3650 Toodyay Road, Bailup

LANDSCAPING PLAN

[for a Vegetative Screen adjacent Site access and intersection with Toodyay Road]

September 2021

Prepared for:

TRICO RESOURCES PTY LTD

Prepared by:

iPlan (WA) Pty Ltd
945 Abernethy Road
Oakford WA 6121
[redacted]

Table of Contents

1 INTRODUCTION

1.1 BACKGROUND AND DESCRIPTION OF THE SITE

Development approval for extractive industry was granted by the Shire of Mundaring on 3650 Toodyay Road, Bailup ('the Site') on 13 April 2021. The Site is approximately 375 hectares in area. Approval for the development has been granted over an area of approximately 42 hectares.

The Site is surrounded by General Agriculture zoned properties to the east, south and west. Vehicular access to the Site is off Toodyay Road, which is a primary regional road, and adjoins the property along its northern boundary. Land to the north of Toodyay Road falls within the municipal boundaries of the Shire of Toodyay and contains rural residential land uses.

Red Swamp Brook traverses the northern section of the Site and flows in a north-westerly direction. There is an existing soak/dam near the southwest corner of the Site in an isolated low-lying area. The surface pond is completely separate from Red Swamp Brook and does not form part of any creek or river system.

Topography of the Site is undulating. The northern part of the Site slopes down towards the northern boundary forming a valley where Toodyay Road and Red Swamp Brook lie. Development areas are located on top of local elevations to the west and south which are predominantly cleared of vegetation. A dwelling is located on the Site which is uninhabited.

The Site is predominantly cleared of vegetation for use as cropping and grazing for more than 40 years. Remnant clumps of native vegetation remain in the northeast quarter, centrally and in the southwest corner. Red Swamp Brook is vegetated with endemic and non-endemic species. It is not interfered with or traversed by the development activities. There are no records of declared flora on the Site.

The Site was formally approved in 2010 as an Extractive Industry development which was granted by Shire of Mundaring and WAPC which expires 31 October 2023. An Extractive Industry Licence was issued by the Shire of Mundaring is currently valid. Operations to date have been limited to exploration and excavating test pits to identify soil quality and obtain samples. Internal vehicle tracks are located across the Site, most of which have been present for more than 40 years, while some newer ones constructed more recently provide vehicle access to areas designated for gravel excavation.

Extractive Industry activity at the Site can be generally described as: excavation of gravel soils from designated areas, crushing and screening, loading and hauling product off site. Associated works include, stripping topsoil and overburden, rehabilitation and revegetation. Works and management plans for the control of emissions are prescribed in the approved development application, and its management plans. This Landscaping Plan shall refer to approved management plans where relevant.

A site plan can be found at Appendix A.

Condition 6 the WAPC approval (8 December 2020) requires the developer to design and construct an access/intersection into the Site from Toodyay Road. This is proposed near the location of the existing crossover. In consultation with Main Roads, the intersection has been substantially varied to meet their requirements. These include an acceleration lane for westbound trucks leaving the Site and extensive earthworks to provide sight distances for eastbound traffic on Toodyay Road.

Construction of the intersection requires the removal of vegetation along the southern verge of Toodyay Road for approximately 600 metres. The intersection design has not yet obtained final approval and is still subject to change.

Vegetation along Toodyay Road impacted by the intersection works is the subject of this Landscaping Plan, and are to be replaced by a vegetative screen immediately adjacent the works area to compensate for the vegetation loss.

Soil conditions are yellow-brown clay and gravel with some boulders evident on the surface. Adjacent land within the Site has been regularly cultivated and used for agricultural purposes (growing crops and livestock). It is consistent with the vegetation complexes and soil type as noted in the *Landscape & Revegetation Guidelines* (Shire of Mundaring, 2015) for the region classified as "Northern Jarrah Forest - Darling Plateau/Scarp – Uplands."

1.2 PURPOSE AND STATUTORY REQUIREMENTS

Condition 6 of the WAPC approval (8 September 2020) states:

> *Prior to the commencement of the development, the applicant/owner shall design and construct at its own cost the Toodyay Road and access point modifications generally in accordance with the concept drawings and Main Roads requirements to the satisfaction of the Western Australian Planning Commission.*

The developer has undergone extensive design and consultation work with Main Roads to develop an acceptable intersection. At the time of this report, it is understood that the design process is at an 85% completion stage. The design incorporates an intersection as well as an acceleration lane exiting the Site to the west. Due to local topography, sight distances are impeded for eastbound, oncoming traffic. Therefore, the proposed construction works include reducing ground levels across much of the southern verge as well as into the Site by up to 10 metres. Vegetation within the earthworks area will be cleared to permit sight distances to Main Roads requirements.

Condition 16 of the Shire of Mundaring planning approval (13 April 2021) states:

> *A landscaping plan for a vegetative screen within the site and adjacent to the Toodyay Road site intersection upgrades, shall be submitted to the satisfaction of the Shire of Mundaring within three (3) months of the date of this approval. The landscaping plan shall detail planting to the south of the proposed acceleration lane, at a minimum depth of 30 metres, to a ratio of 1:2 (removed : replaced). The vegetative screen shall thereafter be established and maintained in accordance with the approved landscaping plan and to the satisfaction of the Shire of Mundaring within 12 months of the date of this approval.*

Advice note (9 June 2021) speaks to condition 16 as follows:

> *In regard to timing for the compliance with condition 16, the applicant shall submit a landscape plan to the shire of Mundaring within 3 months of the date of withdrawal of the SAT application for Review [10 June 2021] In the event that Main Roads require modification to the alignment and/or levels of the intersection with Toodyay Road and/or the access road, such that is requires modification to the landscape plan, the Applicant shall submit a revised landscape plan to the Shire for approval.*

The Applicant is to establish the landscaping within 12 months of the approval of the landscape plan or updated landscape plan if changes to the landscape plan are required as a result of changes to the design of the access road and intersection.

Therefore, the LGA planning approval requires the developer to assess vegetation which is likely to be cleared for the construction of an intersection satisfactory to Main Roads, and then undertake landscaping plan to replace lost vegetation. Revegetation is set out in this Landscaping Plan which has been prepared in line with the Shire of Mundaring's publication entitled, *Landscaping and Revegetation Guidelines* (2015).

Given that the intersection design is not yet fully approved by Main Roads, this report shall rely on the most recent revision of the engineering plans which identify the extent of earthworks/clearing. Relevant engineering drawings used for this Landscaping Plan are as follows [copies found at Appendix B]:

C200	Earthworks Plan	Rev 0
C300	Roadworks Plan Sheet 1 of 4	Rev 1
C301	Roadworks Plan Sheet 2 of 4	Rev 2
C302	Roadworks Plan Sheet 3 of 4	Rev 2
C303	Roadworks Plan Sheet 4 of 4	Rev 1
C371	Car-Sight Distances Plan and Profile (with Acceleration Lane)	Rev E
C800	Land Protection Plan	Rev F

As noted in the abovementioned Shire of Mundaring advice note, this Landscaping Plan is subject to the final approved intersection design. Should the intersection design vary, then this Landscaping Plan shall be varied commensurately and reissued to the Shire of Mundaring for approval.

Implementation (timing) of the Landscaping Plan shall be undertaken in accordance with abovementioned conditions, subject to allowance for seasonally timed works (i.e. planting in winter) and any other site specific issues identified in this report.

2 VEGETATION ASSESSMENT

A site visit was conducted on 9 August 2021 to inspect the area proposed to be cleared and to identify and quantify vegetation in that area. The vegetation survey relied upon the engineering drawings listed in Section 1.2 above. The survey area was subdivided into 20 metre long blocks to quantify and qualify vegetation. Note, reference to distances along Toodyay Road in this report adopt CHG 00 as the intersection with the existing crossover; eastward being +ve and westward being –ve.

2.1 SURVEY AREA

The proposed footprint of the construction of the Toodyay Road intersection (including acceleration lane and sight distances) is located at and adjacent to the existing crossover into the Site, west of the Red Swamp Brook culvert crossing [see Site plan at Appendix A].

The vegetation survey extended over the following areas:

- East of crossover length 620m area 11,680m^2
- West of crossover length 260m area 1,510m^2
- Within the Site at the approach to the crossover length 90m area 1,000m^2

Image 1 illustrates the approximate survey area and vegetation within the southern verge of Toodyay Road.

IMAGE 1 – AERIAL OF VEGETATION SURVEY AREA

From the location of the existing crossover, the construction footprint extends approximately 260 metres to the east but is relatively close to the existing road (approximately 10 metres or less from the southern painted lane line). A strip of new asphalt shoulder had been recently constructed by Main Roads and there is a further gravel road shoulder. The proposed construction footprint will not encounter substantial vegetation in this area other than several immature trees which are immediately adjacent the existing crossover, as seen in Image 2.

IMAGE 2 – TOODYAY ROAD SOUTHERN VERGE, LOOKING EAST, CHG 00

The predominant area of impacted vegetation is located west of the crossover. According to the preliminary plans, the majority of the southern verge of Toodyay Road falls under the construction footprint for a length of approximately 300 meters and then tapers towards Toodyay Road for a further 300 metres. Earthworks and roadworks in this area require up to total vegetation removal to allow the surface to be excavated down to a level which achieve Main Roads' requirement for safe sight distances for east-bound vehicles approaching the intersection. The road reserve width is approximately 20 metres when measured from the southern lane line of Toodyay Road to the boundary line.

The construction footprint extends into the Site by a further 10 metres however there is no vegetation to be cleared south of the boundary [as seen in image 9]. Vegetation along the verge is set back from the southern lane at an approximate average of 5 metres where there is an asphalt shoulder, gravel shoulder and v-drain [as seen in images 3-7]. Vegetation adjacent to the existing crossover within the Site is also impacted and has been surveyed [image 8].

