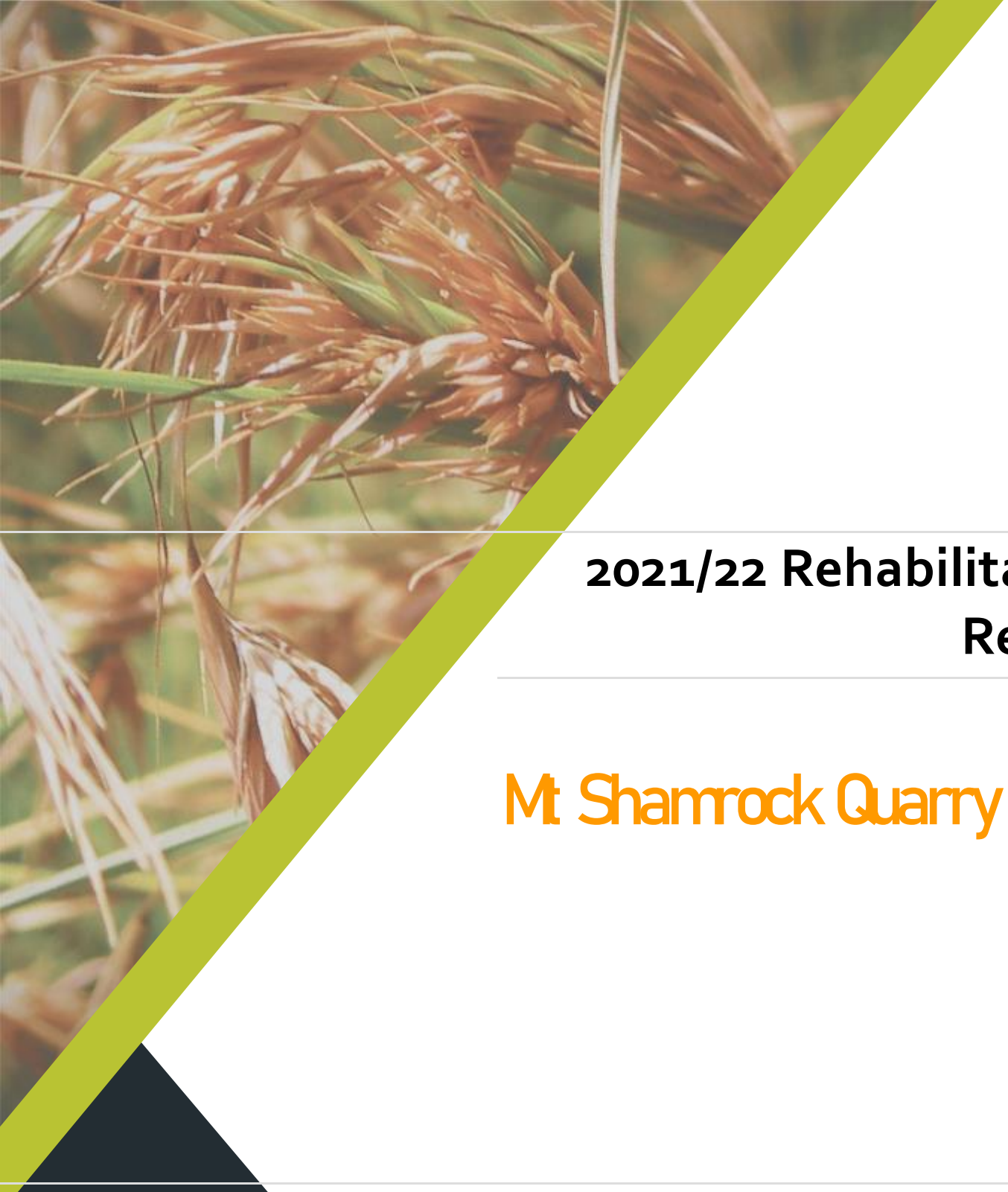

2021/22 Rehabilitation Report

Mt Shamrock Quarry

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Report prepared by Brenton Martin and Nicole Gillard.

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Contents

Report Scope

This report addresses all revegetation and maintenance works carried out by Naturelinks over the period of 2021. Works were undertaken in the following areas depicted in Figure 1: Phase A & B (Teal), 0.8 Hectare (Green), Southern Extraction (Red), South-East Extraction (Blue), Extraction (Orange), Phase C (White), Landslip (Pink) and Net Gain (Yellow). This report outlines issues encountered and management challenges identified throughout the rehabilitation process. Following this a summary of proposed future management actions is detailed.

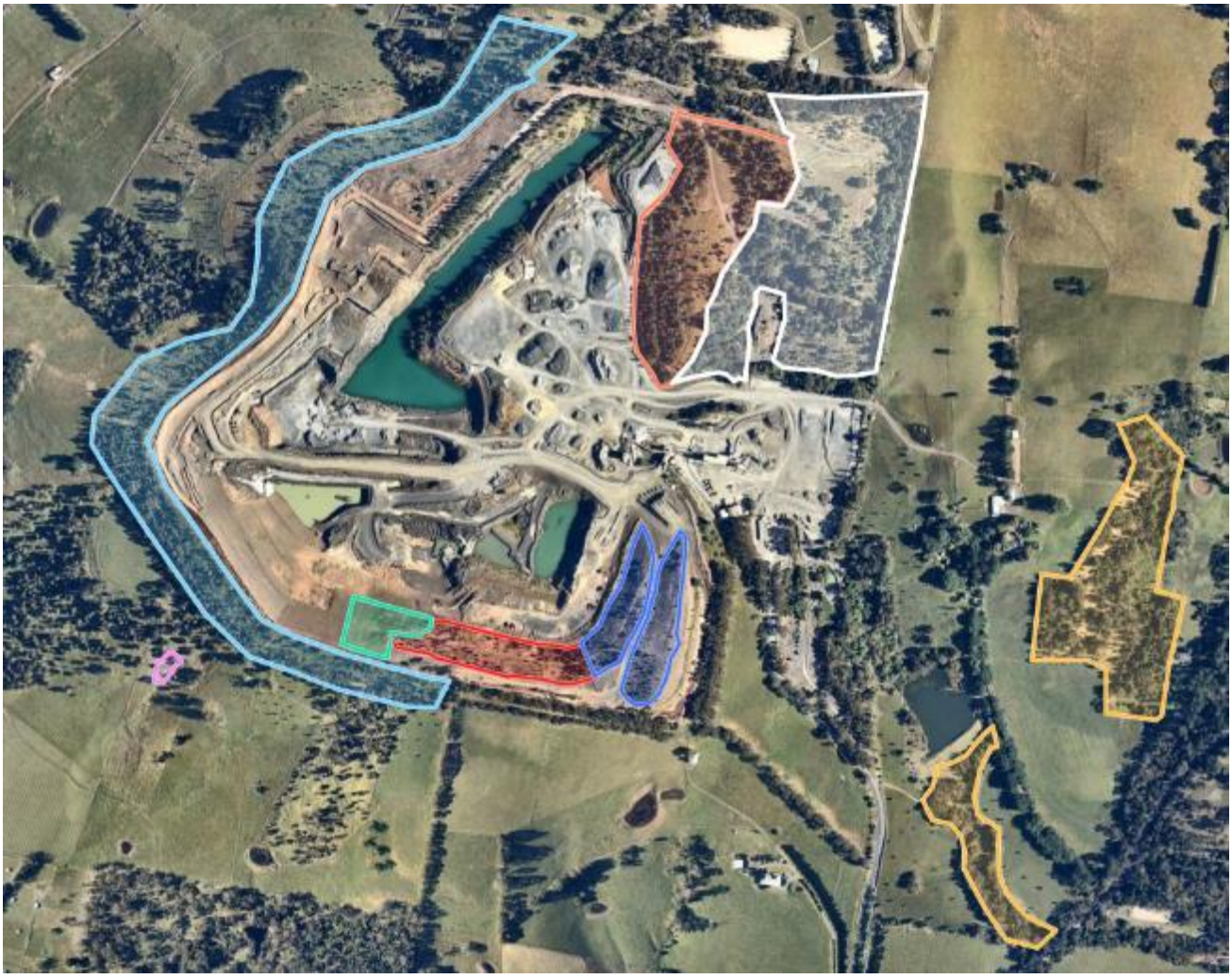

Figure 1: Scope of report and individual sites at Holcim Mt Shamrock Quarry.

