North Central CMA

Mineral Exploration, Mining and Extractive Industries Setback Guidelines for the North Central CMA Region

Acknowledgment of Country

The North Central Catchment Management Authority acknowledges Traditional Owners within the region, their rich culture and spiritual connection to Country. We also acknowledge the contribution and interest of Aboriginal and Torres Strait Islander people and organisations in land and natural resource management, and pay respects to Elders past, present and emerging.

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Background

The North Central Catchment Management Authority (CMA) has a history of creating natural resource management partnerships and programs that deliver lasting change. A core component of the CMA's work is protecting waterways and floodplains to enhance waterway health.

The North Central CMA region contains several important streams and watercourses including the Avoca, Avon-Richardson, Campaspe, Loddon and Murray Rivers along with the Ramsar listed Kerang Lakes and Gunbower Forest. These waterways are major environmental assets with particularly high levels of cultural heritage significance for First Nations people. Additionally, they are recognised by communities for their social, recreational and economic values.

Waterways are important reserves of biodiversity and provide valuable habitat and corridors for native fish, birds, amphibians and mammals such as platypus, and provide, in many cases, a setting for recreational activities. In combination, these attributes (and others) are referred to as waterway health. The management of land adjacent to streams and watercourses is necessary to reduce erosion, ensure the flood conveyance function of waterways are maintained, maintain vegetation and habitat and improve water quality.

Victoria is a rich source of various mineral deposits and the state has an extensive history of mineral exploration, mining and extractive (quarrying) industry. Gold was discovered in Victoria in 1851 and this represented the beginning of extensive mineral resource development throughout the state. The north central region of Victoria has a significant history with gold mining underpinning the cultural and economic development for major parts of the region. Gold mining and mineral exploration continues to be popular in the region today, however, other similar activities such as quarrying for sand and gravel (extractive industries) are increasing.

While mining and the extraction of stone (quarrying) has provided extensive economic benefits, it has had a significant impact on the region's waterways and floodplains. Historic gold mining has created a range of legacy issues in the North Central CMA region including land degradation; straightening and realigning of waterways; loss of riparian vegetation; disconnection of waterways; degraded soil structure; groundwater pollution and disconnected floodplains. While the regulation of mineral exploration, mining and extractive (quarrying) industries has improved the environmental risk to waterways and floodplains remains.

The number of applications to undertake mineral exploration, mining and extractive (quarrying) industry activities are continually growing in the North Central CMA region and this has the potential to have considerable environmental consequences. Consideration must be given to balancing the economic benefits of mineral exploration, mining and extractive (quarrying) industries with the potential impacts on the cultural, economic, environmental and social values of the region's waterways and floodplains.

These guidelines seek to provide a practical and environmental-based approach to decision making, to reduce to an acceptable level, the potential risks to the physical environment (terrestrial and aquatic) and infrastructure assets within designated waterways and the floodplain.

Mineral exploration, mining and extractive (quarrying) industry activities

There are a range of mineral exploration, mining and extractive (quarrying) industry operations that occur throughout the North Central CMA region, which includes:

- Exploration
- Prospecting
- Quarrying for sand, gravel etc.
- Open cut mines
- Underground mines
- Placer gold mining (sifting through waterway sediments)
- Doze and detect

Under the *Mineral Resources (Sustainable Development) Act 1990,* most mineral exploration, mining and extractive (quarrying) industry activity in Victoria requires some form of permission to be undertaken. Depending on the type of activity a relevant licence will be required, namely:

- Exploration licence
- Retention Licence
- Mining Licence
- Prospecting Licence
- Extractive Industry Work Authority or a Recreational Fossicking Permit.

For major works a work plan needs to be approved by Earth Resources Regulation, Department of Jobs, Precincts and Regions, and, with the exception of mineral exploration, a council planning permit is required. In some cases, a code of practice may apply for low risk mines and small quarries, and these were developed under section 89E of the *Mineral Resources (Sustainable Development) Act 1990.* These codes allow holders of a prospecting licence, mining licence or extractive industry work authority (quarry), where activities are defined as low risk, to operate under the code rather than having an approved work plan. The following figure outlines whether the mining works require a work plan or can be governed by a code of practice.

