other rare or threatened flora species were recorded during the survey. The floristic characteristics of the site do not equate to any EPBC Act-listed ecological communities.

A total of 49 fauna species were recorded onsite during the assessment. Of the 49 species, there were 41 species of birds (all native), three species of mammal (two introduced species), two species of reptile and two species of frog and one aquatic invertebrate. No threatened species were recorded during the site visit. The desktop assessment identified 68 significant fauna species (i.e. listed under state or federal legislation) have previously been recorded or had habitat modelled within 5 km of the study area. A likelihood assessment found that of the 68 species, 22 have a moderate likelihood of occurrence within the site. Further assessment was recommended regarding the potential occurrence of the EPBC-listed Flat-headed Galaxias, Swift Parrot (*Lathamus discolour*) and Growling Grass Frog (*Litoria raniformis*), FFG-listed Phascogale (*Phascogale tapoatafa tapoatafa*) and large forest owls (Barking Owl *Ninox connivens* and Powerful Owl *Ninox stenua*) and Advisory listed Brown Toadlet (*Pseudophryne bibronii*). These assessments have not yet commenced.

Aquatic plants such as Typha spp. were present along large sections of the creek, particularly on the east side with a number of areas completely choked. Despite the heavy modification, the creek continues to provide habitat for a range of fauna including fish (e.g. Carp *Gudgeon Hypseleotris sp*. and Australian Smelt *Retropinna semoni*), decapod crustaceans (Common Yabby *Cherax destructor*, Common Shrimp *Paratya australiensis*), reptiles (Eastern Snake-necked turtle *Chelodina longicollis*), frogs (e.g. Common Froglet *Crinia signifera* and Southern Brown Tree Frog *Litoria ewingii*), aquatic birds (e.g. Pacific Black Duck *Anas superciliosa* and Little Pied Cormorant *Microcarbo melanoleucos*) and potentially mammals (e.g. Water Rats *Hydromys chrysogaster*).

**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.

Three EPBC Act-listed ecological communities were modelled as potentially occurring within 5 km of the site:

a) Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions
b) Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia
c) White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

None of these ecological communities were identified within the site. The flora and fauna assessment concluded that the floristic components of the site do not match any of the communities.

Both EVC's recorded on site, Creekline Grassy Woodland and Low Rises Grassy Woodland, are endangered in the Victorian Riverina bioregion. No communities listed as threatened under the FFG Act were recorded during the site assessment.

A total of 29 rare or threatened plant species have been previously recorded or had habitat modelled within 5 km of the study area. This includes 5 EPBC Act-listed species and 6 FFG Act-listed species. Only one rare or threatened flora species was recorded onsite, the Whirrakee Wattle (*Acacia williamsonii*) classified as Rare on the Advisory list of rare or threatened plants in Victoria (noting it appeared to have been recently planted). No other rare or threatened flora species were regarded to have a moderate or higher likelihood of presence within the site.

A total of 55 conservation-significant fauna species have previously been recorded within 5 km of the site. One of these species (FFG-listed Square-tailed Kite) has been previously recorded in the study area. An additional 18 of these species are considered to have a moderate or higher likelihood of occurrence in the site and three species are considered to have a low-moderate likelihood of presence in the site.

The following EPBC Listed species may occur onsite:

- Flat-headed Galaxias (*Galaxias rostratus*): low likelihood of presence in the project area (low confidence)
- Swift Parrot (*Lathamus discolour*) (migratory species): moderate likelihood of presence
- Grey-headed Flying-fox (*Pteropus poliocephalus*): moderate likelihood of presence
- Growling Grass Frog (*Litoria raniformis*): low-moderate likelihood of occurrence
- White-throated Needletail (*Hirundapus caudacutus*): low-moderate likelihood of occurrence

The following FFG Listed species may occur onsite:

- Great Egret (*Ardea alba modesta*), Plumed Egret (*Ardea intermedia plumifera*) and Little Egret (*Egretta garzetta*): moderate or higher likelihood of presence
- Square-tailed Kite (*Lophoictinia isura*): moderate likelihood of presence
- Diamond Firetail (*Stagonpleura guttata*): moderate likelihood of presence
- Hooded Robin (*Melanodryas cucullate*): moderate likelihood of presence
- Barking Owl (*Ninox connivens*): moderate likelihood of presence
- Powerful Owl (*Ninox strenua*): moderate likelihood of presence
- Brown Toadlet (*Pseudophryne bibronii*): low-moderate likelihood of occurrence
- Crested Bellbird (*Oreoica gutturalis*): moderate likelihood of presence
- Brush-tailed Phascogale (*Phascogale tapoatafa*): moderate likelihood of presence

The following species classified as threatened in Victoria by DSE (2013) may occur onsite:

- Brown Treecreeper (*Climacteris picumnus*): Likely
- Latham's Snipe (*Gallinago hardwickii*) (migratory): moderate likelihood of presence
- Nankeen Night Heron (*Nycticorax caledonicus*): moderate likelihood of presence
- Pied Cormorant (*Phalacrocorax varius*): moderate likelihood of presence
- Royal Spoonbill (*Platalea regia*): moderate likelihood of presence
- Eastern Snake-necked Turtle (*Chelodina longicollis*): moderate likelihood of presence

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

The potential threatening processes from the project are:

- Direct loss of native vegetation and associated ecological communities
- Direct loss of large old trees containing hollows
- Direct loss or degradation to habitat for fauna species listed as threatened under the EPBC Act, FFG Amendment Act and/or DELWP Advisory Lists
- Riparian corridor fragmentation (until the site is revegetated)
- Direct and indirect impacts to biodiversity values in the waterway, including changes to

hydrology, hydrogeology, groundwater, water pollution, fish passage and siltation downstream
- Weed and pathogen introduction (although noting the site is already dominated by exotic species)
- Increased mortality of fauna species resulting from mining activities such as clearing of vegetation and increased road traffic

**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.

**Potentially affected EPBC listed species**

Two fauna species listed as threatened under the EPBC Act are considered to have a moderate likelihood of presence: Swift Parrot and Grey-headed Flying Fox. Foraging habitat (flowering eucalypts) is present in the site for both of these species.