IMAGE 3 – TOODYAY ROAD SOUTHERN VERGE, LOOKING WEST, CHG 00

IMAGE 4 – TOODYAY ROAD SOUTHERN VERGE, LOOKING EAST, CHG -80

IMAGE 5 – TOODYAY ROAD SOUTHERN VERGE, LOOKING WEST, CHG -80

IMAGE 6 – TOODYAY ROAD SOUTHERN VERGE, LOOKING EAST, CHG -320

IMAGE 7 – TOODYAY ROAD SOUTHERN VERGE, LOOKING WEST, CHG -320

IMAGE 8 – TOODYAY ROAD SOUTHERN VERGE, EXISTING ACCESS TO SITE, LOOKING SOUTH, CHG 00

A wire fence in the vicinity is not located precisely on the boundary. It varies up to 10 metres south into the Site. Land south of the fence (within the Site) is cleared of all vegetation as it has been developed for agriculture cropping and grazing activities. There is also a firebreak [as seen in image 9]. The fence line is relatively close to the limit of earthworks as noted on the engineering plans and has been used to identify the limit of clearing.

IMAGE 9 – TOODYAY ROAD SOUTHERN VERGE BOUNDARY TO SITE, LOOKING EAST, CHG -200

Warning markers were identified which indicated the presence of underground optic fibre cables in the vicinity of the boundary. It is unclear if underground services infrastructure is located consistent with the cadastral boundary or the fence line, particularly in the area close to Red Swamp Brook. Underground services shall be managed during civil construction works and are likely to be replaced at the existing or future-amended boundary. Revegetation required by this Landscaping Plan shall consider the impact, delay and location of construction and relocation works to ensure that newly planted or seeded areas are not disturbed.

2.2 SPECIES AND QUANTITY

Generally, vegetation was an assortment of medium to tall trees and ground covers, forming a low and high layer of vegetation. Some medium-height shrubs and small trees provided some infill. Tree density was moderate and ground covers were extensive.

Tree species along the entire length were mostly Jarrah, Marri, Wandoo and Flooded Gum. Generally these species were present as advanced trees. Diameters varied up to 1 metre and heights estimated up to 20 metres.

Various small trees dotted the area and were counted by not individually identified. They were mostly Eucalyptus varieties. Some immature Sheoak trees were identified in a cluster near the existing crossover. The most common small trees were Grass Trees which were prevalent across the whole western area. Isolated Zamia Palms also were identified in the region close to the existing crossover.

A dense section of young Banksia trees were surveyed close to the edge of Toodyay Road from CHG -160 to -620, and continued further west outside of the survey area. Growing in a narrow 1-2m wide

strip immediately adjacent the gravel shoulder and drain, that Banksia were all of the same variety and all at a relatively similar size (1.5-2m tall). They were noticeably inconsistent with the surrounding vegetation and did not form a natural or diverse vegetation block. They did not appear particularly suited to the area and were in poor condition, many were dead or had distressed foliage, making their variety difficult to determine. They have created a negative visual screen to much of the vegetation along Toodyay Road Reserve and should be removed pursuant to good regional landscaping maintenance. It is assumed that these trees were likely imported to the area in seed-bearing gravel used for road shoulder repair work in previous years. The block survey estimated quantities of this imported Banksia, however they do not form part of the final survey quantities.

The majority of site has numerous varieties of ground covers, growing across the area relatively densely. The survey was conducted in late Winter, so green new vegetation was readily visible and some flowering had begun, but it was not possible for individual ground covers and low shrubs to be counted. Given the quantity and variety of ground covers, the vegetation survey applied an estimated average density over the vegetation footprint.

The vegetation survey quantified primary species in each block and recorded the results. Smaller and immature vegetation was grouped into categories. Ground covers and low shrubs were assessed based on an approximate coverage. Field data has been transposed into a table found at Appendix C. The vegetation survey divided its vegetation count into two criteria:

- Quantity of individual significant vegetation (trees and tall shrubs); and,
- Area of ground covers.

This method of survey was adopted to determine the revegetation strategy which would meet and surpass the requirement of the Shire of Mundaring's planning condition.

The survey results are summarized as follows:

Type of vegetation	**Species**	**Quantity**
Individual trees, shrubs and significant vegetation	Jarrah, Marri, Wandoo, Flooded Gum, Sheoak, Banksia, Grass Tree, Hakea, various	896
Shrubs and Ground Covers	Various	5137m^2

3 LANDSCAPING PLAN

The following sections discuss and recommend the location, scope, species and planting guide for the Landscape Plan to revegetate the Site adjacent to the works area. Its goal is to achieve the requirements set by the Shire of Mundaring's planning approval and replace native vegetation lost by the construction of the Toodyay Road intersection. The goal of the Landscape Plan is to create a vegetation screen along the south side of Toodyay Road immediately south of the Site boundary, to replace the existing strip of vegetation located on the southern verge between the road and the Site boundary.

The Site is in a rural region and therefore it is appropriate for the Landscape Plan to recreate a vegetation screen resembling endemic species in a natural layout. The primary beneficiaries of the landscape will be Toodyay Road users who will see a native vegetation screen rather than a vista of cleared agricultural land when looking south.

3.1 LOCATION

The Shire of Mundaring's planning approval condition 16 specifies that the area for the Landscaping Plan to be implemented is adjacent the Toodyay Road intersection upgrades, and shall create a 30 metre wide vegetative screen.

The portion of the Site immediately south of the works area is already cleared of vegetation and has been used for agriculture for several decades. The land gradually rises towards the south in this area. A few pockets or remnant vegetation and isolated trees are located in this area, but are not affected by the works or the Landscape Plan. The Landscape Plan does not interfere with Red Swamp Brook.

To create a native landscape which meets the Shire of Mundaring's requirements and compensates for the full area of impact, the location for the landscaping shall be a 30 metre wide by 600 metre long seeded strip along the north boundary of the Site immediately south of the amended boundary with Toodyay Road, with separation for a 3m wide fire break. The preliminary construction plans identify the limit of works at approximately 600m west of the existing intersection. Although the entirety of existing vegetation in the verge will not be removed past approximately 350 metres, a balanced landscape will create a continuous native vegetation strip for the full length of the works area, inside the Site as close to Toodyay Road as possible.

The field vegetation survey identified a total area of vegetation at approximately 5,137sqm. The landscaping strip will be 18,000sqm which is 3.5 times greater. [Refer to the Landscaping Location Plan at Appendix D].

3.2 LAYOUT & QUANTITY

In considering the options for revegetation along the landscaping strip in context with the Shire of Mundaring's requirements, both direct seeding and planting of tube stock were investigated. This report recommends that revegetation occurs by the use of direct seeding a broad range of selected varieties at a rate of 4,000 grams of seeds per hectare which will create a superior outcome to planting individual tube stock. The area will have a larger and much denser landscape of native vegetation to compensate for vegetation affected by construction works.

In justifying the preference of direct seeding over tube stock, the following has been considered:

- Significantly greater numbers. Shire of Mundaring's conditions requires a 1:2 remove : replace quantity. *Landscape & Revegetation Guidelines* (Shire of Mundaring, 2015) recommends seed sowing rates of 400 to 1,000 grams of seed per hectare. This Landscaping Plan recommends the rate of sowing at 4,000 grams of seed per hectare, which is four to ten times the recommended density. Although only able to be estimated, as seeds vary from ten to hundreds of seeds per gram, at an average of 80 seeds per gram, the landscape strip shall be seeded with approximately 500,000 seeds. In comparison, the planting of tube stock at recommended densities would have 1,800 trees and tall shrubs (to replace at 1:2) and approximately 2,500 ground covers and small shrubs to replace double the 5,100 square metres of ground covers being removed. Direct seeding has over 116 times the number of seedlings. Fall-over and non-germination is adequately accounted for by the excess number of seeds being planted;

- Visual aspect. The landscaping area is located in one continuous strip in an area which has a relatively consistent topography. Therefore, the best method to achieve an outcome that results a natural aspect is to revegetate with a broad variety, randomly distributed and non-structured planting. Direct seeding will plant a randomised mixture of seeds to recreate a natural landscape. Planting with tube stock creates semi-defined rows with individual plants separated into their recommended densities of one per 1 to 10 square metres. Spaces between plants are barren and take several years to infill;

- Seeds are considerably more available than seedlings. Moreover, seeds (if unavailable from local seed suppliers) can easily be obtained elsewhere from across Western Australia. The broadest variety of species from the species selection list [Appendix F] shall be seeded;

- Location. The Site is not located in or near a residential or built up area where landscaped areas are often relatively small and utilise landform re-contouring and advanced tree planting. This purpose of this Landscaping Plan is to create a vegetation screen between Toodyay Road and the Site. The screen must create a vegetation strip of high density and a broad variety of endemic species. This is achieved by direct seeding a high quantity of mixed seeds; and,

- Seeds versus seedlings. Planting tube stock has a 12-month head start over direct seeding. However, in this location, that difference will have little to no impact for Toodyay Road users. The landscape strip is set back between 25 and 55 metres from the roadway. One-year-old seedlings will not be visible until established and growing for several years. The difference between 4,300 seedlings and 500,000 seeds is negligible in the short term. After the initial year, direct seeding will be substantially more advantageous. Mass germination will become noticeable and overtake the visual impact of planted seedlings in the following years. As vegetation grows, 500,000 seeds will create a denser 30 metre deep screening strip much faster than 4,300 seedlings. Mid to long term maturation of vegetation to the time where plants will begin self-seeding will have almost no time different between direct seeding and planting tube stock. However, tube stock will take many years to infill between individual trees and shrubs with self seeding. Direct seeding advances that process by 6 to 10 years.

The landscaping vegetation area shall be set back from the boundary by 3 metres to accommodate a firebreak in accordance with the *Planning for Bushfire Protection Guidelines.*

The Landscaping Cross Section Plan [found at Appendix D] illustrates the typical landscape once vegetation has reached maturity.