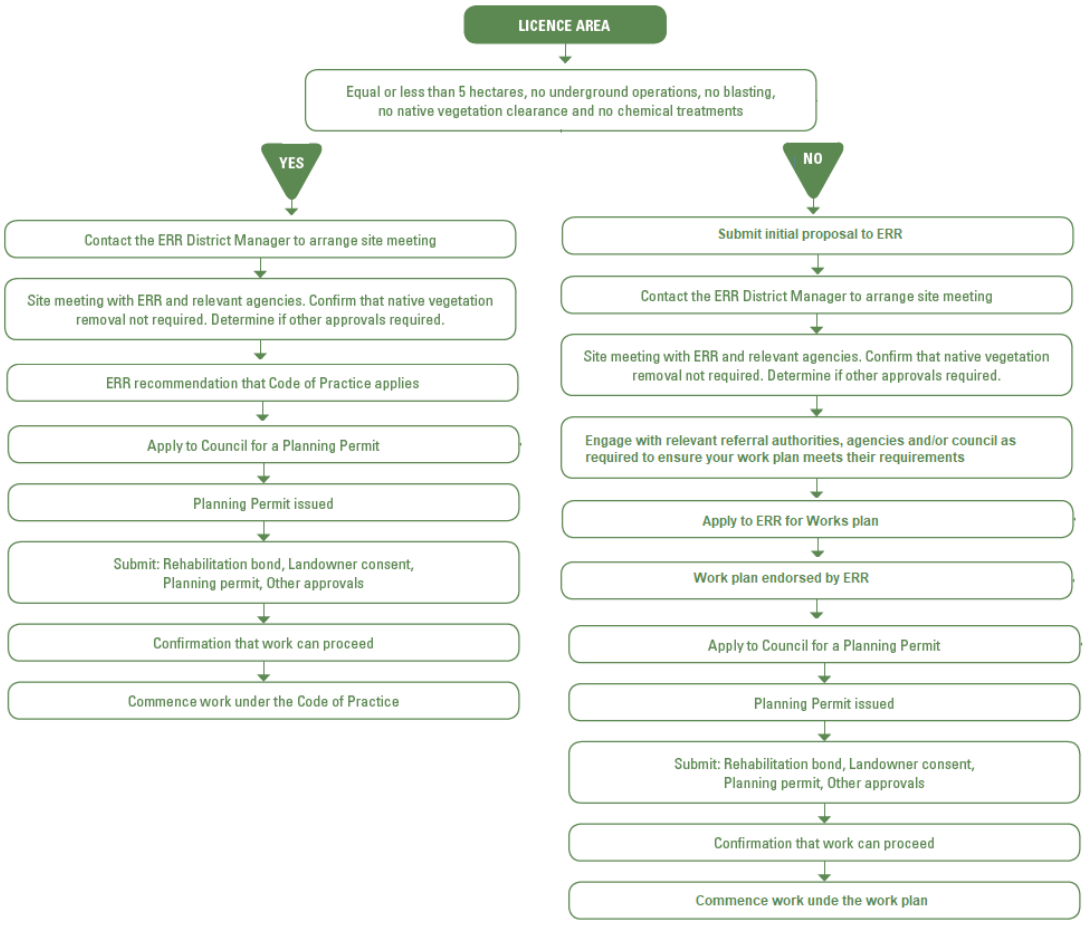

Figure 1: Flow diagram of work plan or code of practice requirements

The North Central CMA is a statutory referral authority under the *Mineral Resources (Sustainable Development) Act 1990* for work plan approvals where the proposed works are to occur on land that is covered by floodway overlays, land subject to inundation overlays or environmental significance overlays. These work plans are referred to the North Central CMA under section 77TE of the *Mineral Resources (Sustainable Development) Act 1990.* Where there are no overlays to

trigger a statutory referral, but the proposed works will occur within 100 metres of a waterway the North Central CMA is often referred the work plan for agency comment.

Furthermore, the North Central CMA is a determining referral authority under the *Planning and Environment Act 1987* and under section 52 or 55 are referred low risk mine or small quarry applications to operate under a code of practice for comment. Typically, these are referred to the North Central CMA when applications are near waterways and the land is covered by overlays such as rural flood overlays, land subject to inundation overlays or environmental significance overlays. Additionally, other agencies including Parks Victoria, the Department of Environment, Land, Water and Planning and the applicable urban and rural water authorities may be referral authorities for a work plan and low risk mine or small quarry applications.