Works & Management Recommendations

South-East Extraction Area

The South-East extraction area consists of two sections depicted in Figure 2; (a) in blue and (b) in pink.

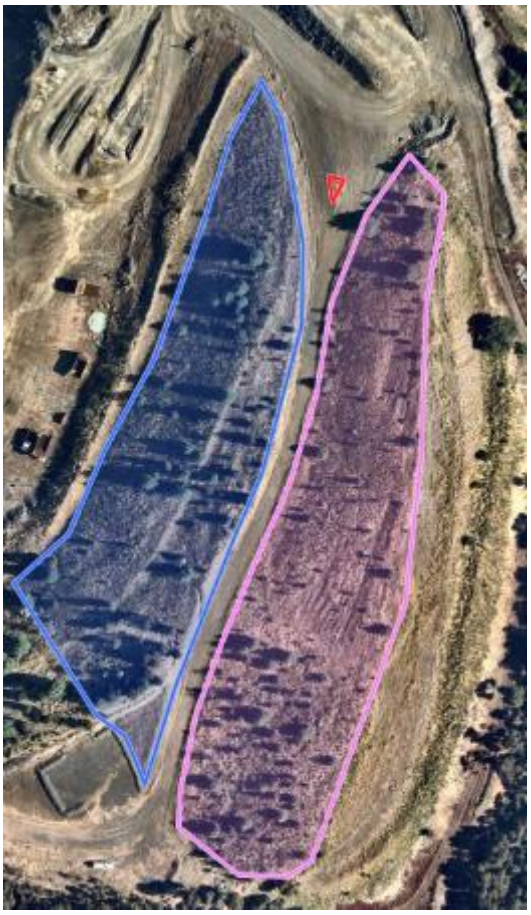

Figure 2: South-East Extraction areas a (blue) and b (pink). Boot hold (red)

2021 Works

Within south-east extraction, native shrub and tree planting has been completed west of the boot hold point (Figure 3 in red). Planting survival in recent years has seen increased success due to an expanded range of dry tolerant species (Table 2.).

Broad-leaf weeds including Sow Thistle (*Sonchus spp*), Fleabane (*Conyza spp*), Wild Radish (*Raphanus raphanistrum*) have been treated through herbicide application with knapsacks. Large areas of exotic grass species including Canary Grass (*Phalaris aquatica*) and Cocksfoot (*Dactylis glomerata*) have been brush-cut and followed up with a grass selective herbicide application. This method has previously demonstrated success in 2020 which included a follow up planting of Grass and Liliaceous species. Environmental conditions within the planted area has led to an incursion of Pigeon Grass (*Setaria sp.)* shown in Figure 3 in Red which has now spread to nearby areas.

Figure 3: Southern Extraction areas of note

In some areas the coverage of annual exotic species is too dense to apply herbicide without posing a risk of off target damage to native species. As this coverage recedes in 2022, future germinates can be targeted more effectively with reduced risk of off target damage in 2022.

Chilean needle grass (*Nassella neesiana*) infestations located west of the access road towards the bottom of the slope have increased since 2020, this area is shown in pink in Figure 3. Chilean Needle Grass found on site has been treated, and continual treatment throughout year 2022 is highly recommended that this species is eliminated from site.

Future Management Recommendations

The recommendations for the south-eastern extraction area include:

- Herbicide application targeting Pigeon Grass in early summer.
- Continued herbicide application to Chilean needle grass.
- Continued slashing and selective herbicide application to perennial exotic grasses.
- Maintain broadleaf-selective herbicide application.
- Plantings of dry-tolerant mid and lower story species to increase diversity across the site (Table 1.)

Table 1. List of recommended species for planting in South-Eastern Extraction Area in 2022.

Species	**Common Name**
Acacia melanoxylon	Blackwood
Amperea xiphoclada var. xiphoclada	Broom Spurge
Astroloma humifusum	Cranberry Heath
Correa reflexa var. lobatus	Powelltown Corea
Daviesia leptophylla	Narrow-leaf Bitter-pea
Dianella laevis var. laevis	Pale Flax-lily (Synonym *Dianella longifolia var. longifolia)*
Epacris impressa	Common Heath
Eucalyptus obliqua	Messmate
Eucalyptus radiata	Narrow-leafed Peppermint
Grevillea alpina (Southern Hills Form)	Mountain Grevillea
Indigofera australis	Austral Indigo
Lomandra filiformis ssp coriacea	Wattle Mat-rush
Lomandra filiformis ssp. Filiformis	Wattle Mat-rush
Lomatia ilicifolia	Holly-leaf Lomatia
Ozothamnus rosmarinifolius	Rosemary Everlasting
Persoonia juniperina	Prickly Geebung
Pimelea flava ssp. Flava	Yellow Rice-flower
Pimelea humilis	Common Rice-flower
Poa ensiformis	Purple-sheath tussock-grass
Poa labillardierei var, labillardierei	Common Tussock-grass
Total	

To determine relevant dry tolerant species Naturelinks previously undertook desktop analysis using the Victorian Government Naturekit website. (https://www.environment.vic.gov.au/biodiversity/naturekit) and located several parcels of native vegetation for all three EVC's 16, 45 and 128 within 5 km of Mt Shamrock. Naturelinks conducted on-ground species surveys in two reference areas containing these EVCs:

- RJ Chambers Flora and Fauna Reserve - Lowland Forest EVC 16 vegetation, and Shrubby Foothill Forest EVC 45 within 5km of Mt Shamrock at RJ.
- Beaconsfield Nature Conservation Reserve - Grassy Forest EVC 128

Species in these EVC's which were also found existing in similar conditions as that found at Mt Shamrock (considering slope, soil type and aspect) were considered appropriate for future planting lists. Species from EVC's 128 and 45 were sought due to their existence within a broader category of Dry Forests, a category which Lowland Forest does not fall within. Lowland Forests typically exist in areas of high soil fertility and relatively high rainfall compared with Dry Forests.

Southern Extraction Area

Southern Extraction is a North facing slope that starts from the viewing area that adjoins South Eastern Extraction to its east and .8 hectare reveg to its west.

Figure 4: Southern Extraction

2021 Works

Broadleaf control using herbicide has seen great success in 2021. Perennial grass species are still persistent including Toowoomba Canary Grass (*Phalaris aquatica*). Large areas exist where this grass is currently out-competing other under-story species. Over 2020 and 2021 these areas have been targeted by brush-cutting with follow up herbicide tanker spraying selectively targeting the Phalaris.