3.3 SPECIES SELECTION

Due to the large number of species to be seeded, it is impractical to identify individual species on the landscaping diagrams. Direct seeding will thoroughly mix recommended varieties to ensure that broadcasting creates a random distribution across the entire landscaped area.

Species will be selected based on the following criteria:

(1) Recommendation. Species shall be selected from the Shire of Mundaring's *Landscape & Revegetation Guidelines* (2015) recommended species suited the regional category *Darling Plateau/Scarp - Uplands*;

(2) Variety. Revegetation shall plant a diverse variety of species plants with differing characteristics and heights in a random manner so as to recreate a natural landscape;

(3) Species removed by the works. Preference to be given to species identified in the vegetation survey to ensure that revegetation returns the area to as close as original as possible;

(4) Dieback resistance. Although there is no evidence of dieback affecting vegetation in the immediate area, in accordance with the *3650 Toodyay Road Bailup Dieback Management Plan* (iPlan (WA), July 2021), priority (but not exclusivity) shall be given to dieback resistant species. A comprehensive list of *Western Australian natives resistant to Phytophthora cinnamomi* is published by the Dieback Working Group; and,

(5) Availability of seeds.

At the time of ordering seeds, the variety of species shall be determined by species list found at Appendix E which list grasses, ground covers shrubs and trees that meet criteria (1), (3) and (4) above.

3.4 PLANTING & FERTILISER

Endemic species of vegetation shall be planted in the landscape area by the direct application of seeds. Once seeds have been purchased and collected, seeds are to be homogeneously mixed. To assist with the distribution of seeds with varying sizes (some being as tiny as 1,000 seeds per gram), seeds should be mixed with a sterile, weed-free bulking agent such as washed 'playground' sand. Care should be taken to ensure that hand broadcasting is even across the landscape area. It is recommended that the person(s) performing the spreading undertake a process of calibration to avoid under or over spreading. Seeding is to be undertaken in May.

Fertiliser tailored for native plans should be applied at the same time as seed distribution. Bags of slow release granulated fertilised should be spread in accordance with the manufacturer's recommendation.

3.5 WEED CONTROL AND GROUND PREPARATION

The area being landscaped is relatively low in weeds. It has been maintained for agricultural use for several decades, including sowing crop seeds. It appears that herbicides have been historically used.

At the time of the vegetation survey, the area had some fodder crop remnants, but was being eaten by livestock.

Glyphosate, or similar herbicide should be applied to weeds and unwanted vegetation when they are growing but prior to shedding their seeds. Generally, this is period from late Winter to mid Spring. Given that direct seeding of the landscape is to occur in late Autumn, it is preferable for spraying to occur the year before. If seeding of the Landscape area is delayed (due to delays in the approval of the intersection), it is desirable to apply herbicide as soon as possible in the next available growing period as this will allow for weed management to occur over several seasons before seeding.

The landscaping area is to be prepared for direct seeding by the use of tilling equipment. Tractor-drawn ripping tines and/or ploughs should be used to break up the surface to assist with germination and early root development. Ripping should achieve a depth of 150-200mm to break up compact subsurface soil. Ripping should occur parallel to ground contours to avoid any scouring caused by stormwater overland flow.

Ground preparation may encounter subsurface laterite boulders. Some rocks are also present on the surface. Exposed rocks can be left in place as they provide no negative impact to the landscaping plan. Ground tilling and seed broadcasting can simply avoid any obvious rocks.

After seeds are distributed, the surface is to be lightly tilled to provide minimal coverage over seeds. This is to promote seed germination and prevent bird peck. Covering can occur with a chain or light mesh dragged behind a vehicle.

3.6 FENCING

The landscaped area shall be fenced with a suitable rural-type post and wire fence to prevent livestock from entering the area. The fence shall be integrated with the proposed new boundary fence to fully surround the landscaped area prior to seeding. The Landscaping Plan at Appendix D provides an indicative location for the fence, but its final location should be confirmed on site prior to commencement of planting.

3.7 MONITORING & MAINTENANCE

To ensure the Landscaping Plan successfully implements a visual screen adjacent the works area, vegetation needs to be monitored regularly. In year 1 and 2, vegetation should be inspected every 3 months to confirm seed germination and early growth has been successful. Areas of poor germination should be examined to determine cause. Care should be taken if replacing vegetation with seeds or seedlings as ground preparation may disturb surrounding plants.

Slow-release granulated fertiliser should be reapplied annual in winter for the two years following germination.

Fencing should be inspected to ensure that it maintains an effective barrier from livestock. Damage can be caused from kangaroos.

Monitoring for the first 2 years must include the management of weeds which may germinate in the landscaping strip to compete with seeded vegetation. Spot spraying with glyphosate (or similar)

should be used cautiously to select individual weeds. Broad application of fusillade (or similar) can be effective for the control of larger areas of weeds. Refer to manufacturer recommendations when using.

3.8 TIMING

In reviewing the Shire of Mundaring's planning condition there is a potential conflict between the prescribed time to implement the Landscaping Plan and the proposed construction of the intersection.

It is understood that Condition 16 (and the respective advice notes) is to implement the Landscaping Plan within 12 months of the approval of the Landscaping Plan; or 12 months of an amended Landscaping Plan. Condition 16 also prescribes the location of the area to be revegetated; immediately adjacent (south) of the portion of Toodyay Road where vegetation is to be cleared.

Other than a 3 metre setback for a firebreak, the 30 metre wide landscaping strip detailed in this Landscaping Plan is located as close to Toodyay Road as possible so that its benefit and visual impact is maximised for road users. However, the current proposed construction plans require substantial earthworks along much of Toodyay Road reserve, and also up to 10 metres south into the Site, in order to lower ground levels necessary to achieve Main Roads' requirements for sight distances. Those earthworks will also interfere with optic fibre cables buried along the existing boundary. Therefore, in anticipating the nature of construction works, it is inevitable that the area of the Site south of the intersection and acceleration lane will be significantly disturbed. This is the location of the landscaping strip to be revegetated. Heavy machinery such as wheel loaders, excavators, and bulldozers will be tracking over the area as they excavate and stockpile clay, gravel and rock from Toodyay Road reserve onto the area of the Site being landscaped. Trenches will also be dug along the boundary for the relaying of underground services. New boundary fences will be installed.

Implementing the Landscaping Plan before civil works are complete is impractical. It will prevent safe access for machinery to fell trees along Toodyay Road reserve away from the roadway, and also restrict access to the area being earthworked. Therefore, to mitigate risk to damaging the landscaping strip, timing of this Landscaping Plan must begin *after* the completion of earthworks for the Toodyay road intersection (and also after the replacement of underground services). Once the Landscaping Plan has been implemented, new fencing surrounding the area will create an exclusion zone for any future activity in the area.

Relocating the landscaped area further south into the Site to avoid the works area is impractical and not consistent with the intent of Condition 16; which is to provide maximum visual benefit to local community and vehicle traffic on Toodyay Road. Although the Site is predominantly cleared, landscaping further away from Toodyay Road will be less noticeable. Furthermore, it will require larger areas of land to be segregated and fenced off from the current livestock agriculture activity.

Therefore, this Landscaping Plan recommends that timing for implementation shall be as follows:

> *The vegetation screen shall be established within 12 months of the completion of the adjacent construction of the Toodyay Road site intersection and upgrades.*

4 PLANTING GUIDE - Step by step

To maximum germination rates for the landscaped area, the following preparation and planting guide shall be used:

Step 1 Identify and mark out limit of Landscaping Strip (including 3m firebreak setback);

Step 2 Spray for weeds and remnant crops (glyphosate or equivalent). If possible, this is to occur in the previous year when in growth stage (i.e. spring).

Step 3 Install fencing to isolate the area from livestock. (Can be delayed until completion if area is not subject to livestock).

Step 4 Order seeds.

Step 5 Rip and harrow the ground. Tractor drawn ripping to maximum depth (minimum 200mm) and tilling the surface to avoid undulation. Can be done shortly before seeding. Ripping to be parallel with ground contours.