Environmental concerns surrounding mineral exploration, mining and extractive (quarrying) industry activities on the floodplain

Mineral exploration, mining and extractive (quarrying) industry activities can result in significant environmental consequences to aquatic and terrestrial environments. In the past where these activities have taken place with little regulation significant environmental damage has occurred which has led to lasting environmental issues. Environmental regulations relating to mineral exploration, mining and extractive (quarrying) industries have improved in Victoria, however, there is still the potential for significant environmental damage if not regulated and monitored effectively. mineral exploration, mining and extractive (quarrying) industry operations can have significant impacts on waterways, floodplains and riparian zones and some of these impacts include:

- Land degradation.
- Drawdown on groundwater table and reduction in water quality.
- Alteration of local hyporheic zones.
- Disconnected floodplains.
- Stream avulsion and channel incisions.
- Soil stability/ -erosion control.
- Alteration of sediment transfer initiating bed and bank instabilities.
- Nutrient, chemical and/or sediment discharge into waterways.
- Changes to channel morphology and flow energy characteristics.
- Loss and/or disturbance of instream habitats for vertebrates and invertebrates.
- Collapse of instream invertebrate and/or vertebrate communities.
- Loss and/or disturbance of riparian vegetation.
- Loss of habitat for riparian species.
- Noxious weed infestation and the change of riparian vegetation composition.

Relevant legislation

The relevant legislation associated with these guidelines include:

- *Aboriginal Heritage Act 2006*
- *Catchment and Land Protection Act 1994*
- *Mineral Resources (Sustainable Development) Act 1990*
- *Water Act 1989*
- *Waterways protection by-law 2014*
- *Planning and Environment Act 1987*

Objectives of guidelines

The objectives of these guidelines are to:

1. *Avoid, minimise or eliminate the risks posed to public safety, property, community infrastructure, waterways and the environment.*

2. *Protect the nature conservation, recreation, scenic and cultural heritage attributes of the waterways of the North Central region and its floodplains.*
3. *Adopt a best practice environmental management and risk management approach which aims to avoid or minimise environmental degradation and hazards.*
4. *Maintain and improve water quality and waterway and floodplain health.*
5. *Ensure that mineral and stone resources are developed with appropriate management measures to protect the long-term health of waterways and floodplains of the North Central CMA region.*
6. *Maintain the natural flood carrying capacity and storage function of the waterways and floodplains of the North Central CMA region.*
7. *Protect areas prone to erosion, landslip or other degradation, and*
8. *Ensure excavated areas can be appropriately rehabilitated.*

Fundamental principles underlying guidelines

The development of these guidelines is underpinned by two guiding principles:

- Based on the best available science and riparian management practices - the minimum waterway setback required to minimise environmental damage and to maintain and improve waterway, floodplain and riparian zone health.
- The minimum setback for mineral exploration, mining and extractive (quarrying) industry is sufficient to minimise flood risk to development and to allow for waterway/floodplain interactions to continue to occur.

Setback requirements for the mineral exploration, mining and extractive (quarrying) industry

Setbacks will be applicable to all designated waterways, which can be named or unnamed, permanent or seasonal, and range in size from a river to a natural depression. Designated waterways are declared under Section 188 of the *Water Act 1989*. The status of designated waterways is not static and can change following a waterway determination by the relevant rural water authority. For further information on designated waterways please contact the North Central CMA floodplain team.

The setback widths in these guidelines have been defined following a comprehensive review of waterway management science in Australia and worldwide (Castelle *et al.* 1994; Crostea 2018; Mossa and Marks 2011; Naiman and Decamps 1997; Sandercock and Ladson 2014; Sandercock and Ladson 2015; Stutter *et al.* 2019; Tiwari *et al.* 2016). They aim to limit flood risk and provide a balance between achieving river health and biodiversity objectives, while allowing mineral exploration, mining and extractive (quarrying) industry operations to occur.

The reference point for the setbacks is generally the nearest top of bank (break of slope from the waterway bank to surrounding land) of the waterway. In some cases, top of bank may not be easily defined, and an alternative reference point will be required instead. North Central CMA will provide further direction on how to determine and locate the reference point at specific sites as required.

Each application for mineral exploration, mining and extractive (quarrying) industry activities will be assessed individually and depending on the type of activity and location of works the setback requirements are likely to vary.

Environmental and practical factors considered during the application process include:

- Are the proposed works on the floodplain?
- Flood risk (works outside the 1% Annual Exceedance Probability (AEP) extent), depending on works type and location it may warrant consideration of flood events greater than a 1% AEP flood event and is our prerogative to consider smaller events for sensitive environments.

- Slope of the land.
- Condition of the riparian zone and presence of high value species.
- Presence of high value instream habitats or communities.
- Waterway condition and target condition.
- Depth of mining or quarrying relative to the invert of the waterway.
- Potential for avulsion, lateral migration or a geotechnical failure such as piping to occur.
- Location within the catchment.
- Soil type and slope stability.
- Filtration capacity of soils.