In areas where the exotic grass is less dominant there has been a noticeable increase of native grasses. Areas where the exotic grass was dominant have largely been replaced with annual exotic grasses including but not limited to Bromes (*Bromus spp*), Wild Oat (*Avena Spp*) and Annual Rye (*Lolium rigidum*).

Ongoing infill plantings were completed in 2021 to improve native diversity and density throughout the site (refer Table 2.). Plantings from previous years have begun to form shaded areas where direct seeded weeping grass (*Microlaena stipoides*) has thrived. Black-anther flax-lily (D*ianella revoluta*) has seen particularly successful growth and spread within 2020 and 2021.

Kangaroos have caused minor issues with plantings in 2021 by colliding with planting guards, this issue can be reduced by avoiding planting near frequently used Kangaroo tracks.

Strong northerly winds have previously caused issues with planting shrub species including Myrtle Wattle (*Acacia myrtifolia*), Prickly Moses (*Acacia verticillata),* Dogwood (*Cassinia aculeata*) and Yellow Hakea (*Hakea nodosa*). To limit the damage to plantings it is recommend to use alternative species.

A small Chilean needle grass infestation was discovered in 2020 and targeted in 2021. Continued spraying in 2022 is required to eliminate species from the site.

Table 2. List of species planted within the South-Eastern Extraction and Southern Extraction Areas in 2021.

Upper Story (canopy)		
Species	**Common Name**	**No.**
Eucalyptus dives	Broad-leaf Box	50
Eucalyptus goniocalyx	Long-leaf Box	100
Eucalyptus Obliqua	Messmate	50
Eucalyptus radiata subsp. radiata	Narrow-leaved Peppermint	150
	Total	**350**
Mid Story (Tall shrubs)		
Species	**Common Name**	**No.**
Acacia implexa	Lightwood	50
Acacia paradoxa	Hedge Wattle	50
Acacia pycnantha	Golden Wattle	50
Allocasuarina littoralis	Black Sheoak	50
Hakea decurrens subsp. physocarpa	Bushy Needlewood	25
Hakea nodosa	Yellow Hakea	25
	Total	**250**
Lower mid story (Small shrubs)		
Species	**Common Name**	**No.**
Acacia genistifolia	Spreading Wattle	125
Acacia myrtifolia	Myrtle Wattle	50
Davesia latifolia	Hop Bitter-Pea	50
Davesia leptophylla	Narrow-Leaf Bitter-Pea	10
Grevillea alpina (Southern Hill form)	Mountain Grevillea	20
	Total	**255**
Ground Covers and climbers		
Species	**Common Name**	**No.**
Austrostipa rudis ssp. Rudis	Veined Spear-grass	100
Dianella admixta var. revouluta	Black-Anther Lily	200
Dianella longifolia	Blueberry Lily	100
Dianella tasmanica	Tasman Flax-Lily	200
Hemarthria uncinate	Matt Grass	120
Lomandra filiformis subsp filiformis	Wattle Matt-rush	50
Lomandra longifolia subsp. longifolia	Spiny-headed Matt-rush	200
Lomandra longifolia var.exilis	Cluster-headed Matt-rush	100
Lomatia ilicifolia	Native Holly	50
Poa labillardierei	Common Tussock-grass	150
Poa sieberiana	Grey Tussock Grass	200

Poa sieberiana	Grey Tussock-grass	200
Themeda triandra	Kangaroo Grass	80
Total		**1750**

Future Management Recommendations

The recommendations for the Southern extraction include:

- Continue targeting of *Phalaris aquatica* via slashing and follow up herbicide application in 2022 to encourage native germination.
- Plant more drought tolerant species, including *Hakea ulicina* and *Hakea decurrens ssp. physocarpa*.
- Continual management of broad-leaf exotic species with selective herbicide application.
- Continual management of Chilean needle grass via herbicide application.
- Infill plantings of tree and shrub species to increase diversity within the site (Table 3).

Table 3. List of recommended species for planting within the Southern Extraction Area in 2022.

Species	**Common Name**
Acacia melanoxylon	Blackwood
Astroloma humifusum	Cranberry Heath
Banksia marginata	Silver Banksia
Daviesia leptophylla	Narrow-leaf Bitter-pea
Dianella laevis var. laevis	Pale Flax-lily (Synonym Dianella longifolia var. longifolia)
Eucalyptus Radiata ssp. Radiata	Narrow-leafed Peppermint
Eucalyptus dives	Broad-leafed Peppermint
Eucalyptus goniocalyx	Long Leafed Box, Bundy
Grevillea alpina (Southern Hills Form)	Mountain Grevillea
Indigofera australis	Austral Indigo
Kunzea leptospermoides	Yarra Burgan
Leptospermum myrsinoides	Heath Tea-tree, Silky Tea-tree
Lomatia ilicifolia	Holly-leaf Lomatia
Persoonia juniperina	Prickly Geebung
Pimelea humilis	Common Rice-flower
Total	

Extraction Site

The Extraction site is south facing starting from the ridgeline of the northern side of the quarry through to the base of current operational area. This is the first zone that Naturelinks direct seeded with native grass and planted. Extraction is the wettest of the revegetation zones.

Works 2021

In some areas the canopy of planted Acacia and Eucalypt species has formed shaded areas allowing native Weeping Grass (*Microlaena stipoides var. stipoides*) and Spiny-headed Mat-rush (*Lomandra longifolia var. longifolia*) to dominate the understory.

Figure 5: Extraction area, Mt Shamrock Quarry

Broad leaf exotic species have been successfully managed in previous years thus requiring minimal management in 2021. Small amounts of thistle species (Sonchus *spp)* and Wild Radish (Raphanus *raphanistrum*) required herbicide treatment.

Exotic grass species prevalent within the site include Toowoomba Canary Grass (*Phalaris aquatica*), Cocksfoot (*Dactylis glomerata*), Caterpillar Grass (*Paspalum dilatatum*) and Kikuyu (*Chenchrus clandestinum*). Due to Kikuyu spreading via rhizome, herbicide application would prove difficult without negative effects on the native understory. As it is not currently outcompeting native species, Kikuyu is sprayed where it is still not dominant, aiming to slowly reduce its prevalence.

Plantings shown in Figure 5. as pink were performed successfully in 2020 were complemented by a second planting in 2021 of understorey species including Tasman Flax-lily (*Dianella tasmanica*), Purple-sheath Tussock-grass (*Poa ensiformis*) and Common Tussock-grass (*Poa labillardierei var. labillardierei*) (Table 3.). These species have been highly successful within this area with the Dianella species contributing to preventing further erosion.

Table 4. List of understory species planted within the Extraction Area in 2021

Upper - Mid Story (tall shrubs)		
Species	**Common Name**	**No.**
Cassinia longifolia	Long-leaf Cassinia	50
Hakea decurrens subsp. physocarpa	Bushy Needlewood	50
Hakea ulicina	Furze Hakea	19
	Total	**119**
Lower-mid story (small shrubs)		

Species	Common Name	No.
Daviesia latifolia	Hop Bitter-pea	50
Grevillea alpina (Southern Hill form)	Cat's Claw Grevillea	20
Pimelea flava subsp. flava	Yellow Rice-flower	50
	Total	**120**
Groundcover/Climbers		
Species	**Common Name**	**No.**
Austrostipa rudis ssp. rudis	Veined Spear-grass	50
Billardiera scandens	Common Apple-berry	40
Dianella admixta var. revoluta	Black-anther Flax-lily	200
Dianella amoena	Matted Flax-lily	25
Lomandra longifolia var.exilis	Cluster-headed Mat-rush	200
Poa ensiformis	Sword Tussock-grass	150
Poa labillardierei	Common Tussock-grass	200
	Total	**1065**
Total		**1304**

Future Management Recommendations

The recommendations for the Extraction area include:

- Further planting to increase native species diversity (Table 5.).
- Targeting broad leaf exotic species and blackberry with herbicide application by knapsack.

