Appendix E – Albany Motorsport Park – Site Feasibility Study (Oct. 2018)

City of Albany

Albany Motorsport Park
Site Feasibility Study –
Lot 5780 Down Road South, Drome

October 2018

Executive summary

Background

Participation in motorsports is a popular recreational activity for many Australians. In Albany and the surrounding areas, motorsport is already known to be popular, with several well organised clubs, a national-level venue for speedway, a state-level venue for go-karts and widely recognised events such as the Albany Classic, Show 'n Shine and Race Wars. However, some motorsport disciplines, particularly motocross, lack suitable facilities in the region.

Recently, an independent proposal has been advanced by the Great Southern Motorplex Group Inc. (GSMG) to develop a multi-use Albany Motorsport Park (AMP) near the Mirambeena timber processing precinct on Down Road. The Western Australian Government has committed $250,000 to undertake preliminary planning for the proposal (Watson, 2018) and a further commitment of $5.75 million in 2020/21 (GoWA, 2017) for its development.

In cooperation with the Department of Local Government, Sport and Cultural Industries (DLGSCI), the City of Albany has commissioned GHD to undertake this technical site feasibility assessment as part of the preliminary planning for the proposed AMP at Lot 5780, Down Road South, Drome (the 'Project Site'). The scope of works for the project included three main elements:

1. Site concept development

- The AMP concept design has been developed by the GSMG (including Roberts Gardiner Architects) and City of Albany. GHD has assisted with the concept design development.
- GHD has prepared a preliminary capital budget estimate, based on the GSMG concept design and these technical feasibility investigations.

2. Site technical feasibility investigations

GHD has undertaken the following technical investigations:

- Collation of background information, existing and surrounding land uses, planning restrictions (including bushfire planning provisions), approvals and buffer requirements,
- Traffic investigation for Down Road and the intersection with Albany Highway,
- Desktop geotechnical investigation of anticipated ground and groundwater conditions,
- Desktop investigation into anticipated power demands and servicing requirements,
- Desktop hydro(geo)logy investigation,
- Preliminary Water Management Plan for the site, particularly addressing the requirements of *Water Quality Protection Note (WQPN) 100: Motor sport facilities near sensitive waters*,
- Preliminary desktop Environmental Impact Assessment (EIA) and site walkover, and
- Preliminary desktop noise investigation and management plan.

3. Stakeholder consultation

Regular consultation with a small working group has occurred throughout the study period. A broader consultation workshop was also held on 17 August with representatives from City of Albany, DLGSCI, GSMG, Department of Planning, Lands and Heritage (DPLH), Department of Water and Environmental Regulation (DWER), Great Southern Development Commission (GSDC), and the office of Peter Watson MLA.

Site description

The Project Site is located approximately 20 km to the north of the Albany CBD and is 192.34 ha in size, of which approximately 52 ha at the western end is covered with well-established vegetation and not considered available for development.

The freehold owner of the property is Susan Elizabeth Page, as executor of the Will of Audrey Helen Old who died on 20 June 2015. The property is presently leased to Lindsay and Joy Black for grazing and sand quarrying purposes. A small portion in the north-west corner of the property (1.3655 ha) is also leased to Plantation Energy Australia Pty Ltd for the purpose of maintaining a detention basin for their site drainage.

Redacted text

Under the City of Albany Local Planning Scheme No. 1 the Project Site is zoned as '*Priority Agriculture*' and is located within an Industrial Buffer Area surrounding the Mirambeena timber processing facilities. The Project Site is also located within a Priority 2 (P2) public drinking water sources area (PDWSA) within the Marbelup Brook Catchment Area (DoP, 2014). In February 2018, the Minister for Water formally provided advice to the City of Albany that while a motorsport facility is incompatible with a P2 PDWSA, "there are measures that can be put in place to protect water quality should the City proceed to approve the development".

The Project Site is currently unserviced, with no connections to scheme water, sewerage, power or wired telecommunications.

Albany Motorsport Park concept design

At full development, the proposed AMP will consist of:

1. Sealed, configurable multi-use track (3.2 km long × 12 m wide) for motor car racing, motorcycle racing, drifting, driver training and cycling:
   – Designed to comply with CAMS' *Track Operator's Safety Guide* (CAMS, 2012) and Motorcycling Australia (MA) *Track Guidelines* (MA, 2011), and
   – To be licensed by Confederation of Australian Motor Sport (CAMS) for FIA Grade 2 and FIM Grade B (i.e. up to second-tier international motor racing).
2. A motocross circuit:
   – Designed and constructed in association with MA guidelines.
3. A 1/8th mile drag racing strip:
   – Designed and constructed in accordance with FIA specifications for drag strips and in association with Australian National Drag Racing Association (ANDRA).
4. A 1,300 m^2 burnout area,
5. An off-road four wheel drive (4WD) and all-terrain vehicle (ATV) training area,
6. Allowance for future speedway,
7. Allowance for future go-karts.

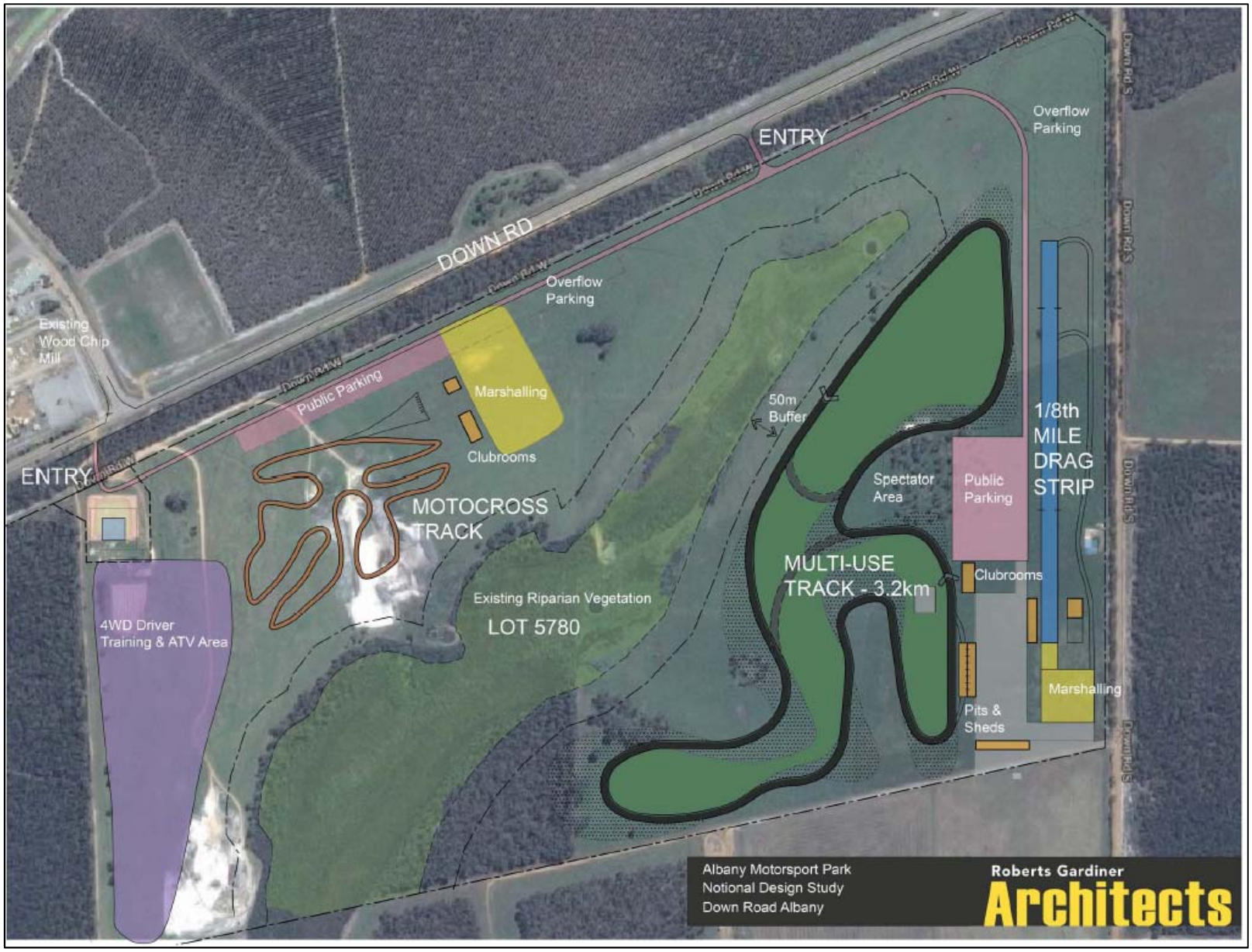

Figure ES-1: AMP concept site layout

For the purposes of sizing facilities and servicing infrastructure, a typical / frequent site attendance of 500 persons has been assumed (i.e. competitors + officials + spectators). For special events that anticipate a greater number of site attendees, additional management measures will need to be implemented.

Governance and ownership arrangements for the AMP are still subject to further investigation, but for the purposes of this study it is assumed that the property, tracks and facilities will be owned by the City of Albany. The AMP will be leased to an operator-manager, for all operational and maintenance activities. The operator-manager will be a “not-for-profit” company consisting of a Board of Management and no other shareholders.

Preliminary capital cost estimate

Outlined in Table ES-1 is a summary of the capital cost estimate for the AMP concept design, including the likely staging of development. The preliminary cost estimate has been prepared for the purpose of budget setting and must not be used for any other purpose.

Table ES-1: Preliminary capital cost estimate

Area	TOTAL ($)	In-kind contribution	Stage 1	Stage 2	Stage 3
Motocross	2,973,000	382,000	437,000	1,673,000	449,000
Multi-use track	11,426,000	151,000	7,379,500	2,772,500	1,111,000
Drag strip	3,726,000	0	0	2,968,000	513,000
4WD / ATV area	444,000	133,000	0	300,000	0
Common / general items	5,261,000	270,000	3,016,000	1,189,200	436,800
TOTAL	**23,830,000**	**936,000**	**10,832,500**	**8,902,700**	**2,509,800**

Priorities and staging plan

The priority facilities in Stage 1 are:

1. The motocross track – to resolve the lack of safe, permanent, easily accessible facilities for the Albany Motorcycle Club and enable rider training, Club and State level competitions to be held on a track that is to be accredited and licenced by Motorcycling Australia (MA),
2. The multi-use track – to allow the operator-manager to generate revenue through driver training and track rental activities, provide a safe and scrutinised venue to local enthusiasts and provide a high level venue for State motor car, motorcycle and cycling events on a track to be approved and licenced by CAMS, and,
3. Enabling works, such as feasibility / planning / design works, and access roads.

Stages 2 and 3 contemplate the further development of the AMP site as patronage increases and the range of uses is broadened (for example, to include lighted evening events) and is dependent on further funding from various sources becoming available.

Summary of site feasibility assessment

To summarise, assess and prioritise the site feasibility issues investigated in this study, GHD has undertaken a preliminary risk assessment, using the City of Albany's *Risk & Opportunity Management Framework* (2018). This preliminary risk assessment captured 20 material risk issues, based on the feasibility investigations. Each risk has then been addressed by recommended remedial actions, controls and responsibility, with attention paid to the preferred hierarchy of controls. The residual risk level for each issue is targeted to be 'Low / acceptable', or 'Medium / monitor'. In the latter case, the proposed remedial actions will require on-going monitoring to assure their effectiveness.

A summary of the risk issues and initial and residual risk ratings is shown in Table ES-2.

Table ES-2: Summary of risk assessment

Risk issue	Initial risk rating	Residual risk rating
Zoning of Project Site	High	Low
Bushfire Prone Area	High	Medium
Security of Project Site	High	Medium
Visual amenity impacts	High	Low
Loss of fauna habitat (Black Cockatoos)	High	Medium
Heritage impacts	Medium	Medium
Adverse geotechnical conditions	High	Medium
Waste materials dumped on site	Medium	Low
General construction phase impacts	Medium	Low
Erosion and sediment pollution to Wetland (construction and operation phases)	Extreme	Medium
Hydrocarbon / chemical pollution to Wetland	Extreme	Medium
Drinking water availability	High	Medium
On-site wastewater management	High	Low
Noise impacts	High	Medium
Traffic impacts from special events	High	Medium
Crash risk with heavy vehicles on Down Rd	High	Medium
Power availability	High	Low
Telecommunications availability	Medium	Low

Based on this assessment, it can be concluded that the Albany Motorsport Park proposal at Lot 5780, Down Road South does not have any technical obstructions to its feasibility, pending regulatory approvals and implementation of the recommended remedial and control actions.

Recommended remedial and control actions

The recommended remedial and control actions for the AMP proposal are outlined below according to the phase of development – i.e. planning, design development, construction and operation.

Planning phase (2018 to 2020)

The following planning phase actions are recommended:

1. City of Albany to include reference to the AMP in the *Albany Local Planning Strategy*.
2. City of Albany and GSMG to continue the baseline water quality monitoring program.

3. GSMG and City of Albany to conduct a baseline flora and fauna survey and undertake environmental offset calculations.
4. City of Albany to seek comment from Wagyl Kaip on the AMP proposal.
5. GSMG to arrange for all waste materials on site to be sampled and removed by sub-Lessees, and site 'made good'.
6. GSMG and City of Albany to prepare a Bushfire Management Plan for the Project Site, including secondary road access from Down Road, north to Redmond-Hay River Road.
7. GSMG and City of Albany to seek MRWA approval for reduction of speed limit on Down Road to 80 km/h, west of CBH site. Also, install a westbound left turn lane on Down Road.
8. City of Albany to prepare a Scheme Amendment to change zoning to 'Special Use'.

Design development phase (2019 to 2021)

The following design development actions are recommended:

9. GSMG and City of Albany to undertake further geotechnical and ASS investigations on site.
10. Designer to incorporate all design elements of the Water Management Plan (refer section 8).
11. GSMG and Designer to liaise with Western Power and Telstra / NBN Co. for power and communications servicing to the Project Site.
12. GSMG and Designer to undertake detailed noise modelling.
13. Designer and GSMG to incorporate security fencing and gates around each separate area.

Construction phase (summer / autumn 2021)

The following construction actions are recommended:

14. GSMG and Constructor to prepare a Construction Environmental Management Plan (CEMP) to mitigate construction phase impacts.
15. GSMG and Constructor to undertake site re-vegetation and beautification.

Operational phase (post 2021)

The following operational actions are recommended:

16. GSMG to prepare an operational phase Environmental Management Plan (EMP).
17. GSMG to implement a Noise Management Plan (NMP).
18. For special events (i.e. >> 500 people), GSMG to undertake community advertising and liaison, additional traffic management controls, and hire additional portable generator(s), portaloos, water carts etc. to meet demand.

This report is subject to, and must be read in conjunction with, the limitations set out in section 1.2 and the assumptions and qualifications contained throughout the Report.

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Appendices

Glossary

ADWG	Australian Drinking Water Guidelines
AEP	Annual exceedance probability
AHD	Australian height datum
ALARP	As low as reasonably practicable
AMP	Albany Motorsport Park
ANDRA	Australian National Drag Racing Association
ANZECC	Australian and New Zealand Environment and Conservation Council
APEC	Albany Plantation Export Company
ARI	Average recurrence interval
ARR	Australian Rainfall and Runoff
ARVS	Albany Regional Vegetation Survey
ASS	Acid sulfate soils
ATV	All-terrain vehicle
BAL	Bushfire attack level
BHL	Bushfire hazard level
BMP	Bushfire Management Plan
BOD	Biochemical oxygen demand
BoM	Bureau of Meteorology
CAMS	Confederation of Australian Motor Sport
CARS	Crash analysis reporting system
CBD	Central business district
CBR	California bearing ratio
(C)EMP	(Construction) environmental management plan
cfu	Colony forming units
CoA	City of Albany
DAA	Department of Aboriginal Affairs
DBCA	Department of Biodiversity, Conservation and Attractions
DBYD	Dial before you dig
DEE	Department of the Environment and Energy
DFES	Department of Fire and Emergency Services
DLGSCI	Department of Local Government, Sport and Cultural Industries
DoH	Department of Health
DoW	Department of Water
DPIRD	Department of Primary Industries and Regional Development

DPLH	Department of Planning, Lands and Heritage
DWER	Department of Water and Environmental Regulation
DBYD	Dial before you dig
DCP	Dynamic cone penetrometer
DLVCHS	Distribution Low Voltage Contribution Headworks Scheme
DVA	Direct value added
EIA	Environmental impact assessment
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESA	Environmentally sensitive area
EY	Exceedance year
FIA	Federation Internationale de l 'Automobile
FIM	Federation Internationale Motocyclisme
FTTP	Fibre to the premise
GoWA	Government of Western Australia
GSDC	Great Southern Development Commission
GSMG	Great Southern Motorsports Group
HV	High voltage
IBRA	Interim Biogeographic Regionalisation for Australia
IECA	International Erosion Control Association
ILUA	Indigenous Land Use Agreement
JDAP	Joint Development Assessment Panel
LGA	Local government area
LGS	Lower Great Southern (i.e. Albany, Denmark, Plantagenet)
LGSTWSS	Lower Great Southern Towns Water Supply Scheme
MA	Motorcycling Australia
MNES	Matters of National Environmental Significance
MRWA	Main Roads Western Australia
NHSA	Noongar Standard Heritage Agreement
NMP	Noise management plan
PDWSA	Public drinking water source area
PEC	Priority ecological communities
PMST	Protected Matters Search Tool
PTTx	Pole top transformer
RAV	Restricted access vehicle
RIWI Act	*Rights in Water and Irrigation Act 1914*

SIA	Strategic industrial area
SLK	Straight line kilometre
SMSB	Site main switchboard
SPP	State Planning Policy
SWAA	Surface Water Allocation Area
SWALSC	South West Aboriginal Land and Sea Council
SWASA	Surface Water Allocation Sub Area
TEC	Threatened ecological communities
TN	Total nitrogen
TP	Total phosphorus
TPP	Timber processing precinct (Mirambeena)
TSS	Total suspended solids
VMS	Variable message signs
WAER	Western Australian electrical requirements
WIN	Water Information Network/Reporting
WoNS	Weeds of National Significance
WQPN	Water quality protection note
WSUD	Water sensitive urban design
1LOP	1st level of protection (*Track Operator's Safety Guide* (CAMS, 2012)
2LOP	2nd level of protection (*Track Operator's Safety Guide* (CAMS, 2012)
3LOP	3rd level of protection (*Track Operator's Safety Guide* (CAMS, 2012)
4WD	Four wheel drive

1. Introduction

1.1 Background

Participation in motorsports is a popular recreational activity for many Australians, including residents in Albany and the Great Southern region. By one estimate, motorsport is the fourth most watched sport in Australia, with over 150,000 participants across the country (CAMS, 2014). Anecdotally, motorsport in Albany and the surrounding areas is already known to be popular, with several well organised clubs, a national-level venue for speedway, a state-level venue for go-karts and widely recognised events such as the Albany Classic, Show 'n Shine and Race Wars at Albany Airport. However, some motorsport disciplines lack suitable facilities in the region. In particular, the closure of Albany Motorcycle Club's facility at Roberts Road in 2011 has meant that motocross and enduro motorcycle riders currently lack a permanent formalised facility to pursue their sport in the lower Great Southern region.

By their nature, motorsports are very capital intensive, requiring significant investment in equipment and facilities by participants, clubs and supporting organisations such as local and state governments. Recently, an independent proposal has been advanced by the Great Southern Motorplex Group Inc. (GSMG) to develop a multi-use Albany Motorsport Park (AMP) near the Mirambeena timber processing precinct on Down Road. This proposal aims to:

- Promote and facilitate multiple motorsports on a club and state level in Albany and the Great Southern region,
- Provide a safe environment and venue for multiple motorsports clubs (and other compatible sports, such as cycling),
- Provide a venue to promote and facilitate commercial driver education and training,
- Provide a safe environment for companies to test and tune their vehicles,
- Promote Albany and the Great Southern region by attracting participants and tourists, and
- Boost the regional economy through increased visitors, funding and sponsorship for events.

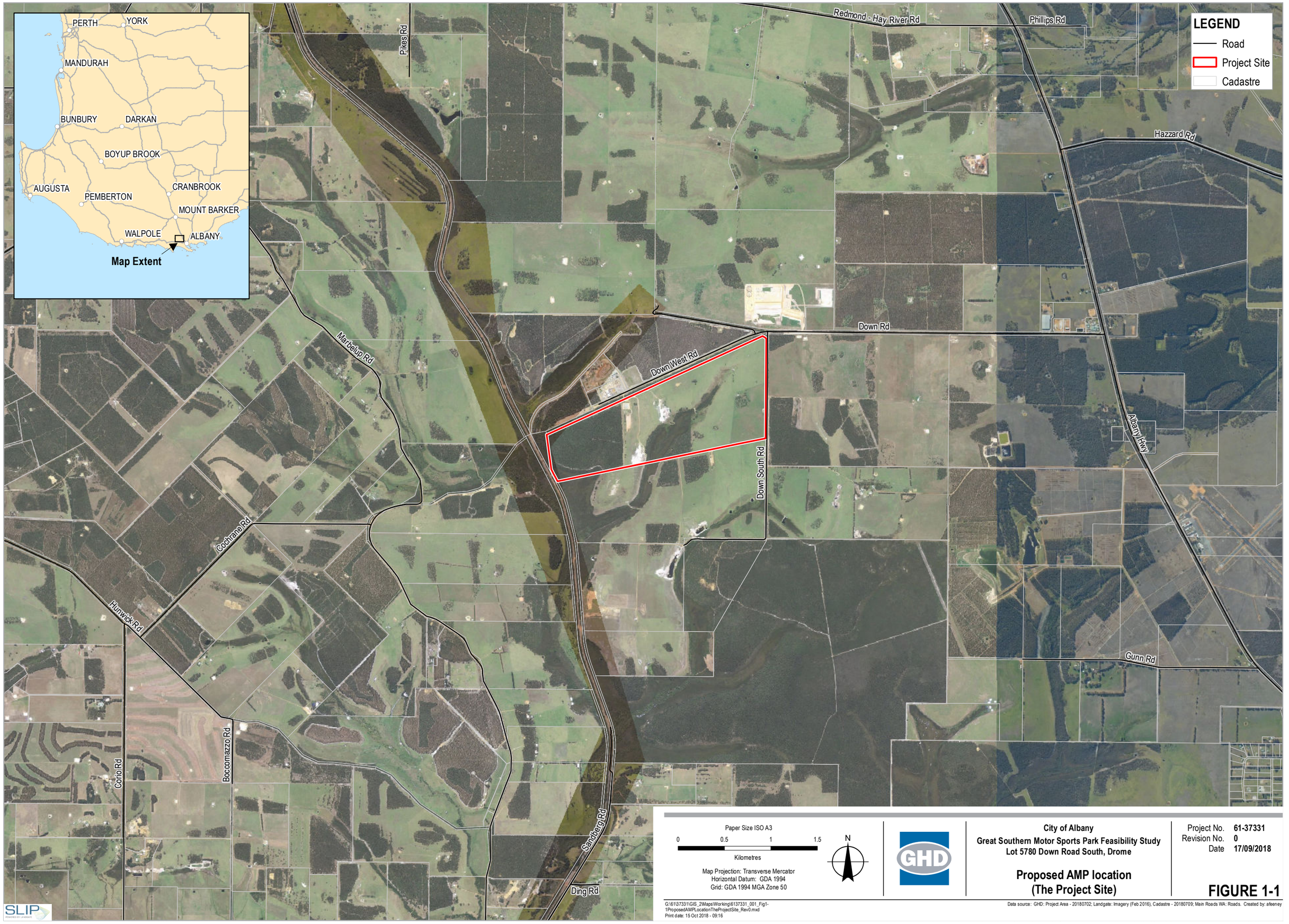
State Government commitment

Recognising the interest in motorsports in the Great Southern, the Western Australian Government has committed $250,000 to undertake preliminary planning for a motorplex (Watson, 2018) and a further commitment of $5.75 million in the 2020/21 forward estimates (GoWA, 2017) for its development.

In cooperation with the Western Australian Department of Local Government, Sport and Cultural Industries (DLGSCI), the City of Albany has commissioned GHD to undertake this technical site feasibility assessment as part of the preliminary planning for the proposed AMP at Lot 5780, Down Road South, Drome.

1.2 Purpose of this report

The purpose of this report is to document the technical site feasibility assessment for the proposed Albany Motorsport Park at Lot 5780 Down Road South, Drome (Figure 1-1) (the Project Site).



Paper Size ISO A3

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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

City of Albany
Great Southern Motor Sports Park Feasibility Study
Lot 5780 Down Road South, Drome

Proposed AMP location (The Project Site)

Project No. **61-37331**
Revision No. **0**
Date **17/09/2018**

FIGURE 1-1

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Print date: 15 Oct 2018 - 09:16

Data source: GHD: Project Area - 20180702; Landgate: Imagery (Feb 2016), Cadastre - 20180709; Main Roads WA: Roads. Created by: afeeney

SLIP

1.3 Scope of works

The scope of works for the project included three main elements:

1. Site concept development

- The AMP concept design has been developed by the GSMG (including Roberts Gardiner Architects). Basic 3D earthworks design development has been undertaken by City of Albany. GHD has liaised and coordinated with the City of Albany and GSMG to assist with the concept design development.
- GHD has prepared a preliminary capital budget estimate, based on the GSMG concept design, the technical feasibility investigations outlined below and civil works quantities advised by City of Albany.

2. Site technical feasibility investigations

GHD has undertaken the following technical investigations, with support from the City of Albany and other relevant agencies:

1. Collation of background information, existing and surrounding land uses, planning restrictions (including bushfire planning provisions), approvals and buffer requirements,
2. Traffic investigation for Down Road and the intersection with Albany Highway,
3. Desktop geotechnical investigation of anticipated ground and groundwater conditions,
4. Desktop investigation into anticipated power demands and servicing requirements,
5. Desktop hydro(geo)logy investigation, including analysis of available data from the GSMG's groundwater and surface water monitoring program,
6. Preliminary Water Management Plan for the site, particularly addressing the requirements of *Water Quality Protection Note (WQPN) 100: Motor sport facilities near sensitive waters* (DoW, 2007),
7. Preliminary desktop Environmental Impact Assessment (EIA) and site walkover, and
8. Preliminary desktop noise investigation and management plan.

The following elements were undertaken by the City of Albany, and outcomes provided to GHD:

- Site feature / topographical survey, and
- Liaison with Department of Fire and Emergency Services (DFES) regarding compliance with *State Planning Policy (SPP) 3.7: Planning in Bushfire Prone Areas* (WAPC, 2015), and
- Liaison with Department of Aboriginal Affairs (DAA) and Wagyl Kaip.