Two additional threatened species – Growling Grass Frog and White-throated Needletail – are considered to have a low-moderate likelihood of presence along the waterways and surrounding terrestrial habitat. A population of Growling Grass Frog is known to occur approximately 1.5 km upstream of the southern boundary (Leans Road) of the site. This includes records along the Bendigo Creek and within the Bendigo Water Reclamation Ponds.

Insufficient data exists to accurately determine the likelihood of presence of Flat-headed Galaxias.

One species listed under the Migratory schedules of the EPBC Act (Lathams Snipe) is considered to have a moderate likelihood of presence in the study area.

Potentially affected FFG listed species of note are:

- Barking Owl
- Brown Toadlet
- Brush-tailed Phascogale
- Crested Bellbird
- Little Egret
- Hooded Robin
- Eastern Great Egret
- Plumed Egret
- Flat-headed Galaxias

No flora species listed under the FFG Act are considered likely to occur within the site.

Impacts on the above species will be considered further in the project assessment.

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

☒ NYD ☒ No ☒ Yes If yes, please briefly describe.

A Flora and Fauna Management Plan will be prepared to mitigate the potential effects on indigenous flora and fauna. This will include:

- Measures to minimise loss of large trees and protect remaining vegetation during clearance and reclamation
- Measures to minimise mortality of fauna during vegetation clearance
- Creation of artificial habitat on site (e.g. nest boxes) to offset loss of tree hollows
- Speed restrictions on site
- Providing a biodiversity offset
- Providing for enhanced biodiversity values on the site through rehabilitation and revegetation.

**Other information/comments?** (eg. accuracy of information)
Information is based on a 2020 study by Ecology Australia

## 13. Water environments

**Will the project require significant volumes of fresh water (eg. > 1 Gl/yr)?**
☐ NYD ☒ No ☐ Yes If yes, indicate approximate volume and likely source.

A raw water dam and a process water dam will be used to meet the water requirements of the project. The raw water will be circulated through the reclamation area and will be free of any contamination. The process water will be circulated through the process plant area and will also receive any overflow dewatering of tailings.

The project will require a net water supply of approximately 35-40 ML per year. Water supply options under consideration include use of water from the Bendigo Creek, sewer discharge or irrigation water from Coliban Water or extraction of groundwater.

A small volume of potable water will be required for employee amenities.

**Will the project discharge waste water or runoff to water environments?**
☐ NYD ☒ No ☐ Yes If yes, specify types of discharges and which environments.

Water will be recycled and reused within the reclamation and processing areas. There will be no discharge to water environments or offsite. Sediment control measures will be developed to prevent sediment leaving the site during flood events.

**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.

The project will affect the Bendigo Creek and associated channels. An objective of the project is to restore the natural alignment of the Bendigo Creek and this will, by necessity, result in impacts on the current modified channels.

Refer to the baseline hydrology report at **Attachment B** for more information.

**Are any of these water environments likely to support threatened or migratory species?**
☐ NYD ☐ No ☒ Yes If yes, specify which water environments.

As described in the Section 12 above, there is a low-moderate likelihood that the EPBC and FFG listed Flat-headed Galaxias (*Galaxias rostratus*) may occur within waterways on site. This is subject to confirmation through a targeted field survey. In addition, the EPBC listed Growling Grass Frog (*Litoria raniformis*), FFG listed Brown Toadlet (*Pseudophryne bibronii*) and DSE listed Eastern Snake-necked Turtle (*Chelodina longicollis*) may also be supported by the waterways onsite.

There are a number of other threatened species that may occur onsite that are likely supported by the water environment. The rare or threatened species which may be supported by the waterways onsite are listed in Section 12.

**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 streamflows?**
☐ NYD ☐ No ☒ Yes If yes, briefly describe implications for streamflows.

An initial hydrology study was undertaken by Water Technology in July 2020 (Water Technology 2020), and is provided as **Attachment B**. The study found that Bendigo Creek and its associated

channel network within the Huntly Streamside Reserve is a highly modified waterway environment. It was also found that there are several active erosion processes evident within the project area. Most of these processes are influenced by the channelisation of the creek, the post European influences and the absence of a continuous riparian vegetation corridor. In addition, the Bendigo Creek channel has over-enlarged due to historic channelisation, bed deepening and channel widening leading to potential channel instabilities.

The project will not affect streamflow volume downstream from the Huntly Streamside compared to that entering the reserve. Through the restoration of the creek, the project will affect flows in the three channels that cross the reserve, before they eventually join the main channel in the northern part of the reserve. The project has the potential to beneficially affect flood flows downstream from the reserve by slowing the movement of floodwaters and reducing the severity of downstream flooding.

The hydrology study also investigated the effect on flood behaviour during a 1% AEP event (**Figure 11**). Modelling indicated that the south portion of site is currently protected from inundation due to the presence of the western levee and lower elevation. The northern portion of the site is subject to inundation north of where the Bendigo Creek and effluent channel merge until Millwood Road.

The reclamation area will provide a lower surface which will increase flood flow conveyance and storage. Modelling shows this should lead to a reduction in flood levels across the floodplain and a reduction in flooding on land west of the reserve by a range of 5 mm -1000 mm (**Figure 12**). There is potential for a slight increase in flooding north of the reserve around Leans Road, however, this is expected to be readily managed through retention of a spoil mound near this area.