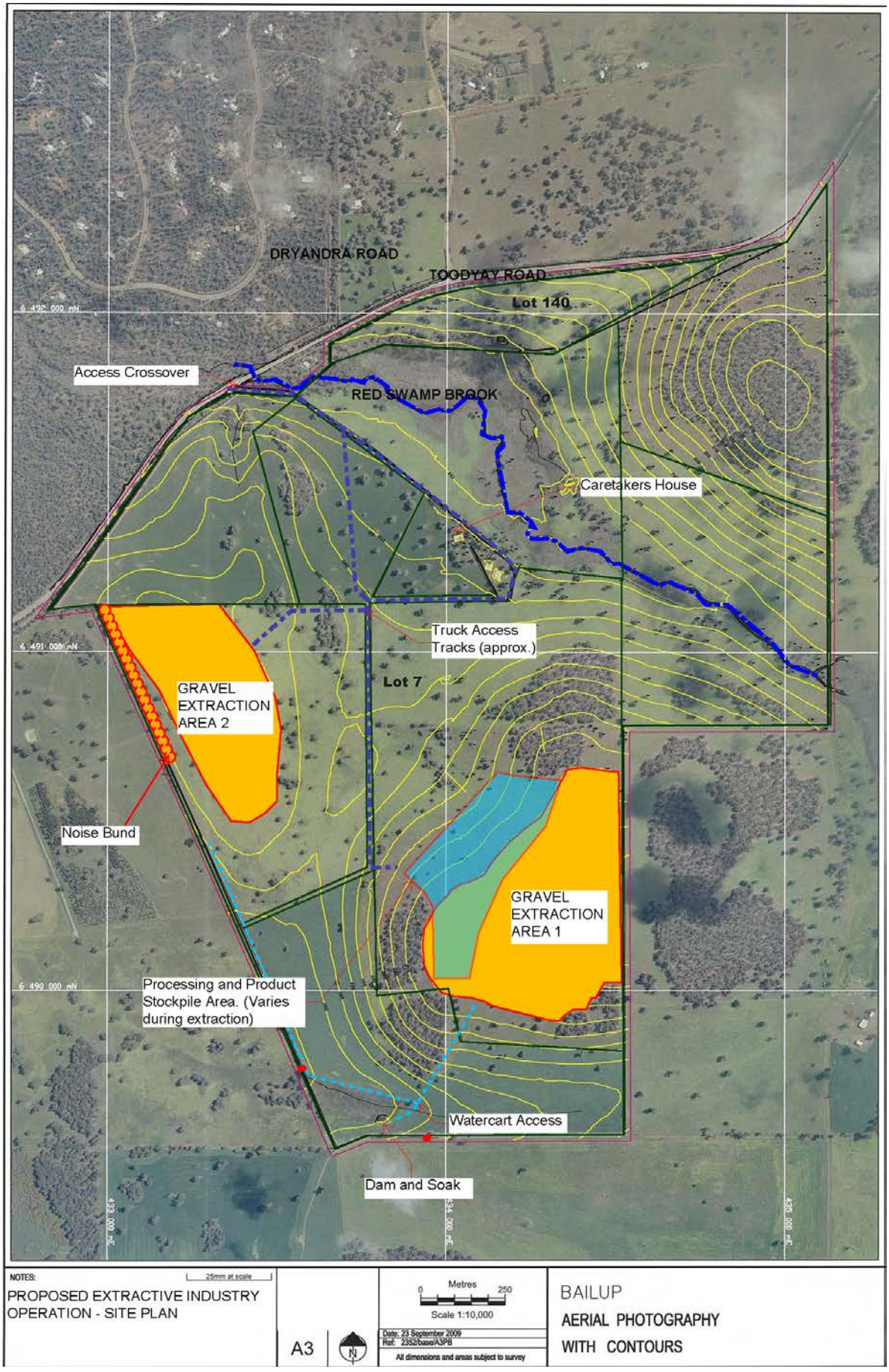
Step 6 Distribution of seed. This can be done by hand or machine. Seed should be thoroughly mixed with a sterile bulking agent and evenly distributed into bags allocated to 50m x 30m seeding zones. This is to avoid over or under spreading seed in any particular area. Recommend undertake a calibration of hand spreading (with sand). Seeding to be undertaken in May.

Step 7 Distribution of fertiliser. Hand spreading of fertiliser over the seeded area.

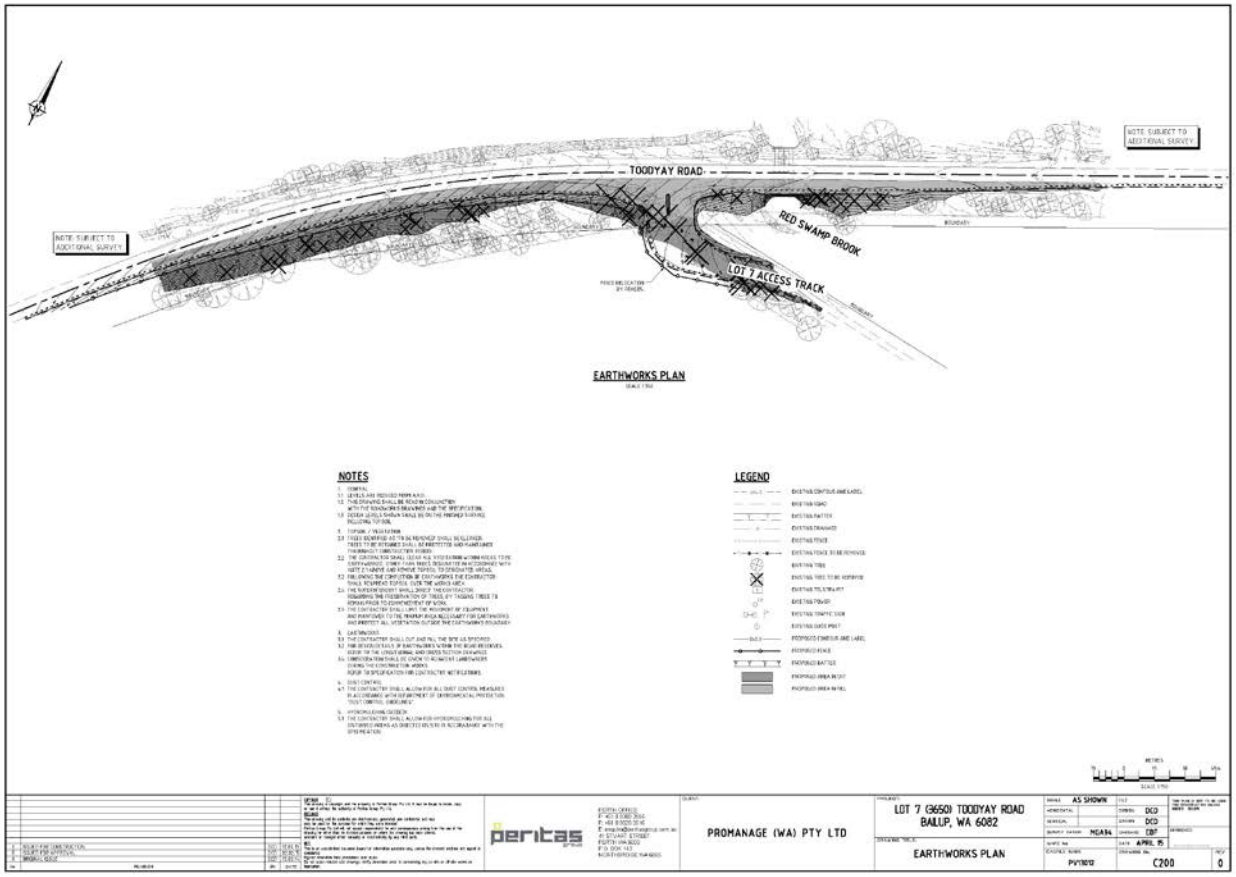
Step 8 Covering. Seed to be lightly covered as soon as possible after seeding to avoid washing away or bird peck. Vehicle drawn chain or light mesh can be used to disturb the surface and cover seeds.

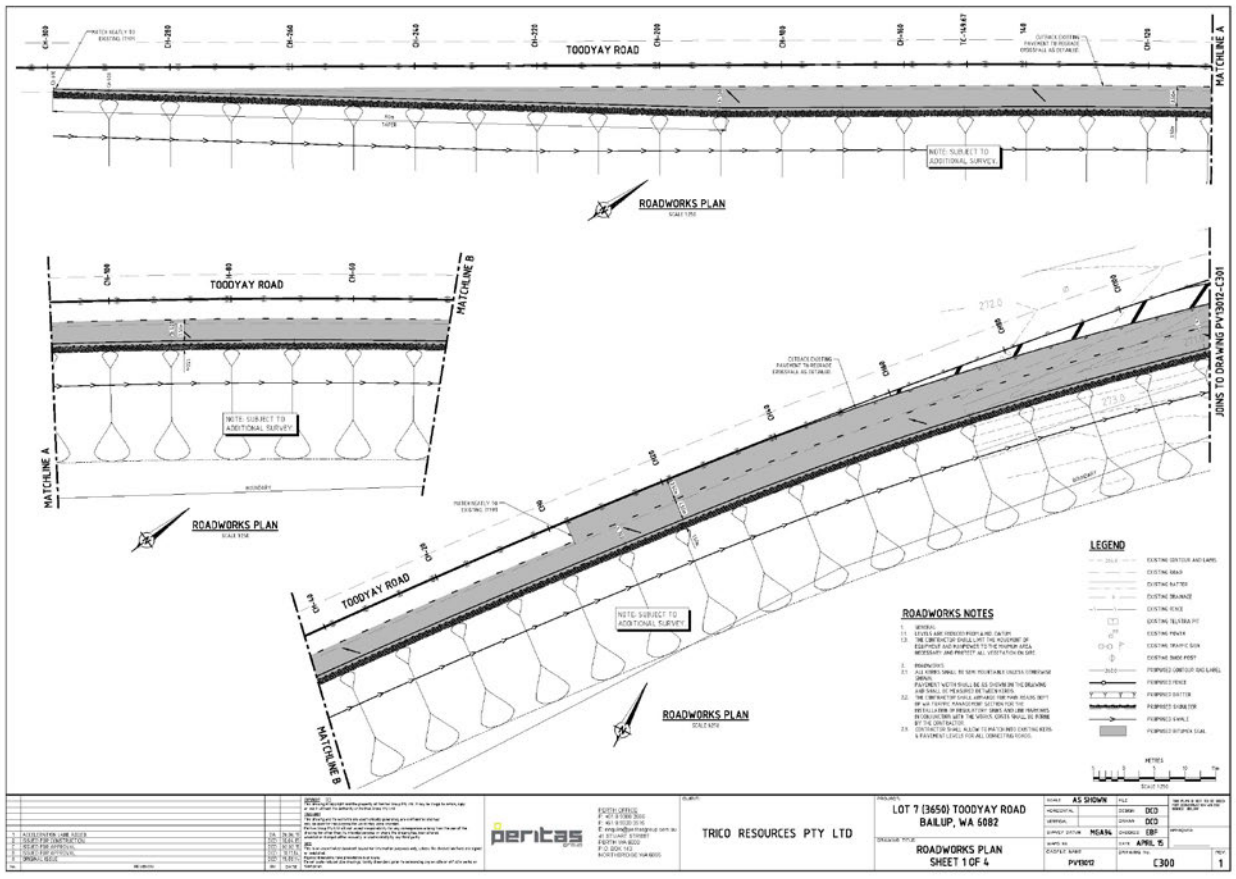
Step 9 Monitoring and Maintenance. Landscaping strip to be inspected for 2 years, every 3 months to ensure fences are adequate, germination is successful and weeds are managed. Weeds to be spot sprayed. Care taken to not disturb areas of successful germination. Reapply fertiliser annual for 2 years.