Further detail on the study's scope of works is provided in the City of Albany Request for e-Quote P18008 (25 June 2018).

3. Stakeholder consultation

Regular consultation with a small working group has occurred throughout the study period. This group comprised representatives from the GSMG, City of Albany and DLGSCI.

A broader consultation workshop was also held on 17 August at City of Albany with representatives from City of Albany, DLGSCI, GSMG, Department of Planning, Lands and Heritage (DPLH), Department of Water and Environmental Regulation (DWER), Great Southern Development Commission (GSDC), the office of Peter Watson MLA.

Minutes of the consultation workshop are attached in Appendix A.

1.3.1 Limitations

This report: has been prepared by GHD for City of Albany and may only be used and relied on by City of Albany for the purpose agreed between GHD and the City of Albany as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than City of Albany arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by City of Albany and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

1.4 Previous studies and strategies

Significant work, over several years, has already been invested in the concept of a multi-use motorsports facility in the lower Great Southern region. Summarised below are some of the key findings and outcomes from the most recent and relevant studies, which have helped to inform the current AMP proposal and this site feasibility study.

1.4.1 City of Albany: Motor Sport in the Lower Great Southern – Feasibility Study (GHD, November 2016)

Motorsport user demand

- There are approximately 800 motorsport participants in the Lower Great Southern (LGS), of which about half are members of formal clubs. A wide variety of motorsport disciplines is enjoyed, with social events, burn-outs, circuit racing and drag racing being the most popular. On average, a typical participant is involved with 15 – 25 motorsport activities per year.
- Some local clubs and motorsport disciplines (i.e. speedway and karting) enjoy high quality facilities and minimal constraints to their sporting activities. Other clubs and motorsport disciplines, especially motorcycle / motocross, are significantly constrained by lack of suitable facilities in the local area. It is highly likely that user demand for these disciplines would increase, if suitable facilities were available.
- For circuit racing and drag racing, many participants are willing to travel to venues in Perth and Collie. Overall, there is a high “willingness to travel” to participate in motorsport events.
- At an appropriately designed facility, cycling could be a compatible sport and would increase the volume and frequency of user demand at the facility.

Motorsport infrastructure needs in the Lower Great Southern

The following table provides a concise 'traffic light' assessment of the adequacy of current facilities in the LGS region to meet user demand and support expanded future participation.

Table 1-1: Assessment of LGS facilities to meet user demand

Motorsport discipline	User demand	Adequacy of facilities	Comments
Circuit racing	High	Inadequate	No circuit racing venue in Study Area. High demand and high potential for expanded participation with improved facilities. Participants currently travel to Collie and Perth (Barbagallo Raceway).
Speed (hill climb, autocross, sprints, super sprints, drifting, regularity)	High	Inadequate	No sealed (non-street) racing venue in Study Area. High demand and high potential for expanded participation with improved facilities. Participants currently travel to Collie and Perth (Barbagallo Raceway).
Drag racing	High	Inadequate	No drag racing venue in Study Area. High demand and high potential for expanded participation with improved facilities. Participants currently travel to Collie and Kwinana (Perth Motorplex).
Rally or off-road racing	Low	Adequate	Low demand. Not identified during survey as a high priority.
Go-karting	Medium	Adequate	State-level facility meets local user demand, and also attracts intrastate competitors. Current venue is not significantly constrained.
Speedway	High	Adequate	National-level facility meets local user demand, and also attracts intrastate, interstate and international competitors. Current venue is not significantly constrained.
Motocross	High	Partially adequate	High demand and medium potential for expanded participation with improved facilities. No permanent / formalised venues in the Study Area. Current temporary venue is significantly constrained. Participants currently access / travel to Cranbrook and South West venues for competition events.
Other motorcycling	Medium	Partially adequate	No circuit racing venue in Study Area. No formalised areas for other off-road events, such as enduro motorcycling. Medium demand and medium potential for expanded participation with improved facilities. Participants currently access / travel to Cranbrook and South West venues for competition events.
Burn-outs and Social events – e.g. "Show 'n shine"	High	Inadequate	No / limited formalised areas for all weather burn-out events. High demand and high potential for expanded participation with improved facilities. No formalised areas for large scale social events, with supporting facilities – e.g. workshops, pits, burn-out pad.

Recommendations for motorsport development in the LGS region

In the long-term, it was recommended that the City of Albany support the development of a regional multi-use motorplex that could accommodate most motorsport disciplines, in a location that is properly zoned, planned and managed. Adopting a long-term planning approach will minimise the typical constraints faced by motorsport clubs and venues, as well as maximising the commercial benefits of shared facilities.

However, a regional multi-use motorplex will require appropriate commercial management and cannot be sustained by relying only on the expected revenue from local motorsport participants. To be successful, such a facility will need to attract significant and consistent revenue from outside of the Great Southern region – i.e. through activities such as driver training, vehicle testing and 'experiential' motorsports tourism. It was recommended that a regional multi-use motorplex should be operated as a business, which alongside its key commercial revenue-generating activities, is also able to provide a venue (for a fee) to local motorsports clubs.

To support the identified motorsport user demand in the Study Area, it was recommended that a multi-use motorplex consists of:

1. Sealed, lighted and configurable racing circuit for:
   – Four-wheel and two-wheel circuit racing,
   – Speed events, inc. drifting,
   – Driver education, and
   – (Bi)cycling (as a compatible sport).
2. Drag strip (min. 1/8th mile) and burn-out pad (40 m × 25 m) for:
   – Four-wheel and two-wheel drag racing,
   – Burn-out competitions,
   – Social / display events, and
   – Driver education.
3. Motocross (dirt) track, potentially with associated enduro track(s).

Desirable characteristics of a multi-use motorplex site

1. A site should be in reasonable proximity (15 – 20 km) to the Albany Health Campus.
2. A site should be securable and sectionable, such that it is able to host multiple events simultaneously.
3. A site should be sufficiently large to accommodate and contain major event crowds, with appropriate spectator areas, competitors' and officials' facilities, function rooms, parking, ablutions and catering facilities. This will minimise impacts on surrounding properties.
4. Access to the site, particularly for major events, should be planned in cooperation with City of Albany and Main Roads to minimise road network impacts.
5. A site should be appropriately located and zoned in the Albany Local Planning Scheme No.1 to minimise long-term encroachment by incompatible land uses.
6. The environmental setting of a site should seek to minimise vegetation clearing, noise and lighting impacts, and surface and groundwater impacts.

Potential socio-economic impacts of a regional multi-use motorplex

- The social / community nature of motorsport clubs is highly valued by participants. Local motorsport enthusiasts will have a permanent, formalised venue to enjoy their passion – avoiding the need to travel to Collie, Perth or other venues across the state – and potentially reduce dangerous driving behaviour on local streets.
- Local motorsport and cycling clubs will be able to share the facilities, lowering their running costs, providing a great venue for social / community / family events, and fostering increased sports participation for young people in the region.

- Commercial driver training / vehicle /component testing business(es) could be established, attracting new revenue and visitors to the region.
- National and international motorsport events would be hosted at the motorplex.
- The local economy would be boosted through increased visitors for motorsport events, and by increased expenditure by local motorsport participants:
  - Direct value added (DVA) of motorsports in the region could grow from $3.3 million currently to $3.7 million over 10 years. This is a small percentage (<<1%) of Gross Regional Product and total household expenditure on “recreation and culture”.
  - Total expenditure by local motorsport participants could be expected to grow through increased participation rates and increased rates of expenditure. This could grow from an estimated $5.6 – $8.8 million currently, to $12.0 – $15.0 million in 10 years. Motorsport participants in the LGS Study Area spend $7,000 – $11,000 per year on their sport (compared to a national average of $12,000 - $15,000 per year).
  - There is presently insufficient information to estimate the potential boost caused by a motorplex to the Study Area’s $90 million tourism industry. However, data suggests that sports-related tourists spend up to 30% more than typical ‘holiday’ tourists.

1.4.2 DLGSCI: WA Motorsport Strategy (DRAFT) (Dave Lanfear Consulting, August 2018)

Sport and Recreation WA (a division of DLGSCI) recently commissioned a state-wide motorsport strategy to guide the state government’s planning and investment decisions in the industry. The stated objectives of the Western Australian (WA) Motorsport Strategy are to:

1. Identify the infrastructure needs of road/track based motorsport activities,
2. Develop a hierarchy of motorsport facilities from State level (Wanneroo Raceway), regional level and district level of functionality and catchment,
3. Provide a plan that supports future investment in road/track based motorsport infrastructure,
4. Leverage the current financial commitments, and
5. Identify appropriate representative governance and management structures including sanctioning and licensing.

In relation to the proposed AMP, the WA Motorsport Strategy identifies it as a “regional” or “local” level facility and makes the following recommendations:

- Undertake more detailed planning and feasibility of developing a motorsport precinct at Down Road for regional based motorsport activity by:

a. Undertaking an initial assessment of the viability of developing a motorsport precinct for bitumen and no-bitumen activities, focusing on water monitoring and assessment for a two year period and environmental assessment based on advice from the Department of Water and Environmental Regulation. This will need to consider the implications on the capital and ongoing operational costs of operating a motorsport precinct, having regard to potential operational restrictions.

b. Rationalise current proposed infrastructure to limit activity to:

   (1) Small multi-functional bitumen circuit which can be subdivided to provide hill climb, driver and rider training/experience and club based competition. Initially the circuit should be developed between 1.6 km and 2.2 km to provide an effective club and driver/rider training circuit.

   (2) Burnout areas within a controlled affiliated facility – sanctioned by an appropriate body.

   (3) Motocross.

   (4) Clubhouse and maintenance shed.

   (5) Fenced competitors pit area with water and power supply, roofed assembly area, enclosed wash bays with concrete floor and silt traps.

   (6) Starting grid and starter's control tower, and public address system.

   (7) Bitumen car parking areas adjacent to the bitumen racing circuit (to potentially double up for additional driver and rider training).

   (8) Spectator infrastructure (banking incorporating limestone blocks).

c. Develop and implement an environmental management plan for the site. To be led by the City of Albany. Ensure that a long-term management plan is established and implemented to protect and enhance the natural environment within the Motorsport Complex.

- The above is predicated on the ability to develop the site. Should the site not be capable of being developed due to the high quality drinking water and potential environmental issues and/or the capital and lifecycle costs of the water mitigation strategies, alternative options will need to be explored across the Great Southern region to identify an alternative site which may accommodate a range of motorsport disciplines.

2. Site description

2.1 Location

The Project Site is located approximately 20 km to the north of the Albany CBD, at Lot 5780, Down Road South, Drome within the City of Albany municipality (refer Figure 1-1).

The Project Site is bounded by:

- Down Road West to the north,
- Down Road South to the east,
- Lot 5781, Down Road South to the south (private owner), and
- A local road reserve and the Avon-Albany rail reserve to the west.

Lot 5780 is 192.34 ha in size, of which approximately 52 ha at the western end is covered with well-established vegetation and not considered available for development.

2.2 Ownership

The freehold owner of the property is Susan Elizabeth Page, as executor of the Will of Audrey Helen Old who died on 20 June 2015, registered 1 December 2015. Certificate of Title of the property is Lot 5780, on Plan 206199 Volume 1352 Folio 224, located on Down Road South, Drome, Western Australia.

Redacted text

A pending Mining Tenement also exists over a large portion of Lot 5780. This Mining Tenement is an Exploration Licence (E 7005016) held by Australian Silica Quartz Pty Ltd since 22 August 2017, and currently has a status of ‘unsurveyed’ (DMIRS, 2018).

2.3 Zoning and existing buffers

Under the City of Albany Local Planning Scheme No. 1 the Project Site is zoned as '*Priority Agriculture*' and is located within an Industrial Buffer Area (IA4BA) surrounding the Mirambeena Timber Processing Precinct (TPP – i.e. Albany Plantation Export Company (APEC) and Plantation Energy) to the north of Down Road West (Figure 2-1) (DoP, 2014).

The land immediately adjacent to the Project Site is also predominantly zoned '*Priority Agriculture'* with the exception of the Albany Plantation Export Company (APEC) wood chip mill and Plantation Energy wood pellet production facility, which are zoned '*General Industry'*. The western boundary of the Project Site lies adjacent to a local road reserve and railway line which is zoned '*Major road, Rail'*. Land to the south-west of the railway is zoned '*General Agriculture'* (DPLH, 2018).

The Project Site is also located within a Priority 2 (P2) public drinking water sources special control area within the Marbelup Brook Catchment Area (DoP, 2014). This public drinking water source area (PDWSA) is gazetted under the *Country Areas Water Supply Act 1947*, however is not currently used. It has been identified as a potential future water source option in the *Great Southern Regional Water Supply Strategy 2014* (DoW, 2014). The Minister for Water has formally provided advice to the City of Albany (Kelly, 2018) that while a motorsport facility is incompatible with a P2 PDWSA (DoW, 2016), "there are measures that can be put in place to protect water quality should the City proceed to approve the development". These measures are further discussed in section 8 – Preliminary water management plan.

Approximately 900 m to the south of the Project Site, the Down Road Nature Reserve (Lot 7388 on P091191 and Lot 7676 on P217695) is zoned '*Parks and Recreation'* (DPLH, 2018).

2.4 Surrounding land uses

The immediately surrounding land uses include a railway to the west of the Project Site, APEC and Plantation Energy to the north of Down Road West and '*Priority Agriculture*' to the south and east. The CBH Mirambeena grain storage facility is also north of the site, on Down Road.

Further afield land uses are also largely '*Priority Agriculture*', or '*General Agriculture*'. The Down Road Nature Reserve is located approximately 900 m to the south; and the Water Corporation's Gunn Road tree plantation is located approximately 2,500 m to the east. The Mirambeena Strategic Industrial Area (SIA) is located approximately 2,000 m to the east on Albany Highway.

2.5 Existing services

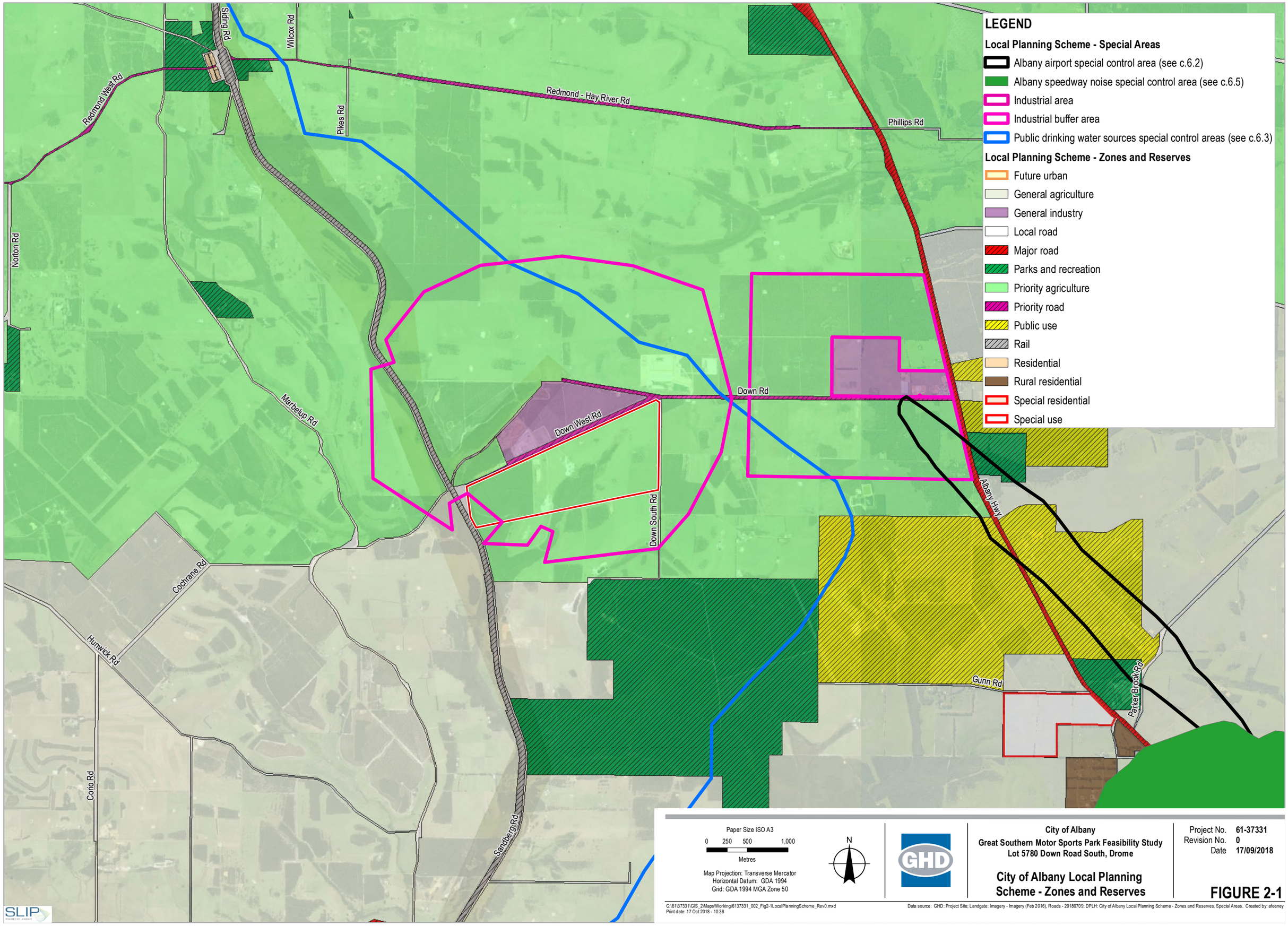
The Project Site is currently unserviced, with no connections to scheme water, sewerage, power or wired telecommunications. The site does receive reasonable 4G and 3G mobile phone coverage (refer to section 11.1.2).

The Water Corporation's Lower Great Southern Towns Water Supply Scheme (LGSTWSS) runs along Albany Highway, with the nearest connection point approximately 4 km to the east at 66 Down Road (fertiliser distribution warehouse) (Water Corporation, 2018). Drinking water supply is further discussed in section 8.1.

The Water Corporation's Albany sewerage scheme is not in close proximity to the site, with the nearest connection point being at Lancaster Road, McKail (being some 10 km distant). Wastewater management will require on-site solutions and is discussed further in section 8.4.

Western Power high voltage power lines currently run along the eastern boundary of the Project Site. Connection to power is further discussed in section 11.

Telstra fibre optic communications cables currently run along the northern side of Down Road West. Connection to telecommunications is discussed in section 11.2.1.



Paper Size ISO A3

0 250 500 1,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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GHD

City of Albany
Great Southern Motor Sports Park Feasibility Study
Lot 5780 Down Road South, Drome

City of Albany Local Planning Scheme - Zones and Reserves

Project No. **61-37331**
Revision No. **0**
Date **17/09/2018**

FIGURE 2-1

G:\61\37331\GIS_2Maps\Working\6137331_002_Fig2-1LocalPlanningScheme_Rev0.mxd
Print date: 17 Oct 2018 - 10:38

Data source: GHD: Project Site; Landgate: Imagery - Imagery (Feb 2016), Roads - 20180709; DPLH: City of Albany Local Planning Scheme - Zones and Reserves, Special Areas. Created by: afeeney

SLIP

2.6 Existing and historical uses

The perimeter of the Project Site is entirely fenced and is currently used for the primary purpose of cattle grazing. Historically the Project Site is likely to also have been used solely for the purpose of agriculture. The western end of the property consists of 52 ha of native vegetation that will be retained. An unnamed creek line runs from the north-east corner of the property through to the south-west corner, from where it joins into Marbelup Brook. A number of small dams are located across the property for stock watering. These will be retained and maintained for the AMP.

The Plantation Energy sub-leased area consists of a small retention basin, connected to their site drainage system on the other side of Down Road West. The sub-lease area is powered, and Plantation Energy operates a pump from the retention basin. This area is unfenced, although there is a locked access gate on the site perimeter fence, off Down Road West.

Adjacent to the Plantation Energy retention basin, there is presently a significant amount of rubbish (comprising of what appears to be decommissioned process vessels, oil drums, scrap metal, electrical cable, plastic, chemical containers, etc.), which will need to be removed prior to any property transactions. Several large stockpiles of woodchips are also present, which will also need to be removed. It is understood that the woodchip stockpiles are owned by Plantation Energy and the stockpile area sub-leased by Plantation Energy from Lindsay and Joy Black (although it is noted that the Black's formal lease over the property is expired). The GSMG understand that this area will need to be cleared and made good prior to the sale of the property.

Figure 2-2: Images of Plantation Energy sub-lease area

Mr Lindsay Black also has a current Planning Consent over two locations on this site for the purpose of extracting sand. Both sand pits are covered under the same Consent (No. P275225), which was approved on 14 September 2007. Access is via Down Road West, using the same gate as the Plantation Energy sub-lease area. The GSMG understand the Mr Black is imminently ceasing the quarrying activities and will make good the affected area (as required under the conditions of the Planning Consent).

3. Albany Motorsport Park concept design

3.1 Layout and facilities

The concept design for the Albany Motorsport Park (AMP) has been developed by the non-for-profit Great Southern Motorplex Group (GSMG) and Roberts Gardiner Architects. The GSMG has undertaken significant research into the requirements for track licensing by the Confederation of Australian Motor Sport (CAMS) and the specifications of:

- Fédération Internationalé de l'Automobile (FIA),
- Fédération Internationalé Motocyclisme (FIM),
- Motorcycling Australia (MA), and
- Australian National Drag Racing Association (ANDRA).

The proposed AMP will consist of:

1. Sealed, configurable multi-use track (3.2 km long × 12 m wide) for motor car racing, motorcycle racing, drifting, driver training and cycling:
   – Designed to comply with CAMS' *Track Operator's Safety Guide* (CAMS, 2012) and MA's *Track Guidelines* (MA, 2011), and
   – To be licensed by CAMS for FIA Grade 2 and FIM Grade B (i.e. up to second-tier international motor racing).
2. A motocross circuit:
   – Designed and constructed in association with MA guidelines.
3. A 1/8th mile drag racing strip:
   – Designed and constructed in accordance with FIA specifications for drag strips and in association with ANDRA.
4. A 1,300 m^2 burnout area,
5. An off-road four wheel drive (4WD) and all-terrain vehicle (ATV) training area,
6. Allowance for future speedway;
7. Allowance for future go-karts.

At full development, the AMP will also include associated facilities, such as:

- Toilets,
- Medical / first aid station,
- Manager's office,
- Meeting / briefing room
- Kitchen / canteen,
- Storage / grounds maintenance workshop,
- Vehicle scrutineers' workshop,
- Control tower,
- Spectators viewing areas,
- Grassed spectators' picnic area with shade and BBQs,
- Competitors parking, and
- Spectators parking.

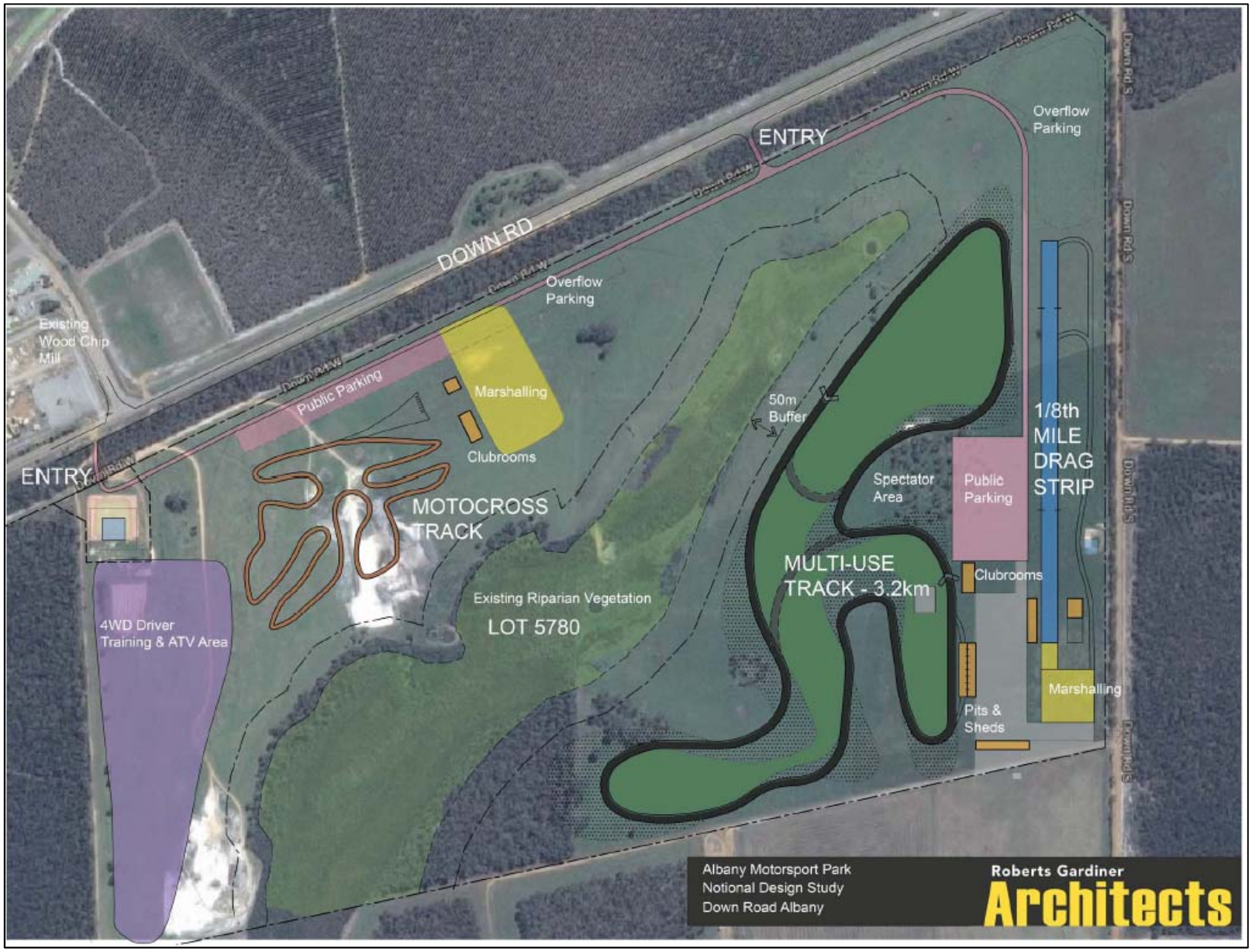

Figure 3-1: AMP concept site layout

3.2 Events and usage

Outlined below in Table 3-1 is the expected usage of the AMP, as conceptualised by the GSMG. For the purposes of sizing facilities and servicing infrastructure, **a typical / frequent site attendance of 500 persons has been assumed** (i.e. competitors + officials + spectators). This was determined through discussion with the GSMG on the nature and size of expected typical events. For special events that anticipate a greater number of site attendees, additional management measures will need to be implemented – for example:

- Community notices,
- Portable generators,
- Porta-loos,
- Drinking water carts,
- Temporary seating, and
- Traffic and parking management controls.