It is important to note that the modelling presented here is preliminary only and will be refined through a further hydrological study during the assessment process.

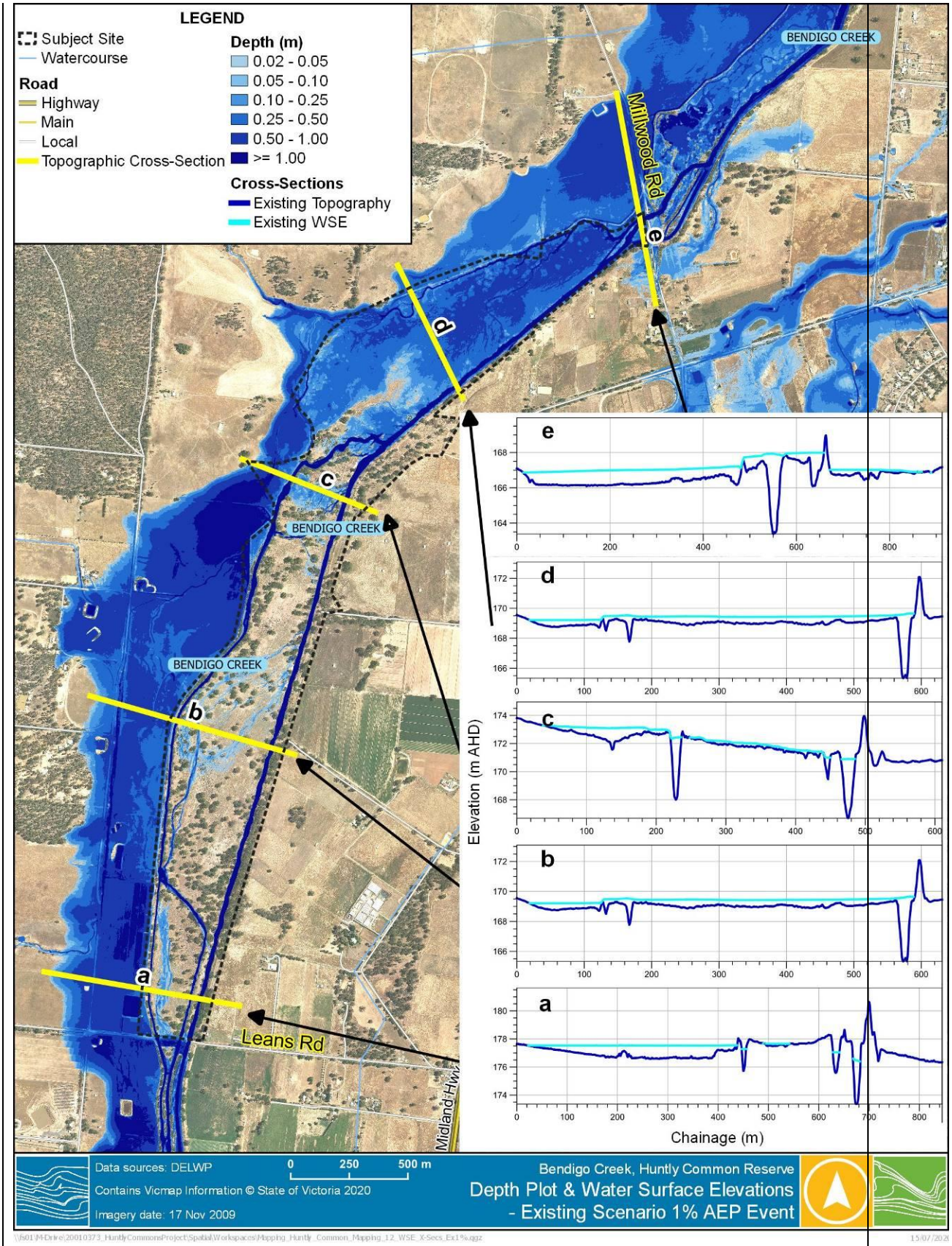



**Figure 11: Existing 1% AEP event flooding**

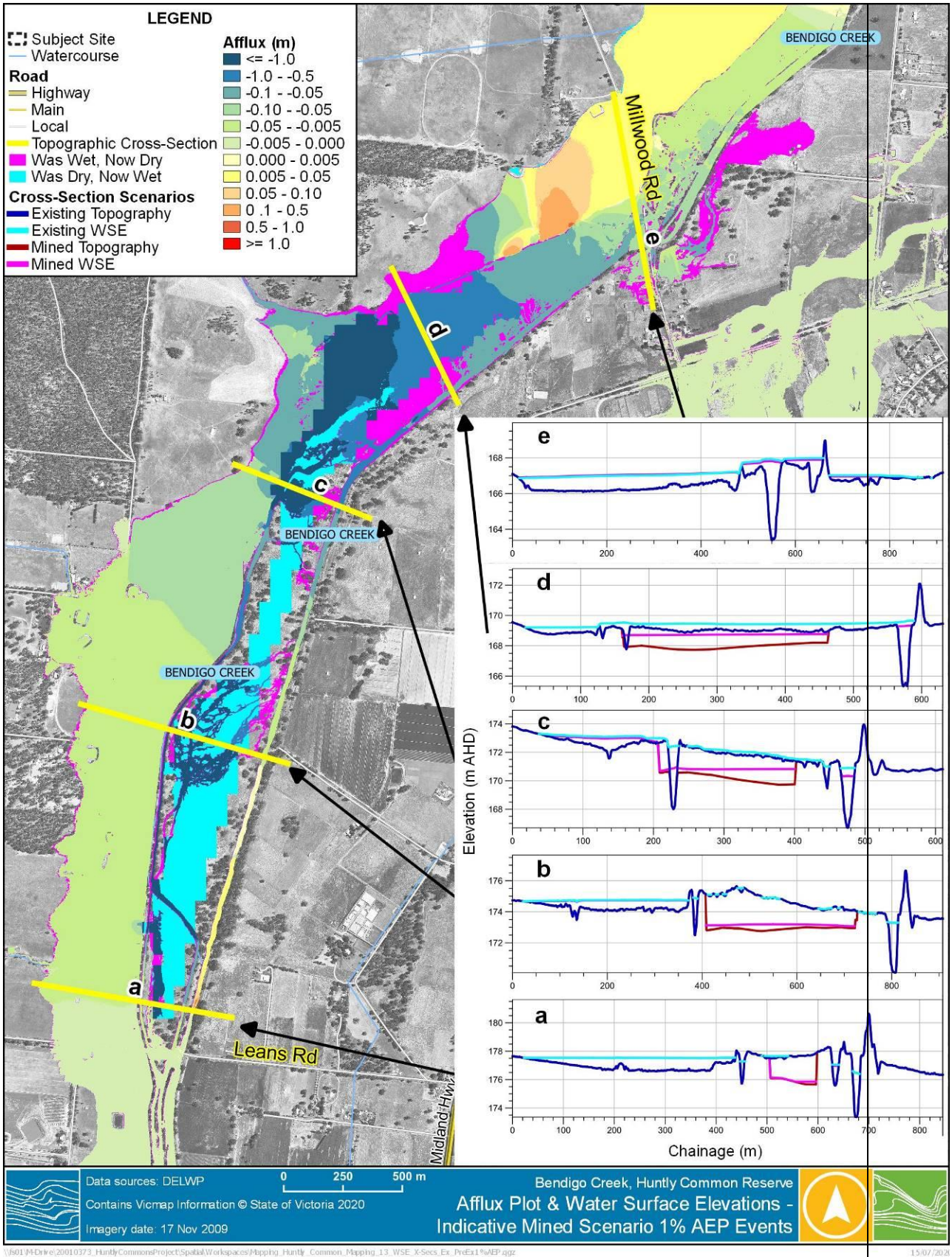



**Figure 12: Changes to 1% AEP flooding as a result of project**

**Could regional groundwater resources be affected by the project?**

☒ NYD ☐ No ☐ Yes If yes, describe in what way.

Limited groundwater information is available for the area. Visualising Victoria's Groundwater

suggests groundwater may occur between 0 – 5 m below ground level (BGL). Test pitting undertaken by JBS&G as part of the soil assessment were progressed to 3 mGBL and groundwater was not encountered. The hydrology report (**Attachment B**) notes that licensed wells within two kilometres of the Huntly Streamside Reserve are generally below 10 m.

The potential impacts to groundwater are:

- Intersection of shallow groundwater during reclamation operations.
- Enhanced or reduced groundwater recharge as a result of changes to surface topography
- Mobilisation of chemicals of concern to the water table during and following operation
- Exposing potential acid sulphate soils.

Groundwater is being considered as a water supply option for the project. If this is used, it could result in localised groundwater drawdown.

The site is not located within a Groundwater Management Area or a Water Supply Protection Area.

Impacts of the project on groundwater will be subject to further assessment.

**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)

The southern portion of site falls within the 3,501 to 13,000 mg/L Total Dissolved Solids (TDS) range and the northern portion of site the 13,001 to 200,000 mg/L TDS range. Under the Water State Environment Protection Policy (SEPP 2018) the site falls within TDS segment C,D,E and F. The beneficial uses to be protected under these segments are:

- Water dependent ecosystems and species
- Potable mineral water supply
- Agriculture and irrigation (stock watering)
- Industrial and commercial
- Water-based recreation (primary contact recreation)
- Traditional Owner cultural values
- Buildings and structures
- Geothermal properties

There is potential that the following beneficial uses will be impacted due to the project:

- Water dependent ecosystems and species
- Agriculture and irrigation (stock watering)