Unless it can be demonstrated that the environmental consequences of the mineral exploration, mining and extractive (quarrying) industry operation will be minimised, a blanket setback of 30 metres will be required. Scientific literature identifies that for riparian zones to be effective and provide their environmental benefits a minimum 30-metre vegetated buffer is required (Parkyn 2004; Sweeney and Newbold 2014; Tiwari *et al.* 2016). However, this setback distance can be increased depending on the type of works, flooding or other practical or environmental considerations. Additionally, any extractive industry (quarrying) activities on the floodplain that require creating large pits will be required to be set back a minimum of 100 metres from the top bank of the designated waterway. Research has shown that large setbacks are required for quarrying on the floodplain due to the high risk of waterway avulsion and the threat of piping (Crostea 2018; Maya *et al.* 2012; Mossa and Marks 2011; Sandercock and Ladson 2014; Sandercock and Ladson 2015). Additionally, section 77B of the *Mineral Resources (Sustainable development) Act 1990* states that a person must not search for stone at a depth of more than 0·75 metres below any land that is within 100 metres of—

a) a waterway that is owned by, vested in or managed or controlled by an Authority under the *Water Act 1989*; or
b) any main drains, sewers, aqueducts, channels or pipelines of that Authority— unless the person has first consulted the Authority and searches for stone in compliance with any conditions specified by the Authority.

As a guide, all mineral exploration, mining and extractive (quarrying) industry works near major waterways in the North Central CMA region (Avoca, Avon-Richardson, Campaspe, Loddon and Murray Rivers) will be at least 100 metres from the nearest top bank of the waterway unless otherwise approved by the North Central CMA. This is due to the heightened potential for flooding and the need to provide adequate waterway health protection for large waterways as is consistent with scientific research (Maya *et al.* 2012; Mossa and Marks 2011; Sandercock and Ladson 2014; Sandercock and Ladson 2015).

Finally, there will be setback and rehabilitation considerations for waterways that have not been declared designated waterways by the North Central CMA. For example, if the waterway is connected to a designated waterway downstream, setbacks and rehabilitation may be considered as there is the potential for downstream water quality or instream habitats to be disturbed. Setback and rehabilitation requirements for non-designated waterways will be determined using these guidelines.

General work requirements

Waterways, floodplains and riparian zones are sensitive environments and careful work is required on mineral exploration, mining and extractive (quarrying) industries sites to minimise additional damage. The following are a list of minimum conditions that mineral exploration, mining and extractive (quarrying) industry activities will be required to meet:

1. *Storage of any fill must be located outside the 1% AEP flood extent, unless approved on the basis of a flood impact assessment.*
2. *Exclude excavations, dams, spoil, tracks and any other mineral exploration, mining and extractive (quarrying) industry infrastructure from buffer zones unless otherwise agreed to. Machinery may only be allowed in the buffer zone under special circumstances.*
3. *Where applicable the licensee must minimise the area of ground disturbance throughout the life of the operation.*
4. *Prior to the commencement of mineral exploration, mining and extractive (quarrying) industry activities appropriate silt control measures must be installed to prevent the distribution of sediment laden or contaminated runoff. The silt control measures must be maintained throughout the works period until rehabilitation has occurred and the land stabilised.*
5. *Delineation is required between works and the required setback from any adjacent waterways. For example, fencing is required between works and nearby waterways to ensure the mineral exploration, mining and extractive (quarrying) industry operations are not getting any closer to the waterway. This is required to ensure there is no future encroachment of mineral exploration, mining and extractive (quarrying) industry related activities, beyond that in the work plan or planning permit, into the buffer adjacent to the designated waterways.*

Rehabilitation requirements

Following the completion of any mineral exploration, mining and extractive (quarrying) industry works there is the requirement that environmental rehabilitation must occur. The following minimum conditions outline some of the rehabilitation requirements for works that occur near waterways and on floodplains:

1. *The licensee must ensure that disturbed land is rehabilitated as soon as practicable.*
2. *The land must be shaped to retain the existing flow paths where possible.*
3. *The area must be compacted and revegetated with locally occurring native species of grasses and shrubs (in line with the agreed final land use) to reduce the potential for erosion.*
4. *It is recommended that progressive rehabilitation is undertaken where practicable to minimise the total area disturbed at any one time and to allow revegetated vegetation to establish.*
5. *The area of rehabilitation should be fenced using temporary fencing to allow the revegetated areas to recover faster.*
6. *Where construction of a pit has occurred, native vegetation (shrubs and trees) must be planted along the rim of the excavation area to limit the potential for erosion.*