Table 3-1: Indicative AMP event profile

Use	Level	Frequency	Duration	Entrants	Spectators
Driver training, schools, manufacturer testing		Week days	Day	50	0
Car test & tune day	Club	4 week days / month	Day	30	30
Car speed events	Club	1 weekend / month	Day	100	200 – 500
Car speed events	State	1 weekend / month	Day	100 – 200	200 – 1,000
Car speed events	National	1 weekend / year	Day	200 – 300	2,000 – 5,000
Super cars events	National	1 × 3 day weekend / year	Day	200 – 300	10,000 – 20,000
Bike test and tune day	Club	4 week days / month	Day	50	50
Bike speed events	Club	1 weekend / month	Day	100	200 – 500
Bike speed events – Champions Ride Day	State	1 weekend / month	Day	100	200 – 1,000
Bike speed events	National	1 weekend / year	Day	200	1,000 – 5,000
Motocross events	Club	3 days / week training 4 single days / month	Day	100 – 200	200 – 400
Motocross events	State	1 weekend / month	Day	200 – 300	500 – 1,000
Drifting day	Club	2 days / month	Day and evening	30	30
Drifting day	State	1 weekend / month	Day and evening	50	200 – 500
Burnout day	Club	1 weekend / month	Day or evening	30	30
Burnout day	State	1 × 3 day weekend / year	Day or evening	50	1,000 – 2,000

Use	Level	Frequency	Duration	Entrants	Spectators
Drag racing practice day	Club	4 week days / month	Day	30	100
Drag racing competition	Club	1 day / month	Day and evening	30	200 – 500
Drag racing competition	State	4 weekends / year	Day and evening	50	500 – 1,000
Drag racing competition	National	1 weekend / year	Day or evening	50	1,000 – 5,000
Motorkhana	Club	1 day / month	Day	50	200
Tractor pull	State	2 weekends / year	Day	50	1,000 – 2,000

Duration of events:

- Typical day operation is 8:00 am – 6:00 pm, and
- Typical evening operation is 6:00 pm – 10:00 pm and only conducted if fixed or mobile lighting is available.

3.3 Governance

Governance and ownership arrangements for the AMP are still subject to further investigation, but for the purposes of this study it is assumed that the property will be owned by the City of Albany, as will the tracks and all permanent facilities constructed on the property. The AMP will be leased to an operator-manager by the City of Albany, with all operational and maintenance activities to be conducted by the operator-manager.

The operator-manager of the AMP will be a “not-for-profit” company consisting of a Board of Management and no other shareholders. The Directors will be representatives from the following:

- City of Albany Council,
- DLGSCI,
- The Member for Albany,
- Any other authority nominated by the City of Albany,
- A representative of the motorsports clubs involved in the AMP.

3.4 Servicing requirements

To successfully operate the AMP, the following servicing requirements are anticipated:

- Power – for buildings, control tower, lighting, security and competitors’ requirements (e.g. tools, motorcycle tyre warmers, battery chargers etc.),
- Telecommunications for office buildings,
- Lighting – either fixed or mobile lights for burnout pad, drifting circuit and drag strip,
- Parking – sealed or gravel hardstand for approx. 200 – 250 vehicles (competitors + officials + spectators), including single trailers and trucks,
- Drinking water – either by rainwater collection and/or water carts, and
- On-site wastewater treatment and disposal.

The deployment of these services is likely to occur in a staged delivery, commensurate with the progressive development of the Project Site.

3.5 Preliminary capital cost estimate

GHD has prepared the preliminary capital cost estimate set out in this section ("Cost Estimate") using information reasonably available to the GHD employee(s) who prepared this report; and based on assumptions and judgments made by GHD. The Cost Estimate has been prepared for the purpose of budget setting and must not be used for any other purpose.

The Cost Estimate is a preliminary estimate only. Actual prices, costs and other variables may be different to those used to prepare the Cost Estimate and may change. Unless as otherwise specified in this report, no detailed quotation has been obtained for actions identified in this report. GHD does not represent, warrant or guarantee that the project can or will be undertaken at a cost which is the same or less than the Cost Estimate.

Outlined in Table 3-2 is a summary of the capital cost estimate for the AMP, including the likely staging of development. An estimate for a similar concept design was independently prepared for the WA Motorsports Strategy (Lanfear, 2018) and came to $35.65 million.

Table 3-2: Preliminary capital cost estimate

Area	TOTAL ($)	In-kind contribution	Stage 1 ($)	Stage 2 ($)	Stage 3 ($)
Motocross	2,973,000	382,000	437,000	1,673,000	449,000
Multi-use track	11,426,000	151,000	7,379,500	2,772,500	1,111,000
Drag strip	3,726,000	0	0	2,968,000	513,000
4WD / ATV area	444,000	133,000	0	300,000	0
Common / general items	5,261,000	270,000	3,016,000	1,189,200	436,800
TOTAL	**23,830,000**	**936,000**	**10,832,500**	**8,902,700**	**2,509,800**

The full detail and assumptions contained in the estimate are attached in Appendix B. Where estimates of potential costs are provided with an indicated level of confidence, notwithstanding the conservatism of the level of confidence selected as the planning level, there remains a chance that the cost will be greater than the planning estimate, and any funding would not be adequate. The confidence level considered to be most appropriate for planning purposes will vary depending on the conservatism of the user and the nature of the project. The City of Albany should therefore select appropriate confidence levels to suit their particular risk profile.

3.5.1 Priorities and staging plan

Outlined below is Table 3-3 is an indicative staging plan for the AMP development. The priority facilities in Stage 1 are:

1. The motocross track – to resolve the lack of safe, permanent, easily accessible facilities for the Albany Motorcycle Club and enable rider training, Club and State level competitions to be held on a track that is to be accredited and licenced by Motorcycling Australia (MA),
2. The multi-use track – to allow the operator-manager to generate revenue through driver training and track rental activities, provide a safe and scrutinised venue to local enthusiasts such as the Great Southern Street Machine Association and provide a high level venue for State motor car, motorcycle and cycling events on a track to be approved and licenced by CAMS, and,
3. Enabling works, such as feasibility / planning / design works, critical environmental controls and access roads.

Stages 2 and 3 contemplate the further development of the AMP site as patronage increases and the range of uses is broadened (for example, to include lighted evening events) and is dependent on further funding from various sources becoming available.

Table 3-3: AMP staging plan

Stage 1 facilities	Stage 2 facilities	Stage 3 facilities
Motocross track, plus: Associated civil works (i.e. drainage, fencing, unsealed parking area, etc.), Scrutineers and first aid temporary building, Portable toilets for events, Portable power generator, Rainwater tank for drinking water, and Portable communications / public address system.	Motocross clubrooms, plus: Sealed parking area, On-site wastewater treatment plant, Power connection, and Public address system.	Motocross maintenance and storage shed.
Multi-use track (inc. drifting and burn-out), plus: Associated civil works (i.e. drainage, 1LOP barriers, 2LOP fencing), Control tower, Temporary pits / control accommodation, Temporary first aid accommodation, Portable toilets for events, Portable power generator, Rainwater tank for drinking water, and Portable communications / public address system.	Multi-use track buildings for: Pits area and control room, First aid room, Clubrooms and briefing room, Scrutineers workshop, On-site wastewater treatment plant, Power connection, and Public address system.	Multi-use track maintenance shed, and Multi-use track lighting.
	Drag strip (1/8th mile), plus: Associated civil works (i.e. drainage, fencing, barrier protections, etc.), Control tower, Rainwater tank for drinking water, and Communications / public address system.	Drag strip grandstand and landscaping, and Drag strip lighting.

Stage 1 facilities	Stage 2 facilities	Stage 3 facilities
4WD / ATV training area, plus: Associated civil works (i.e. drainage, fencing, etc.).	4WD / ATV maintenance shed, plus: Power connection, and Rainwater tank for drinking water.	
Common / general items: Feasibility, planning and design costs, Property purchase costs, Secondary emergency access road, Internal (unsealed) access road and (unsealed) parking area, Perimeter fencing and gates, and Down Road access and gatehouse.	Common / general items: Asphalt seal to parking area, Asphalt seal to access road, and Overflow parking area.	Site revegetation, landscaping and beautification.

4. Planning approvals

4.1 Scheme amendment

As identified in section 2.3, the proposed Project Site is currently zoned *Priority Agriculture* and hence a motorsport park would not be a permissible use. Based on advice from the DPLH and City of Albany Planning Department, the proposed site would need to be re-zoned as *Special Use* within the Albany Local Planning Scheme No.1. This change will require a formal Scheme amendment, which has a defined process and timeline under the Western Australian Planning Commission (WAPC) (refer to Figure 4-1). Key points to note in the Scheme amendment process are:

- Amendments can be defined as *basic, standard* or *complex*. The AMP proposal would likely be regarded as *standard* (particularly if the motorsports park concept is incorporated into the current draft of the Albany Local Planning Strategy).
- The amendment process is to be initiated by the relevant local government (i.e. City of Albany) and requires significant preparatory effort.
- All proposed amendments are referred to the Environmental Protection Authority (EPA), whom then determines whether the amendment needs to be assessed under the *Environmental Protection Act 1986*.
- Following advice from the EPA, the local government must then advertise the proposed amendment and accept public submissions for at least 42 days. This period extends to 60 days if the amendment is defined as *complex*.
- Following receipt and resolution of public submissions, the proposed amendment is then submitted by the local government to the WAPC, whom then has 60 days to make recommendations to the Minister.
- The Minister for Planning has final approval.

Given this defined approval process and the required consultation periods, it can be expected that a Scheme amendment process could take 6 – 12 months.

4.2 Development application

Once the Albany Local Planning Scheme No.1 is appropriately amended, the AMP proposal would then need to proceed with the normal development application process with City of Albany. For regional development applications, a project with value greater than $10 million would also be mandatorily referred to the Southern Joint Development Assessment Panel (JDAP).

As per usual practice and prior to any decision by Council, the AMP development application would be referred to relevant state government agencies, such as Main Roads, DFES, Department of Health and Department of Water and Environmental Regulation (e.g. for noise, vegetation clearing, impacts on PDWSAs, etc.) for advice.

Based on formal correspondence and discussions, it is expected that DWER would provide advice to Council opposing any motorsport development within a PDWSA. This is consistent with DWER policy, as expressed in:

- WQPN 76 (March 2006): Land use planning in Public Drinking Water Source Areas,
- WQPN 25 (April 2016): Land use compatibility tables for PDWSAs, and
- WQPN 100 (April 2007): Motor sport facilities near sensitive waters.

Click on tabs to activate

Process for basic amendments to local planning schemes flowchart

Process for standard amendments to local planning schemes flowchart

Process for complex amendments to local planning schemes flowchart

Process for standard amendments to local planning schemes flowchart

LG refuses to adopt amendment where no agreement for LG to use copyrighted material: **r.35(4)**

LG resolves to **adopt** an amendment to a scheme prepared by a land owner: **r. 35(1).** Resolution to specify that the amendment is a standard amendment: **r.35(2)**

LG resolves **to prepare** an amendment to a scheme : **r.35(1).** Resolution to specify that the amendment is a standard amendment: **r.35(2)**

LG must refer the proposed amendment to the EPA in accordance with **s.81 PD Act**

Landowner may request the Commission to advise whether amendment is complex, standard or basic: **r.36**

LG prepares amendment

EPA determines whether t or not amendment needs to be assessed: **s.48A EP Act**

Commission advises LG that amendment stream chosen is incorrect: **r.36(2)**

Commission advises LG that amendment stream chosen is correct

Amend resolution to reflect the correct amendment stream: **r.36(2)**

If EPA determines that environmental review is required under **s.48C(1)(a) of the EP Act,**

- the LG must complete the environmental review and forward it to the EPA; and
- the EPA must advise the LG that the review has been undertaken in accordance with instructions, or 30 days must have elapsed since the LG forwarded the review and the EPA has not provided advice,

before the amendment can be advertised: **s.82(2)**

LG must prepare a notice and advertise amendment in accordance with r.47(2) and accept submissions for at least 42 days: **r.47(1) and (4)**

LG considers submissions
Must consider all submissions received before end of submission period, may consider submission received after submission period but before end of consideration period: **r.50(2).** See r. 49(1) for length of consideration periods.

If the amendment will be subject to environmental review LG must refer submissions received that relate to enviro issues to EPA and inform EPA of its views in relations to the environmental concerns raised in the submissions: **s.85 PD Act**

NO SUBMISSIONS RECEIVED

SUBMISSIONS RECEIVED

As soon as practicable after the end of the submission period (if no submissions received) or the consideration period (if submissions received) LG must resolve whether to support amendment: **r.50(3) and (4)**

Resolves not to support: **r.50(3)(c)**

Resolves to support with proposed modifications: **r.50(3)(b)**

Resolves to support: **r.50(3)(a)**

LG may decide to advertise proposed modifications if considered significant: **r.51**

If applicable, environmental conditions set by the EPA are incorporated: **r.52**

Within 21 days of resolution to support or not to support amendment under **r.49(3)(a) or (c)** or of making a recommendation with respect to advertising of proposed modifications under **r.51(7)**, LG must provide amendment to WAPC together with other relevant information: **r.53(1): r. 53(3).** Note: proposed modifications to the amendment should not be made by the LG prior to providing the documents to the Commission.

Commission must within 60 days consider and make recommendations with respect to the amendment and submit to the Minister in accordance with s 87(1) of the PD Act: **r.55**

Commission may direct amendment to be treated as a complex amendment and direct LG to readvertise the amendment or take any other steps the Commission sees fit: **r.54**.

If the Minister considers modifications to advertised amendment by the LG or Commission to be significant, Minister can direct LG to advertise proposed modifications: **r.56(1)**

Minister to decide whether to support amendment

Approves amendment: **s.87(2)(a) PD Act**

Requires amendment to be modified and resubmitted: **s. 87(2)(b) PD Act**

Refuses to approve amendment: **s.87(2)(c) PD Act**

Within 14 days LG must forward 2 copies of the amendment to the Commission for endorsement: **r.62(3) and (4)**

Within 42 days LG must modify the amendment, execute the modified amendment to the scheme and resubmit executed docs to the Minister and Minister approves: **r.62(2)**

As soon as practicable LG must notify each person who made a submission of the refusal: **r. 62(1)**

Commission endorses copies and provides one endorsed copy to the Minister for endorsement: **r.63(1)**

Minister endorses the copy with the Minister's approval and returns it to the Commission: **r.63(2).** This also serves as the Minister's notification of approval for the purposes of s.87(3) of the PD Act.

A person authorised by the Commission is to certify that the amendment is a true copy approved by the Minister: **r.63(3)**

Commission publishes the amendment in the Gazette: **s.87(3) PD Act**

Commission forwards copy of the notice published in the Gazette to the LG: **r.64(1)**

LG advertises approved amendment in accordance with **r. 64(2)**

LEGEND

- **Local government**
- **Commission**
- **Minister**
- **EPA**

Under WQPN 25 (DoW, 2016), a permanent motorsport facility is listed as 'incompatible' with P1 and P2 areas, and 'compatible with conditions' for P3 areas. WQPN 100 provides advice on the environmental risks to water resources posed by motorsport facilities, such as:

- Clearing of native vegetation,
- Leaks / spills of chemicals and hydrocarbons,
- Turbid / contaminated stormwater runoff,
- Solid waste and wastewater from workshops and washdown areas, and
- Toilet amenities for large numbers of people.

WQPN 100 provides further advice on the measures (through design and operation of the facility) that could be deployed to manage and monitor the above environmental risks. Any development application for a motorsport facility in a PDWSA would need to address the issues raised in WQPN 100 for a reasonable assessment to be made by Council. The development application should also include consideration of the facilities required to meet the provisions of the *Draft Country Sewerage Policy* (1999).

Under Western Australian planning legislation, any decision made by Council on a development application cannot be appealed by a third party.

4.3 Bushfire

The Department of Fire and Emergency Services (DFES) Map of Bush Fire Prone Areas indicates the Project Site is located in a 'Bush Fire Prone Area' and additional planning and building requirements may apply to development on the site (DFES, 2018).

Initial consultation with DFES by the City of Albany (*pers. comms.* J. Van Der Mescht, Manager Planning and Land Information Services, City of Albany 29 August 2018) indicates the Project Site will likely be classified as a 'vulnerable land use' with a tourism benefit and therefore a Bushfire Management Plan (BMP) will be required to be developed in accordance with AS 3959-2009: *Construction of buildings in bushfire prone areas* and the *Guidelines for Planning in Bushfire Prone Areas* (WAPC, 2017).

DFES have recommended that, as a component of the BMP, a precinct-wide strategic secondary access is developed to provide connection to Redmond-Hay River Road to the north, as shown in Figure 4-2. This has been suggested as a preferred alternative to a secondary east-west connection to Albany Highway, as this would terminate in the same general area as the intersection of Down Road and Albany Highway.

The potential alignment shown in Figure 4-2 minimises the number of properties impacted, and minimises vegetation clearing. The relevant properties are:

- Lot 22 Down Road (CBH site), and
- Lot 5774 Redmond-Hay River Road (private owner).

No consultation has yet been undertaken with these property owners.

Given the strategic nature of this secondary access road for the broader precinct, it is proposed that the easement (approx. 3.5 km × 14 m wide) be acquired by the City as 'local road reserve'. Alternatively, 'easements in gross' could be negotiated as a short term solution, but this is not preferred.

As the Project Site is proposed to be a tourism use DFES have suggested it may also be considered a place of refuge in the event of a fire.

Figure 4-2: Potential secondary access to Redmond-Hay River Road

The Bushfire Management Plan will be a critical element in securing planning approvals for the proposed site. Development of the AMP layout and concept design will need to give close consideration to the requirements of the *Guidelines for Planning in Bushfire Prone Areas* (WAPC, 2017). Further site investigations, such as Bushfire Hazard Level (BHL) and Bushfire Attack Level (BAL) assessments, will also be required to support the BMP once the AMP site layout and buildings design are refined.

5. Preliminary environmental impact assessment

5.1 Assessment of environmental aspects and impacts

The key environmental factors considered relevant to the AMP project are outlined in this section. For each aspect, a baseline environmental description is included and, where appropriate, is followed by an assessment of potential environmental impacts. The aspects assessed include:

- Acid sulfate soils (ASS),
- Hydrology and hydrogeology – surface water, wetlands, drainage, groundwater and public drinking water sources,
- Reserves and conservation areas,
- Environmentally sensitive areas,
- Terrestrial flora and vegetation – vegetation type, vegetation extent and status, vegetation condition, clearing, significant flora, Threatened Ecological Communities (TEC) and Priority Ecological Communities (PEC),
- Weeds and Declared Plants,
- Fauna – threatened fauna, habitat values, habitat linkages,
- Dieback,
- Aboriginal heritage,
- European heritage,
- Contaminated sites, and
- Construction and operational phase impacts – dust emissions, noise and vibration, visual amenity, fire, pollution, waste and hazardous materials, traffic management, topsoil management, revegetation and landscaping.

Where relevant, recommendations are provided for additional investigations and mitigation measures.

5.1.1 Relevant legislative requirements

Key Commonwealth and Western Australian environmental legislation that may be relevant to the AMP project is listed in Table 5-1.

Table 5-1: Key environmental legislation relevant to the AMP project

Legislation	Responsible agency	Aspect
Commonwealth legislation		
Environment Protection and Biodiversity Conservation Act 1999	Department of the Environment and Energy (DEE)	Matters of National Environmental Significance including threatened flora and fauna
Native Title Act 1993	National Native Title Tribunal	Native title
State legislation		
Aboriginal Heritage Act 1972	Department of Lands, Planning and Heritage (DPLH)	Archaeological and ethnographic sites
Biodiversity Conservation Act 2016	DBCA	Protection of native flora and fauna
Biosecurity and Agricultural Management Act 2007	Department of Primary Industries and Regional Development (DPIRD)	Weeds and feral animals
Conservation and Land Management Act 1984	Department of Biodiversity, Conservation and Attractions (DBCA)	Use, protection and management of public lands and waters and its flora and fauna
Contaminated Sites Act 2003	Department of Water and Environment Regulation (DWER)	Management of contaminated sites
Environmental Protection Act 1986	Environmental Protection Authority (EPA) (Part IV) DWER (Part V)	Environmental impact assessment and management
Environmental Protection (Noise) Regulations 1997	DWER	Noise standards
Environmental Protection (Clearing of Native Vegetation) Regulations 2004	DWER	Clearing of native vegetation
Heritage of Western Australia Act 1990	Heritage Council of Western Australia	European heritage protection
Land Administration Act 1997 Department of Regional	DPLH	Administration of State Land
Rights in Water and Irrigation Act 1914	DWER	Access to and use of water resources; protection and management of river flows and drainage
Soil and Land Conservation Act 1945	DPIRD	Protection of soil and prevention/management of soil erosion

5.1.1 Methodology

Desktop assessment

A desktop assessment of the AMP project and Project Site was undertaken by viewing GIS spatial files and reviewing information from publically available, government managed databases. The information sources utilised in this assessment are presented in Table 5-2.

Table 5-2: Information sources

Aspect	Information source
Climate	Bureau of Meteorology (BoM) Climate Data Online (BoM, 2018).
Geology, landform and soils	DPIRD Soil landscape mapping (GoWA, 2018).
Acid Sulphate Soils	DWER Acid Sulfate Soil Risk Map, Albany – Torbay (GoWA, 2018).
Land use and reserves	DBCA Legislated Lands and Waters (GoWA, 2018). City of Albany Local Planning Scheme No. 1 (Department of Planning (DoP, 2014).
Environmentally Sensitive Areas	DWER Clearing Regulations – Environmentally Sensitive Areas (GoWA, 2018).
Vegetation	Beard vegetation mapping (1979). DPIRD Pre-European Vegetation (GoWA, 2018). Statewide Vegetation Statistics (GoWA, 2018). DBCA NatureMap (DBCA, 2018). Albany Regional Vegetation Survey (ARVS) (Sandiford & Barrett, 2010). FloraBase (WA Herbarium, DBCA, 1998)
Threatened and Priority Ecological Communities	DBCA Threatened Ecological Communities (TEC) (GoWA, 2018). *Pers. comms* Sandra Maciejewski, Reserves (Natural) Officer, City of Albany 8 August 2018. EPBC Act Protected Matters Search Tool (DEE, 2018).
Conservation Significant Flora and Fauna	DBCA NatureMap database (DBCA, 2018). EPBC Act Protected Matters Search Tool (DEE, 2018).
Surface water and Groundwater	DWER data layers (GoWA, 2018): Groundwater Salinity Statewide Hydrographic Catchments – Catchments Hydrographic Catchments – Sub-catchments Public Drinking Water Source Areas RIWI Act, Groundwater Areas RIWI Act, Rivers RIWI Act, Surface Water Areas and Irrigation Districts Surface Water Allocation Areas Surface Water Allocation Subareas. DBCA data layers (GoWA, 2018): Ramsar Sites South Coast Significant Wetlands.
Contaminated sites	DWER Contaminated Sites Database (DWER, 2018).
Heritage	DPLH Heritage Inquiry System Search Tool (DPLH, 2018). EPBC Act Protected Matters Search Tool (DEE, 2018). Heritage Council InHerit database (GoWA, 2018). State Register of Heritage Places (DPLH, 2018).
Matters of National Environmental Significance (MNES)	EPBC Act Protected Matters Search Tool (DEE, 2018).

Site walkover

A GHD Senior Environmental Scientist and Principal Engineer conducted a site walkover on 3 July 2018. The site walkover included a visual assessment of native vegetation, observations on drainage / flow paths and the presence of existing disturbances such as waste dumping within the Project Site. Photographs were taken at key points within the Project Site.

The findings from the site walkover have been incorporated (where appropriate) into the relevant following sections. The photographs from the site walkover have been included as Appendix I.

5.1.2 Physical environment

Climate

Albany is located on the south coast of Western Australia and the climate is broadly described as Mediterranean, with warm dry summers and mild wet winters. The nearest Bureau of Meteorology (BoM) official recording station is Albany Airport (Station No. 9741). A summary of climatic data for this station is provided in Table 5-3 (BoM, 2018).

Table 5-3: Climatic data for the Albany Airport (Station No. 9741) for years 1960 to 2014 (BoM 2018)

Climatic variable	Statistic
Mean annual maximum temperature range	15.8°C in July to 24.9°C in February
Mean annual minimum temperature range	7.5°C in July to 14.5°C in February
Mean annual rainfall	798.1 mm
Mean annual rain days per year	83.1

Topography, geology, landform and soils

The surface elevation of the Project Site ranges from approximately 41 m AHD to 73 m AHD. The lowest elevation is on the southern boundary and extends through the centre of the Project Site within a gully (a tributary to Marbelup Brook) that lies in a north-easterly direction. The highest elevation occurs on the eastern boundary of the Project Site.

The regional geology is discussed in section 6.1.1. The local geology is further delineated by DPIRD Soil Landscape Mapping identified in Table 5-4 and illustrated in Figure 5-1.

Table 5-4: Soil map units within the Project Site (GoWA, 2018)

Map unit symbol	Name	Landform	Geology	Soil
242KgDMc	Dempster Crest phase	Broad convex crests of sandy and lateritic spurs and ridges	Deeply weathered siltstone	Duplex sandy gravels; Grey deep sandy duplexes; Pale deep sand; Shallow gravels
242KgS7f	Minor Valleys S7 floor phase	Foot slopes and swampy valley floors of minor valleys	Colluvial and alluvial deposits over weathered sedimentary rocks	Wet and semi-wet soils; Pale deep sands; Grey deep sandy duplexes
242KgS7h	Minor Valleys S7 slope phase	Side slopes of minor valleys	Colluvium sedimentary rocks	Pale deep sands; Grey deep sandy duplexes
242ReDMc	Dempster Crest phase	Elongate crests	No information recorded	Sands and laterite

Acid sulfate soils

A review of the DWER ASS risk mapping for Albany-Torbay indicates the Project Site is located outside of the boundary of this dataset. Tributaries of Marbelup Brook located approximately 750 m to the south of the Project Site are mapped within areas of "*Moderate to Low Risk*" of ASS occurring within 3 m of the natural soil surface (Figure 5-2).