Table 5. List of recommended species for planting in the Extraction Area in 2022.

Species	Common Name
Amperea xiphoclada var. xiphoclada	Broom Spurge
Anthropodium strictum	Chocolate Lily
Corea reflexa var. lobatus	Powelltown Corea
Cyperus lucidus	Leafy Flat-sedge
Epacris impressa	Common Heath
Ozothamnus rosmarinifolius	Rosemary Everlasting
Pimelea flava ssp. Flava	Yellow Rice-flower
Poa ensiformis	Purple-sheath Tussock-grass
Polyscias sambucifolia ssp. 3	Elderberry Panax
Total	

Phase A & B Site

The Phase A and B site encompasses a planted area bordering the outer quarry fenceline to act as a visual barrier as well as a screen for noise and dust pollution.

2021 Works

Works in this site has focused on infill planting with some weed control of high threat species.

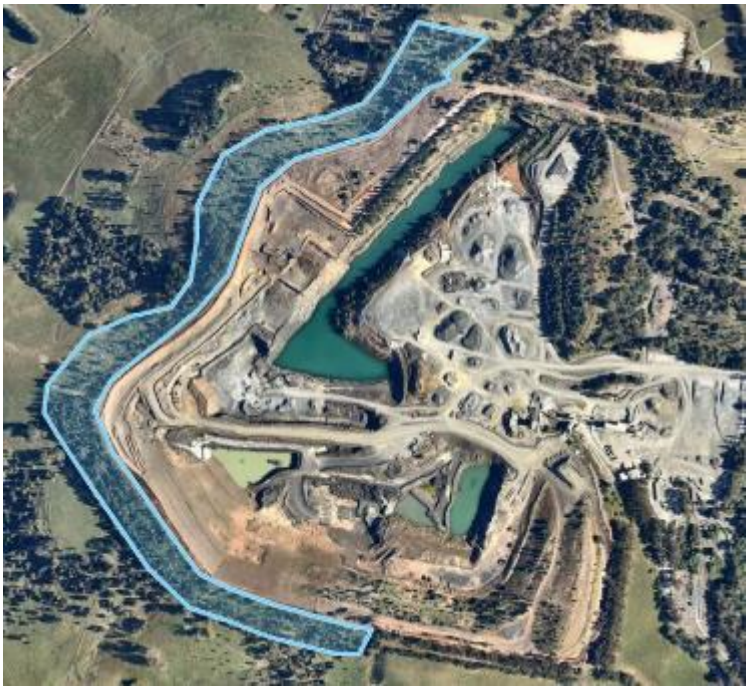

Figure 6: Phase A & B, Mt Shamrock Quarry

Large infill plantings of native trees and shrubs were completed within 2020 and 2021. To reduce the risk of significant planting losses Naturelinks has diversified the suite of planting species. (See Table 6.).

The dominant exotic species within the site include Blackberry (*Rubus fruticosus agg.),* Spear Thistle (Cirsium vulgare), Variegated Thistle (*Silybum marianum)* and Slender Winged-thistle (*Carduus tenuiflorus*).

Thistle species were managed in 2021 by herbicide application by both knapsack and tanker spray units. The density of these species has noticeably reduced since 2020. Herbicide application targeting blackberry in this area is recommended in the autumn of 2022.

Chilean Needle Grass was targeted with herbicide in 2021, future follow up annual targeted herbicide application with the aim of eventual elimination is recommended.

Kangaroos have caused issues with plantings in 2021 by colliding with the larger planting guards that were used in the area, these are not recommended to be used in the future.

Within the site Deer are causing noticeable damage to softwood trees and shrubs particular Banksia species. Damage can include removing bark or damaging and breaking the main stem. Naturelinks is licensed, insured and able to undertake Deer control by ground-based shooting at night in a safe manner, with the removal of carcasses from site.

Table 6. List of tree and shrubs planted within the Phase A & B area in 2021

Species	**Common Name**	**No.**
Eucalyptus obliqua	Messmate	100
Eucalyptus radiata	Narrow-leaf Peppermint	150
Acacia paradoxa	Hedge Wattle	100
Hakea nodosa	Yellow Hakea	50

Acacia mearnsii	Black Wattle	100
Acacia pycnantha	Golden Wattle	50
Cassinia aculeata subsp. aculeata	Dogwood	50
Allocasuarina viminalis	Black Sheoak	50
Acacia myrtifolia	Myrtle Wattle	50
Eucalyptus goniocalyx	Bundy	50
Total		**750**

Future Management Recommendations

The recommendations for Phase A and B include:

- Follow up annual targeted herbicide application of Chilean Needle Grass with the aim of eventual elimination is recommended.
- Herbicide application targeting blackberry in this area is recommended in the Autumn of 2022.
- Continued managing thistle species by herbicide application using knapsack and tanker spray units.
- Continue to monitor Deer impact. Naturelinks to prepare a control plan for consultation with Holcim if damage continues

Phase C Site

The Phase C site comprises disturbed remnant and revegetated areas that border the Extraction site to the west. The most significant remnant areas include:

(a) a small open area (yellow in Figure 7). NE of Extraction where a many slender sun-orchid (*Thelymitra pauciflora*) and yellow onion-orchid (*Microtidium atratum*) persist, and

(b) the gully north of the graveyard (orange in in Figure 7). .

Due to a wet winter in 2021, the gully provided a breeding ground for large numbers of native frogs. Just north of the gully are two remnant adult rough tree-ferns (Cyathea australis) (Blue markers in in Figure 7.)and a single remnant Clover Tree (*Goodia lotifolia*) (Green marker in Figure 7.). Other remnant vegetation includes two areas shown {red in Figure 7). of scattered Tall Sword-sedge (*Lepidosperma elatius*) east of graveyard and north of extraction.

Prevalent exotic species include Blackberry (*Rubus fruticosus agg.),* Common Pampas grass (*Cortaderia selloana*) and Thistle species.

Figure 7: Phase C, Mt Shamrock Quarry

Works 2021

Weed control in 2021, through targeted knapsack herbicide application has been successful, building on the achievements in 2020. Previously inaccessible areas (Figure 7. Blue) containing exotic species have been treated consistently with herbicide application to remove biomass, this has increased accessibility and in turn has reduced the spread of exotic species. Common Pampas Grass and Blackberry persist in areas that are still currently inaccessible, further future herbicide application is recommended.

Future Management Recommendations

The recommendations for Phase C include:

- Continue targeting Blackberry, Common Pampas Grass and Thistle species by herbicide application by knapsack and further increasing accessibility to the site.
- Planting of native tree, grass and lily species within wet areas north and south of the graveyard area to increase native diversity and canopy cover (Table 7.).