- Water-based recreation (primary contact recreation)
- Traditional Owner cultural values.

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

☐ NYD ☐ No ☒ Yes If yes, describe in what way.

The terrestrial and aquatic ecosystems associated with the site will be impacted as result of the project. Huntly Streamside Reserve consists of terrestrial ecosystems which have a high potential of being supported by groundwater. Similarly, Bendigo Creek is defined as an aquatic GDE with high potential of being supported by groundwater. The project will involve modification of the existing waterways on the site to restore the Bendigo Creek to its original course, to the extent practicable, and to achieve a stable waterway design across the site.

Aquatic ecosystems may be impacted in the following ways:

- Sedimentation of waterways resulting in reduced light availability and stratification
- Mobilisation of contaminated sediments
- Alteration of channel structure and destruction of streamside and benthic environments
- Alteration of flood behaviour resulting in the inundation of new areas
- Detrimental impacts to aquatic and terrestrial GDEs

The next stage of hydrology studies will identify how to appropriately manage these potential

impacts.

Downstream from the site, the Bendigo Creek passes trough farmland with no significant conservation values, other than streamside vegetation.

**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.

The next stage in the hydrology study will include identification of design objectives, philosophies and constraints in the selection of a preferred waterway arrangement. This will include assessing potential temporary channel and floodplain arrangements to facilitate flows through the works area during reclamation to ensure operations do not adversely affect surface water values. An erosion and sediment control plan will be developed for the project.

**Other information/comments?** (eg. accuracy of information)

Clause 21-08-5 of the Greater Bendigo Planning Scheme notes: 'Bendigo Creek and its tributaries have a long history of flooding that has historically caused damage to infrastructure and buildings throughout the Bendigo urban area. The new development areas of Maiden Gully, Strathfieldsaye and Huntly are also affected by flooding from waterways. …The Bendigo Urban Flood Study, November 2013 has determined the extent and likely impacts of flooding and is the basis of the selection of the planning scheme overlays'.