Therefore it is considered reasonable to assume that the tributaries of Marbelup Brook within the Project Site may also have a "*Moderate to Low Risk*" of ASS occurring within 3 m of the natural soil surface.

Potential impacts

The AMP project will potentially result in impacts to the physical environment. These impacts are expected to occur during the construction phase and are likely to be minor and temporary given appropriate management measures. Potential impacts include:

- Temporary risk of water and wind erosion as a consequence of the proposed works. Areas of the Project Site with lighter-texture soils (e.g. sandy soils) are likely to be vulnerable to water and wind erosion. Areas of the Project Site with dispersive soils (e.g. clay soils) may also be prone to water erosion, particularly during high intensity rainfall events.
- Undisturbed ASS does not pose a risk, and only become an issue where excavation occurs, works are required below the water table, or lowering of the water table is required. The AMP project will likely include excavations and dewatering. ASS investigations and an ASS management plan (if required) should be undertaken once further construction details are defined.

Management

It is anticipated that the potential impacts to the physical environment can be adequately managed for the construction and operational phase of the AMP project using standard techniques to maintain existing environmental conditions through the detailed design phase and the Preliminary Water Management Plan outlined in Section 8 including:

- Spill control and pollution management,
- Water sensitive urban design,

- Erosion and sediment control, and
- On-site wastewater management and operational controls.

Once ASS investigations are deemed required and subsequently completed, an ASS (and if required – dewatering) management plan should be prepared, if ASS is identified. The ASS (and dewatering) management plan is to be prepared in accordance with DWER guidelines *Treatment and Management of Soils and Water in Acid Sulfate Soil Landscapes* (DER, 2015).

Soil Landscape Mapping

242KgDMc - Sands and laterite on elongate crests; Jarrah-Albany Blackbutt-Marri forest.

242KgS7f - Footslopes and swampy valley floors of minor valleys

242KgS7h - Broad valleys in sedimentary rocks; 30 m relief; smooth slopes. Deep sands and iron podzols on slopes; Albany Blackbutt-jarrah-sheoak woodland. Podzols and yellow duplex soils on floors; paperbark woodland, teatree heath.

242ReDMc - Sands and laterite on elongate crests; Jarrah-Albany Blackbutt-Marri forest.

242ReRD - Broadly undulating plateau; scattered lakes and depressions. Yellow duplex soils and laterite on plains. Marri-Jarrah-Albany Blackbutt forest. Yellow solonetzic soils in depressions; Paperbark woodland.

LEGEND

Project Site

Cadastre

242ReRD

242KgS7h

Down Rd

242ReDMc

Down West Rd

Down South Rd

242KgDMc

242KgS7h

242KgS7f

242KgS7h

242KgDMc

242KgDMc

242KgS7h

SLIP

Paper Size ISO A3

0 100 200 300

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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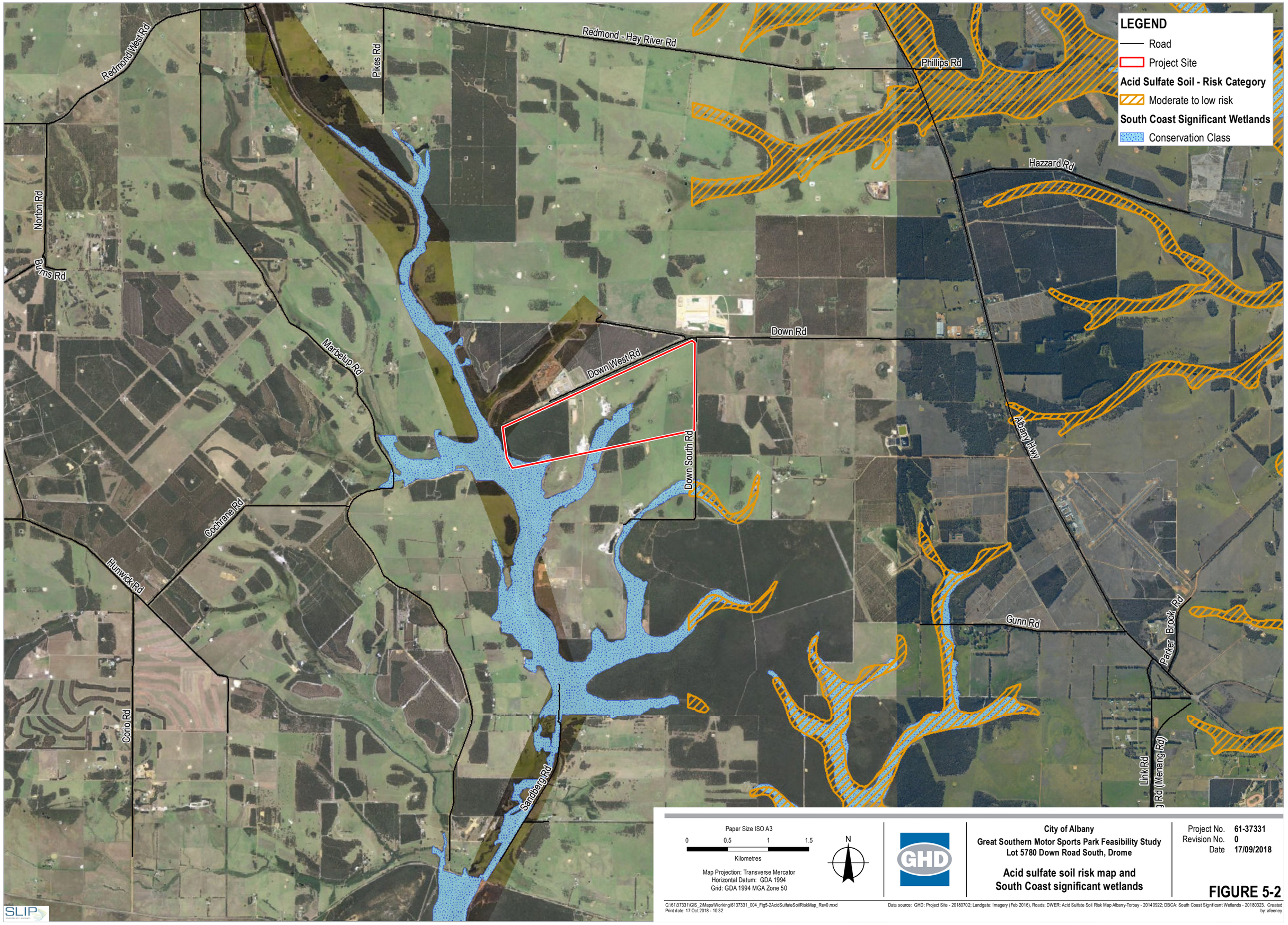
Soil landscape mapping

Project No. **61-37331**
Revision No. **0**
Date **17/09/2018**

FIGURE 5-1

G:\61\37331\GIS_2\Maps\Working\61737331_003_Fig5-1SoilLandscapeMapping_Rev0.mxd
Print date: 15 Oct 2018 - 09:27

Data source: GHD: Project Site - 20180702; Landgate: Imagery (Feb 2016), Cadastre, Roads - 20180709; DPIRD: Soil Landscape Mapping (Best Available) - 20171220. Created by: afeeney



Paper Size ISO A3

0 0.5 1 1.5

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Acid sulfate soil risk map and South Coast significant wetlands

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Revision No. **0**
Date **17/09/2018**

FIGURE 5-2

G:\61\37331\GIS_2\Maps\Working\6137331_004_Fig5-2AcidSulfateSoilRiskMap_Rev0.mxd
Print date: 17 Oct 2018 - 10:32

Data source: GHD: Project Site - 20180702; Landgate: Imagery (Feb 2016), Roads; DWER: Acid Sulfate Soil Risk Map Albany-Torbay - 20140922; DBCA: South Coast Significant Wetlands - 20180323. Created by: afeeney

5.1.3 Hydrology and hydrogeology

Desktop searches of the DWER hydrology layers were undertaken and are summarised in Table 5-5.

Table 5-5: DWER data queries within the Project Site (GoWA, 2018)

Aspect	Details	Result
Public Drinking Water Source Areas (PDWSA)	PDWSA is a collective term used for the description of Water Reserves, Catchment Areas and Underground Pollution Control Areas declared (gazetted) under the provisions of the Metropolitan Water Supply, Sewage and Drainage Act 1909 or the Country Area Water Supply Act 1947.	Project Site lies within the Priority 2 Marbelup Brook Catchment Area (Figure 5-3).
Groundwater Areas	Groundwater areas proclaimed under the Rights in Water and Irrigation Act 1914 (RIWI).	Project Site lies within Albany Groundwater Area (Figure 5-4).
Surface Water Areas	Surface water areas proclaimed under the RIWI Act 1914.	None present.
Irrigation District	Irrigation Districts proclaimed under the RIWI Act 1914.	None present.
Rivers	Rivers proclaimed under the RIWI Act 1914.	None present.
Waterways Management Areas	Areas proclaimed under the Waterway Conservation Act 1976.	None present within the Project Site, however the Albany Waterways Management Area is located approx. 800 m to the north.
Clearing Control Catchments	Country Area Water Supply Act 1947 Part 2A.	None present.

Groundwater and hydrology

On a regional scale, the 250K Map Series – Hydrogeology identifies a "*sedimentary aquifer within intergranular porosity – extensive aquifers, major groundwater resources*" underlying the Site (DoW, 2002). Groundwater salinity in the local area is in the range of 500 – 1000 mg/L, which is considered to be marginal for productive uses (GoWA, 2018).

Bio Diverse Solutions has undertaken groundwater investigations for the Project Site, which are summarised in section 6.1.3.

Surface water and drainage

The Project Site lies in the Marbelup Brook sub-catchment which forms part of the wider Torbay Inlet Catchment in the Denmark Coast Basin within the South West Division (GoWA, 2018).

The entire Project Site and surrounds are located within the Marbelup Brook Surface Water Allocation Sub Area (SWASA), which is a sub area of the Albany Coast Surface Water Allocation Area (SWAA) (GoWA, 2018).

An unnamed water course is present within the Project Site, draining from the north-east and centre of the site to the south across the southern boundary to the Marbelup Brook, which ultimately drains to Lake Powell. However the natural drainage of the lower part of Marbelup Brook catchment has been modified which diverts the lower part of Marbelup Brook away from Lake Powell to the Torbay Inlet (DoW, 2007).

During the site visit the watercourse was observed to be in a modified state, with cattle currently having access to the watercourse. Erosion was evident, particularly in the eastern extent of the watercourse. This area was also mostly devoid of native vegetation, with the exception of some sedges (*Juncus* spp) (Plate 5-1). The western section of the watercourse contains native shrubs / sedges and had a defined bed / banks.

Plate 5-1: Eastern extent of the watercourse showing evidence of erosion and cattle access

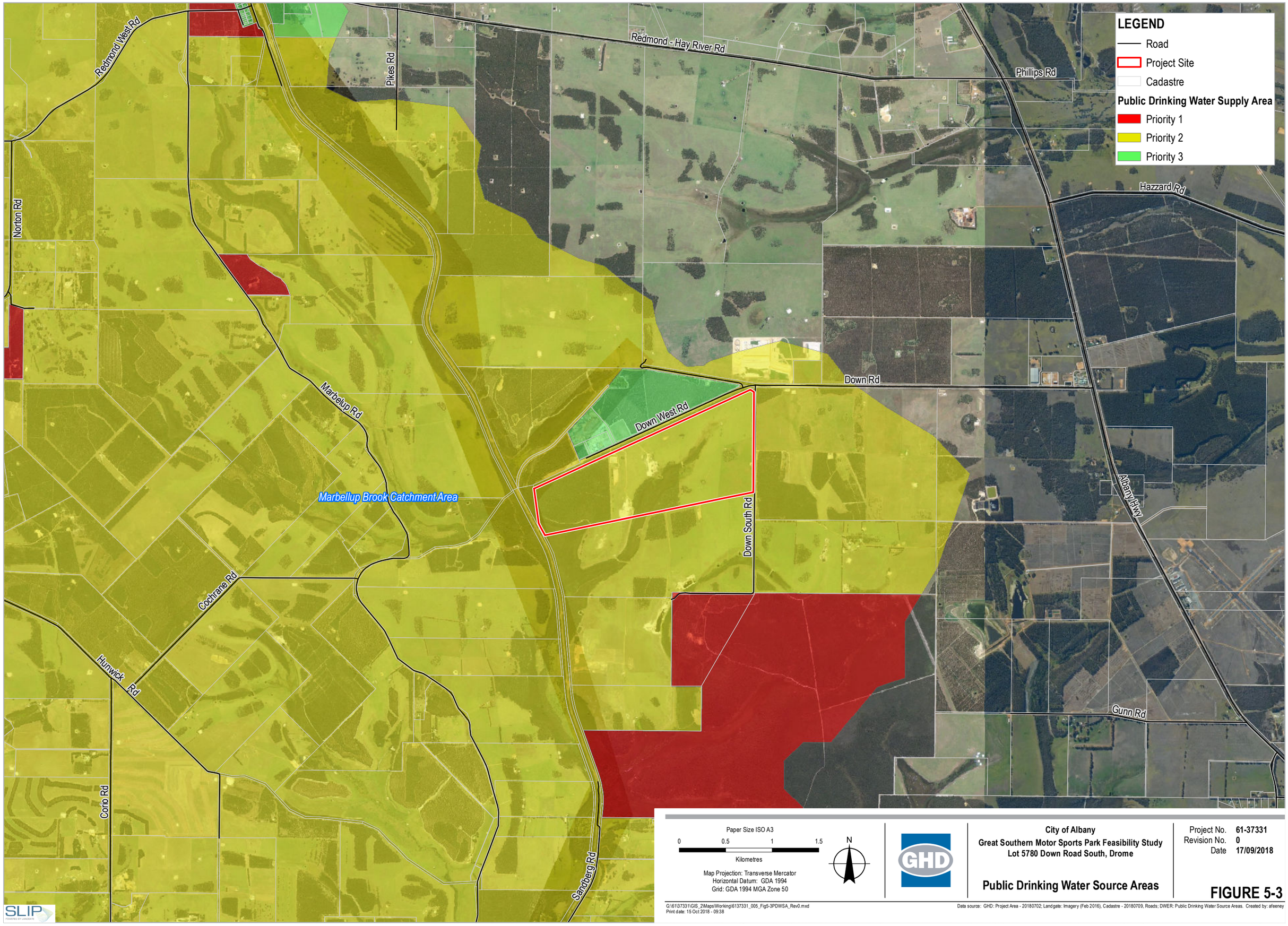
Wetlands

International and nationally important wetlands

Desktop searches identified no internationally important (Ramsar) or Nationally Important listed wetlands within 5 km of the Project Site (GoWA, 2018).

South Coast Significant Wetlands

The unnamed water course located within the Project Site is a tributary of Marbelup Brook and is a Conservation Class wetland (Figure 5-2) (GoWA, 2018).



Paper Size ISO A3

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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Public Drinking Water Source Areas

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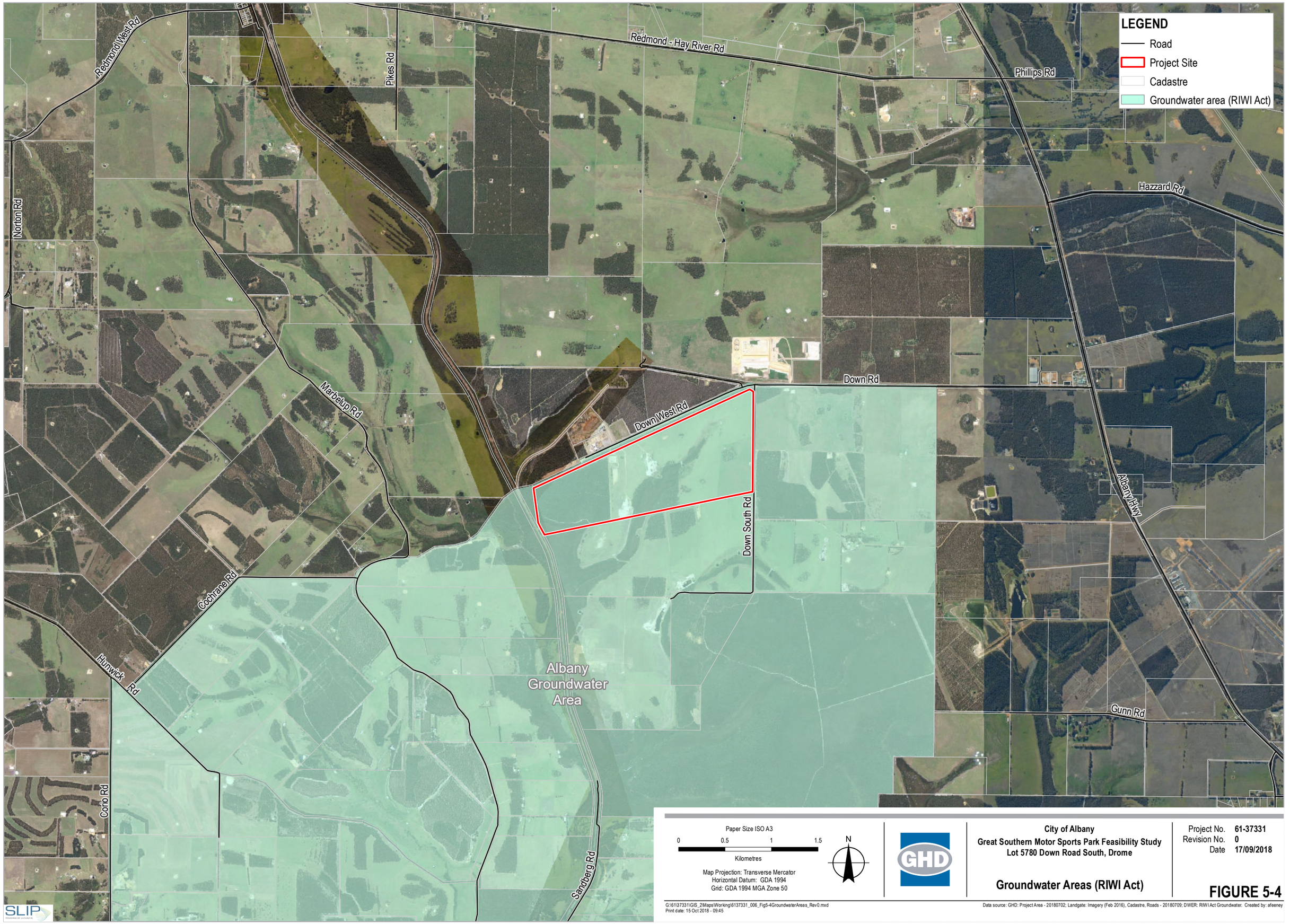
FIGURE 5-3

G:\61\37331\GIS_2\Maps\Working\6137331_005_Fig5-3PDWSA_Rev0.mxd
Print date: 15 Oct 2018 - 09:38

Data source: GHD: Project Area - 20180702; Landgate: Imagery (Feb 2016), Cadastre - 20180709, Roads; DWER: Public Drinking Water Source Areas. Created by: afeeney



Paper Size ISO A3

0 0.5 1 1.5

Kilometres

N

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Groundwater Areas (RIWI Act)

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Revision No. **0**
Date **17/09/2018**

FIGURE 5-4

G:\61\37331\GIS_2\Maps\Working\6137331_006_Fig5-4GroundwaterAreas_Rev0.mxd
Print date: 15 Oct 2018 - 09:45

Data source: GHD: Project Area - 20180702; Landgate: Imagery (Feb 2016), Cadastre, Roads - 20180709; DWER: RIWI Act Groundwater. Created by: afeeney

Potential impacts

The AMP project may cause disturbance or interruption to the natural drainage and surface run-off patterns, resulting in run-off to watercourses and wetlands potentially leading to issues in relation to contamination and sedimentation. However, the drainage design will aim to maintain existing hydrological regimes (refer to section 8).

Potential impacts to hydrology include:

- Groundwater – There may be the need for temporary lowering of groundwater levels during the construction phase of the AMP project. If so, a dewatering management plan should be prepared (generally included within the ASS management plan, if ASS is identified). No ongoing dewatering or abstraction of groundwater is considered likely during the operational phase of the AMP.
- Surface water – Marbelup Brook and associated tributaries. It is expected that the AMP project will utilise drainage features such as drains, basins, culverts and kerbing to avoid direct discharge of hardstand run-off into waterways. It is expected that the surface water hydrology will be maintained in its current regime with appropriate drainage design.
- Erosion/ sedimentation – During the construction phase and until revegetation has achieved a stable landform there is the potential for erosion and sedimentation. This is likely to be more pronounced in drainage areas.
- Vegetation – Clearing will not be undertaken within the watercourse. A 50 m development exclusion buffer will be maintained around the water course. Positive impacts on vegetation (improved vegetation health) within this buffer may be associated with removal of cattle (grazing/ trampling) and revegetation works.
- Pollution impacts associated with construction/ operational phase – The storage and handling of chemicals and hydrocarbons will require management to prevent pollution of soil, surface water and groundwater. Impacts associated with the operation phase of the AMP include runoff from hardstand areas, however, it is expected that with appropriate drainage design and management this can be minimised.

Management

It is anticipated that the potential impacts to hydrology can be adequately managed for the construction and operational phase of the AMP project using standard techniques to maintain existing environmental conditions through the detailed design phase and the Preliminary Water Management Plan outlined in section 8 including:

- 50 m development exclusion buffer around the water course,
- Site revegetation and removal of cattle access,
- Spill control and pollution management,
- Non-structural measures (refer section 8.3.4),
- Erosion and sediment control, and
- On-site wastewater management and operational controls.

5.1.4 Conservation reserves and Environmentally Sensitive Areas

Conservation reserves

There are no DBCA Legislated Lands and Waters intercepted by the Project Site. However there are two sites within 5 km of the Project Site including the following (GoWA, 2018):

- Down Road Nature Reserve located approximately 900 m to the south, and
- Phillips Brook Nature Reserve located approximately 4.4 km to the north east.

Environmentally Sensitive Areas

The unnamed water course located within the Project Site is a tributary of Marbelup Brook and is a Conservation Class wetland (Figure 5-2) (GoWA, 2018). As per DWER guidance (DER, 2014), a conservation category wetland is "*a defined wetland and the area within 50 m of the wetland"* and is declared to be an Environmentally Sensitive Area (ESA) under the *Environmental Protection Act 1986.*

There is also one mapped ESA located within 5 km; approximately 4.7 km to the north-east of the Project Site (Figure 5-5) (GoWA, 2018).

Potential impacts

A 50 m development exclusion buffer will be maintained around the water course to help mitigate potential impacts during the construction and operational phases of the AMP project.

It is anticipated that the potential impacts to this ESA can be managed through the implementation of a project-specific Construction Environmental Management Plan (CEMP) and EMP for construction and operational phases of the AMP.

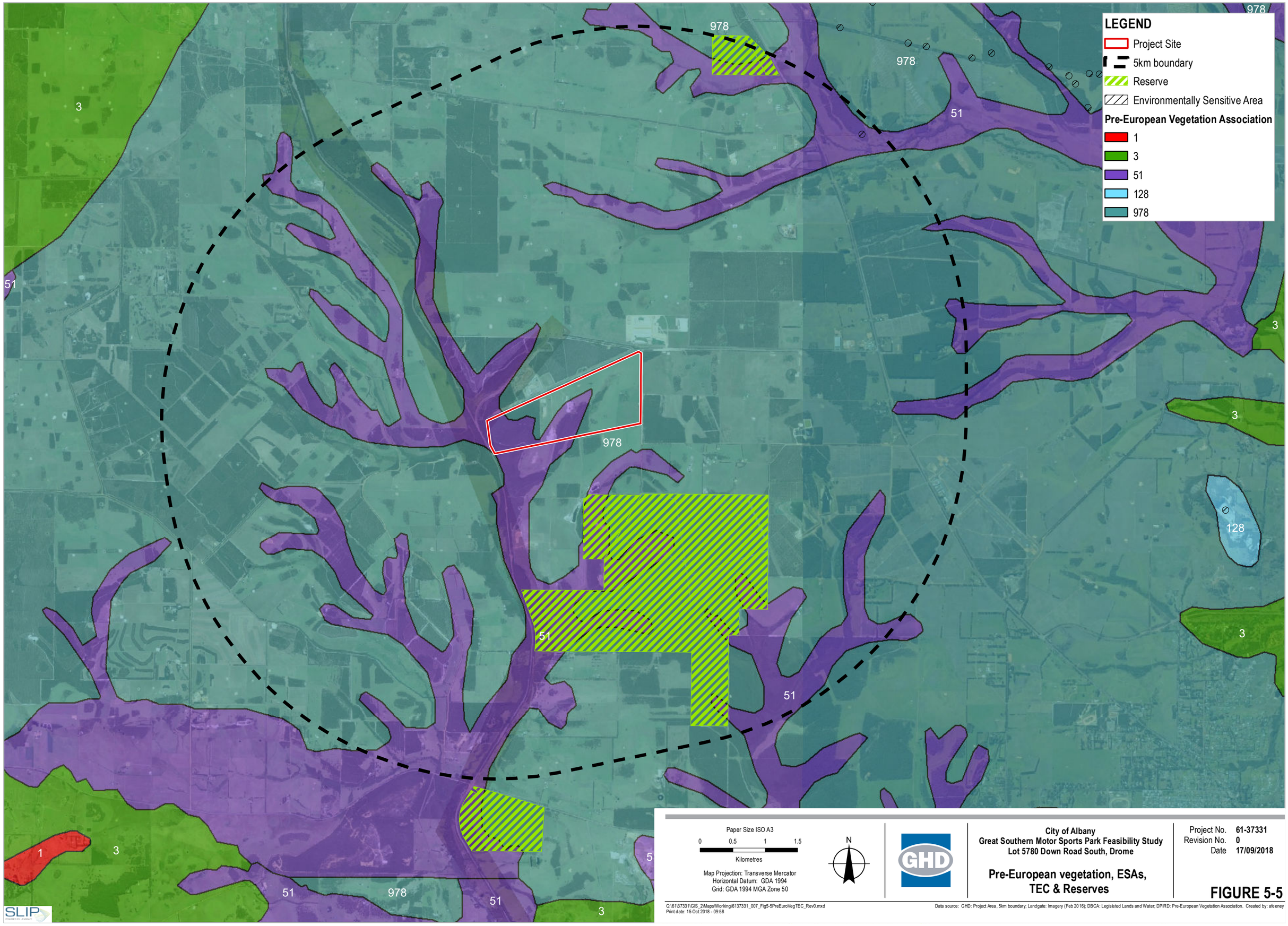
5.1.5 Vegetation and flora

Regional biography

The Project Site is located in the South West Botanical Province of Western Australia (Beard, 1990). The Southern Jarrah Forest IBRA subregion is characterised by "*Jarrah-Marri forest on laterite gravels and, in the eastern part, by Wandoo - Marri woodlands on clayey soils. Eluvial and alluvial deposits support Agonis shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands*" (Hearn, Williams, Comer, & Beecham, 2002, p. 382).