Table 7. List of recommended species for planting in the Phase C area in 2022

Species	**Common Name**
Bursaria spinosa ssp. Spinosa	Sweet Bursaria
Cyperus lucidus	Leafy Flat-sedge
Dianella tasmanica	Tasman Flax-lily
Eucalyptus cephalocarpa	Silver-leafed Stringybark. Mealy Stringybark

Eucalyptus ovata var. ovata	Swamp Gum
Ozothamnus rosmarinifolius	Rosemary Everlasting
Poa ensiformis	Purple-sheath tussock-grass
Total	

0.8 Hectare Revegetation Site

The 0.8 Ha site is an area adjacent to the Southern Extraction Zone. Works on this area began in 2021.

Figure 8: 0.8Ha Revegetation Area

2021 Works

Direct seeding of native grass and planting of native trees and shrubs was completed in 2021 (Table 8). Direct seeding included 20% weeping grass (*Microlaena stipoides var. stipoides)* and 80% Wallaby Grass (*Rytidosperma spp.*) seed at 40kg/Ha. *Rytidosperma* species included ~50% of *setaceum*, *caespitosum, duttonianum, racemosum & fulvum* and 50% of *geniculatum, caespitosum, pilosum & setaceum*. Sterile rye and native wallaby grass species from direct seeding have successfully germinated at the site.

Previously plantings were completed in areas of Southern and SE Extraction which had similar dry conditions to this site had a low survival rate in the first year. Given this experience, our first-year plantings done at this site were deliberately sparse and will be supplemented by a second-year planting done in 2022. The most robust, dry tolerant and fast-growing species are to be planted first, with each additional year increasing native diversity and density.

Broad leaf exotic species were targeted by herbicide application in 2021.

Table 8. List of trees and shrub species planted within the 0.8 Hectare Revegetation Area in 2021

Upper Story (canopy)		
Species	**Common Name**	**No.**
Eucalyptus cypellocarpa	Mountain Grey Gum	50
Eucalyptus dives	Broad-leaf Box	50
Eucalyptus Obliqua	Messmate	100
Eucalyptus radiata subsp. Radiata	Narrow-leaf Peppermint	150
	Total	**350**
Upper - Mid Story (tall shrubs)		
Species	**Common Name**	**No.**
Acacia implexa	Lightwood	50
Acacia mearnsii	Black Wattle	50
Acacia paradoxa	Hedge Wattle	50
Acacia stricta	Hop Wattle	25
Allocasuarina littoralis	Black Sheoak	50
Bursaria spinosa	Sweet Bursaria	50
Cassinia aculeata	Dogwood	50
Hakea nodosa	Yellow Hakea	50
Hakea ulicina	Furze Hakea	0
Ozothamnus ferrugineus	Tree Everlasting	50
	Total	**425**
Lower-mid story (small shrubs)		
Species	**Common Name**	**No.**
Acacia genistifolia	Spreading Wattle	50
Acacia myrtifolia	Myrtle Wattle	50
Correa reflexa	Common Correa	50
Epacris impressa	Common Heath	50
Goodenia ovata	Hop Goodenia	50
	Total	**250**
Grand Total		**1025**

Future Management Recommendations

The recommendations for 0.8 hectare include:

- Continue targeting broadleaf exotic species with herbicide application.
- Begin targeting exotic grass species with herbicide application in 2022.
- Second year planting to be completed in 2022 following the first-year planting done in 2021 (Table 9.).

Table 9. List of recommended species for planting in the 0.8 Hectare Revegetation Area in 2022

Species	**Common Name**
Acacia implexa	Lightwood
Acacia melanoxylon	Blackwood
Acacia pycnantha	Golden Wattle
Acacia stricta	Hop Wattle, Straight Wattle
Banksia marginata	Silver Banksia

Eucalyptus Radiata ssp. Radiata	Narrow-leafed Peppermint
Eucalyptus dives	Broad-leafed Peppermint
Eucalyptus goniocalyx	Long Leafed Box, Bundy
Eucalyptus oblique	Messmate
Eucalyptus viminalis ssp. Viminalis	Manna Gum
Kunzea lepitospermoides	Yarra Burgan
Lomandra longifolia var. exilis	Cluster-headed Mat-rush
Total	

Landslip Site

The Landslip site is an area containing a small natural spring, south of the quarry in a fenced area surrounded by former grazing paddocks.

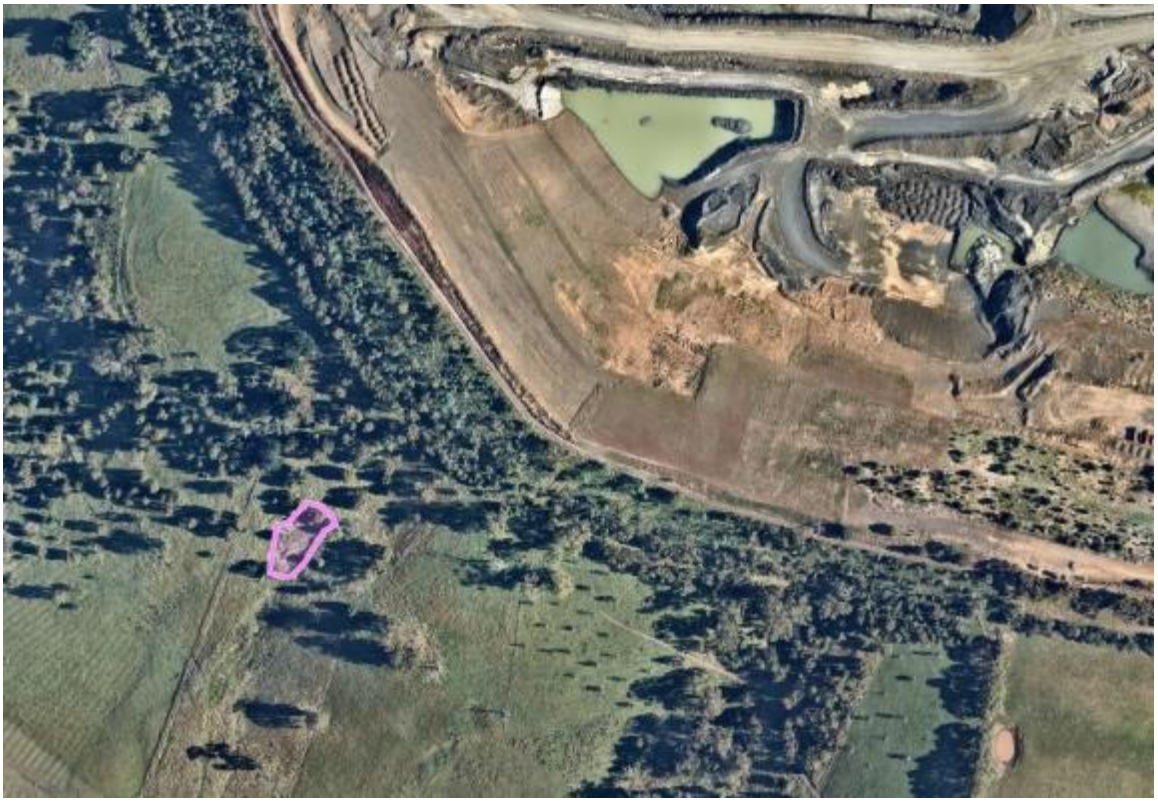

Figure 7: Landslip, Mt Shamrock Quarry

2021 Works

Planting of native trees, shrubs and grass species was completed surrounding the natural spring, building on revegetation done in previous years (Table 10.)

Exotic grass biomass was reduced by brush cutting prior to planting.

Table 10. List of native tree, shrubs and grass species planted within the Landslip area in 2021.