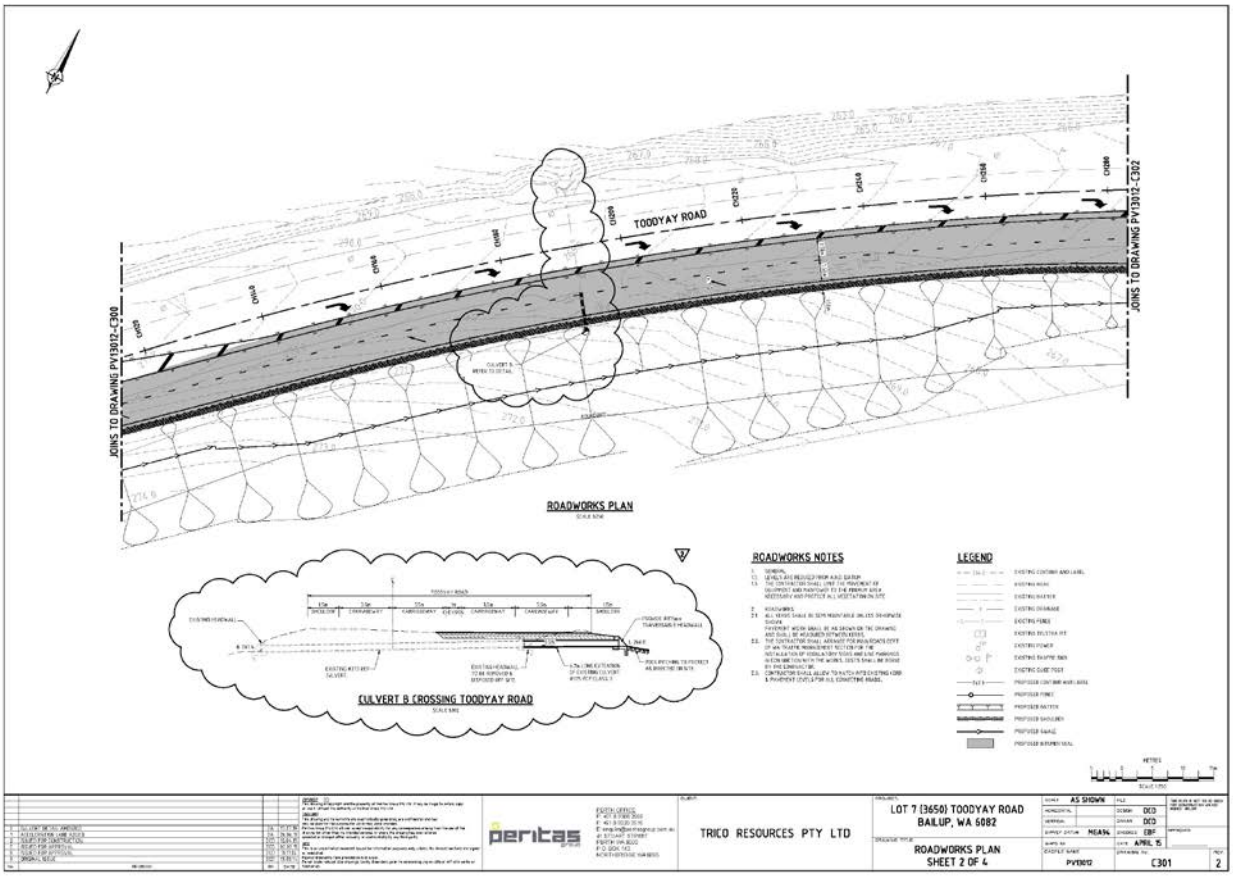
APPENDIX A – Site Plan

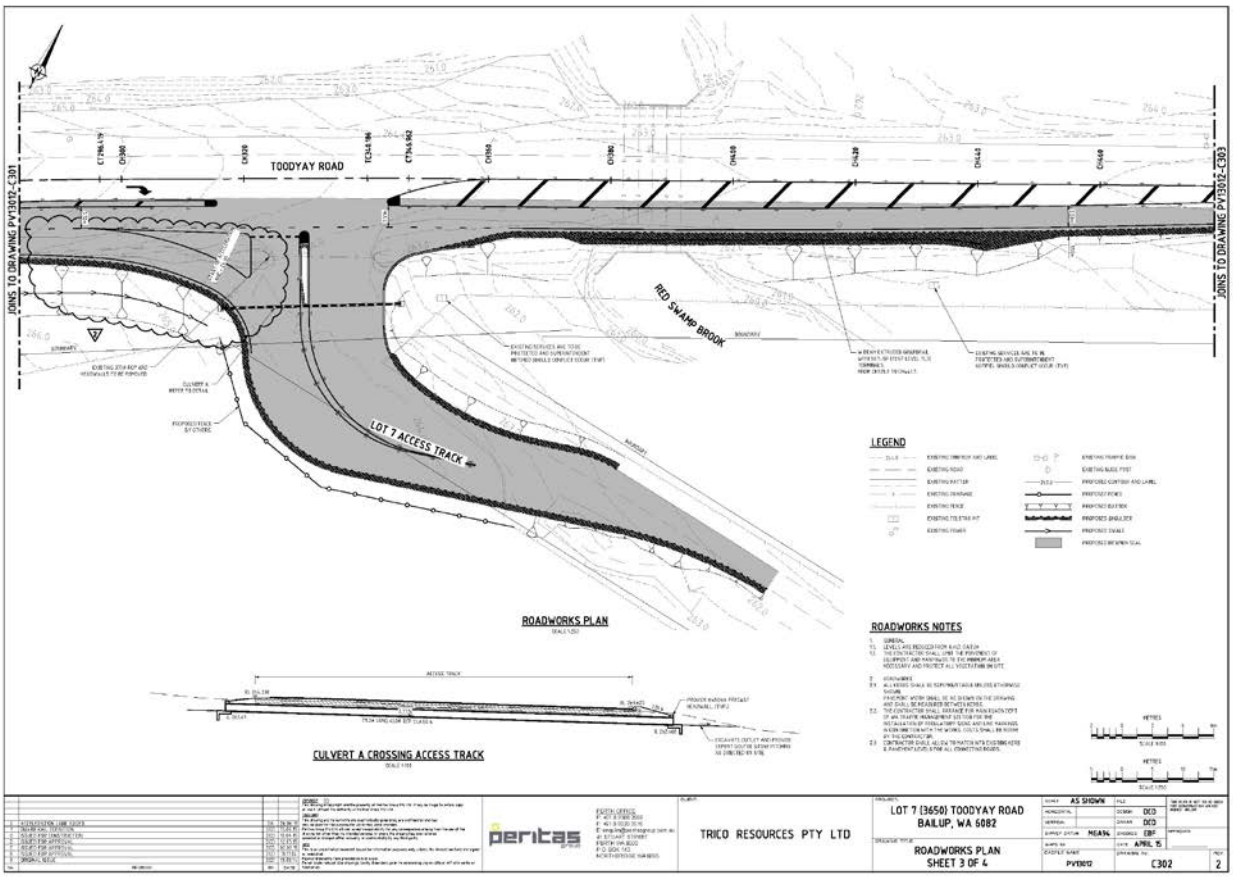


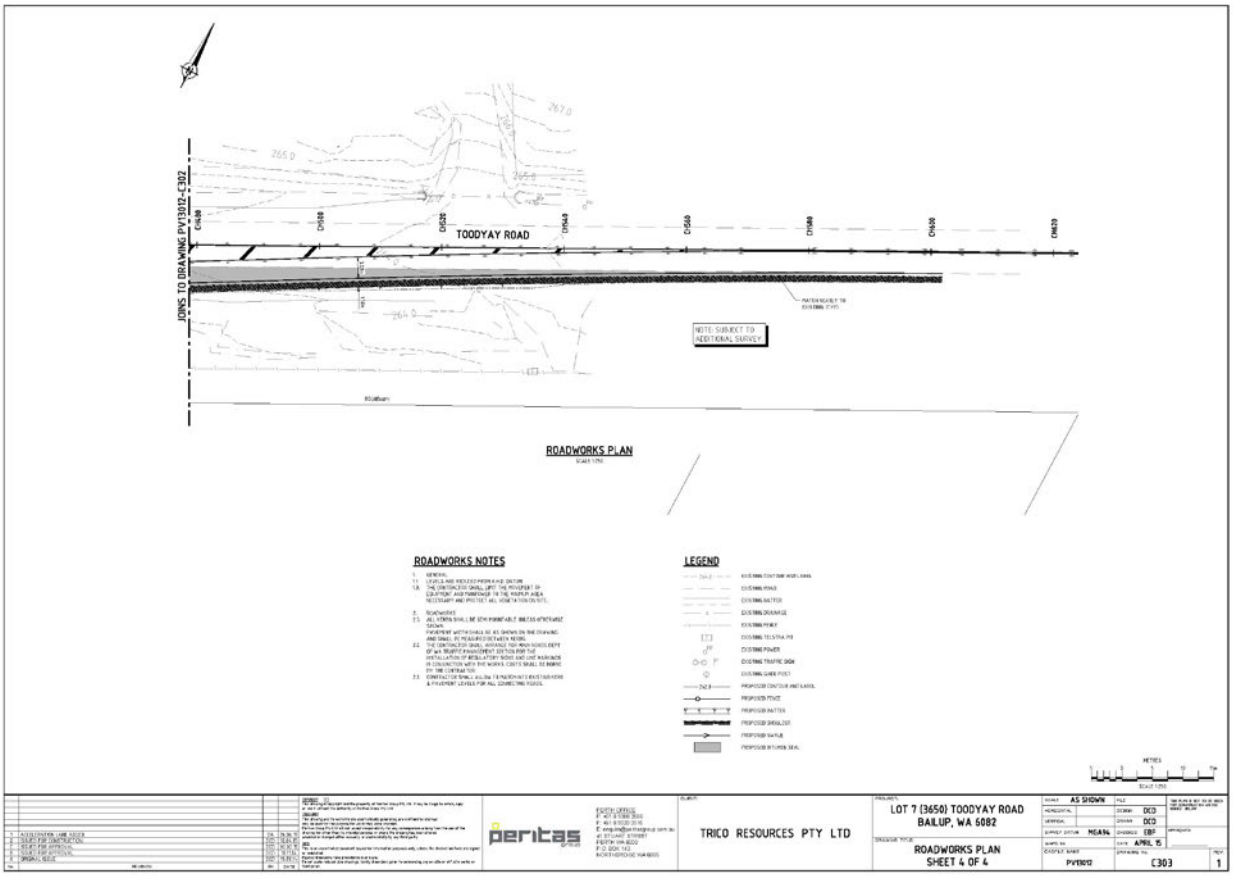
APPENDIX B – Intersection design drawings