Pre-European vegetation

Broad scale pre-European vegetation mapping of the Southern Jarrah Forest IBRA Region was completed by Beard (1979) at an association level. The mapping indicates that two vegetation associations are present within the Project Site and lie within the Albany System Association (Table 5-6 and Figure 5-5).



Paper Size ISO A3

0 0.5 1 1.5

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Lot 5780 Down Road South, Drome

Pre-European vegetation, ESAs, TEC & Reserves

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Revision No. 0
Date 17/09/2018

FIGURE 5-5

G:\61\37331\GIS_2Maps\Working\6137331_007_Fig5-5PreEuroVegTEC_Rev0.mxd
Print date: 15 Oct 2018 - 09:58

Data source: GHD: Project Area, 5km boundary; Landgate: Imagery (Feb 2016); DBCA: Legislated Lands and Water; DPIRD: Pre-European Vegetation Association. Created by: afeeney

SLIP

Table 5-6: Vegetation associations present within the Project Site (Beard 1979)

Vegetation association	Flora description	Structure description	Extent within the Project Site (ha)	Extent within the Project Site (%)
51	Cyperaceae, Restionaceae, Juncaceae (mainly in the South-West)	Sedgeland	66.34	34.5
978	Jarrah, banksia or casuarina *Eucalyptus marginata*, Banksia spp., Allocasuarina spp.	Low forest, woodland or low woodland with scattered trees	125.87	65.5
		Total	192.21	100.00

Albany Regional Vegetation Survey

The Albany Regional Vegetation Survey (ARVS) (Sandiford & Barrett, 2010) provides a local and regional overview of the native vegetation within a 124,415 ha area to the east, west and north of Albany. This survey described, mapped and assessed the conservation status of native vegetation within the ARVS area.

The Sandiford and Barrett (2010) mapping indicates that three ARVS vegetation units occur within the Project Site (Table 5-7).

Table 5-7: ARVS vegetation units present within the Project Site (Sandiford and Barrett 2010)

Map code	Vegetation unit	Soil type description	Extent within the Project Site (ha)	Extent within the Project Site (%)
12	Jarrah/ Marri/ Sheoak Laterite Forest	Well drained shallow loamy/ sandy soil, with outcropping laterite, usually occurring on the crests and middle slopes of low relief hills and plateaus with occasional occurrences on lower slopes	44.80	23.3
13	Jarrah/ Sheoak/ *E. staeri* Sandy Woodland	Usually found on gentle middle to lower slopes on sandy soil overlying laterite	8.14	4.2
47	Homalospermum firmum/ *Callistemon glaucus* Peat Thicket	Occurs in drainage depressions below the seepage zone on dark brown peat or sandy peat that is waterlogged in winter and moist in summer	16.39	8.5
	Total		69.33	36.0

The remaining extent (64%) within the Project Site aligns with cleared/ agricultural land.

Site Visit – Observed Vegetation

During the site visit the on-ground vegetation was compared to the ARVS mapping and considered to be consistent with the ARVS vegetation units and their mapped boundaries. The exception being a stand of marri / jarrah forest within the cleared paddocks that is not shown on the ARVS mapping but should be mapped as ARVS unit 12 (Plate 5-2, Figure 5-6).

The majority of the Project Site is cleared of native vegetation, and is currently used for cattle grazing. There are some stands of Marri / Jarrah Forest (aligning to ARVS Unit 12) within the paddocks (Plate 5-3). These were devoid of any native understorey and were in a Degraded condition. Within the Project Site there are some remnant patches of Marri / Jarrah Forest in Very – Good to Excellent condition, with a native shrub and understorey layer. These occur in the western extent of the Site and in a patch through the central section and along Down Road West.

Along Down Road South and along the northern side of the watercourse contains Jarrah / Sheoak / *Eucalyptus staeri* Woodland (ARVS Unit 13, Plate 5-4). This was generally in Very Good to Excellent condition.

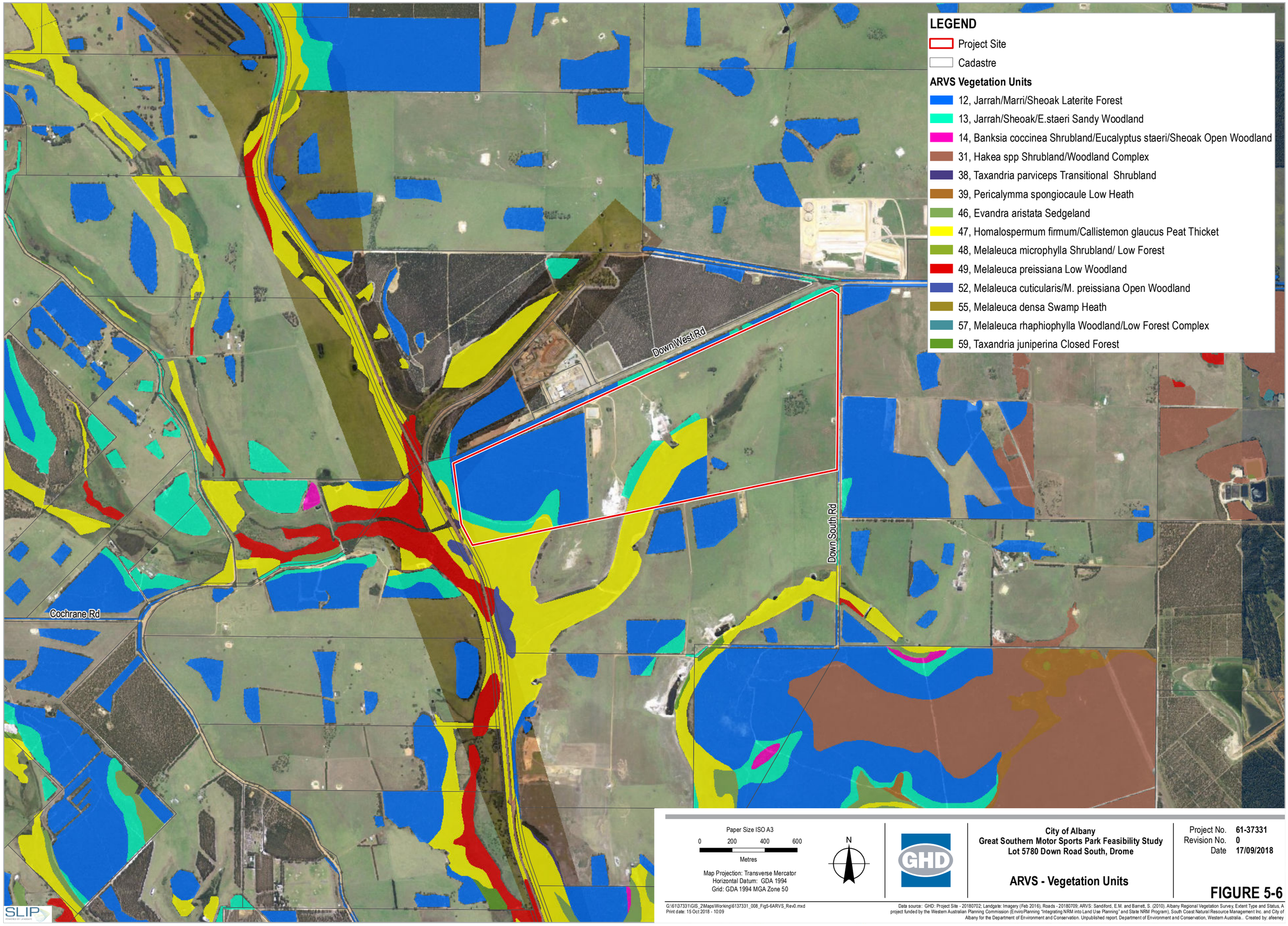
The watercourse is mapped as ARVS Unit 47, the condition of vegetation along the watercourse varies depending on the degree of disturbance (Plate 5-5).

Plate 5-2 Stand of Marri / Jarrah Forest within cleared paddock.

Plate 5-3 Marri / Jarrah Forest (ARVS Unit 12).

Plate 5-4 Vegetation along Down Road West Reserve that aligns with ARVS Unit 13.

Plate 5-5 Watercourse vegetation that aligns with ARVS unit 47.



Paper Size ISO A3

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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ARVS - Vegetation Units

Project No. **61-37331**
Revision No. **0**
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FIGURE 5-6

G:\61\37331\GIS_2\Maps\Working\6137331_008_Fig5-6ARVS_Rev0.mxd
Print date: 15 Oct 2018 - 10:09

Data source: GHD: Project Site - 20180702; Landgate: Imagery (Feb 2016), Roads - 20180709; ARVS: Sandiford, E.M. and Barrett, S. (2010). Albany Regional Vegetation Survey, Extent Type and Status. A project funded by the Western Australian Planning Commission (EnviroPlanning "Integrating NRM into Land Use Planning" and State NRM Program), South Coast Natural Resource Management Inc. and City of Albany for the Department of Environment and Conservation. Unpublished report. Department of Environment and Conservation, Western Australia.. Created by: afeeney

Pre-European vegetation extent

The pre-European mapping has been adapted and digitised by Shepherd *et al*. (2002). The extent of the vegetation association has been determined by the State-wide vegetation remaining extent calculations maintained by the DBCA (latest update December 2017) (GoWA, 2018). As shown in Table 5-8, the current extents remaining of these vegetation associations are all greater than 30 per cent (%) of their pre-European extents at various levels (State, IBRA Bioregion, IBRA Subregion and Local Government Area (LGA)).

Table 5-8: Extent of Beard (1979) vegetation association within the Project Site (GoWA 2018)

Vegetation association	Scale	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	Current extent remaining in all DBCA managed lands (%)
Jarrah Forest IBRA Bioregion		4,506,660.26	2,406,938.58	53.41	69.52
51	State: Western Australia	59,085.59	32,867.25	55.63	69.21
	IBRA Bioregion: Jarrah Forest	19,962.06	7,187.97	36.01	32.26
	IBRA Subregion: Southern Jarrah Forest	19,899.01	7,124.92	35.81	31.66
	LGA: City of Albany	17,586.13	5,751.05	32.70	21.54
978	State: Western Australia	53,230.64	18,855.77	35.42	26.75
	IBRA Bioregion: Jarrah Forest	53,016.57	18,751.03	35.37	26.79
	IBRA Subregion: Southern Jarrah Forest	53,016.57	18,751.03	35.37	26.79
	LGA: City of Albany	52,154.39	18,719.90	35.89	26.94

Conservation significant ecological communities

Desktop searches did not identify any Threatened or Priority Ecological Communities within the Project Site. However one DBCA-listed Priority Ecological Community (PEC), "*Banksia coccinea* Shrubland/ *Eucalyptus staeri*/ Sheoak Open Woodland (ARVS Community type 14a)", was identified within a 5 km buffer of the Project Site (Figure 5-6) (GoWA, 2018).

This PEC has been further delineated in the ARVS mapping and has been previously identified in small populations to the south and west of the Project Site. The closest population is located approximately 800 m from the Project Site on the western side of the railway (Figure 5-6). The ARVS identified that this PEC has less than 30% of its total pre-clearing extent remaining in Western Australia (Sandiford & Barrett, 2010).

This DBCA-listed PEC forms part of the EPBC Act-listed Threatened Ecological Community (TEC) "Proteaceae dominated kwongkan shrublands of the southeast coastal floristic province of Western Australia" (DotE, 2014).

Flora diversity

The EPBC Act Protected Matters Search Tool (PMST) (DEE, 2018) and DBCA *NatureMap* (DBCA, 2018) database searches identified 108 vascular flora species (including subspecies and varieties) that have been previously recorded or have habitat likely to occur within 5 km of the Project Site. This total is comprised of 99 native species and nine introduced and/or naturalised species.

Conservation significant flora

Searches of the EPBC Act PMST (DEE, 2018) and DBCA *NatureMap* (DBCA, 2018) database identified the presence/potential presence of 14 conservation significant flora within 5 km of the Project Site (Table 5-9). The desktop searches recorded:

- Eight EPBC Act and/ or WC Act listed species,
- One Priority 1 species, and
- Five Priority 4 species.

Table 5-9: Flora of conservation significance within the Project Site

Scientific name	Common name	WA status/ rank	EPBC Act status
Banksia brownii	Feather-leaved Banksia	T – CR	EN
Banksia goodii	Good's Banksia	T – VU	VU
Banksia serra	Serrate-leaved Dryandra	P4	-
Caladenia harringtoniae	Harrington's Spider-Orchid	T – VU	VU
Centrolepis caespitosa		P4	-
Chordifex abortivus	Manypeaks Rush	T – VU	EN
Conostylis misera	Grass conostylis	T – VU	EN
Drakaea micrantha	Dward Hammer Orchid	T – EN	VU
Gonocarpus simplex		P4	-
Isopogon uncinatus	Albany cone bush	T – CR	EN
Laxmannia jamesii	James' Paperlily	P4	
Lysinema lasianthum		P4	
Sphenotoma drummondii	Mountain paper heath	T – EN	EN
Synaphea incurva		P1	

Information regarding conservation codes is provided in Appendix F.

Introduced flora

Eight Weeds of National Significance (WoNS) were identified in the desktop assessment as having habitat likely to occur within 5 km of the Project Site (DEE, 2018). These species include:

- *Asparagus asparagoides,*
- *Chrysanthemoides monilifera,*
- *Genista monspessulana,*
- *Lantana camara,*
- *Rubus fruticosus aggregate,*
- *Sagittaria platyphylla,*
- *Salix* spp. except *S. babylonica, S.x calodendron* and *S.x reichardtii , and*
- *Ulex europaeus.*

Potential impacts

Based on the current concept design the AMP project will result in direct loss of native vegetation. The Clearing Impact Area is approximately 2.05 ha and is required for a cross over on Down Road West, multi-use track and public parking areas. However the AMP is largely located within existing cleared areas which are currently used for agricultural purposes (cattle grazing) (Figure 3-1).

The pre-European vegetation association located within the Clearing Impact Area is 978: "*Jarrah, banksia or casuarina, Eucalyptus marginata, Banksia spp Allocasuarina spp."* (GoWA, 2018).

The ARVS mapping (Sandiford and Barrett, 2010) does not map all vegetation within the Clearing Impact Area however the vegetation units previously mapped include the following which are also shown in Figure 5-6:

- Jarrah/ Marri/ Sheoak Laterite Forest, and
- Jarrah/ Sheoak/ *E. staeri* Sandy Woodland.

There will be no clearing of riparian vegetation and there is a 50 m development exclusion buffer surrounding the watercourse as per DWER requirements for motorsports development sites near Conservation Category wetlands (DoW, 2007).

If not appropriately managed, the AMP project could potentially result in a range of indirect impacts on vegetation including:

- Introduction and/or spread of weeds and dieback into adjacent vegetation: given historical clearing and current level of disturbance within the Project Site, this is not likely to be a significant issue.
- Indirect impacts such as dust, surface water/ groundwater contamination (see section 5.1.3) and sedimentation of downstream drainage areas during the construction and operational phases of the AMP.

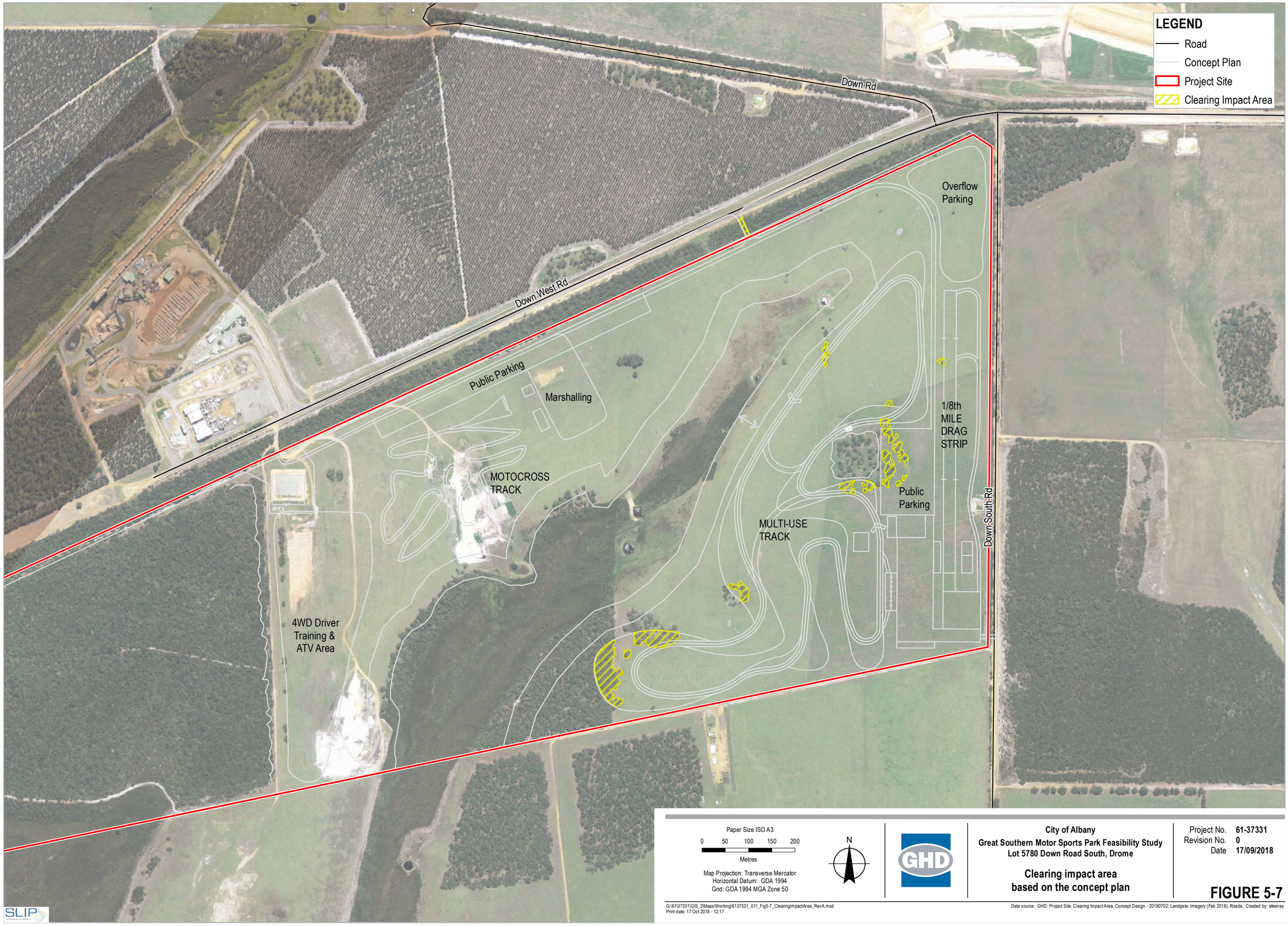
Management

Management will be required during design and construction of the AMP project to minimise both direct and indirect impacts on vegetation. Clearing will be kept to the minimum necessary to safely construct and operate the AMP.

No clearing is proposed for temporary work areas, such as site offices, storage areas or access tracks.

A baseline flora and vegetation survey is recommended to be undertaken prior to commencement of construction works so as to further delineate the vegetation types, species and condition within the Project Site. This will provide baseline information for any future vegetation and flora monitoring within the Project Site.

It is anticipated that the potential impacts to vegetation and flora can be managed through the implementation of a project-specific CEMP and EMP for construction and operational phases of the AMP.



Paper Size ISO A3

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

City of Albany
Great Southern Motor Sports Park Feasibility Study
Lot 5780 Down Road South, Drome

Clearing impact area based on the concept plan

Project No. **61-37331**
Revision No. **0**
Date **17/09/2018**

FIGURE 5-7

G:\61\37331\GIS_2\Maps\Working\6137331_011_Fig5-7_ClearingImpactArea_RevA.mxd
Print date: 17 Oct 2018 - 12:17

Data source: GHD: Project Site, Clearing Impact Area, Concept Design - 20180702; Landgate: Imagery (Feb 2016), Roads. Created by: afeeney

SLIP

5.1.6 Fauna

Fauna diversity

Searches of the EPBC Act PMST (DEE 2018) and DBCA *NatureMap* (DBCA 2018) databases identified 92 vertebrate fauna species (excluding marine species) that have previously been recorded within a 5 km buffer of the Project Site. This total is comprised of 80 native species and 12 introduced and/or naturalised species, including 70 birds, 12 mammals, six fish, three amphibians, and one reptile.

Conservation significant fauna

Searches of the EPBC Act PMST (DEE 2018) and DBCA *NatureMap* (DBCA 2018) database identified the presence/potential presence of 22 conservation significant fauna within 5 km of the Project Site (Table 5-10). The desktop searches recorded:

- 15 species listed under the EPBC Act and/or the WC Act,
- Nine migratory birds protected under international agreement (Schedule 5), and
- One DBCA Priority listed species.

Marine and migratory marine species have been excluded from further consideration as the Project Site is entirely terrestrial and not suitable habitat for these species.

Table 5-10: Fauna of conservation significance within the Project Site

Scientific name	Common name	WA status/ rank	EPBC Act rank	Type of presence
Birds				
Actitis hypoleucos	Common Sandpiper	IA	MI	Species or species habitat may occur within area
Botaurus piciloptilus	Australasian Bittern	T – EN	EN	Species or species habitat known to occur within area
Calidris acuminata	Sharp-tailed Sandpiper	IA	MI	Species or species habitat may occur within area
Calidris canutus	Red Knot	IA (& VU at subsp level)	EN & MI	Species or species habitat may occur within area
Calidris ferrunginea	Curlew Sandpiper	T – VU & IA	CR & MI	Species or species habitat may occur within area
Calidris melantos	Pectoral Sandpiper	IA	MI	Species or species habitat may occur within area
Calyptorhynchus banksia naso	Forest Red-tailed Black-Cockatoo	T – VU	VU	Species or species habitat known to occur within area
Calyptorhynchus baudinii	Baudin's Cockatoo	T – EN	EN	Breeding likely to occur within area
Calyptorhynchus latirostris	Carnaby's Cockatoo	T – EN	EN	Breeding likely to occur within area A flock of approximately 15 birds were observed during the site visit in the watercourse.
Cereopsis novaehollandiae subsp. *Grisea*	Cape Barren Goose (south-western)	T – VU	VU	Species or species habitat may occur within area

Scientific name	Common name	WA status/ rank	EPBC Act rank	Type of presence
Dasyornis longirostris	Western Bristlebird	T – VU	EN	Species or species habitat known to occur within area
Motacilla cinerea	Grey wagtail	IA	MI	Species or species habitat may occur within area
Numenius madagascariensis	Eastern Curlew	T – VU & IA	CR & MI	Species or species habitat may occur within area
Pandion haliaetus	Osprey	IA	MI	Species or species habitat may occur within area
Tringa nebularia	Common Greenshank	IA	MI	Species or species habitat likely to occur within area
Mammals				
Dasyurus geoffroii	Chuditch	T – VU	VU	Species or species habitat likely to occur within area
Isoodon obesulus fusciventer	Quenda, south-western brown bandicoot	P4	-	-
Parantechinus apicalis	Dibbler	T – EN	EN	Species or species habitat likely to occur within area
Pseudocheirus occidentalis	Western Ringtail possum	T – CR	CR	Species or species habitat known to occur within area
Fish				
Galaxiella munda	Mud Minnow	T – VU	-	-
Galaxiella nigrostriata	Black-stripe Minnow	T – EN	EN	-
Nannatherina balstoni	Balston's pygmy perch	T – VU	VU	Species or species habitat likely to occur within area
Invertebrates				
Westralunio carteri	Carter's Freshwater Mussel		VU	Species or species habitat may occur within area

Information regarding conservation codes is provided in Appendix F.

Introduced fauna

Twelve introduced species were identified in the desktop searches with species or species habitat likely to occur within a 5 km radius of the Project Site. These species include:

- *Anas platyrhynchos* (Mallard),
- *Columba livia* (Domestic pigeon),
- *Streptopelia senegalensis* (Laughing Turtle-dove),
- *Sturnus vulgaris* (Common Starling),
- *Canis lupus* (Dog),
- *Felis catus* (Cat),
- Feral Deer,
- *Mus musculus* (House mouse),

- *Oryctolagus cuniculus* (European Rabbit),
- *Rattus rattus* (Black Rat),
- *Sus scrofa* (Pig), and
- *Vulpes vulpes* (Fox).

Potential impacts

The potential impacts to fauna as a consequence of developing the AMP project are:

- Habitat loss – Based on the concept design the AMP project will result in the loss of approximately 2.05 ha of native vegetation of varying condition.

  The fauna habitat that may be impacted by the construction of the project includes:

  – Up to 2.05 ha of potential breeding, foraging and roosting habitat for Black Cockatoos.

  – There is also approximately 170 ha of fauna habitat that is considered highly modified, of low habitat value (cleared paddocks) that will be impacted by the AMP project. This habitat may be used opportunistically by fauna.
- Landscape fragmentation – the AMP is unlikely to have a significant impact on any important local or regional linkages.
- Injury and mortality – The detrimental impacts of roads on wildlife has been documented in Australia and abroad. Native fauna may be susceptible to injury/death during the construction and operational phases of the AMP project (e.g. habitat clearance).
- Secondary impact from dust, light, noise and vibration during construction and operation the Project Site. As activities undertaken during the operation of the Project Site will be intermittent it is considered that this will temporarily scare fauna away from the Project Site but is considered unlikely to have a permanent impact on fauna.

Management

Management will be required during design and construction of the AMP project to minimise both direct and indirect impacts on fauna habitat. Clearing will be kept to the minimum necessary to safely construct and operate the AMP.

A fauna survey including a targeted assessment for Black Cockatoo species is recommended to be undertaken prior to commencement of construction works. This will provide baseline information for any future fauna monitoring within the Project Site.

It is anticipated that the potential impacts to fauna habitat can be managed through the implementation of a project-specific CEMP and EMP for construction and operational phases of the AMP project.

5.1.7 Dieback

Phytophthora cinnamomi threatens over 2,300 different plant species in Western Australia. Once the pathogen infects the roots, the plant may begin to show symptoms of ‘dying back’, hence the common name used for the pathogen: Dieback. Dieback has a widespread but discontinuous range in areas with an annual rainfall above 400 mm (Dieback Working Group, 2016).