Cultural heritage requirements

The First Nations people of the North Central CMA region have a strong connection to country and waterways hold significant cultural heritage values. Mineral exploration, mining and extractive (quarrying) industry activities could cause significant damage to culturally significant waterways and riparian zones. Any works occurring on, in or near named waterways may have additional cultural heritage requirements. Please note that some ground disturbing activities may require the preparation of a Cultural Heritage Management Plan (CHMP) by a suitably qualified Heritage Advisor. It is your responsibility to determine whether a CHMP is required. For further information please contact Aboriginal Victoria at http://www.vic.gov.au/aboriginalvictoria/heritage/planning-and-heritage-management-processes/cultural-heritage-management-plans.html or by telephone (03) 9208 3333.

Important definitions

Designated waterway: Under the ***Water Act 1989*** “designated waterway” means a waterway that—

a) in relation to an Authority, other than Melbourne Water Corporation, is declared under section 188 as a designated waterway; and
b) in relation to Melbourne Water Corporation, is a designated waterway under section 188A;

Exploration: Under the ***Mineral Resources (Sustainable Development) Act 1990*** "exploration" means exploration for minerals and includes—

a) conducting geological, geophysical and geochemical surveys; and
b) drilling; and
c) taking samples for the purposes of chemical or other analysis; and
d) extracting minerals from land, other than for the purpose of producing them commercially; and
e) in relation to an exploration licence, anything else (except mining) that is specified in the licence;

Land degradation: Under the ***CALP Act 1994*** ‘land degradation’ is defined as—

a) a decline in the quality or productive capacity of land; or
b) the infestation of land by noxious weeds or pest animals;

Low risk mines: Under the ***Mineral Resources (Sustainable Development) Act 1990*** A licensee who proposes to do work under the licence must lodge a work plan with the Department Head, but this does not apply to –

a) a licensee who proposes to carry out only low impact exploration work; or
b) a licensee who holds a mining licence that –

    (i) covers an area of 5 hectares or less; and

    (ii) does not involve underground operations, blasting, clearing of native vegetation or the use of chemical treatments; or

c) a licensee who holds a prospecting licence that does not involve underground operations, blasting, clearing of native vegetation or the use of chemical treatments – unless the Minister declares, in writing, that the licensee must lodge a work plan

Mining: Under the ***Mineral Resources (Sustainable Development) Act 1990*** ‘mining’ is defined as extracting minerals from land for the purpose of producing them commercially and includes processing and treating ore.

Riparian zone: A riparian zone or riparian area is the interface between land and a river or stream that serve to moderate processes between the catchment and the waterway.

Stone: Under the ***Mineral Resources (Sustainable Development) Act 1990*** ‘stone’ is defined as -

a) sandstone, freestone or other building stone; or
b) basalt, granite, limestone or rock of any kind ordinarily used for building, manufacturing or construction purposes; or
c) quartz (other than quartz crystals); or
d) slate or gravel; or
e) clay (other than fine clay, bentonite or kaolin); or
f) peat; or
g) sand, earth or soil; or
h) other similar materials;

Waterway: Under the ***Water Act 1989*** a 'waterway' is defined as –

a) a river, creek, stream or watercourse; or
b) a natural channel in which water regularly flows, whether or not the flow is continuous; or
c) a channel formed wholly or partly by the alteration or relocation of a waterway as described in paragraph (a) or (b); or
d) a lake, lagoon, swamp or marsh, being—
    i. a natural collection of water (other than water collected and contained in a private dam or a natural depression on private land) into or through or out of which a current that forms the whole or part of the flow of a river, creek, stream or watercourse passes, whether or not the flow is continuous; or
    ii. a collection of water (other than water collected and contained in a private dam or a natural depression on private land) that the Governor in Council declares under section 4(1) to be a lake, lagoon, swamp or marsh; or
e) land on which, as a result of works constructed on a waterway as described in paragraph (a), (b) or (c), water collects regularly, whether or not the collection is continuous; or
f) land which is regularly covered by water from a waterway as described in paragraph (a), (b), (c), (d) or (e) but does not include any artificial channel or work which diverts water away from such a waterway; or
g) if any land described in paragraph (f) forms part of a slope rising from the waterway to a definite lip, the land up to that lip;

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