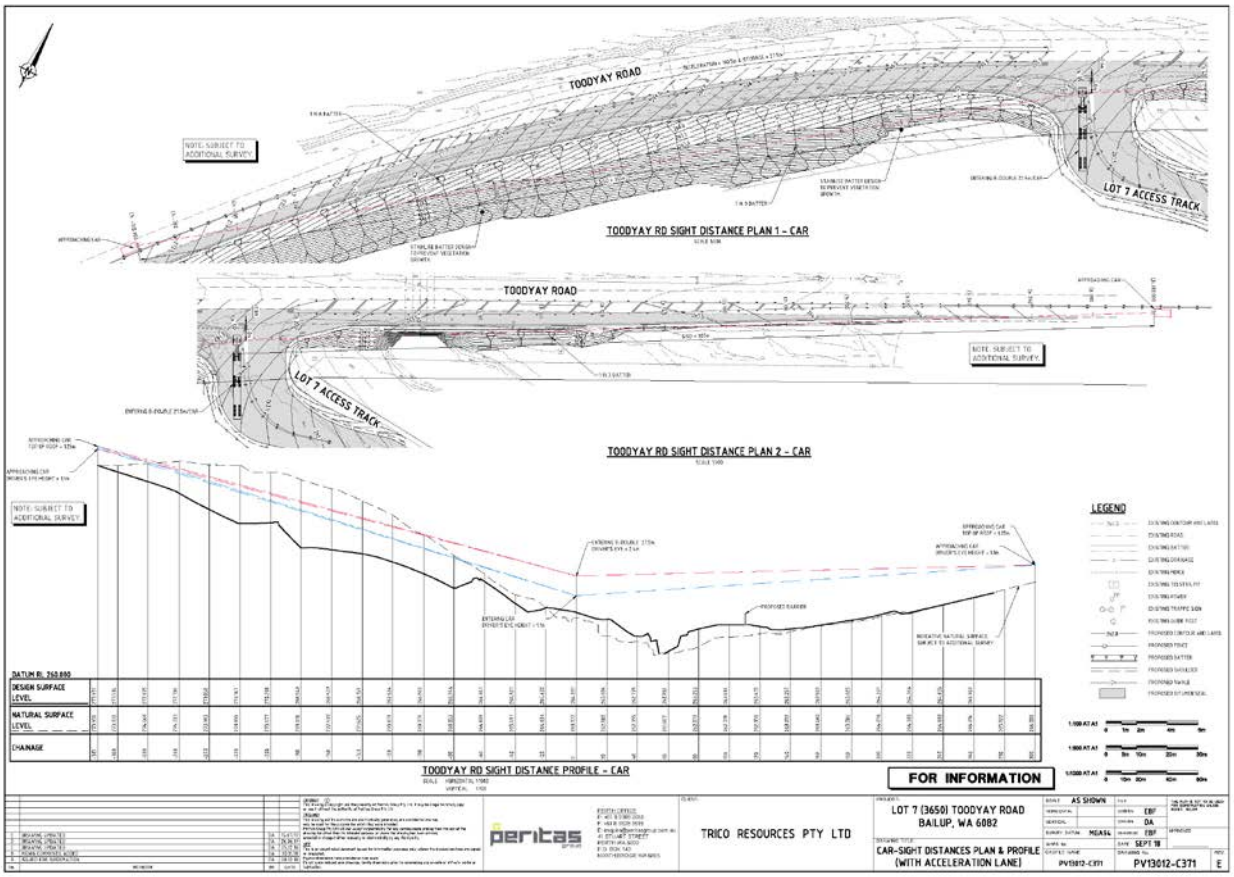


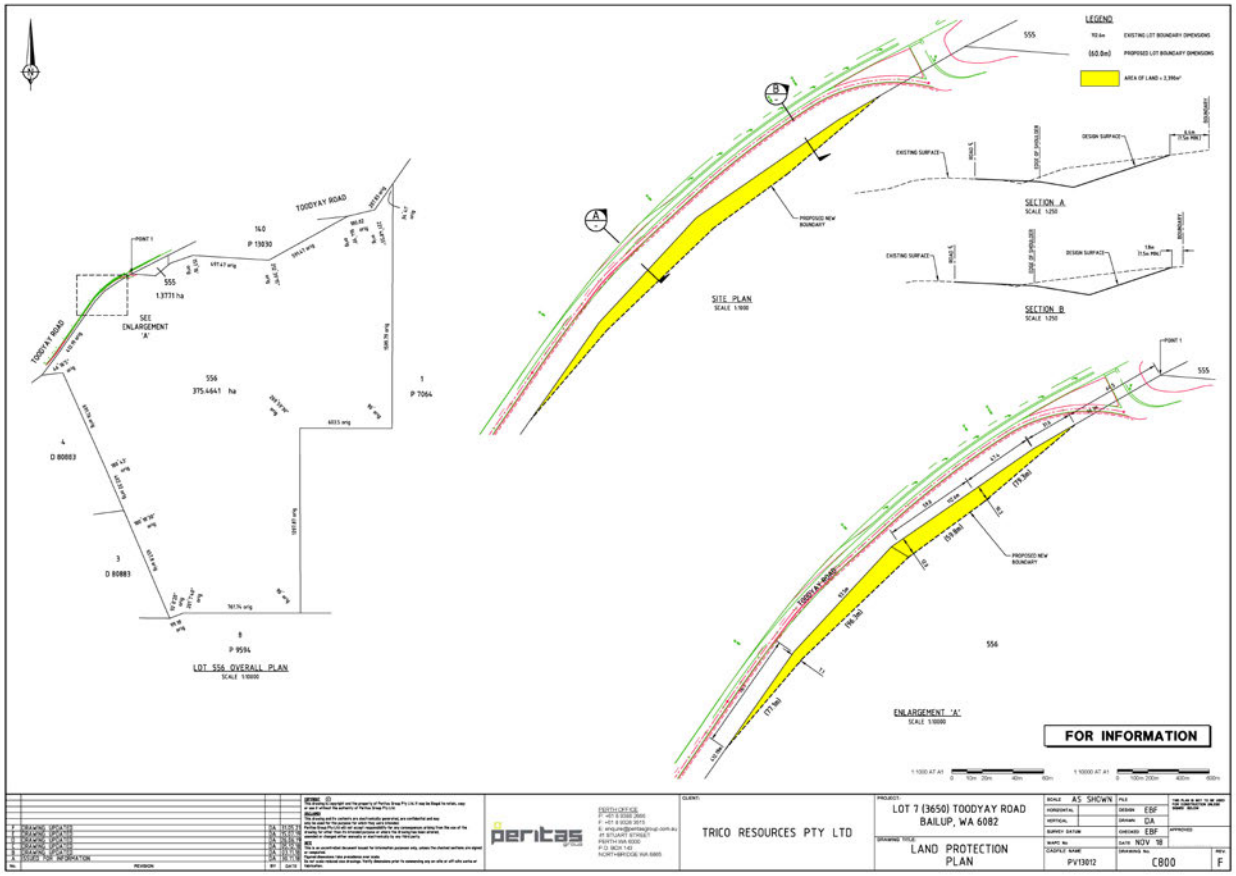



TOODYAY ROAD
JOINS TO DRAWING PV13012-C300
JOINS TO DRAWING PV13012-C302
ROADWORKS PLAN
CULVERT B CROSSING TOODYAY ROAD
ROADWORKS NOTES
LEGEND
TRICO RESOURCES PTY LTD
LOT 7 (3650) TOODYAY ROAD
BAILUP, WA 6082
ROADWORKS PLAN
SHEET 2 OF 4
PV13012
C301
2


TOODYAY ROAD
JOINS TO DRAWING PV13012-C301
JOINS TO DRAWING PV13012-C303
RED SWAMP BROOK
LOT 7 ACCESS TRACK
ROADWORKS PLAN
CULVERT A CROSSING ACCESS TRACK
ROADWORKS NOTES
LEGEND
TRICO RESOURCES PTY LTD
LOT 7 (3650) TOODYAY ROAD
BAILUP, WA 6082
ROADWORKS PLAN
SHEET 3 OF 4
PV13012
C302
2


TOODYAY ROAD
JOINS TO DRAWING PV13012-C302
NOTE: SUBJECT TO ADDITIONAL SURVEY
ROADWORKS PLAN
ROADWORKS NOTES
LEGEND
TRICO RESOURCES PTY LTD
LOT 7 (3650) TOODYAY ROAD
BAILUP, WA 6082
ROADWORKS PLAN
SHEET 4 OF 4
AS SHOWN
APRIL '15
PV13012
C303