No site-specific dieback assessments or detailed mapping has been undertaken of the Project Site to date. However, given the level of previous disturbance it is expected that much of the Project Site will be considered dieback infested and/ or un-interpretable.

Potential impacts

The AMP project has the potential to spread dieback into adjacent and nearby areas of native vegetation during construction.

Management

Dieback will need to be managed through a project-specific CEMP.

5.1.8 Aboriginal heritage

A search of the Aboriginal Heritage Inquiry System found that there are no Registered Sites of Aboriginal heritage significance within the Project Site or within a 5 km buffer of the Project Site. There are also no sites lodged as 'Other Heritage Places' which intersect the Project Site, however three 'Other Heritage Places' are located within 5 km of the Project Site (Appendix G).

The search of the Aboriginal Heritage Inquiry System provided the following information regarding Indigenous Land Use Agreements in the South West:

> *"On 8 June 2015, six identical Indigenous Land Use Agreements (ILUAs) were executed across the South West by the Western Australian Government and, respectively, the Yued, Whadjuk People, Gnaala Karla Booja, Ballardong People, South West Boojarah #2 and Wagyl Kaip & Southern Noongar groups, and the South West Aboriginal Land and Sea Council (SWALSC).*
>
> *The ILUAs bind the parties (including 'the State', which encompasses all State Government Departments and certain State Government agencies) to enter into a Noongar Standard Heritage Agreement (NSHA) when conducting Aboriginal Heritage Surveys in the ILUA areas, unless they have an existing heritage agreement. It is also intended that other State agencies and instrumentalities enter into the NSHA when conducting Aboriginal Heritage Surveys in the ILUA areas. It is recommended a NSHA is entered into, and an 'Activity Notice' issued under the NSHA, if there is a risk that an activity will 'impact' (i.e. by excavating, damaging, destroying or altering in any way) an Aboriginal heritage site"* (DPLH, 2018).

Potential impacts

The AMP project does not impact upon any Registered sites of Aboriginal heritage significance. However, as part of these Feasibility Study investigations, the City of Albany has liaised with the Department of Aboriginal Affairs and advised Wagyl Kaip and Southern Noongar Group of the AMP proposal. Comments on the proposal have been invited.

At this stage, no further Aboriginal heritage investigations are seen to be necessary, pending feedback from Wagyl Kaip and Southern Noongar groups.

Due to the extent of earthworks required to complete the AMP project, there is low potential for sub-surface materials to be uncovered.

5.1.9 Heritage (non-indigenous)

A search of the EPBC Protected Matters Search Tool did not identify any Commonwealth listed heritage sites within, or within a 5 km buffer of the Project Site.

A search of the Western Australian State Heritage Office Inherit database did not identify any State Registered Places within the Project Site (DPLH, 2018). The closest known site of heritage significance (Albany Airfield and 'Sigint' Radar System Place No 15574) was identified approximately 4.5 km from the Project Site (Appendix G).

Potential impacts

No non-Indigenous heritage sites are considered likely to be impacted by the AMP project. As a result, no impacts were identified or recommendations warranted for this project factor.

5.1.10 Contamination

A review of the DWER Contaminated Sites Database undertaken in August 2018 indicates there are no sites currently classified under the *Contaminated Sites Act 2003*, within 5 km of the Project Site (including the Project Site itself) (DWER, 2018).

Potentially contaminating activities undertaken within the Project Site, as observed during the site walkover, include the following:

- A portion of the Project Site is currently leased by Plantation Energy for the purpose of a retention dam however it is understood that no water is discharged from this dam onto the Project Site (Plate 5-6),
- Storage/ dumping of materials was noted during the site visit; this includes used chemical drums and equipment (Plate 5-7 and Plate 5-8),
- Stockpiling of wood chips (Plate 5-9),
- Dumping of waste materials such as building rubble and possibly a risk of asbestos containing materials in previously excavated areas within the Project Site (Plate 5-10 and Plate 5-11).

Plate 5-6 Retention dam with area leased by Plantation Energy on the northern boundary.

Plate 5-7 Dumping of materials with the Project Site to the south of the retention dam.

Plate 5-8 Dumping of materials with the Project Site to the south of the retention dam.

Plate 5-9 Wood chip stockpiles to the south of the retention dam.

Plate 5-10 Sand excavation undertaken through the central part of the Project Site.

Plate 5-11 Dumping of waste materials (building rubble) within previously excavated areas.

There are also a number of industries in the surrounding area which may undertake potentially contaminating activities/ land uses as summarised in Table 5-11.

Table 5-11: Potentially contaminating land uses/ activities within 5 km of the Project Site

Industry	Distance from Project Site	Potential contaminating activities and associated potential contaminants of concern (DER, 2014)
Railway	Located immediately adjacent to the west of the Project Site (approx. 50 m)	Railway yards/marshalling yards and transport corridors: • Petroleum hydrocarbons • Monocyclic aromatic hydrocarbons (e.g. benzene, toluene, ethylbenzene & xylenes) • Phenolics (creosote) • Metals (e.g. arsenic, cadmium, chromium, iron, lead, zinc) Nutrients (e.g. nitrates, ammonia) • Carbamates • Organochlorine pesticides (e.g. pentachlorophenol) Organophosphates pesticides • Herbicides Asbestos • Additional contaminants according to what has been transported by rail
Plantation Energy and APEC	Plantation Energy is approx. 80 m and APEC is approx. 240 m to the north of the Project Site	Timber preserving/storage/saw mills wood product manufacturing: • Solvents (e.g. trichloroethene) • Polycyclic aromatic hydrocarbons (e.g. creosote, naphthalene) Organochlorine pesticides (e.g. chlordane, endosulfan, pentachlorophenol) • Aldrin and dieldrin • Metals (e.g. arsenic, copper, chromium VI, zinc) Boron • Ammonia Cresols

Industry	Distance from Project Site	Potential contaminating activities and associated potential contaminants of concern (DER, 2014)
United Farmers fertiliser	Approx. 3.0 km to the north-east of the Project Site	Fertiliser manufacture or storage: • Calcium phosphate, calcium sulfate, nitrates, ammonium sulfate, carbonates, potassium, copper, chloride, sulfur, sulfuric acid, nitrates, ammonia • Pentachlorophenol • Metals (e.g. boron, cadmium, cobalt, copper, magnesium, molybdenum, potassium, selenium, zinc)
Water Corporation wastewater irrigation tree farm	Approx. 2.4 km to the east of the Project Site	Biosolids application, organic fertiliser application: • Nutrients (e.g. nitrogen, phosphorus) • Metals (aluminium, arsenic, cadmium, chromium, cobalt, lead, nickel, potassium, zinc) • Phenols • Pathogens (e.g. *E. coli*, Enterococci)
Mount Romance Sandalwood Factory	Approx. 3.4 km to the north east of the Project Site	Production of sandalwood oil: • Distillation process • Water recycling facility • Biomass boiler (renewable energy)

Potential impacts

The Project Site largely traverses farmland and remnant vegetation. However based on a visual assessment of the Project Site it is evident that there has been previous stockpiling and dumping of materials predominantly confined to the north-west area of the Project Site.

It is the responsibility of the current Lessees to remove/ clean up materials stockpiled, stored or dumped within the Project Site prior to sale of the Site under the *Contaminated Sites Act 2003*. It is unknown if there has been any previous burial of waste materials within the Project Site.

Plantation Energy also currently lease a portion of the Project Site which is anticipated to continue if the AMP project goes ahead.

Project construction and ongoing operation may result in minor, localised contamination from the use and storage of hazardous substances.

Management

Prior to sale of the Project Site the existing dumped materials located within the Project Site will be removed by the Lessees and/ or previous owners.

In particular, it is recommended that any cement sheeting building materials (or other suspected materials) dumped onsite are sampled for asbestos identification by a NATA accredited laboratory. All waste materials on site will need to be managed in accordance with the *Landfill Waste Classification and Waste Definitions* (DWER, 2018) prior to removal offsite.

It is recommended that following removal of waste materials from the Project Site, the clean-up is confirmed via visual assessment of exposed soils (i.e. green waste removed during the clean-up) and sampling of soils to determine whether there are any residual contamination impacts (DER, 2014). If any contamination is identified during this process, it is recommended that further investigation and management is undertaken as per DWER guidelines for *Assessment*

and Management of Contaminated Sites (DER, 2014). If deemed warranted, this should also be reported to the DWER through a Form 1 submission as a suspected contaminated site.

Materials used within the Project Site will be handled, used and disposed of in accordance with their Materials Safety Data Sheet (MSDS) during the construction and operational phases of the AMP project. Any contamination identified during project works should be managed in accordance with a project-specific CEMP and if required reported to DWER Contaminated Site Branch under the *Contaminated Sites Act 2003*.

Furthermore, any pollution generating activities such as refuelling or storage of chemicals during construction works and ongoing site operation should also be managed in accordance with a project-specific CEMP and EMP for construction and operational phases of the AMP project.

Unexpected finds during the construction phase should be managed in accordance with the Unexpected Finds Protocol in the CEMP.

5.1.11 Construction and operational phase potential impacts

A range of impacts requiring consideration and management during the AMP project's construction and operational phases are predicted or possible. These include:

- Dust emissions,
- Noise and vibration,
- Visual amenity,
- Fire, and
- Pollution through the use of fuels, chemicals or from general construction litter (or unexpected finds).

The Project Site is located in an area which is zoned as "*Priority Agriculture*" and "*General Agriculture*" and is located within an Industrial Buffer Area surrounding the *General Industry* timber processing precinct to the north of Down Road West (refer section 2.4). The closest sensitive receptor is a residential dwelling approximately 1.4 km from the Project Site (refer section 9.2).

These impacts have the potential to be management issues during both the construction and operational phases of the AMP project. Management of these issues should be clearly defined through the preparation and implementation of a project-specific CEMP and EMP for construction and operational phases of the AMP project.

Dust emissions

Dust is likely to result from construction and materials cartage and storage operations, with impacts expected to be localised to the Project Site.

Dust lift may result from construction activities, particularly during summer. Dust emissions may result from traffic movement, vegetation clearing, earth moving, operation of vehicles and plant equipment, excavation and stockpiled materials. These are typically localised, short term impacts during construction.

Noise and vibration

It is expected there will be elevated noise and vibration during construction activities, from earth works, vehicle and machinery movement. However it is considered that noise and vibration during construction activities would be similar to those undertaken by the nearby APEC and Plantation Energy during their operational activities using heavy vehicles and wood processing machinery.

The construction phase of the AMP project will be temporary and is regulated under the *Environmental Protection (Noise) Regulations 1997*, which under Regulation 13, provide an exemption from compliance with the requirements of Regulation 7, for noise emitted from construction works on a construction site. Construction noise is managed by limiting working hours and the implementation of a CEMP for works outside of normal working hours.

Noise and vibration will be generated during the operational phase of the AMP and have been considered in Section 9 addressing a Preliminary Noise Assessment and Management Plan.

Visual amenity

The existing amenity of the Project Site includes remnant vegetation, agricultural areas, existing roads and railways and previously cleared areas.

Construction and operation of the AMP has the potential to impact on the amenity of the local area as a consequence of vegetation clearing, machinery movements, traffic noise exposure, light spill from street lighting and traffic, changes to the local road systems and some property access, and visibility of the AMP.

Residual amenity impacts are expected to be permanent, however the nearest residence is 1.4 km from the Project Site. Native vegetation present on the east, west and north of the Project Site also provides an existing visual barrier on these sides. To the south lies agricultural land.

Management of these issues should be clearly defined through the preparation and implementation of a CEMP and EMP. Operational impacts will be considered during the detailed design phase and may include additional landscaping, if required.

Fire ignition

Fire can pose a threat to human life, property and livestock as well as flora and fauna. The vegetation adjacent to the Project Site is considered to be susceptible to fire. The CEMP should give consideration to fire risk activities and preventative measures.

A Bushfire Management Plan (BMP) is also to be developed in accordance with AS 3959 and the *Guidelines for Planning in Bushfire Prone Areas* (WAPC, 2017) as per section 4.3.

Waste, litter and hazardous materials

There is a risk that the construction works will create temporary or localised pollution/ contamination as a result of fuel or chemical spills or mismanagement of construction materials. Construction works are likely to generate general waste and construction wastes. Poor management of waste materials may lead to litter or contamination of the Project Site and surrounds. This in turn may impact on the aesthetics of the area (e.g. visual amenity) and the health of terrestrial ecosystems.

Hazardous materials, including hydrocarbons, will be used during construction and operation of the Project Site. Spills and discharges of these hazardous materials may result in small scale contamination of soil, or may result in contamination of adjacent land. Consequently, hazardous materials will require management during construction. This should be managed through the following general actions:

- Any bulk fuel and oil stores should be bunded and managed in accordance with relevant Australian Standards, and
- All litter and construction waste should be contained in lidded bins and removed regularly to an approved waste facility.

5.2 Commonwealth aspects and impacts

Matters of National Environmental Significance (MNES) are factors that require legislated protection in order to conserve biodiversity, protect World Heritage and National Heritage Places, and comply with international treaties. An assessment, based on the findings of the desktop searches (DEE, 2018) and site visit, was undertaken to determine whether the AMP project will impact upon MNES and require referral to the Commonwealth (Table 5-12).

Table 5-12: Assessment of the Project Site against Matters of National Environmental Significance

MNES	Present	Impact and justification
World Heritage Properties	No	None
National Heritage Properties	No	None
Wetlands of International Significance	No	None
Listed Threatened Ecological Communities (TEC)	No Commonwealth or State listed TECs were identified within Project Site. The closest TEC is located approximately 800 m to the west of the Project Site. The ARVS mapping did not identify this TEC within the Project Site.	None
Listed Threatened Species	**Fauna** The following EPBC Act listed threatened fauna species and their habitats are 'Known to occur' and 'Breeding likely to occur' within the Project Site: Birds • Australasian Bittern (*Botaurus poiciloptilus*) (Endangered) • Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) (Endangered) • Carnaby's Cockatoo (*Caluptorhynchus latirostris*) (Endangered) • Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (Vulnerable)	The Clearing Impact Area is approximately 2.05 ha and, based on the ARVS mapping (Sandiford and Barrett, 2010) and site visit the vegetation types are considered to be suitable Black Cockatoo habitat.
	Mammals • Western Ringtail Possum (*Pseudocheirus occidentalis*) (Critically Endangered) An additional nine EPBC Act listed threatened fauna species were identified as 'Likely to occur' or 'May occur' within the Project Site.	Based on the ARVS mapping (Sandiford and Barrett, 2010) it is considered that the vegetation type within the Clearing Impact Area is unlikely to be core habitat for Australasian Bittern and Western Ringtail Possum.

MNES	Present	Impact and justification
	Flora One EPBC Act threatened flora was identified as species or species habitat is known to occur within the Project Site: • Brown's Banksia (*Banksia brownii*) (Endangered) Seven EPBC Act listed threatened flora species are 'Likely to occur' or 'May occur' within the Project Site.	Conservation significant flora may occur in areas of remnant vegetation, which should be confirmed as part of a baseline spring flora and vegetation survey.
Listed Migratory Species (excluding marine species)	There are no listed migratory terrestrial or wetlands species known to occur within the Project Site. Nine conservation significant species were identified as 'Likely to occur' or 'May occur' within the Project Site.	These species may pass through the Project Site, on an opportunistic basis (for resting/ foraging), but loss of the vegetation is considered unlikely to have a significant impact on available local or regional habitat.
Great Barrier Reef Marine Park	No	None
Commonwealth Marine Areas	No	None

The key MNES identified from the desktop searches and site visit relates to the clearing of approximately 2 ha of potential foraging habitat for Black Cockatoos. The relevant DEE guidance statement (SEWPaC, 2012) suggests 1 ha of clearing as a guide for high risk of referral for Federal assessment. However, it is likely that if the AMP proposal was referred to the DEE for assessment, the likely outcome would be 'not a controlled action'.

5.3 Summary of the assessment

This section provides an assessment of the impacts to the factors as described in section 5.1 as a result of construction and operation of the AMP project.

It is recommended a project-specific CEMP and EMP is prepared prior to construction of the AMP project and ongoing environmental management during operation of the AMP. The CEMP will address the environmental requirements for the construction works and include all regulatory environmental conditions that are required to be met.

An assessment of the potential impacts identified in section 5.1 was undertaken, considering likely duration and magnitude and the residual impact post mitigation. The following categories were applied:

- Low Risk Impacts: those considered to be temporary and/or not significantly different to existing site conditions and that can be appropriately managed to prevent long term environmental impacts. These impacts are unlikely to need to be offset.
- Medium Risk Impacts: those aspects that have the potential to have significant environmental impacts should management measures not be sufficient. Depending on the level of mitigation and management, these impacts may require offsets.
- High Risk Impacts: those aspects that result in a significant impact to the environment that cannot be mitigated. These impacts may still be acceptable, but will most likely require an offset for residual environmental impacts.

As shown in Table 5-13, many of the aspects assessed are considered to be minor risks once management is applied.

Table 5-13: Environmental impact risk assessment

Aspect	Discussion
Low risk impacts	
Physical environment (landform, soils, ASS)	These aspects are considered to be temporary and/or will not be substantially different from existing site conditions. It is expected that they can be appropriately managed through the preparation and implementation of a project-specific CEMP and EMP for construction and operational phases of the AMP.
Land use	
Conservation reserves and ESAs	
Dieback	
Weeds	
Aboriginal heritage	
Heritage (non-indigenous)	
Contamination	
Dust	
Noise and vibration	
Pollution	
Medium risk impacts	
Surface water and drainage	The project is likely impact to surface water flow and groundwater. Design and implement a drainage strategy to maintain existing surface water flows. Requires management during construction and operational phases through a Water Management Plan (Section 8).
Groundwater	
Wetlands	The Conservation Category waterway requires a 50 m development exclusion buffer which will be refined during the detailed design phase.
Visual amenity	The AMP will permanently alter the amenity of the Project Site. Requires management during construction and operational phases.
Fire	A Bushfire Management Plan will be required to be developed and implemented as per WAPC (2017) guidelines including the provision of a strategic precinct-wide secondary access.
High risk impacts	
Vegetation	The AMP will result in the permanent loss of approximately 2.05 ha of native vegetation.
Fauna	The AMP will result in the permanent loss of native vegetation that provides fauna habitat, potentially including habitat for the conservation significant Black Cockatoos and other species as discussed in Section 5.1.6 Fauna.

6. Geotechnical assessment

6.1 Ground and groundwater conditions

6.1.1 Regional geology

Reference to the 1:50,000 Environmental Geology series map (Albany sheet) and the 1:250,000 Geological Series map (Mt Barker – Albany sheet) indicates the Project Site is underlain by Cainozoic sand of colluvial origin – "*Qc: Colluvium – Sand, silt and clay"* on the slopes and within the low lying areas of the Marbelup Brook "*QA – Clay, silt, sand and gravel in watercourses*" (Allen & Sofoulis, 1984).

The sand is described as pale grey, fine to coarse, angular to sub-rounded quartz that is loose and moderately sorted and contains occasional pebbles of laterite. The thickness of the sand unit is not indicated on the maps, however the 1:250,000 map sheet indicates sand unit generally overlays laterite.

The local geology is further delineated by DPIRD Soil Landscape Mapping identified in Table 5-4 and illustrated in Figure 5-1.

6.1.2 Available information

GHD – 2014/15

GHD was appointed by CBH to carry out a site investigation for the new Mirambeena grain handling facility on Down Road, to the north-east of the Project Site.

The CBH site investigation comprised four boreholes, 27 test pits and a number of Dynamic Cone Penetrometer tests. The ground conditions observed at the CBH site are summarised in Table 6-1.

Table 6-1: Generalised subsurface profile at CBH Mirambeena site

Layer / unit	Typical depth to top of layer (m)	Typical layer thickness (m)	Description / remarks
Silty sand (topsoil)	0.0 (ground surface)	0.1	Loose to medium dense, grey / dark grey, fine grained with rootlets
Sand	0.1	0.2 to 0.5	Loose to medium dense, pale grey / brown, fine grained with occasional lateritic gravel
Gravel / clayey gravel	0.1 to 0.8	0.25 to 0.6	Dense to very dense, orange / brown, fine to coarse grained, clay of low to medium plasticity, locally weakly to moderately iron cemented
Sandy clay (locally clayey sand	0.5 to 1.0	> 6.0	Sandy clay: Stiff to very stiff, orange, mottled white / red, low to high plasticity, fine grained sand. Clayey sand: Medium dense, orange, mottled white / red, fine to medium grained, low plasticity

Geotechnical laboratory tests completed on samples recovered from the CBH site indicate the units described above have the range of geotechnical properties indicated in Table 6-2.

Table 6-2: Summary of soil properties at CBH Mirambeena site

Unit	Group symbol	Particle size distribution			Plasticity		CBR (%)
		% Fines	% Sand	% Gravel	LL (%)	LS (%)	
Sand / gravel	SP/GP	3 - 14	17 - 84	63 - 78	NP	-	15 - 35
Clayey sand / gravel	SC/GC	12 - 37	24 - 63	0 - 62	22 - 23	1.5 – 2.5	8
Sandy clay / clayey sand	CI/CH	58 - 80	18 - 42	1 - 2	47 - 58	9 - 11	2

Legend: LL = liquid limit LS = linear shrinkage NP = non-plastic
SP/GP = Poorly graded sand/gravel SC/GC = Clayey sand/gravel
CI/CH = Medium to high plasticity clay

Bio Diverse Solutions – 2018

Bio Diverse Solutions Pty Ltd were appointed by the Great Southern Motorplex Group (GSMG) to install 12 shallow monitoring bores within the site at the locations shown in Figure 7-1. The soil profiles noted in Bio Diverse Solutions' letter to GSMG are generally similar to those described in Table 6-1, except the presence of a patchy layer of cemented laterite approximately 500 mm thick, found at a depth of between 0.5 m and 1.2 m of the ground surface.

6.1.3 Groundwater

GHD's investigation on the nearby CBH site intersected groundwater in only one pit at a depth of 2.4 m. Drilling at the site was completed using drilling muds which precluded the observation of groundwater levels.

Monitoring data provided in the Bio Diverse Solutions letter indicates groundwater is present in the boreholes drilled in the lower lying areas, close to the watercourse which bisects the site. When intersected the groundwater was generally observed to be between 0.0 m and 1.0 m below the existing surface. Further discussion is provided in section 7.2.

6.2 Geotechnical assessment

6.2.1 Proposed development

Site facilities

While no details are provided, it has been assumed that the buildings at the Project Site will be single storey, relatively light masonry or steel clad/frame structures and likely to be founded on shallow footings. Significant areas of road pavement will be required for the development, ranging from car park areas to heavier pavements expected to be required for the multi-use track.

Site earthworks

Contour information available for the Project Site indicates that some cut to fill earthworks will be required. Differences in elevation in the order of 5 – 10 m are present in the south-east of the site where the drag strip, the multi-use track and their related infrastructure are proposed to be built.

Differences in elevation are greater in the north-western part of the site, however the land uses in this part of the site (4WD area and motocross track) mean that minimal earthworks are likely to be required to develop these areas for their intended use.

6.2.2 Excavations

Excavation conditions

The soils at the Project Site comprise an upper layer of generally granular material (sands and gravels) overlying a variably cemented layer of laterite, which in turn overlays generally sandy clay and clayey sand soils to depth.

Excavations within these materials are expected to be within the operating capacity of typical mechanical excavators (nominally 20 tonnes or greater). The majority of the laterite on the site is expected to be excavatable using hydraulic excavators, but may require local ripping or the use of a rock breaker to speed up the rate of excavation.

Re-use of excavated materials

The surficial topsoil layer and other soils containing significant quantities of organic matter should not be re-used as fill material, and should be removed and stockpiled for future landscaping purposes.

Materials excavated from the top 1 m to 2 m during earthworks of the elevated areas of the site are expected to comprise predominantly granular soils such as sand (particularly on the north-western side) and mixes of sand and gravel. These granular soils are considered suitable for re-use as engineered fill provided they are clean, and free of debris, deleterious and oversized (i.e. greater than 100 mm diameter) particles. The gravel soils should be reserved, where possible for use in pavement construction.

The clayey soils at the Project Site are sensitive to variations in moisture content which could result in handling and compaction difficulties if the materials become too wet and shrink / swell behavior with seasonal changes in moisture content. Excavations and stockpiles should be managed to ensure water does not infiltrate the clayey soils. If the clayey soils are re-used as engineered fill, the designer must consider the effects of surface movements due to the shrink / swell potential. To reduce these effects, the clayey soils should be allocated to the base of any fills and kept away from the pavement layers or the bottom of foundations. Alternatively foundations should be designed to tolerate the additional movement.

6.2.3 Site classification in accordance with AS 2870

The Project Site was assessed in accordance with *AS 2870-2011: Residential slabs and footings*. The assessment takes into account the differences in the site geology and potential earthworks on the site, both of which will impact the site classification.

AS 2870-2011 assigns a classification to a site based on the expected characteristic surface movement (Y_s) caused by the shrink / swell behaviour of reactive clayey soils. Y_s is impacted by:

- The plasticity of the soil – the more plastic the soil, the more it reacts to changes in moisture content and the worse the site class;
- The climate of the site – the rainfall and temperatures experienced at a site impact the depth to which soils will experience moisture changes. The greater the depth of soil (for a given plasticity) that is impacted by moisture change, the greater the Y_s and the worse the site class; and

- The amount of non-reactive soil (i.e. sand or gravel) overlying the clayey soils – sand or gravel above a clay layer reduces the depth of clay impacted by moisture change and therefore improves the site class.

For this site four scenarios have been considered. These scenarios allow for variations in the natural thickness of the granular materials above the clays and changes that will occur due to cut to fill earthworks.

- Case 1: Construction on predominantly inert, granular soils (natural or engineered fill) overlying the natural clayey soils at a depth of 1.5 m or greater,
- Case 2: Construction on predominantly inert, granular soils (natural / engineered fill) overlying the natural clayey soils at a depth of 1.0 m,
- Case 3: Construction on predominantly inert, granular soils (natural / engineered fill) overlying the natural clayey soils at a depth of 0.5 m, and
- Case 4: Construction immediately on clayey soils exposed during cut excavation or on clayey soils re-used as engineered fill.

In accordance with Table 2.5 of AS 2870-2011, the depth of design change (Hs) is taken as 1.5 m, corresponding to a Climatic Zone of 1 (wet coastal). A weight Atterberg Limit value has been used to assess the soil plasticity. The expected site classification for each of the four scenarios is summarised in Table 6-3.