## 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.

There is an Environmental Significance Overlay along the Bendigo Creek and other watercourses on the site. Refer to **Figure 13**.


**Figure 13: Environmental Significance Overlay**

- **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 reclaim area is public land managed by Parks Victoria as a Streamside Reserve (Huntly

Streamside Reserve) in accordance with recommendations of Victorian Environmental Council Box-Ironbark Forests & Woodlands Investigation 2001 (recommendation H4). Refer to section 9 for more detail.

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

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

As noted in the ecology report, the reclaim area contains

- 101.7 ha of Endangered Creekline Grassy Woodland supporting 577 large old trees in 17 patches. The dominant canopy species in this community was River Red Gum *Eucalyptus camaldulensis*, with scattered Grey Box *Eucalyptus microcarpa*, Yellow Box *Eucalyptus melliodora* and occasional Yellow Gum *Eucalyptus leucoxylon subsp. pruinosa*.
- 4.1 ha of Endangered Low Rises Grassy Woodland supporting 25 large old trees in 2 patches. Canopy species dominant in this community were largely Grey Box and Yellow Gum, with the occasional River Red Gum
- 220 Scattered trees including 42 large old trees. The majority of these scattered trees (154; 70%) were River Red Gum. However, there were also scattered Grey Box, Yellow Box and Yellow Gum trees.

Most of the large old trees are River Red Gums and are up to 150 years old. The Reimagining Bendigo Creek draft plan notes that: 'Beautiful stands of ancient large River Red Gums emerge from the creek's edge making this River Red Gum Woodland ecosystem a unique environment'. Some trees along the creek can be retained but the clearance of vegetation across the remainder of the reserve, including most of the large old trees, will result in the diminution of landscape values for users of the reserve, until such time that revegetation is of sufficient age and size to replace those values.

Vegetation clearance and reclaim activities will be visible to traffic using Leans Road and Millwood Road. However, views travelling towards the reserve will be largely screened by vegetation buffers retained along creeks. The activities will be mainly visible as vehicles pass along the reserve. The reserve width at Leans Road is 270 m and 160 m at Millwood Road, meaning that vehicle traffic will pass the reserve in seconds.

Views from or near Huntly will be substantially shielded by the levee bank and vegetation on the eastern side of the reserve. It is possible that reclamation activities will be visible to some landowners west of the reserve.

Note that vegetation clearance, reclamation and rehabilitation/revegetation will occur progressively across the reserve.

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

☐ NYD ☒ No ☐ Yes Please briefly explain response.

Huntly Common is not aware of any documentation that would indicate the project area contains landscape values of regional or State importance. The project area is proximate to the Greater Bendigo National Park but does not affect the park.

**Is mitigation of potential landscape effects proposed?**

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

As noted above, vegetation buffers will be retained along creeks. Reclaim areas will be progressively rehabilitated and revegetated with indigenous species.

**Other information/comments?** (eg. 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.

Soils may be erodible following disturbance in reclamation activities. They will immediately be stabilised through the use of water sprays and soil conditioning. Following revegetation, soil stability will be enhanced through the increased vegetation cover, compared to the current groundcover consisting mainly of exotic species.

The CSIRO Australian Soil Resource Information System indicates that the site has a low probability of occurrence of Acid Sulphate Soils.

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

☐ NYD ☒ No ☐ Yes If yes, please briefly describe.

**Other information/comments?** (eg. accuracy of information)

The reclaim site is an artificial landform created from the deposition of sediment derived from historic mining activity in the Bendigo area. Soils are fairly consistent with the surface underlain by a shallow organic layer, damp brown coarse silty sand, lighter coarse silty sand, very fine and soft sandy silt and then natural orange sandy silt with clay inclusions.

JBS&G completed a preliminary environmental site assessment of the Huntly Streamside Reserve in July 2020The key findings from this assessment were:

- Based on the results from the investigative works undertaken and exceedances of the adopted screening level assessment criteria, the tailings material in the Huntly Streamside Reserve poses a potential risk to the surrounding environment and human health, particularly with respect to arsenic and, to a lesser extent, mercury.
- There is a slight potential that the tailings material may be impacting the underlying natural material, based on the detected levels of arsenic in the underlying natural material and the leachability of arsenic in the tailings material. The level of arsenic in the natural soil may, however, reflect the naturally elevated concentrations in the region.
- The potential for mobilisation of arsenic during reclamation operations will require suitable control measures to protect the environment and human health, given:
    - the identified leachability of arsenic in soils tested
    - the correlation of higher arsenic concentrations to smaller, more erodible particle size fractions.
- Removing and appropriately managing the arsenic present in the tailings should reduce the current and future potential risks to human health and the environment, post-completion of the proposed project.

Given the correlation between arsenic and particle size, arsenic concentrations in the coarse and fine sand products are not expected to be a concern. Arsenic concentrations in the silt and clay material are likely to limit the reuse of this material.

As the sludge consists of waste material from mining operations and been deposited on site over a period of time since the 1850s, it has already been subjected to considerable disturbance and exposure to air. Further disturbance of this material is unlikely to result in acidification. Measurements of pH in the samples ranged from 5.7 to 8.4 with an average of 7.6.

Further information is provided in the Preliminary Environmental Site Assessment at **Attachment C.**

## 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 operational workforce will be around 25-30 people which will generate minimal traffic relative to the current volume on Leans Road.

Most traffic will be generated by the removal of sand from the site. The 1987 EES calculated this would generate approximately 10,500 trips in total. This removal is dependent on demand for construction sand and will extend over several years. This traffic would also use Leans Road.