Species	**Common Name**	**No.**
Acacia dealbata	Silver Wattle	50

Eucalyptus viminalis	Manna Gum	50
Lomandra longifolia	Spiny-headed Mat-rush	100
Poa ensiformis	Sword Tussock-grass	50
Poa Labillardierei	Common Tussock-grass	150
Total		**400**

Net Gain Site

The Net Gain Site comprises two offset zones located on the old Donson property; a former farm adjacent to the quarry. It contains a Northern and Southern section.

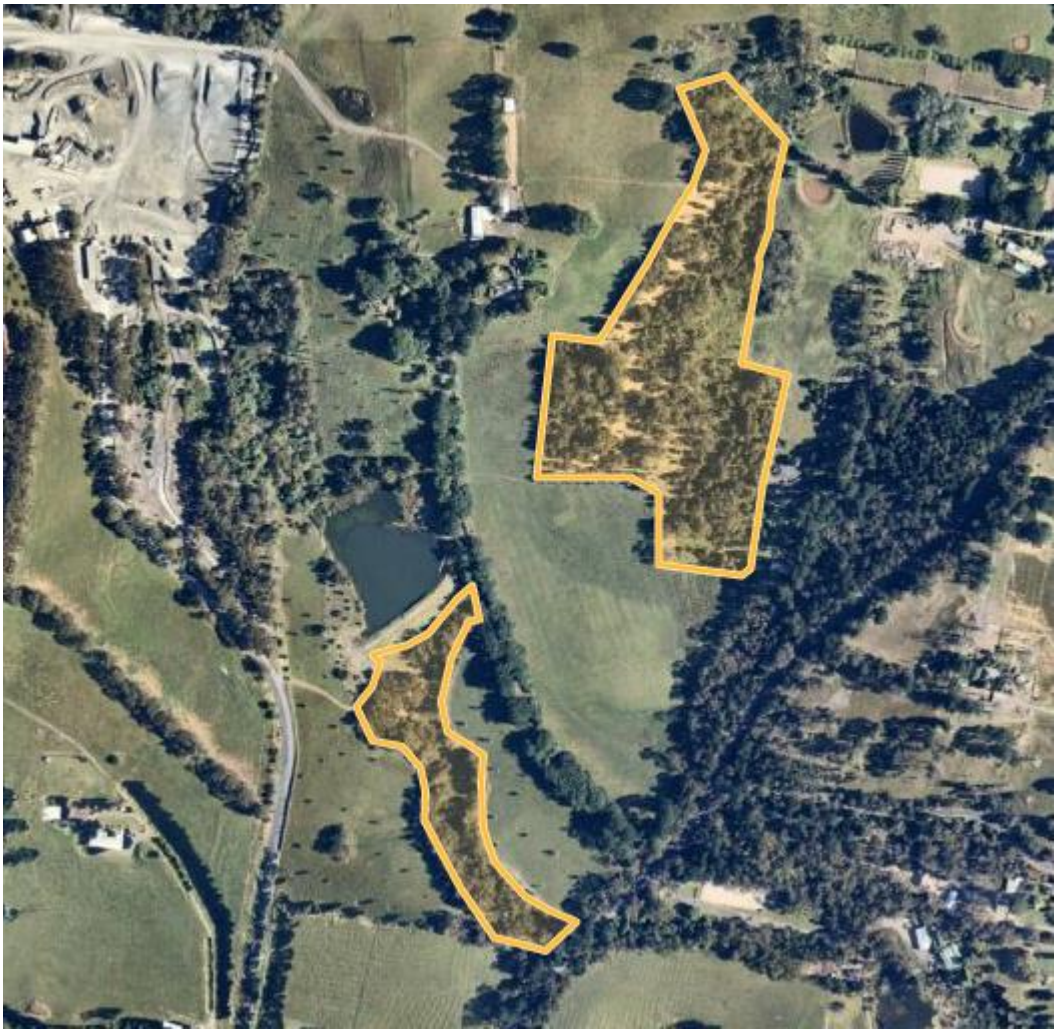

Figure 8: Net Gain North and South, Mt Shamrock Quarry

2021 Works

Low numbers of understorey species were planted in 2021 (Table 11.) focusing on increasing native species diversity with some further planting to be suggested in 2022 (See Table 12.).

The native canopy of the site continues to increase, as well as woody debris which can provide habitat for smaller fauna. Native weeping grass (*Microlaena stipoides var. stipoides*) in managed, shady areas continues to out-compete many of the exotic grass species.

Bishop's weed (*Ammi visnaga*) is prevalent in the SW corner of Southern Section west of the spillway (Figure 9.). Prolific seeding and germination mean the weed requires continuous regular herbicide application.

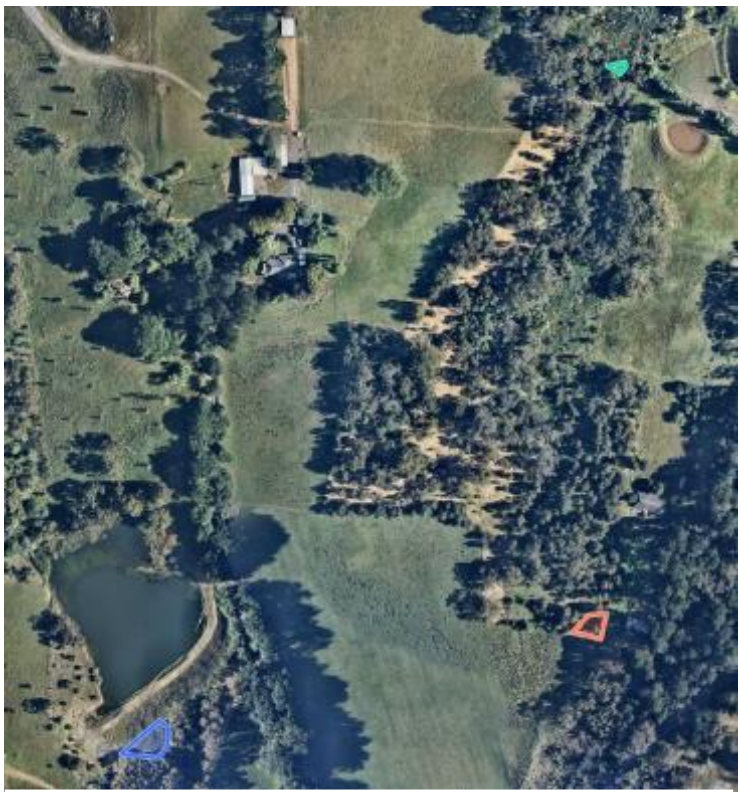

Figure 9: Blue – Bishops Weed, Pink – St Augustine grass, Green – Japanese Honeysuckle

English ivy (*Hedera helix*) is prominent in the Northern Section and frequently germinates and can be difficult to spot the small germinates within the undergrowth.

Japanese honeysuckle (*Lonicera japonica*) is confined to the northern section top swamp area, it is difficult to access except in dry conditions, herbicide application would cause significant off target damage while removing by hand is labour intensive (Figure 9.).

St. Augustine grass (St*enotaphrum secundatum*) is prominent within the bottom NE corner of Northern section (Figure 9.). that requires herbicide application by tanker spraying in the summer months when is it actively growing. It is also only accessible by vehicle in the summer months.

Damage by Deer within the site includes grazing on planted and recruiting native tree and shrub species, disturbance of soft soil within wet areas and damage to bark and stems of softwood species, particularly on Banksia *spp.*

Table 11. List of understory species planted within the Net Gain area in 2021.