Table 6-3: Site classification in accordance with AS 2870-2011

Case	Thickness of granular soils overlying clayey soils (m)	Site classification
Case 1	> 1.5	A
Case 2	1.0	S
Case 3	0.5	M
Case 4	0	M – H

6.2.4 Anticipated foundation conditions

Footings at the Project Site are expected to comprise lightly loaded, pad or strip reinforced concrete footings. The foundation subgrade will be dependent on the location of the structure and the proposed depth of cut/fill earthworks and could comprise sand/gravel or sandy clay.

Both foundation subgrades are suitable for footings, however the foundations proposed for clayey subgrade conditions will require a greater embedment depth and greater reinforcement in order to resist the shrink/swell movements of the clays. The alternative is to place granular fill to a depth of 1 m – 1.5 m below all structures. AS 2870-2011 should be consulted for guidance on suitable footing depths and reinforcement options for each site classification.

Footing widths ranging from 0.5 to 1.0 m have been considered, with a typical minimum embedding depth of 0.3 m below the final formation level for footings on granular soils and 0.6 m for clayey subgrades.

For the range of footing dimensions considered, a maximum allowable bearing pressure of 100 kPa is expected to be appropriate for the site, based on a minimum factor of safety of 3 against bearing capacity failure and a typical settlement tolerance of 20 mm.

Differential settlements under the recommended maximum bearing pressure would generally be anticipated to be less than 10 – 15 mm. A higher bearing capacity may be applicable following site specific investigations.

6.2.5 Pavement design consideration

Testing on the nearby CBH site indicates the following soaked CBR values for the various material types found on the Project Site may be appropriate for use in preliminary concept design. The values will require confirmation once site specific investigations are complete.

Table 6-4: Preliminary CBR values

Unit	Group symbol	CBR (%)
Sand / gravel	SP/GP	15/35
Clayey sand / gravel	SC/GC	8
Sandy clay / clayey sand	CI/CH	2

6.3 Potentially adverse geotechnical conditions

The Project Site is generally suitable for its intended use. No significant adverse geotechnical conditions are anticipated, however the following issues should be taken into account during design and construction:

- The site contains reactive clay soils which are likely to become more of a factor when the cut to fill earthworks are completed. Footings and pavements at the site must be designed to accommodate the lower bearing capacity/CBR and higher shrink/swell movements expected from these materials.
- The clayey soils on this site will become difficult to handle and compact if water is allowed to enter them. Appropriate drainage of excavations and filled surfaces is required to prevent this during construction.
- A perched water table may briefly develop in the upper layer of granular soils on this site following heavy rainfall. Excavations completed while the perched water table is present may require dewatering and are likely to be unstable if cut too steeply or if they are subject to significant groundwater inflows.
- Excavations at the site should be avoided following periods of high rainfall and no person should enter an excavation if groundwater is flowing into it.

6.4 Recommendations for further site investigations

Site specific investigations are required for the Project Site to confirm the geotechnical, ASS and groundwater conditions. GHD envisages these investigations would comprise a program of test pitting, supplemented by boreholes in areas where significant cuts are anticipated, where heavily loaded structures are proposed and where future drainage basins are proposed. A program of selective soil sampling and laboratory testing of the materials to confirm their ASS risk, and suitability for re-use as fill and founding soils is also recommended. A more definitive scope of work can be devised once the site layout and details of the structures are confirmed.

7. Hydrology and hydrogeology assessment

7.1 Site assessment

As previously highlighted in section 5.1.3 the site is located within the Marbelup Brook catchment on an unnamed upper gully/creek line which traverses the site from north-east to south-west. A summary of regional site geology and geotechnical conditions is detailed in section 6.1. A site visit was undertaken on 3 July 2018 by a GHD environmental scientist and engineer to observe and where possible verify any site specific features, natural or man-made, that might affect the overall understanding and conceptualisation of the site hydrology and hydrogeological conditions.

Further desktop review of available data was undertaken, which included:

- Site survey and AMP conceptual layout,
- Groundwater well data (DWER Water Information Reporting (WIN) database),
- Groundwater sampling by Biodiverse Solutions on 27 February and 4 September 2018,
- Aerial photography and topographical data, and
- Available hydrogeological information from adjacent sites.

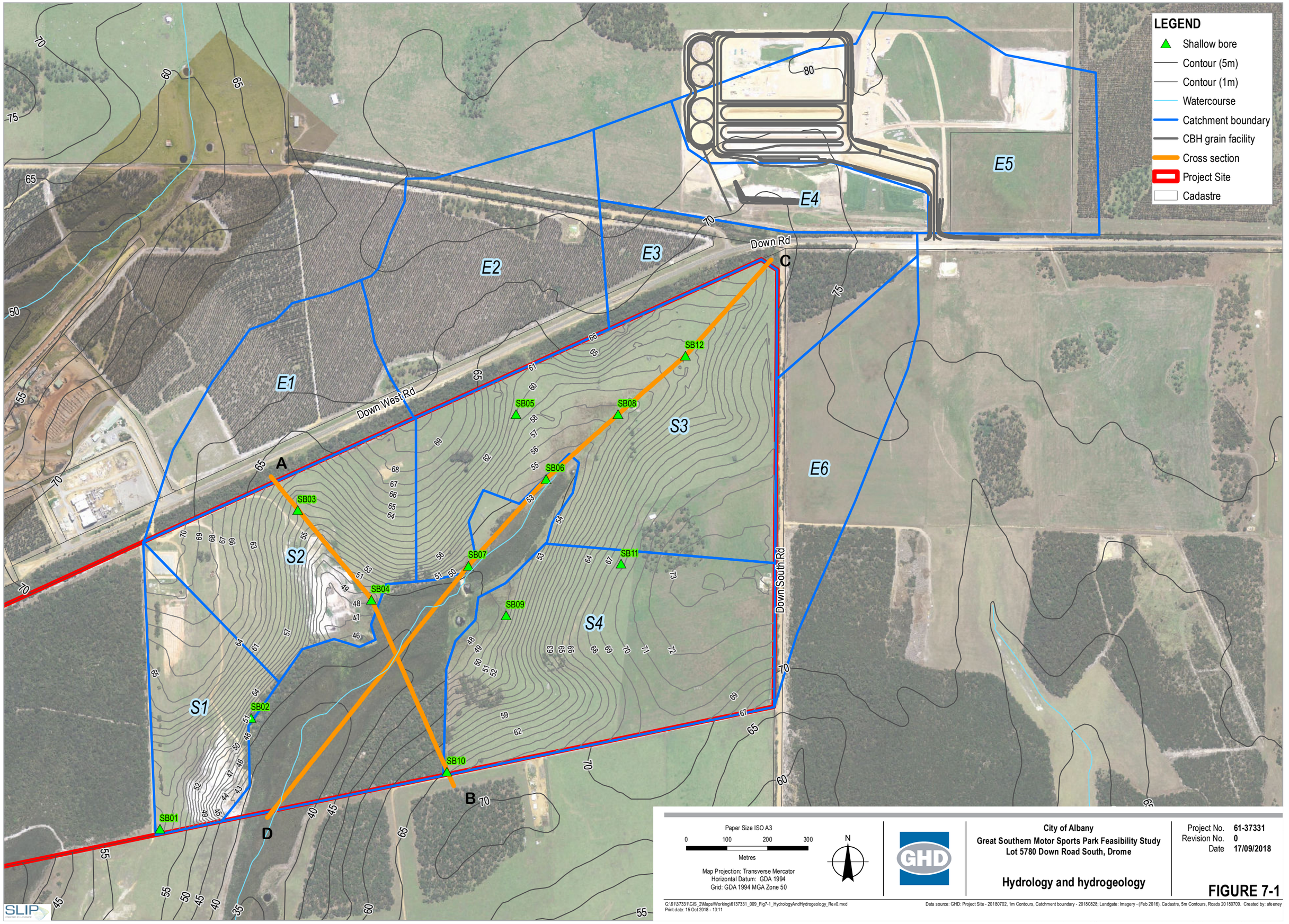
The site has existing features such as dams and quarries that need to be considered during development, some of which may offer potential flow and treatment opportunities from a stormwater management perspective. Preliminary drainage catchments have been delineated for the site and are shown in Figure 7-1. Lot 5780 has an area of 192.34 ha, with the estimated area being considered for development comprising of approximately 143 ha. There is a significant upstream catchment, of approximately 132 hectares, to the north and east. It is believed that these areas drain into the site via culverts along Down Road and Down Road West, particularly in larger storm events. Upstream land uses include agriculture and industrial sites with both woodlots and developed hardstand. Within the external upstream catchments is the CBH Mirambeena grain storage facility which may have a potential impact. Within Lot 5780's development area, the topography ranges from a maximum of 73 m AHD on the eastern boundary to a minimum of 41 m AHD in the creek line that bisects the southern boundary.

7.2 Groundwater monitoring results

GHD has an appreciation for the general site context in the surrounds, having undertaken previous studies in the Mirambeena Strategic Industrial Area and to the north of Lot 5780. A geotechnical study was undertaken in 2014 and 2015 for CBH Mirambeena grain storage facility to the north (shown on Figure 7-1).

As noted in section 6.1.3, GHD received monitoring bore installation information from Bio Diverse Solutions, which included a basic site lithological description of the soils on site to around 2 m depth. GHD has also received groundwater monitoring data, undertaken by Bio Diverse Solutions, in February, May and September 2018. The information provided is included in Appendix D and summarised in Table 7-1. The information at this stage is limited by the shallow nature of the investigation (approximately 2 m depth).

A search of DWER's WIN reporting online system for available bore data (within a 3 km radius) revealed no other relevant time series data.



Paper Size ISO A3

0 100 200 300

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

City of Albany
Great Southern Motor Sports Park Feasibility Study
Lot 5780 Down Road South, Drome

Hydrology and hydrogeology

Project No. **61-37331**
Revision No. **0**
Date **17/09/2018**

FIGURE 7-1

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Print date: 15 Oct 2018 - 10:11

Data source: GHD: Project Site - 20180702, 1m Contours, Catchment boundary - 20180828; Landgate: Imagery - (Feb 2016), Cadastre, 5m Contours, Roads 20180709. Created by: afeeney

Table 7-1: Site bores and groundwater levels

Bore ID	Easting (m)	Northing (m)	Ground level – est. RL (mAHD)	Depth to Groundwater (m BGL) Feb 2018	Depth to Groundwater (m BGL) May 2018	Depth to Groundwater (m BGL) Sep 2018
SB01	567179.967	6133615.868	58.4	> 2.0	> 2.0	> 2.0
SB02	567404.995	6133889.541	49.6	> 2.0	> 2.0	> 2.0
SB03	567519.139	6134401.422	56.8	> 2.0	> 2.0	1.21
SB04	567700.649	6134179.907	48.2	> 2.0	0.91	0.30
SB05 (not surveyed)	568056.306	6134636.37	60.0	> 2.0	> 2.0	> 2.0
SB06	568131.287	6134478.244	53.6	0.87	0.70	0.00
SB07	567939.672	6134264.362	51.6	0.64	0.54	0.44
SB08	568308.576	6134637.482	56.5	> 2.0	1.55	0.18
SB09	568032.238	6134141.798	50.3	0.66	0.57	0.44
SB10	567886.921	6133756.724	62.7	> 2.0	> 2.0	> 2.0
SB11 (not surveyed)	568314.202	6134267.661	68.6	> 2.0	> 2.0	> 2.0
SB12	568474.386	6134781.396	60.2	> 2.0	> 2.0	1.04

Notes: BGL – below ground level - Where results shown as "> 2.0", this means the groundwater table was not intersected by the shallow groundwater monitoring bore (being only 2 m deep)

7.3 Conceptual hydro(geo)logical model

A conceptual model was developed for the site to gain an initial understanding of surface and groundwater water flows and potential linkages. The development of this model was limited by the first round of shallow bore data that was made available (refer Appendix D). As previously discussed in section 7.2 there were no relevant public data available for the Project Site (DWER WIN database) as the site and surrounding area is relatively undeveloped. Soil landscape mapping shown in Figure 5-1 and regional geology mapping were used to infer geological units and soil types in the absence of deeper borehole data. Cross sections showing the conceptual site geology and flow directions are shown below in Figure 7-2 (across the valley) and Figure 7-3 (down the line of the central waterway). Refer to Figure 7-1 for the location in plan of the cross sections.

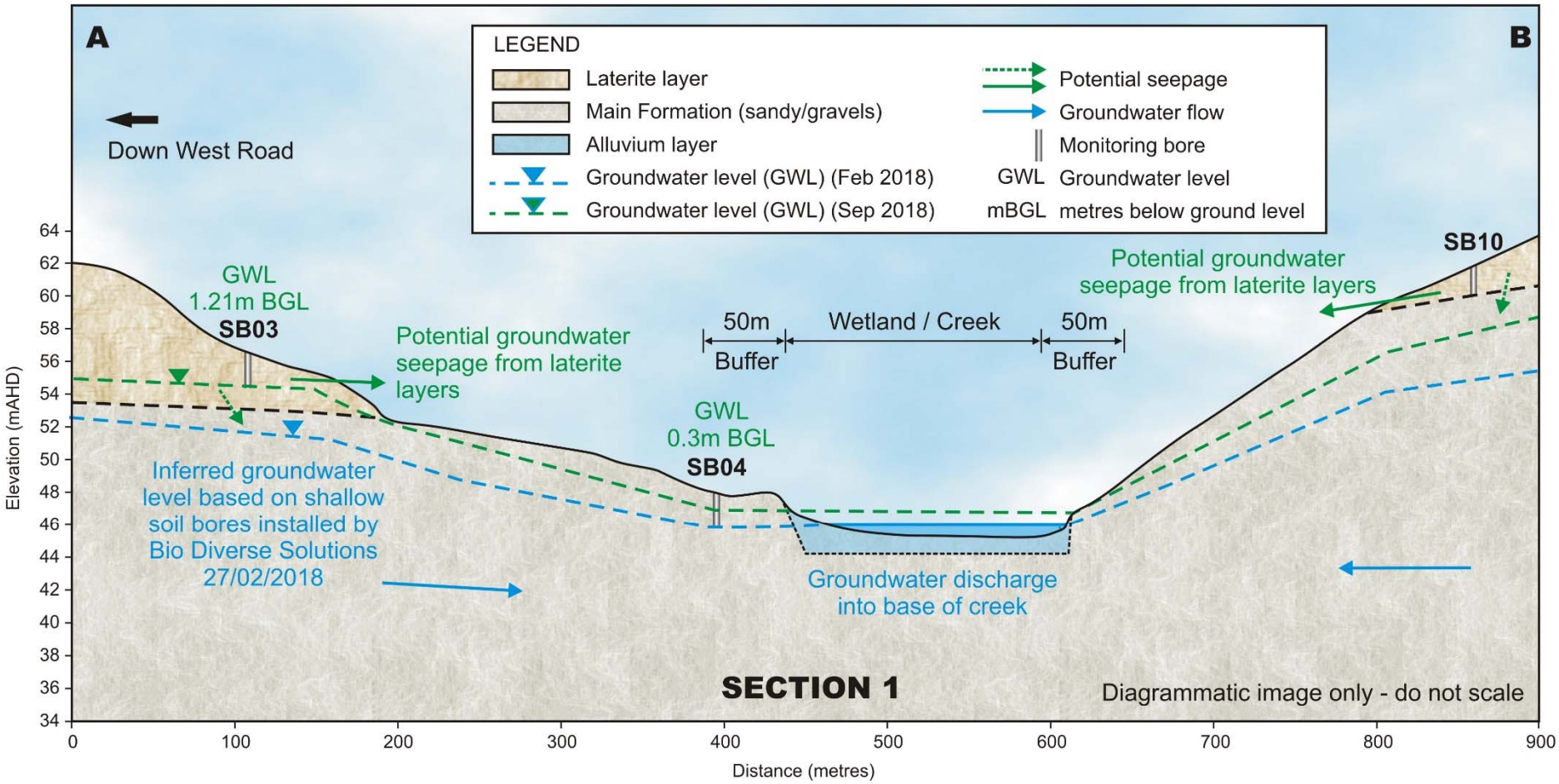


Figure 7-2: Preliminary hydrogeological section 1 (A-B)

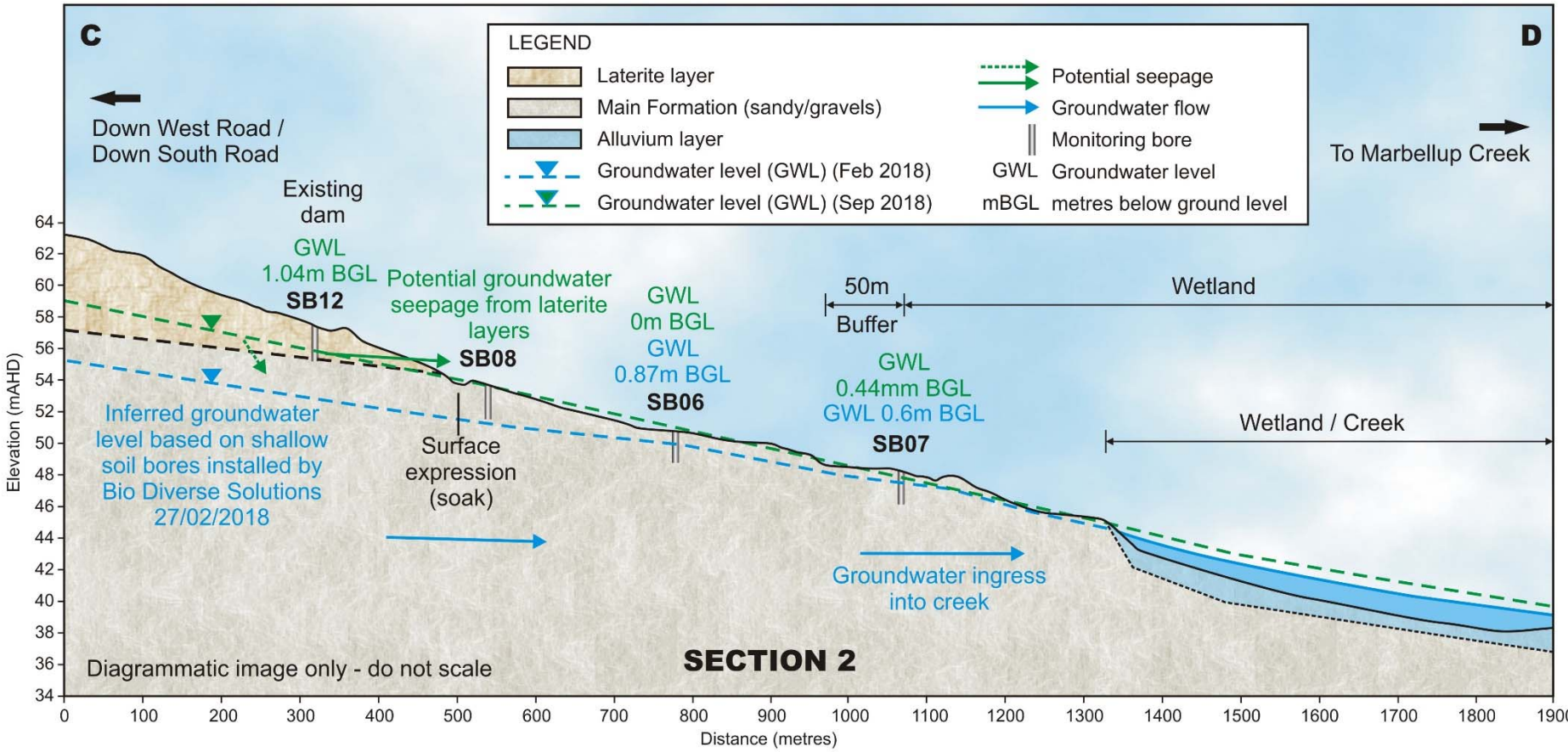


Figure 7-3: Preliminary hydrogeological section 2 (C-D)

The following key hydrogeological features are noted in the conceptual model:

- The groundwater levels observed in the shallow bores indicate that groundwater is present in the lower lying areas nearer the creek and will be most likely be supplying the creek with groundwater inflow.
- The groundwater levels and gradient, inferred from topography, supports that groundwater discharges into the creek.
- Shallow/perched groundwater may discharge and resurface via sandier layers that sit on top of more impermeable lateritic, coffee rock or clay layers; especially when there is significant slope.
- The discharging groundwater is either expressed as surface water, or migrates within the deeper more permeable deposits.

8. Preliminary water management plan

8.1 Drinking water supply and risk assessment

The Project Site is within a Priority 2 area of the Marbelup Brook public drinking water source area (see Figure 5-3 and section 2.3). A risk assessment for the proposed development was undertaken in accordance with the Australian Drinking Water Guidelines (ADWG) (NHMRC, NRMMC, 2011) and *Water Quality Protection Note 77: Risk Assessment of Public Drinking Water Source Areas* (DoE, 2005). The purpose of the risk assessment is to understand the hazards and events that could compromise drinking water quality. The assessment will help to identify preventative measures to safeguard the future drinking water source. The preliminary risk assessment is included in Appendix E. Recommended remedial measures are incorporated into the broader stormwater quantity and quality control outlined in sections 8.2 and 0.

8.1.1 Drinking water supply to the Project Site

The Water Corporation's Lower Great Southern Towns Water Supply Scheme (LGSTWSS) runs along Albany Highway, with the nearest connection point approximately 4 km to the east at 66 Down Road (fertiliser distribution warehouse) (Water Corporation, 2018). At least in the initial stages of the Project Site's development, it would be cost prohibitive to connect to the LGSTWSS. Hence, it is proposed to service drinking water needs on the site through a combination of collected rainwater and water carts.

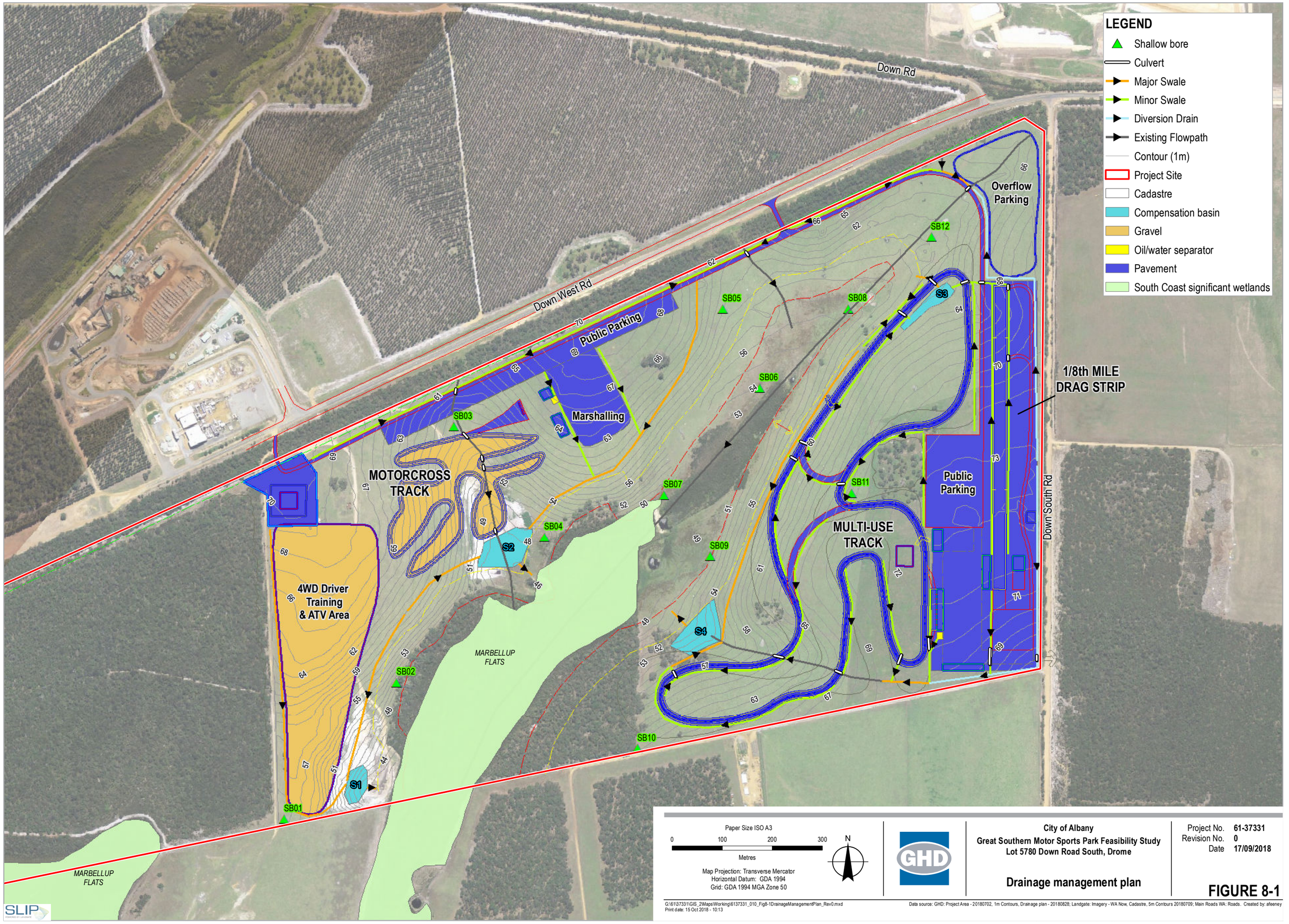
Uncontaminated rainwater from the AMP buildings will be collected in standard 110,000 litre rainwater tanks. At source treatment by household-scale filtration and ultraviolet disinfection will be undertaken. This will allow a safe drinking water supply to the AMP facilities (i.e. clubrooms, canteen, etc.) and ablutions.

A preliminary water balance for the site suggests that rainfall alone will be insufficient to meet expected demand for regular attendance of 500 people. Where there is a shortfall, the GSMG will need to purchase and cart water to the site. Water demands for other external uses (i.e. irrigation, dust suppression, etc.) will be met from site dams.

8.2 Stormwater quantity management

The proposed stormwater management plan for the site is depicted in Figure 8-1 and consists of the following principles and elements:

- Where possible, uncontaminated runoff from impervious areas will be collected for drinking water, or targeted for infiltration near to the source.
- The release of (potentially) hydrocarbon impacted stormwater from high risk areas (e.g. maintenance areas, pits, etc.) is prevented by suitable engineering controls.
- Drainage swales are used to divert the (upstream) eastern boundary catchment around the drag strip and multi-use track, so as to minimise the potential for this water to impact on the site infrastructure.
- Suitable compensating (detention) basins are used to limit post-development peak discharge rates to pre-development rates from areas subject to development.
- Suitable swales, culverts and pipework are used to convey the runoff generated from the site to engineered locations for treatment / compensation before discharge to the waterway.
- Suitable buffer separations to the wetland/creek are used to minimise the potential for impacts of site-generated water impacting on the wetland.