The 1987 EES figure was based on removal of the coarser sand material. The current proposal includes:

- Stockpiling and sale of coarse sand (> 250 micron) from the Huntly Streamside Reserve
- Stockpiling and sale of fine sand from the processing site
- Dry stacking of tailings (clay and silt) on the processing site with potential to treat and sell this material as topsoil

If all material is sold, based on the 1987 EES calculation, this could generate over 30,000 trips but over an extended period.

The estimate of traffic volumes will be reviewed during the assessment.
I

**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 amenity of residents could potentially be affected by:

- Additional traffic using Leans Road
- Noise from reclamation and processing operations
- Dust from reclamation operations, stockpiles, tailings and areas undergoing rehabilitation
- Potential visual impacts as discussed in section 14
- Temporary loss of recreation opportunities due to restricted access to active reclamation areas.

The project will increase heavy traffic numbers on Leans Road which will generate additional traffic noise and potentially present a hazard to residents entering or using the road. It should be noted, however, that Leans Road is regularly used by heavy traffic. A traffic impact assessment will be completed for the project.

**Figure 14** shows receptors within 1 km of the Mining Licence boundary. There are 51 residential receptors within 1 km of the boundary; 32 within 750 m; 15 within 500 m and 6 within 250 m. Other receptors include the Bendigo Livestock Exchange and saleyards and several trotting tracks.

Vegetation buffers along the creek will provide some protection to residents east of the reserve. However, reclaim operations are expected to occur up to the western boundary on the Mining Licence area.

The main source of noise on the reclaim area will be the excavators. The excavators proposed to be used (PC 200) have similar noise emissions to agricultural tractors.

The processing site will be more remote from residences. Noise sources will include pumps, screening equipment and vehicles.

A noise assessment will be completed to determine compliance with the *Noise from Industry in Regional Victoria* guideline (EPA 2011). Noise impacts will be managed through the use of modern well-maintained equipment and ongoing communication with surrounding landowners.

Potential dust sources from the project include excavation and initial trash screening, cleared areas awaiting reclamation, areas undergoing revegetation, the tailings facility wall and surface, and sand and fine sand stockpiles.

Water sprays will be used to minimise dust on exposed surfaces within the reclaim area. Excavated material will enter a slurry immediately following the initial screening and, consequently, will no longer be a dust source. Dry stacked tailings will still contain moisture and will only become a potential dust source as they dry out. This will be managed through water sprays as necessary.
The coarse sand stockpile is unlikely to cause dust impacts on neighbouring properties as the particle size will minimise movement. The fine sand stockpile will be situated away from adjoining properties to minimise impact and managed with water sprays if necessary.

An air quality assessment will consider dust impacts in more detail. Other emissions (e.g. vehicle) will have a negligible impact on air quality.

**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.

Increased traffic on Leans Road potentially creates an increased risk to residents and road users. This needs to be considered in the context of the current usage of Leans Road.

Dust levels will not be sufficient to present a health hazard.

The sludge material contains a number of contaminants, notably arsenic and mercury. Sediment controls measures will be used in the reclaim area to ensure there is no offsite discharge of contaminates. Processing will remove mercury as a product. Further information on site contamination is provided in the Soils section above and in **Attachment C**.

Huntly Common is examining alternatives to the use of cyanide in processing and is proposing to use EarthGold which has a relatively low toxicity. Huntly Common is committed to operating significantly below EU and other standards for WAD (Weak Acid Dissociable) leaching agent levels in the tailings storage facility.

**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.

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

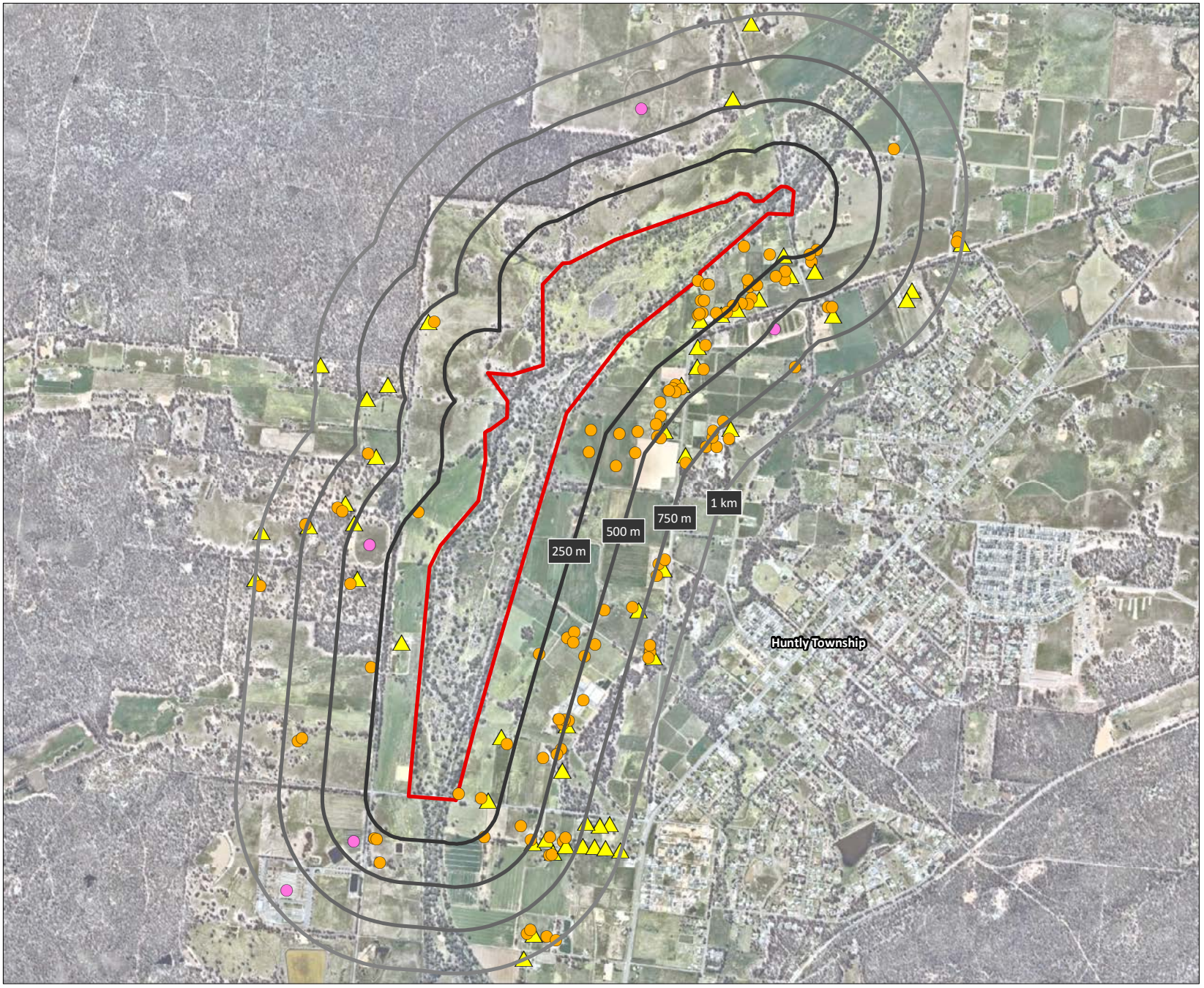
☒ NYD ☒ No ☒ Yes If yes, briefly describe the likely effects.