Species	Common Name	No.
Carex fasicularis	Tassel Sedge	50
Carex appressa	Tall Sedge	50
Dianella amoena	Matted Flax-lily	10
Dianella laevis var. laevis	Pale Flax-lily (Synonym Dianella longifolia var. longifolia)	5
Dianella longifolia	Blueberry Lily	10
Pultenaea scabra	Rough Bush-Pea	15
Pultenaea gunnii ssp. gunnii	Golden Bush-pea	15
Xanthorrhoea minor ssp. lutea	Small Grass-tree	10
Total		**165**

Future Management Recommendations

Naturelinks propose the following actions to continue in the improvement of the Net Gain area:

- Managing problem exotic species with herbicide application and hand-weeding including Bishop's Weed (*Ammi visnaga*), English ivy (*Hedera helix),* Japanese Honeysuckle (*Lonicera japonica*) and St. Augustine Grass (*Stenotaphrum secundatum*).
- Increasing native species diversity and canopy cover with further planting within wet areas in both the Northern and Southern sections of the site to be completed in 2022 (Table 12.).
- Continue to monitor Deer impact. Naturelinks to prepare a control plan for consultation with Holcim if damage continues

Table 12. List of recommended species for planting in the Net Gain area in 2022.

Species	Common Name
Northern Section	
Acacia melanoxylon	Blackwood
Eucalyptus cephalocarpa	Silver-leafed Stringybark. Mealy Stringybark
Eucalyptus ovata var. ovata	Swamp Gum
Southern Section	
Cyperus lucidus	Leafy Flat-sedge
Eucalyptus cephalocarpa	Silver-leafed Stringybark. Mealy Stringybark
Eucalyptus ovata var. ovata	Swamp Gum
Total	

Aspects and Impacts Assessment

Activity	Aspect	Impacts	Controls
Working onsite	Naturelinks owned vehicles, trailers, powered plant (electric / petrol), hand tools and PPE (footwear etc.) entering and exiting site	Spread weed seed, pathogens & weed propagules into and out of site	• All Naturelinks employees are to be trained on Hygiene HSEP • Crew leaders are to clean down all vehicles, trailers, powered plant (electric / petrol), hand tools and PPE (footwear etc.) before entering site. • Crew leader are to complete site specific inspection before entering site "HSE Daily Inspection Checklist - Holcim - Mt Shamrock" which includes questions about hygiene • Before exiting site crew leader are to complete site specific inspection before entering site "HSE Exit Inspection Checklist - Holcim - Mt Shamrock" • If vehicles, trailers, powered plant (electric / petrol), hand tools and / or PPE (footwear etc.) need to be cleaned contact site contact to be provided with access to wash down area • See Table 14. List of noxious weeds in West Gippsland region **Detailed Controls by area** **Landslip** *Noxious weeds West Gippsland region present or potential:* Blackberry, Slender thistle, Spear thistle, Variegated thistle *Actions taken to reduce risk:* Walk into site from adjacent paddock eliminating contamination risk for vehicle from weed seed. Manually clean all petrol driven plant and hand tools of loose soil and visible weed seed. More thorough cleaning to be undertaken in designated quarry washdown area as required. **Paddock replacement** *Noxious weeds West Gippsland region present or potential:* Blackberry, Ragwort (potential), Slender thistle, Spear thistle, Variegated thistle *Actions taken to reduce risk*: Avoid driving in areas where seeding thistles are present, manually clean all petrol driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated washdown quarry area as required. Do not remove Ragwort from site, any hand weeded ragwort is to be left in situ any seed heads with viable seed is to be buried where possible. **Phase A&B** *Noxious weeds West Gippsland region present or potential:* Blackberry, Chilean Needle Grass, Hawthorn, Ragwort

			(potential), Slender thistle, Spear thistle, Variegated thistle *Actions taken to reduce risk:* Site is only to be accessed from cleared track within quarry fence-line by using periodical access gates with the exception of two areas with double gates in which a cleared access area is maintained. Manually clean all petrol driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated washdown quarry area as required. Do not remove Ragwort from site, any hand weeded ragwort is to be left in situ and any seed heads with viable seed is to be buried where possible. Any Chilean Needle grass discovered is to be sprayed immediately with herbicide where possible no hand weeding of Chilean Needle grass is to be undertaken. Avoid using any hand or petrol driven plant in or near identifiable plants including planting. **1.6 hectare** *Noxious weeds West Gippsland region present or potential:* Spear thistle, Stinkwort, Variegated thistle *Actions taken to reduce risk:* Manually clean all petrol driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated washdown quarry area as required. **.8 Hectare** *Noxious weeds West Gippsland region present or potential:* Blackberry, Spear thistle, Stinkwort, Variegated thistle *Actions taken to reduce risk:* Manually clean all petrol driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated washdown quarry area as required. **Southern Extraction** *Noxious weeds West Gippsland region present or potential:* Blackberry, Chilean Needle Grass, Spear thistle, Stinkwort, Variegated thistle *Actions taken to reduce risk*: Manually clean all petrol driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated washdown quarry area as required. Any Chilean Needle grass discovered is to be sprayed immediately with herbicide where possible no hand weeding of Chilean Needle grass is to be undertaken. Avoid using any hand or petrol driven plant in or near identifiable plants including planting. **South East Extraction** *Noxious weeds West Gippsland region present or potential:* Blackberry, Chilean Needle Grass, Slender thistle, Spear thistle, Stinkwort, Variegated thistle

			Actions taken to reduce risk: Manually clean all petrol driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated washdown quarry area as required. Any Chilean Needle grass discovered is to be sprayed immediately with herbicide where possible no hand weeding of Chilean Needle grass is to be undertaken. Avoid using any hand or petrol driven plant in or near identifiable plants including planting. **Extraction/Phase C** *Noxious weeds West Gippsland region present or potential:* Angled Onion (potential), Blackberry, Crack Willow, Flax leaf broom, Gorse, Hawthorn, Ragwort, Slender thistle, Spear thistle, Soursob, Stinkwort, Sweet Briar, Variegated thistle *Actions taken to reduce risk:* Manually clean all petrol driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated washdown quarry area as required. Do not remove Ragwort from site, any hand weeded ragwort is to be left in situ any seed heads with viable seed is to be buried where possible. Do not leave designated access tracks with vehicle, do not drive over any flowing weeds growing on tracks. Clean any disturbed mud that may accumulate underneath the wheel arch before leaving site at designated washdown area. **Net Gain** *Noxious weeds West Gippsland region present or potential:* Angled Onion, Blackberry, Bridal creeper, Crack Willow, Flax leaf broom (nature strip only), Garden asparagus, Hawthorn, Maderia vine (nature strip only), Ragwort, Slender thistle, Spear thistle, St Johns wort, Stinkwort, Soursob Variegated thistle *Actions taken to reduce risk:* Manually clean all petrol driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated washdown quarry area as required. Do not remove Ragwort from site, any hand weeded ragwort is to be left in situ any seed heads with viable seed is to be buried where possible. Park vehicle near main access gate only for northern section, leave car in nearby paddock or gate entrance for southern section. Limit all driving unless absolutely necessary in northern section. Clean any disturbed mud that may accumulate underneath the wheel arch before leaving site at designated washdown area.
Controlling weeds	Use of herbicide to control weeds	Incorrect use of herbicide on plant species Off-target damage	All employees who use herbicides are trained in its correct use and hold a Chemcert license, or are under direct supervision while in training, by a Chemcert holder. Restricted use chemicals are to be only used by those staff holding an Agricultural Chemical User's Permit (ACUP) • Herbicides are carefully selected to each species see Table 13. List of herbicides used at Holcim – Mt Shamrock