TOODYAY ROAD
LOT 7 ACCESS TRACK
NOTE: SUBJECT TO ADDITIONAL SURVEY
TOODYAY RD SIGHT DISTANCE PLAN 1 - CAR
TOODYAY RD SIGHT DISTANCE PLAN 2 - CAR
TOODYAY RD SIGHT DISTANCE PROFILE - CAR
DATUM RL 260.000
DESIGN SURFACE LEVEL
NATURAL SURFACE LEVEL
CHAINAGE
LEGEND
FOR INFORMATION
TRICO RESOURCES PTY LTD
LOT 7 (3650) TOODYAY ROAD
BAILUP, WA 6082
CAR-SIGHT DISTANCES PLAN & PROFILE
(WITH ACCELERATION LANE)
AS SHOWN
SEPT '18
PV13012-C371
E


LEGEND
SITE PLAN
SCALE 1:1000
SECTION A
SCALE 1:250
SECTION B
SCALE 1:250
LOT 556 OVERALL PLAN
SCALE 1:10000
ENLARGEMENT 'A'
SCALE 1:5000
FOR INFORMATION
TOODYAY ROAD
PROPOSED NEW BOUNDARY
EXISTING SURFACE
DESIGN SURFACE
TRICO RESOURCES PTY LTD
LOT 7 (3650) TOODYAY ROAD
BAILUP, WA 6082
LAND PROTECTION
PLAN
peritas

APPENDIX C – Survey Field Report

VEGETATION SURVEY

LOCATION: 3650 Toodyay Road, Bailup
DATE: 9 August 2021
CONDUCTED BY: B. Avila & J. Avila

Survey Block	Road Chg	Construction footprint width	Total area of works	Width of road shoulder	Total area of vegetation	Trees and Shrubs						Other (specify)	Shrubs and ground covers	
	Chg 00 at intersection of existing crossover	Distance from southern lane of Toodyay Road to limit of earthworks		Avg setback from road to vegetation		Jarrah	Marri	Eucalyptus (Flooded Gum, Wandoo etc)	Sheoak	Grass Tree	Various	Banksia (small). Introduced along edge of road	Portion of clearing area with ground cover	Total area of ground covers
Unit	*m*	*m*	*sqm*	*m*	*sqm*	*qty*	*qty*	*qty*	*qty*	*qty*	*qty*	*qty*	*%*	*sqm*
W1	0 to -20	24	480	6	360			13	1	12	2		50%	240
W2	-20 to -40	20	400	6	280			6		16	5		50%	200
W3	-40 to -60	20	400	6	280		1	3		11	5		60%	240
W4	-60 to -80	27.5	550	6	430			4		22	4		40%	220
W5	-80 to -100	31	620	6	500	5	5	12		48	7		50%	310
W6	-100 to -120	33	660	6	540	1	1	12		44	7		60%	396
W7	-120 to -140	30	600	6	480	6	5	13		41	13		70%	420
W8	-140 to -160	30	600	6	480	2	5	12		29	12		70%	420
W9	-160 to -180	30	600	5	500	8	3	17		33	11	50	40%	240
W10	-180 to -200	28	560	5	460	5	3	3		25	7	40	40%	224
W11	-200 to -220	27	540	5	440	13	3	10		26	4	30	40%	216
W12	-220 to -240	24	480	5	380	10	5	3		22	4	30	40%	192
W13	-240 to -260	22	440	5	340	5	3	5		11	3	30	50%	220
W14	-260 to -280	23	460	5	360	4	3	7		21	4	20	40%	184
W15	-280 to -300	22	440	5	340	5	4			11	2	10	30%	132
W16	-300 to -320	22	440	5	340	6				9	7	10	30%	132
W17	-320 to -340	21	420	5	320	3	6			8	8	10	30%	126
W18	-340 to -360	21	420	5	320	2	2			7	6	20	30%	126
W19	-360 to -380	21.5	430	5	330	7	1			8		10	40%	172
W20	-380 to -400	21.5	430	5	330	6	1			8		4	40%	172
W21	-400 to -420	21.5	430	5	330	5	1			3		5	50%	215
W22	-420 to -440	15	300	5	200	3	3	2		4		3	40%	120
W23	-440 to -460	12	240	5	140	3				2		12	50%	120
W24	-460 to -480	8	160	5	60	1				2		15	30%	48

W25	-480 to -500	7	140	5	40	1						38	20%	28
W26	-500 to -520	6	120	5	20							40	20%	24
W27	-520 to -540	5	100	5	0									
W28	-540 to -560	4	80	5	0									
W29	-560 to -580	3	60	5	0									
W30	-580 to -600	2	40	5	0									
W31	-600 to -620	2	40	5	0									
E1	00 to 20	8	160	4	80			11	3					
E2	20 to 40	10	200	4	120			15	12					
E3	40 to 60	8	160	4	80			2	8			10		
E4	60 to 80	12	240	5	140									
E5	80 to 100	10	200	5	100									
E6	100 to 120	8	160	5	60									
E7	120 to 140	4.5	90	5	0									
E8	140 to 160	3.5	70	5	0									
E9	160 to 180	3.5	70	5	0									
E10	180 to 200	3	60	5	0									
E11	200 to 220	2	40	5	0									
E12	220 to 240	1.5	30	5	0									
E13	240 to 260	1.5	30	5	0									
A	Within the Site (adjacent crossover at approach to intersection)	n/a	1500	n/a	670			20		4	8			
TOTAL						**101**	**55**	**170**	**24**	**427**	**119**	**387**		**5137**

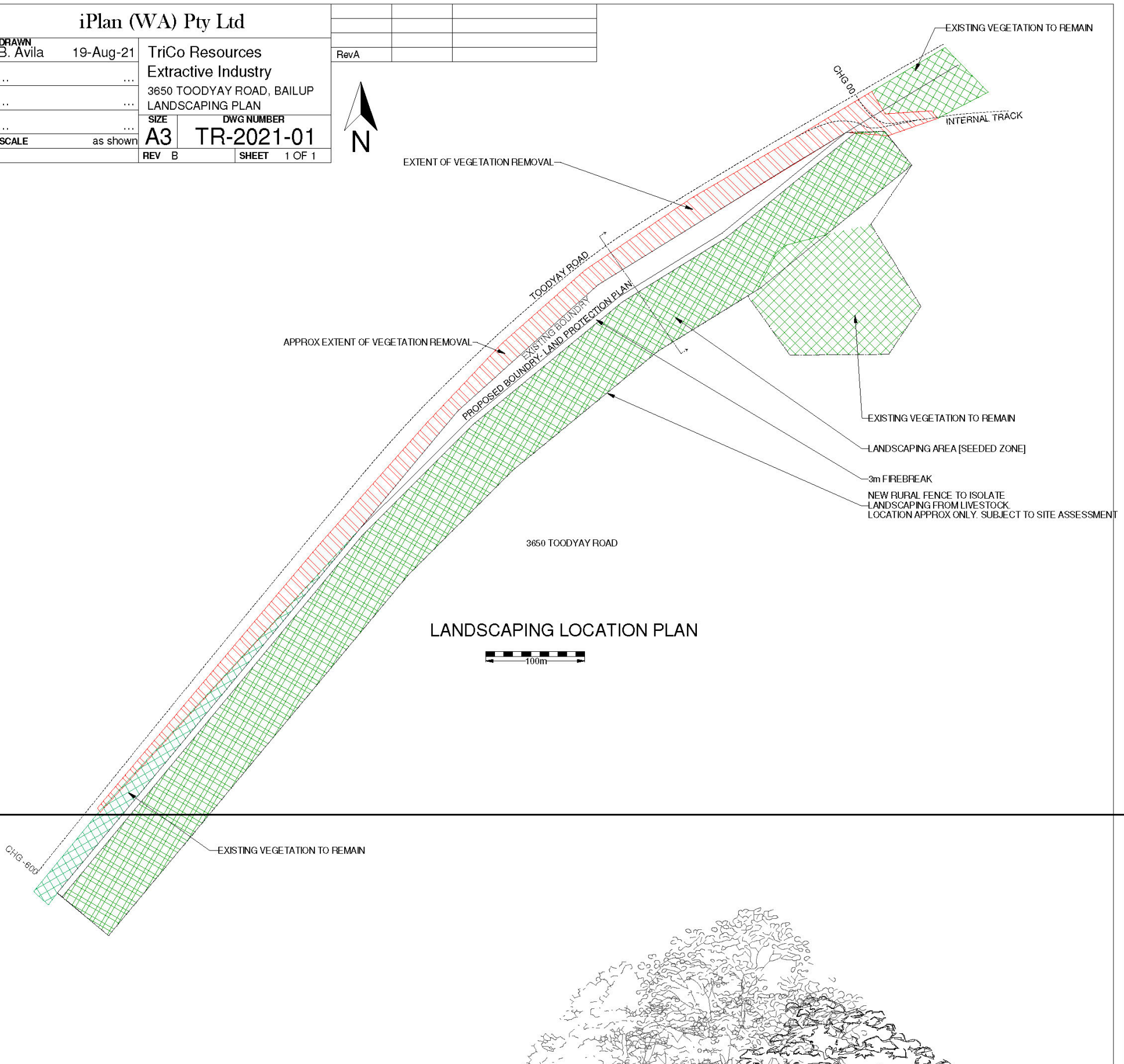
APPENDIX D – Landscaping Plan

iPlan (WA) Pty Ltd

DRAWN B. Avila	19-Aug-21	TriCo Resources Extractive Industry 3650 TOODYAY ROAD, BAILUP LANDSCAPING PLAN
...	...	
...	...	
...	...	SIZE A3 / DWG NUMBER TR-2021-01
SCALE	as shown	REV B / SHEET 1 OF 1