The Huntly Streamside Reserve is currently used for recreational activities. This use will be restricted during reclamation operations. The restriction will only apply to areas currently undergoing reclamation or active rehabilitation. The amenity for recreational users will be reduced while rehabilitation is underway but rehabilitation will aim to provide enhanced recreational opportunities compared to those currently available (such as additional walking tracks, cyclepaths and picnic areas).

**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.

As noted above, there will be temporary loss of recreation use in discrete areas of the Huntly Streamside Reserve. Restrictions will only apply in the active reclamation areas and areas undergoing active revegetation. Consequently, most of the reserve will remain accessible to the public. Rehabilitation will create enhanced recreational opportunities through the increase in vegetation cover and construction of walking tracks and other facilities as agreed with Dja Dja Wurrung, Parks Victoria and other stakeholders.




**Legend:**

- Site Boundary
- 250 m Buffer
- 500 m Buffer
- 750 m Buffer
- 1 km Buffer
- Shed (107)

**Sensitive Receptors**

- Residence (51)
- Other (5)

JBS&G

Job No: 58207

Client: Huntly Common

| Version: Final_Rev0 | Date: 03-Dec-2020 |
|---|---|
| Drawn By: SW | Checked By: LW |

Scale at A4 1:32,000

0 400 800

metres

Coor. Sys. GDA 1994 MGA Zone 55

**Huntly Streamside Reserve, Leans Road**
**Huntly, Victoria**

**SENSITIVE RECEPTORS**

**FIGURE 14**

Document Path: V:\05 Projects\Huntly Common\58207 Huntly Work Plan - Bendigo Gold\8 - ArcGIS\01_MXD\05_EES_Referral\14_58207_Senstive_Receptors_Rev0_2020_12_03.mxd
Image Reference: www.nearmap.com© - Imagery Date: 12 October 2020

**Is mitigation of potential social effects proposed?**

☒ NYD ☒ No ☒ Yes If yes, please briefly describe.

Restrictions to access within the Huntly Streamside Reserve will be minimised and restored when rehabilitation is sufficiently advanced. In the longer term, rehabilitation will create an improved environment for locals and enhanced recreational opportunities. As noted in section 3, it will contribute to a number of the Huntly Precinct objectives in the Reimagining Bendigo Creek Plan, particularly in regard to enhancing Aboriginal cultural values and experiences, improving walking and cycling access and providing recreation and education opportunities.

Dust and noise impacts will be minimised as discussed above.

**Other information/comments?** (eg. accuracy of information)

## 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.

Dja Dja Wurrung Clans Aboriginal Corporation

**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)

Australian Cultural Heritage Management (ACHM) has been engaged to prepare a cultural heritage management plan for the project with the Dja Dja Wurrung. ACHM initially completed a field survey as part of a standard assessment with representatives from the Dj Dja Wurrung in May 2020. The standard assessment aimed to survey mature native vegetation and areas where the sludge was shallowest within the activity area, where localised erosion may have exposed the natural sediment beneath the sludge. Ground surface visibility of the activity area was poor due to grass and other organic materials. Overall ground surface visibility was 5%. The standard assessment confirmed that the surface of the activity area is of low archaeological potential due to the recent age of native trees (post the deposition of sludge) and the absence of exposures of remnant natural sediment. The surface of the activity area appeared to have been covered extensively by the sludge deposit, and this finding is consistent with the geomorphic data presented in the desktop assessment. As the standard assessment was not effective in determining the presence or absence of Aboriginal cultural heritage within the activity area due to the extensive coverage of mine sludge, a complex assessment of the activity area was undertaken.

The complex assessment was conducted in July 2020, and involved the excavation of four 1m x 1m test pits and the recording of three exposed stratigraphic profiles along the Bendigo Creek drain. Soil profiles within the activity area were consistent with those identified during previous geotechnical assessments. The entire activity area is covered with varying deposits of light brown mine sludge overlying remnant, natural, orange-brown soil deposits at depths between 0.7-3.0m. No Aboriginal cultural heritage was identified during the excavation of the test pits, and it was concluded that the sludge deposits contained very little potential for Aboriginal archaeological material.