		Herbicide entering waterways	*Alternative methods to herbicide spraying to be considered by Holcim and quoted by Naturelinks* • Hand weeding: Useful for high quality areas and when working near sensitive species. Inefficient for large areas, time consuming. Cut and paint: used for woody weeds when not small. Can be used for small infestations of blackberry in high quality areas or around sensitive species. Can be labour intensive depending on scale. • Brush-cutting/slashing: Useful for biomass control and maintaining access to tracks and areas with high weed load. Can be used to target annual weedy grasses to prevent seeding depending on site conditions and season. Can be Cost effective in the right circumstance. Grazing: Cattle or goats in areas with high weed load and low-quality native vegetation. Environmentally friendly requires adequate fencing so not suitable to some situations. May require additional permits. Goats will likely be the more effective particularly for control of blackberry. • Fire: Historically this method has been ruled out by Quarry management. Naturelinks does have the relevant licenses, Insurance, training, equipment to undertake controlled burns.

Table 13. List of herbicides used at Holcim – Mt Shamrock

Herbicide	Usage	Species Controlled	Application	Notes
Weedmaster Duo ACTIVE CONSTITUENT: 360 g/L Glyphosate	Commonly used across the site Control of grass and broadleaf weed species via backpack spray and tanker spray. Occasionally combined with other herbicides for specific hard to kill weeds	Agapanthus, Blue Periwinkle, Holly, English Ivy, Ragwort, Madeira vine	Cut and paint of woody weeds (both with hand tools and chainsaw): Hawthorn, Willow, Prunus sp., Sweet Pittosporum, Large Broom. Backpack spay and tanker spray application	Fast acting, non-selective, cost effective, is inactivated immediately in the soil and does not provide residual weed control
Kamba M ACTIVE CONSTITUENTS: 340 g/L MCPA, 80g/L DICAMBA	Commonly used across the site For broadleaf specific weeds when off target damage to native grass species is to be avoided via backpack spray and tanker spray.	Broadleaf weed species	Backpack spray or tanker spray	Average field half life of dicamba is 14 days. Average field half life of MCPA is 7 days.

Associate Herbicide ACTIVE CONSTITUENT: 600g/kg METSULFURON METHYL	Occasionally used across the sites When targeting particularly hard to kill broadleaf weeds, some woody weeds and weeds with tuberous root systems, will not harm grass via backpack spray or tanker spray (rarely). Occasionally combined with other herbicides for specific hard to kill weeds	Bridal creeper (Asparagus sp.), Angled onion, Sour sob (and other Oxalis sp.), Spanish heath, Blackberry (occasionally only but can be used all year round)	Backpack spray or tanker spray	Associate will remain in the soil for a period of time. The persistence of Associate in the soil is dependent on various environmental conditions e.g. soil pH, temperature, soil moisture and organic matter. Wet, warm, acid soils high in organic matter favour breakdown of Associate in the soil. It should be noted that Associate does not provide a commercially acceptable level of soil residual weed control.

Maca 600 (most widely known by brand name of Garlon) ACTIVE CONSTITUENT: TRICLOPYR	Control of Blackberry sp., Broom, young Hawthorn and Prunus sp, Briar Rose via pack spray or tanker spray	Blackberry sp., Broom, young Hawthorn and Prunus sp, Briar Rose	Backpack spray or tanker spray	Cost effective, very effective and fast acting on blackberry (Spring to mid-Autumn), avoid spraying near waterways, selective but will burn grass at high rate. Should not be used when temperature may exceed 30 degrees as this product can evaporate and move through the air and harm nearby vegetation.
Lontrel Advanced ACTIVE CONSTITUENT: 600g/L CLOPYRALID	Semi selective broadleaf herbicide specifically designed for control of Asteraceae and Fabaceae (daisy and pea family) but also effective against some other broadleaf families while leaving other families unharmed, will not harm grass via pack spray and tanker spray (rarely).	Thistles, Flea bane, Bristly ox-tongue, Stinkwort (Dittrichia graveolens), Cats ear, Plantain, Aster weed, Broom sp., Vetch, Clover, Cape weed. Can harm acacia species when sprayed in high volumes and herbicide can have a detrimental effect on these species (E.g. tanker spraying)	Backpack spray or tanker spray	Local understory species not harmed by overspray: Bidgee widgee and Sheeps Bur, Kidney weed, Native raspberry, Australian Hounds-tongue. Withholding periods: Do not graze or cut for stock food for 7 days after application. Low toxicity to fish, birds, honey bees, livestock, earthworms and aquatic organisms.
Apparent Clopyralid 300 ACTIVE CONSTITUENT: 300g/L CLOPYRALID	Semi selective broadleaf herbicide specifically designed for control of Asteraceae and Fabaceae (daisy and pea family) but also effective against some other broadleaf families while leaving other families unharmed, will not harm grass via pack spray and tanker spray (rarely).	Thistles, Flea bane, Bristly ox-tongue, Stinkwort (Dittrichia graveolens), Cats ear, Plantain, Aster weed, Broom sp., Vetch, Clover, Cape weed. Can harm acacia species when sprayed in high volumes and herbicide can have a detrimental effect on these species (E.g. tanker spraying)	Backpack spray or tanker spray	Local understory species not harmed by overspray: Bidgee widgee and Sheeps Bur, Kidney weed, Native raspberry, Australian Hounds-tongue. Selective herbicide, useful for herbicide rotation, relatively expensive, less harmful to waterways than alternatives with the exception of Associate, residual in soil and thatch. Withholding periods: Do not graze or cut for stock food for 7 days after application.

Table 14. List of noxious weeds in West Gippsland region

Species	Type	Risk of Spreading	Method of potential seed or propagules dispersal by Naturelinks staff
Angled Onion	Restricted Weeds	Low	Loose Seed
Blackberry	Regionally Controlled Weeds	Low	Fruit
Bridal creeper	Restricted Weeds	Low	Fruit
Chilean Needle Grass	Restricted Weeds	High	Soil (may contain seed) Loose Seed
Flax leaf broom	Regionally Controlled Weeds	Low	Loose Seed
Garden asparagus	Restricted Weeds	Low	Fruit
Gorse	Regionally Controlled Weeds	Low	Loose Seed
Hawthorn	Regionally Controlled Weeds	Low	Fruit
Ragwort	Regionally Controlled Weeds	High	Soil (may contain seed) Airborne Seed
Maderia vine	Restricted Weeds	Medium	Vegetation
Slender thistle	Regionally Controlled Weeds	Medium	Soil (may contain seed) Airborne Seed
Spear thistle	Regionally Controlled Weeds	Medium	Soil (may contain seed) Airborne Seed
St Johns wort	Regionally Controlled Weeds	Low	Loose Seed
Stinkwort	Restricted Weeds	Medium	Soil (may contain seed) Airborne Seed
Sweet Briar	Regionally Controlled Weeds	Low	Fruit
Soursob	Restricted Weeds	Low	Soil (may contain seed) Loose Seed
Variegated thistle	Regionally Controlled Weeds	Medium	Soil (may contain seed) Airborne Seed
Crack Willow	Restricted Weeds	Low	Vegetation