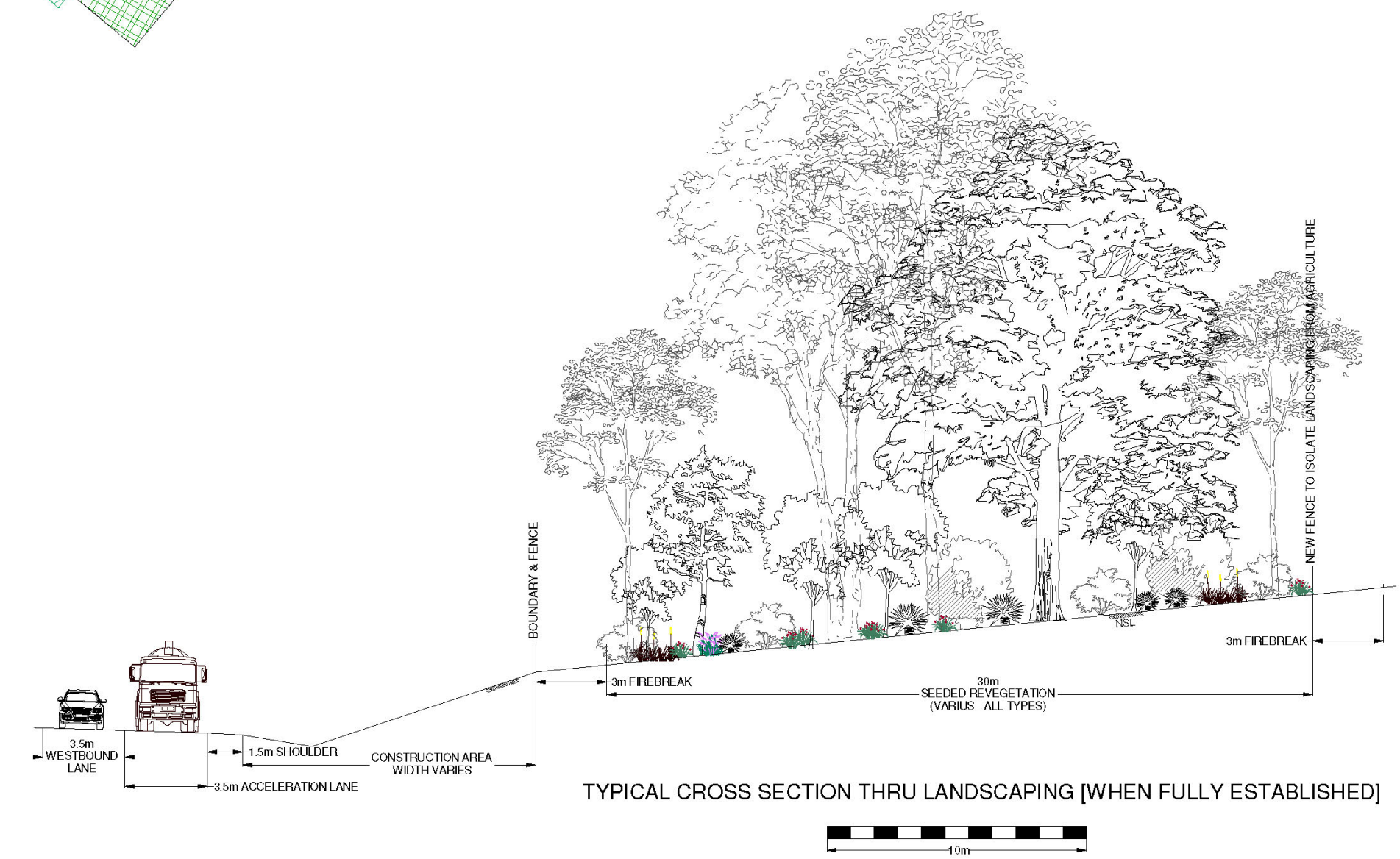
RevA		

N



LANDSCAPING LOCATION PLAN

100m



TYPICAL CROSS SECTION THRU LANDSCAPING [WHEN FULLY ESTABLISHED]

10m

APPENDIX E – Species List

Botanical Name	Common Name	Dieback resistant ++	Identified in survey
Grasses			
Amphipogon amphipognoides	Little Amphipogon	N	
Austrostipa elegantissima	Feather Speargrass	N	
Cymbopogon obtectus	Native Lemon Grass	N	
Lomandra sericea	Silky Mat Rush	N*	
Neurachne alopecuroidea	Foxtail Mulga Grass	N	
Rytidosperma caespitosum	Common Wallaby Grass	N	
Themeda triandra	Kangaroo Grass	N	
Ground Covers			
Billardiera fusiformis	Australian Bluebell	N*	
Clematis pubescens	Common Clematis	Y	
Dampiera linearis	Common Dampiera	Y	
Hardenbergia comptoniana	Native Wisteria	Y	
Hemiandra pungens	Snakebush	Y	
Kennedia coccinea	Coral Vine	Y	
Kennedia prostrata	Running Postman	Y	
Scaevola calliptera	Royal Robe	N*	
Small Shrubs			
Acacia drummondii	Drummond's Wattle	Y	
Acacia pulchella	Prickly Moses	Y	
Adenanthos barbiger	Hairy Jugflower	N	
Anigozanthos manglesii	Mangles Kangaroo Paw	Y	
Boronia ovata	Heart-leaved Boronia	N*	
Bossiaea eriocarpa	Common Brown Pea	N*	
Chorizema cordatum	Heart-leaf Flame Pea	N*	
Chorizema dicksonii	Yellow-eyed Flame Pea	N*	
Conostylis aculeata	Prickly Conostylis	Y	
Dianella revoluta	Blueberry Lily	N	
Gastrolobium capitatum	Bacon and Eggs	N	
Gompholobium tomentosum	Hairy Yellow Pea	Y	
Grevillea pilulifera	Wooly-flowered Grevillea	N*	
Grevillea synapheae	Catkin Grevillea	Y	
Grevillea wilsonii	Wilson's Grevillea	N*	
Haemodorum laxum	Bloodroot	N*	
Hibbertia hypericoides	Yellow Buttercup	N*	
Hovea trisperma	Common Hovea	Y	
Hypocalymma robustum	Swan River Myrtle	N*	
Laxmannia squarrosa	Paper Lily	N	
Lechenaultia biloba	Blue Leschenaultia	Y	
Orthrosanthus laxus	Morning Iris	Y	
Patersonia occidentalis	Purple Flag	N*	
Petrophile biloba	Granite Petrophile	N	
Philotheca spicata	Salt and Pepper	N	
Phyllanthus calycinus	False Boronia	Y	
Scaevola pilosa	Hairy Fanflower	N*	
Thomasia glutinosa	Sticky Thomasia	N	
Thysantus multiflorus	Many Flowered Fringe Lily	N*	

Medium Shrubs			
Acacia alata	Winged Wattle	N	
Acacia celastrifolia	Glowing Wattle	N	
Acacia dentifera	Toothed Wattle	N	
Acacia extensa	Wiry Wattle	Y	
Acacia lateriticola	Unknown	Y	
Acacia sessilis	Unknown	N	
Acacia urophylla	Tail-leave Acacia	Y	
Allocasuarina humilis	Dwarf Sheoak	Y	
Beaufortia squarrosa	Sand Bottlebrush	N	
Billardiera heterophylla	Broad-leaved Brown Pea	N*	
Calothamnus quadrifidus	One-sided Bottlebrush	Y	
Calothamnus sanguineus	Silky-leaved Blood flower	Y	
Darwinia citriodora	Lemon-scented Darwinia	Y	
Daviesia cordata	Bookleaf Pea	N	
Grevillea bipinnatifida	Fuschia Grevillea	N*	
Grevillea endlicheriana	Spindly Grevillea	N*	
Hakea lissocarpha	Honey Bush	Y	
Hakea prostrata	Harsh Hakea	N	
Hakea ruscifolia	Candle Hakea	N	
Hakea trifurcata	Two-leaf Hakea	N	
Hakea undulata	Wavy-leaved Hakea	N	
Hovea pungens	Devil's Pins	N	
Hypocalymma angustifolium	White Myrtle	Y	
Isopogon dubius	Pincushion Coneflower	N	
Leptospermum erubescens	Roadside Teatree	Y	
Macrozamia riedlei	Zamia Palm	N	Y
Melaleuca lateritia	Robin Redbreast Bush	N	
Melaleuca radula	Graceful Honeymyrtle	N	
Trymalium ledifolium	Unknown	N	
Verticordia densiflora	Compacted Featherflower	N*	
Verticordia plumosa	Plumed Featherflower	N*	
Xanthorrhoea gracilis	Graceful Grass Tree	N	
Tall Shrubs			
Acacia saligna	Orange Wattle	Y	
Banksia sessilis	Parrot Bush	N	
Bossiaea aquifolium	Water Bush	N*	
Callistemon phoeniceus	Lesser Bottlebrush	N	
Calothamnus rupestris	Mouse Ears	N*	
Eremaea pauciflora	Orange Flowered Eremaea	N	
Eucalyptus drummondii	Drummond's Gum	N*	
Hakea petriolaris	Sea Urchin Hakea	Y	
Hakea varia	Variable-leaved Hakea	N*	
Melaleuca viminea	Mohan	N*	
Xanthorrhoea preissii	Grass Tree	N	Y
Trees			
Allocasuarina fraseriana	Sheoak	N*	Y
Allocasuarina huegeliana	Rock Sheoak	N*	N
Banksia grandis	Bull Banksia	N	N
Corymbia calophylla	Marri	Y	Y
Eucalyptus accedens	Powerbark Wandoo	Y	Y

Eucalyptus laeliae	Darling Range Ghost Gum	Y	Y
Eucalyptus marginata	Jarrah	N	Y
Eucalyptus patens	Swan River Blackbutt	Y	Y
Eucalyptus wandoo	Wandoo	Y	Y
Nuytsia floribunda	Christmas Tree	Y	N

++ *Western Australian natives resistant to Phytophthora cinnamomi* is published by the Dieback Working Group
*some but not this species