No landforms of archaeological sensitivity and no Aboriginal cultural heritage was identified during the assessment. The investigations confirmed that the reclaim area is substantially a modified landscape with the natural ground surface overlain by up to 3.6 m of sludge. The sludge layer holds no cultural heritage values as it has been deposited in the last 160 years. While unlikely to be present, any artefacts within the sludge layer would be ex situ, limiting their significance.

As the project does not propose to excavate material below the natural surface, the risk to cultural heritage values is low. Removal of the sludge layer will, in fact, help to restore cultural values in

the area and is supported by the Dja Dja Wurrung for that reason.

A draft CHMP has been prepared and submitted to the Dja Dja Wurrung for approval.

**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

The site is within an area of cultural heritage sensitivity due to its proximity to watercourses. However, this sensitivity is within the underlying natural soils rather than the overlying sludge.

**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.

**Is mitigation of potential cultural heritage effects proposed?**

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

Huntly Common will implement measures in the CHMP to ensure excavation is confined to the sludge layer and there is minimal disturbance of the natural surface. These include:

- Work will be planned in work panels which will be clearly marked on the surface using spray paint and flags.
- An auger will be used to determine the depth to the natural surface within each panel.
- Excavators will operate from the embankments and operators will be able to clearly see the reclaim panels. There is a distinct colour difference between the sludge and the natural soil.
- Operators will also use a GPS in the excavator to assist them in determining how far they are from the target depth and to prevent over-excavation.
- A mobile ground penetrating radar may also be used to scan the work panels to identify any anomalies that should be further investigated.

Restoration of the creek is likely to require some engineering works and disturbance to natural soils. These works will be detailed in the rehabilitation plan and designed in conjunction with the Dja Dja Wurrung.

**Other information/comments?** (eg. accuracy of information)

## 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 …500 kW…….
- ☒ 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.

The processing site will have a back-up generator in case of power outage.

**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.

An onsite sewerage treatment plant will treat wastewater from ablution and other employee facilities. Treated water from this plant will be disposed of on site.

Huntly Common is seeking to develop a zero waste project. The coarse sand portion of the sludge will be stockpiled for sale to the construction industry. There is potential to use fine sand and organic material to develop soil products for sale. Some material may be used in rehabilitation.

Silts and clays will be dry stacked in a tailings facility. They will remain on site and the tailings facility rehabilitated if the material cannot be reused.

Refer to section 3 for more information about waste products.

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

- ☒ Less than 50,000 tonnes of $CO_2$ equivalent per annum
- ☒ Between 50,000 and 100,000 tonnes of $CO_2$ equivalent per annum
- ☒ Between 100,000 and 200,000 tonnes of $CO_2$ equivalent per annum
- ☒ More than 200,000 tonnes of $CO_2$ equivalent per annum

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

## 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

The processing plant, tailings facility and stockpiles will be located to minimise impact on native vegetation.

- ☒ Design: Please describe briefly

The rehabilitation plan for the reclaim site on the Huntly Streamside Reserve will seek to maximise cultural, ecological, recreational and social values on the reserve through waterway design, appropriate species selection and provision of visitor use facilities. Waterway design will also reduce flooding risk in the surrounding area and downstream.

☒ Environmental management: Please describe briefly.

An environmental management plan will be developed for the project addressing matters including:
- Erosion and sediment control
- Flood management
- Dust and noise management
- Flora and fauna protection
- Pest plant and animal control
- Cultural heritage protection
- Traffic management
- Monitoring and reporting.

In addition, a comprehensive rehabilitation plan will be developed in conjunction with the Dja Dja Wurrung and other stakeholders.

☐ Other: Please describe briefly

Add any relevant additional information.

## 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.

The following studies have been completed as discussed above:

- Ecological baseline study – Ecology Australia
- Site contamination study – JBS&G
- Hydrology baseline study – Water Technology
- Cultural heritage investigations including development of cultural heritage management plan – Australian Cultural Heritage Management

**Has a program for future environmental studies been developed?**

☐ No ☒ Yes If yes, briefly describe.

The following studies are proposed:
- Further consideration of water supply options and development of water balance for project
- Investigation of alternatives to the use of cyanide in processing
- Further consideration of options for reuse of tailings material

- Assessment of impacts on flora and fauna and identification of offsets options
- Assessment of hydrological impacts and development of mitigation measures, as needed, to protect property and minimise sedimentation
- Noise and air quality impact assessment
- Traffic impact assessment
- Visual impact assessment
- Stakeholder engagement, planning and studies, as required, to develop a rehabilitation plan for the reclaim site.

**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.

Huntly Common has met several times with the Dja Dja Wurrung Clans Aboriginal Corporation and met with relevant government agencies.

As noted above, the project contributes to implementing the *Reimagining Bendigo Creek Plan*. This plan is supported by the Greater Bendigo City Council, DELWP, Parks Victoria, EPA, North Central CMA, Coliban Water and the Dja Dja Wurrung.

**Has a program for future consultation been developed?**

☐ NYD ☒ No ☐ Yes If yes, briefly describe.

A community and stakeholder consultation plan is being developed

**Attachments**

A: Ecology baseline report
B. Hydrology baseline report
C: Preliminary Environmental Site Assessment

## Authorised person for proponent:

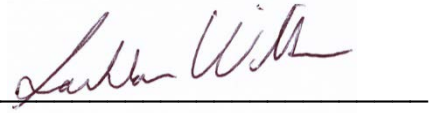
I, Bruno Campisi, Director of Huntly Common Pty Ltd, confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature 

Date 4 December 2020

## Person who prepared this referral:

I, Lachlan Wilkinson, Principal Technical Advisor, JBS&G Australia Pty Ltd, confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature 

Date 4 December 2020