Paper Size ISO A3

0 100 200 300

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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GHD

City of Albany
Great Southern Motor Sports Park Feasibility Study
Lot 5780 Down Road South, Drome

Drainage management plan

Project No. 61-37331
Revision No. 0
Date 17/09/2018

FIGURE 8-1

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Print date: 15 Oct 2018 - 10:13

Data source: GHD: Project Area - 20180702, 1m Contours, Drainage plan - 20180828; Landgate: Imagery - WA Now, Cadastre, 5m Contours 20180709; Main Roads WA: Roads. Created by: afeeney

SLIP

8.2.1 Plan outline

The following preliminary plan is proposed in accordance with the principles and objectives of this technical feasibility study, the *Stormwater Management Manual for Western Australia* (DoW, 2007); and the *Subdivision and Development Guidelines 2018* (CoA, 2018).

1-year ARI event and smaller (1EY)

To retain and treat the 1-year ARI (1EY) event:

- Roofs and other impervious areas will be managed via a range of measures including:
  - Targeted infiltration in areas where there is sufficient separation to groundwater (i.e. soakage pits or infiltration galleries),
  - Targeted rainwater (roof water only) capture for potable (i.e. drinking) and non-potable uses (such as toilet flushing or vehicle wash down).
- Drainage swales will convey stormwater to compensation basins and will allow stormwater to be infiltrated as close to source as practical, in accordance with Water Sensitive Urban Design (WSUD) principles. Weirs, and vegetated swales will contribute to achieving WSUD objectives. Culverts will be installed to allow crossings of access tracks and raceway pavements.
- Direction of runoff to compensating basins targeting peak flow management to pre-development levels.

10-year ARI event (10% AEP)

To maintain site serviceability in the 10-year ARI (10% AEP) event:

- The compensating basin will be designed to detain the peak flow to pre-development levels, and maximise opportunities for infiltration prior to discharge from the site.
- Drainage swales will convey stormwater to compensation basins and will allow stormwater to be infiltrated as close to source as practical in accordance with WSUD principles. Weirs, and vegetated swales will contribute to achieving WSUD objectives. Culverts will be installed to allow crossings of access tracks.

100-year ARI event (1% AEP)

To protect from flooding in the 100-year ARI (1% AEP) event:

- Ensure suitable separation is provided between flooding levels and key site infrastructure such that a minimum freeboard of 300 mm is provided to prevent ingress of water into habitable buildings.
- The compensating basins will detain the peak flow to levels that will not adversely impact the downstream system, and maximise opportunities for infiltration prior to discharge from the site.
- Stormwater flows will exceed the capacity of the internal drainage swales, but will be contained within the swales freeboard.
- Ensure suitable overland flow paths are provided to minimise the potential for exposure of publicly accessible areas to flood waters.

8.2.2 Drainage swales

Stormwater runoff discharged from the site access roads and proposed facilities areas will be collected by swales located alongside the access track, and on the downstream of the facilities areas. The design levels of the facilities area are expected to generally follow the natural topography of the site, i.e. falling typically towards the wetland/creek. Any trapped low point, such as that associated with pockets of the motor cross track will be captured by pit and piped to discharge into swales or basins as dictated by site topography. Refer to the proposed stormwater management plan in Figure 8-1.

Swales are typically expected to be either V type or trapezoidal in design. Overall drains will, where space and topography permit, have batter slopes of 1V:6H. It is expected that side slopes will be limited to no great slopes than 1V:3H in areas restricted by space or topography. The widths and depths of swales will be determined by hydraulic modelling. A typical freeboard of 0.3 m (over the 10 year design event water level), which allows additional storage and conveyance beyond the 10 year ARI (10% AEP) serviceability is also expected to be required to ensure drains convey the major event flows to the discharge basins. Dimensions of swales likely to be required are summarised in Table 8-1. Typically Type A, B and C drains would be considered major drain/swales and Type C and D as minor drains/swales.

Table 8-1: Example swale dimensions

Swale	Base width (m)	Top width (m)	Side slope (V/H)	Typical gradient (%)	Max depth (m)
Type A	3	12	1:6	0.5 to 3%	0.7
Type B	3	15	1:6	0.5 to 3%	1.0
Type C	0	12	1:6	0.5 to 3%	1.0
Type D	0	6	1:3	0.5 to 3%	1.0
Type E	3	9	1:3	0.5 to 3%	1.0

Drainage swales are proposed in accordance with the Stormwater Management Manual for Western Australia (DoW, 2007), Subdivision and Development Guidelines (CoA, 2018) and *WQPN 52 – Stormwater Management at Industrial Sites* (DoW, 2006) whereby they provide both conveyance and treatment of stormwater, which is suitable for the site being located in an area with sensitive downstream receptors.

Swales will be broad and shallow, with vegetation covering the side slopes and base, perform an important function in disconnecting the impervious environment from the downstream environment, in this case the wetland/creek, protecting it from pollutants carried by frequent storm events. They do this by improving stormwater quality and reducing the peak flow, velocity and volume reaching the receiving environment.

In small rainfall events, swales detain and retain water, promoting infiltration close to source, and reducing volume and flow. The gentle slope and high hydraulic roughness of the swales also reduces stormwater velocity, attenuate peak flows and also prevent scouring. In larger, less frequent rainfall events, the swales protect infrastructure by conveying stormwater away to a central storage or outlet.

The reduced water velocity allows the physical processes for particulate removal to occur; infiltration, deposition and filtration of stormwater through vegetation. As coarse and medium sediments fall out of suspension, associated suspended solids and trace metals are also removed from the stormwater, reducing the pollutant loads from frequent events. Biochemical processes also act to improve water quality reaching the downstream environment, as nitrogen is removed through denitrification, bio storage through plant and bio-film uptake, and changes in soil storage. In addition to their conveyance and water quality functions, swales have the additional benefit over traditional pit and pipe drainage systems, of providing both habitat and aesthetic value to the site.

A summary of the benefits and constraints of swales are listed in Table 8-2.

Table 8-2: Benefits and constraints of swales

Potential benefits	Potential constraints
Provide water conveyance Retain and detain water Allow infiltration Reduces stormwater runoff peak flow, velocity and volume Removes coarse and medium sediments including suspended solids and trace metals Easy access for maintenance Protect downstream surface water bodies and receiving environments from frequent storm events Disconnect impervious environment from downstream environments Habitat value Aesthetic value Biochemical pollutant (nitrogen) removal	Uses more land area than conventional piped system Maintenance – vegetation mowing/replacement/weeding, gross pollutant trap emptying, sediment removal (other systems will also require this) Site topography may limit location and size

8.2.3 Diversion drains

Diversion drains are proposed to divert surface water runoff from catchments external to the Project Site, around the site or through the site such that it does not impact on the site. The diversion drains also aim to minimise the interaction of this surface water runoff with site runoff which will require treatment. It is expected that due to the nature of the site use it will likely have an increased potential of pollutant generation; in particular sediments and vehicular generated pollutants. Diversion drains may also be utilised to divert external catchments through the site and safely to the wetland/creek.

The external surface water catchments to the site consist of the adjacent APEC and CBH sites to the east and north of site, and areas of uncleared land.

The diversion drains would most likely be similar in size and shape to the major drainage swales proposed in section 8.2.2. The drains are proposed to be earthen utilising in-situ materials.

8.2.4 Compensating basins

Compensating basins are proposed to reduce peak discharge by providing temporary storage for stormwater and encouraging infiltration through permeable walls and floor close to source. The basins are sized such that the post-development peak discharge is maintained at or below pre-development level for the 10% AEP (10-year ARI) and that flows are similar to pre-development flows for the 1% AEP (100-year ARI) event.

Batter slopes of 1V:6H should be adopted where space permits as this will allow for the batter sides and floor to be vegetated and maintained more easily, also reducing potential erosion risks. The purpose of this vegetation is to stabilise banks, and provide water quality treatment by enhancing sedimentation and nutrient removal.

The proposed locations for compensating basins within the site are shown in Figure 8-1. Where possible these should utilise the natural topography of the site and generally have low (piped) and high (suitable overflow structure) outlets.

Where possible, depths of basins should be limited to no greater than 1.5 m (at top water level before the spillway activates) and where possible water depths within the basins should be minimised in minor storm events (10 year ARI/ 10% AEP and less) so as to reduce potential risks to the public but also target infiltration via a large base surface areas. Should this not be possible, consideration should be given to increasing basin side slopes (to 1V:3H) to facilitate an increase base infiltration surface in the basin. Basins with these slopes should be assessed for the possible need for appropriate fencing and signage for safety. Standing water in basins is to be minimised so as to assist with mosquito and midge control during risk periods. With this in mind, onsite infiltration testing at proposed drainage basin sites will be needed to support future design. Currently, basins are designed with an assumed 2 m/day infiltration rate.

The location of compensation basins should be such that they are installed out of the flood impacted area of the adjacent creek/wetland. An assessment of this risk should be undertaken during detailed design.

Basins should also be installed such that the base of the basin has a suitable separation to the maximum expected groundwater level in the location, so as to ensure suitable infiltration can be achieved.

8.2.5 Pit and pipe drainage

It is conceptualised that the use of pit and pipe drainage systems will be minimised wherever possible. However it is expected that use of pipework on buildings and within larger hardstand areas is possible (i.e. pit and marshalling areas along with pedestrian concourse areas). It is also expected that a number of culverts will be needed throughout the site to convey stormwater across access roadways and across parts of the proposed multi-use and motocross tracks as shown in Figure 8-1. Culverts are expected to be designed to convey events up to and including the minor event (10 year ARI/ 10% AEP) without overtopping. Suitable erosion protection should be provided at culvert outlets to ensure structural stability of any receiving waterway.

A significant culvert is likely to be required on the main internal access road to the multi-use track, where it crosses the main drainage line of the creek in the north-east corner of the Project Site.

For areas subject to higher risks of oil spills and hydrocarbons, installation of suitable oil spill separation areas/devices will be required. Currently, this is expected for the pits areas at both the multi-use track and motocross areas.

8.2.6 Hydrologic and hydraulic assessment

Pre-development

A preliminary hydrologic and hydraulic assessment has been undertaken to estimate the pre-development stormwater runoff from the Project Site for the future sizing of stormwater management structures.

The hydrological assessment includes mapping of catchments external to and within the site.

Figure 7-1 shows the catchments. A one-dimensional Drains model with ILSAX hydrology was used for calculation of runoff. Model parameters included:

- Paved (impervious) area depression storage = 1 mm,
- Supplementary area depression storage = 1 mm,
- Grassed (pervious) area depression storage = 5 mm, and
- Soil Type 3 (slow infiltration rates).

This assessment was determined in accordance with Australian Rainfall and Runoff (ARR) 2016 (Geoscience Australia, 2016), with design rainfall data from the ARR 2016 data hub and the Bureau of Meteorology (BoM, 2018).

The estimated peak flows for pre-development from various catchments are shown below in Table 8-3.

Table 8-3: Estimates of peak flows pre-development

Catchment	Area (ha)	Impervious fraction (%)	Peak flows (m^3/s)			
			1EY (1 yr ARI)	0.5 EY (2 yr ARI)	10% AEP (10 yr ARI)	1% AEP (100 yr ARI)
E1	19.8	3	0.06	0.08	0.43	2.44
E2	17.4	3	0.08	0.10	0.39	2.24
E3	15.3	3	0.01	0.02	0.36	1.97
E4	13.9	0	0.00	0.00	0.45	2.27
E5	36.4	60	0.00	0.00	0.00	0.67
E6	17.4	0	0.00	0.00	0.33	1.81
S1	14.1	0	0.00	0.00	0.31	1.64
S2	23.4	0	0.00	0.00	0.57	3.30
S3	44.9	0	0.00	0.00	1.02	6.07
S4	35.0	0	0.00	0.00	0.65	3.64
S5	25.1	0	0.00	0.00	0.90	4.18
TOTAL	262.7	-	0.03	0.03	1.82	17.0

Note: E denotes an external catchment, S denotes a catchment within the site or with a significant portion of the catchment within the site. TOTAL denotes the flows leaving the site via the creek/wetland which may be different to the individual catchments due to routing and storage within the site/model.

Post-development

A conceptual post-development Drains model was also developed to estimate preliminary basin sizes for the development. The basins were sized such that the total post-development flow off the site was equal to or less than the pre-development flow for the minor (10% AEP) design event and targeted appropriate compensation and management of major storms (i.e. the 1% AEP or 100 year ARI). Basin parameters included:

- Nominal depth of 1.5 metres to spillway levels and 2 m to top of wall.
- Basins equipped with a spillway that has sufficient capacity to handle 1% AEP flow.
- 1V:6H side slopes (this could be increased to a max of 1V:3H as required with suitable geotechnical assessment).
- 2 m/day infiltration rate in the absence of testing,
- Each basin would be equipped with a low flow piped discharge, designed to be:
  - Set above the peak 1 EY basin water level such that no discharge occurred for water quality management, and
  - Set and sized so as to ensure that the basin spillway didn't activate in events up to and including the 10% AEP.
- The intent is that basin does not activate the spillway in events up to and including the 10% AEP. Upstream external catchments would be directed into each of the basins as detailed in Figure 8-1.
- Post development flows are those of the combined catchment areas that contribute to the basin location.

The results of the basin sizing are shown below in Table 8-4.

Table 8-4: Preliminary basin sizing

	Cont. Catch	Catch Area (ha)	Predevelopment Flow (m^3/s)			Post Development Flow (m^3/s)			Approx. footprint (m^2)	Approx. storage volume (m^3)
			1EY	10% AEP	1% AEP	1EY	10% AEP	1% AEP		
S1	S1	14.1	0	0.22	1.64	0	0.13	2.08	2,800	3,000
S2	S2/S3*/ E1	51.5	0	1.06	6.59	0	0.33	6.55	6,200	7,300
S3	S3*	15.3	0	0.29	1.99	0	0.18	2.91	2,600	3,600
S4	S4	35.0	0	0.60	3.55	0	0.18	5.64	6,200	7,200

*Portion of S3 catchment only contributing to basin

8.3 Stormwater quality management

8.3.1 Overview

Stormwater quality issues requiring management within the site include:

- **Sediment Load**: Erosion caused by high flow velocity can result in a loss of soil, damage to drainage swales, and increased sediment load to the receiving water body.
- **Nutrient Load**: Increased nutrient loading to the receiving water body may result from over-application of fertilisers to landscaped areas.
- **Gross**: Suspended and dissolved pollutants: Including rubbish, hydrocarbons, dissolved metals, and pesticides.

If not responsibly managed, the development has the potential to negatively affect stormwater quality discharging from the catchment.

8.3.2 Best management practices

Best Management Practices (BMPs) are design strategies targeted to manage total suspended solids, gross pollutants, total phosphorous (TP) and total nitrogen (TN) within stormwater discharged from urban catchments (DoW, 2007). Frequently occurring rainfall events are targeted, using source, in-transit and end-of-pipe controls to improve water quality. BMPs considered appropriate for the AMP development include:

- Construction of drainage swales and dry/ephemeral detention basins using weirs and low flow drain system, to reduce flow velocity, thus reducing erosion and sediment mobilisation, allowing sedimentation, reduce total flow discharged from each site, and allowing infiltration to groundwater.
- Construction of suitable bio-retention areas to allow for suitable water quality treatment.
- Planting and regeneration of low-lying native vegetation in swale drains for filtering of particulates and uptake of dissolved nutrients.
- Use of suitable soils within bio-retention areas that target the uptake of nutrients.
- Maximising infiltration by adopting a stormwater retention system to contain, and as a minimum, treat the first 15 mm of rainfall on site.
- Construction of compensating basins/storages to reduce peak flow rates and encourage infiltration.
- Minimising discharge rates, allowing the compensating basin to act as a sediment trap, to capture suspended solids and bound pollutants prior to discharge.

8.3.3 Spill control and pollution management

To achieve spill control and pollution management in the high risk areas of the AMP, the following practices from *WQPN 52: Stormwater management at industrial sites* (DoW, 2006) and *WQPN 100: Motor sport facilities near sensitive waters* (DoW, 2007) will be implemented:

- Separation of uncontaminated stormwater from potentially contaminated stormwater (particularly roof water from other trafficked hardstands).
- Fuel / chemical storage and handling areas to be located within secondary containment areas that allow maximum recovery of any spilt materials.

- Paved areas exposed to rainfall where dust, litter or spilt substances accumulate should be regularly cleaned with methods that prevent fluid drainage or leaching into the surrounding environment. Litter, oil and sand traps (as appropriate to the site) are recommended at drain entry points. First-flush water diversion for dusty outdoor areas should be considered to capture initial stormwater run-off after any extended dry period.
- Turbidity should be controlled and where practical, stormwater should be treated (if necessary) then (in order of preference) used as a process water source, irrigated onto well-vegetated areas or infiltrated via on-site soak pits.
- Chemical solvents and non-degradable detergents used to clean equipment or pavements should not be released into stormwater systems.
- Rainwater should not be released from chemical or fuel storage compounds, unless first tested and found to be uncontaminated.
- Where the groundwater table is within five metres of the surface or soil permeability is poor (less than one metre per day), alternatives to water infiltration may be needed to avoid harmful effects due to water table mounding.

Water contamination barriers

The following water contamination barriers are proposed, to prevent any loss of hydrocarbons and chemicals from the site:

- A 50 metre buffer from the unnamed watercourse and Conservation Class wetland.
- A 200 metre from the unnamed water course and Conservation Class wetland to vehicle pits/maintenance and refuelling areas (as per DoW *WQPN 100*).
- Double bunded pit/vehicle services areas for hydrocarbon management. These areas will drain to treatment devices such as oil-water separators and/or interceptor traps prior to outlet to the site-wide drainage system.

8.3.4 Non-structural measures

There are a number of temporary and non-structural measures that may also be applied to the development project, as described below.

Construction

Construction sites can be a major source of silt and other pollutants. Proponents and builders should be encouraged to undertake good practice on building sites. Good practice for construction sites are to be documented in a CEMP and should include:

- Temporary bunds and silt fences to prevent silt runoff from sites under construction into the drainage system.
- Litter and waste storage bins to prevent litter to be blown by wind or washed away by rainfall.
- Establishing a washing-down area behind the bund or silt fence.
- Provide a stabilised entry and exit point to prevent vehicle tracking of soil from the building site onto roads.
- Position stockpiles of sand and soil stockpiles to prevent material being tracked, washed, of blown into roads, and then into the stormwater systems.

Maintenance

Regular maintenance of the drainage system should be undertaken prior to the start of the wet season. Cleaning of the stormwater drainage system and detention basins will provide an opportunity to remove gross pollutants and silt build up that may enter the receiving water bodies after heavy rainfall. In addition to transporting pollutants, drains with accumulated pollutants may also overflow, leading to localised flooding and erosion, as well as risks to human safety and constructed assets. Unlined open drains may be reshaped at this time if required.

Revegetation

Revegetation of the degraded creek/wetland area is strongly recommended as part of the development.

8.3.5 Erosion and sediment control

All reasonable and practicable measures need to be taken to protect adjacent properties and downstream environments from the adverse effects of sediment and sediment-laden water displaced from site (IECA, 2008).

It is acknowledged that sediment control measures can be expensive and introduce unwanted initial delays to a project when firstly being installed. Sediment control measures need to be appropriate for the given soil properties, expected weather conditions, required treatment standard, and the type, cost and scope of works.

With these considerations the following sediment control measures should be incorporated in the AMP site design to prevent sediment displacement from site (IECA, 2008):

- Dust control,
- Sediment fences,
- Coir logs, and
- Stockpile management.

The detailed design for the Project Site will need to be developed consistent with the requirements for erosion control in consideration of the site topography. When construction is undertaken the contractor will be required to have a suitable erosion and sediment control plan (within the CEMP) in place prior to works commencing and maintain these during and following construction during the site establishment period.

8.4 On-site wastewater management

Given the significant distance of the Project Site from the nearest connection point of Water Corporation's Albany sewerage scheme (refer section 2.5), on-site management of wastewater will be required. On-site wastewater management will need to cater for human sewage as well as grey and blackwater from vehicular activities.

The proposed use of the motorsports park will be mostly periodic (i.e. events based) with several different groups using the site. Preliminary estimates of events, site usage and spectator numbers were provided by GSMG and are discussed in section 3.2. On-site wastewater treatment systems will typically consist of both a treatment system and a disposal system. These were preliminarily sized using the Department of Health's (DoH) *Onsite wastewater system assessment tool* for estimation purposes.

The following inputs were used in the assessment:

- System capacity: 500 people (at each of the two main parts of the AMP – i.e. motocross track and multi-use track).
- Site category: Clubs (licensed), with a hydraulic loading of 35 L/person/day.

- Treatment system type: 'Secondary' wastewater treatment plant, with engineering certification to meet effluent quality of BOD < 20 mg/L; TSS < 30 mg/L; TN < 10 mg/L; TP < 1 mg/L; *E. coli* < 10 cfu/100mL; and free chlorine > 0.5 mg/L. This is to meet the requirements of *WQPN 100* (DoW, 2007).
- Site conditions: Clayey loam soil on a flat slope (< 10%), with a design irrigation rate = 3.5 mm/d.

The calculator tool produced a required demand (hydraulic loading) of 17,500 L/day and aided in the sizing of the treatment and disposal systems.

There are many vendors in the WA market for 'off the shelf' package wastewater treatment plants. For the purposes of the concept design and costing, a budget estimate was sought from MAK Water [(1)].

Selecting a disposal system and sizing the area needed will require a better understanding of the geotechnical conditions of the chosen location, and the area available. However, for the purpose of this concept design and costing, sub-surface drip irrigation was chosen as the most suitable option. This will require a disposal/irrigation area of approx. 5,000 m^2, which could be readily accommodated within the track design and facilities area.

The most suitable arrangement will be to have two wastewater treatment systems, one serving the motocross facilities, the other serving the multi-use track, and drag strip. Numbers in excess of system capacity (potentially up to 20,000 for national race events) would need to be catered for with portable facilities.

A minimum clearance of two metres between the maximum groundwater level and the discharge point of the disposal system will also be required. Therefore, wastewater facilities should be located at high ground on the site, where a greater clearance to groundwater is to be expected.

Demand requirements should be further investigated in future design stages, when the usage of the facility is better defined.

8.5 On-going water quality monitoring

Initial groundwater and water quality sampling was undertaken by Bio Diverse Solutions in February, May and September 2018. It is understood that DWER has been consulted during the development of this monitoring plan. Further to this, GHD recommends the following;

- There is limited existing site-specific groundwater data, and pre-development data are limited. If the development proposal seeks approval to install a production bore for abstraction of groundwater as a water supply source for the development, then six-monthly groundwater monitoring for water levels and salinity will be a required.
- Groundwater monitoring should be conducted for three years following practical completion, to allow any groundwater level or quality changes as a result of development to be identified, and action taken if necessary.

The program and parameters outlined in Table 8-5 below will provide a suitable representation of groundwater quality at the site. The groundwater bores established for pre-development monitoring will be used for construction phase and post-development monitoring.

[1] https://www.makwater.com.au/products/activated-sludge-bioreactor-plus/

Table 8-5: Summary of groundwater monitoring program

Site	Frequency	Duration	Parameters
Production bore and/or Shallow bores	Monthly	Pre-development 3 years post-development	Water level
	Quarterly	Pre-development 3 years post-development	In-situ pH, EC, temperature Unfiltered sample: pH, EC, TN, FRP, TKN, ammonia, TP, heavy metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Hg) Filtered sample: NO_2/NO_3, PO_4

8.5.1 Surface water monitoring

It is recommended that surface water sampling is continued to be undertaken prior to the construction of the development. This would be used to develop a baseline for ongoing assessment. This monitoring should continue during construction and then following construction to assess the impact of the development on runoff water quality.

The recommended monitoring parameters are outlined in Table 8-6. Surface water monitoring program will involve the collection of grab samples from the compensating basins and the creek/wetland. Sampling should occur during or immediately following rainfall events. It is assumed the first flush will have the highest level of nutrients and chemicals, therefore sampling should occur at the time/after the first significant rainfall event of each wet season. Field notes should include details of the rainfall events, site conditions, time of sampling and time of sample testing.

While not listed in the below table, in the event of a major water quality incident at the site, it is recommended that increased monitoring be undertaken.

Table 8-6: Summary of surface water monitoring

Site	Frequency	Duration	Parameters
1. Compensating basins (outlet) 2. Upstream of the site (TBC) 3. Downstream of the site (TBC)	Event based	For 3 years post-development	In-situ pH, EC, temperature Unfiltered sample: pH, EC, TN, FRP, TKN, ammonia, TP, heavy metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Hg) Filtered sample: NO_2/NO_3, PO_4

Samples should be taken and handled in accordance with the following Australian Standards:

- AS/NZ 5667.1:1998 Water quality - Sampling Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples.
- AS/NZ 5667.12:1999 Water quality - Sampling Part 12: Guidance on sampling bottom sediments.

8.5.2 Reporting

It is recommended that GSMG prepare an annual water quality report for each year of post-development monitoring, which will be presented to the City of Albany and DWER. This report will summarise the sampling results from the previous year.

Reporting and monitoring shall be in accordance with ANZECC *Guidelines* (2000) and the Department of Water quality assurance/quality control systems to allow inclusion into DWER's WIN database.

8.6 On-site operational controls

On site operational controls shall include but not limited to the following:

- Vehicle maintenance and refuelling to only be undertaken in the designated pit area where hydrocarbon interception/spill controls are implemented.
- Vehicle wash down to be undertaken on a bunded, impervious pad and runoff directed into a detention area containing a sediment trap and oil separator.
- Clean-up kits to be kept at strategic locations across the site in order to provide an immediate response to fuel, oil or chemical spills.
- On-site wastewater treatment (secondary standard) and disposal from toilets, washrooms and kitchens to be in accordance with the *Draft Government Sewerage Policy 2016* and as noted in section 8.4.
- An adequate number of rubbish and recycling bins to be provided across the site and regularly maintained.
- Any landscaping on the site to be designed to minimise water, fertiliser and pesticide use.
- An emergency response plan to be prepared for situations that could place local water resources at risk.

9. Preliminary noise assessment and management plan

9.1 Noise criteria

Environmental noise is managed through the *Environmental Protection (Noise) Regulations 1997* (the Regulations). The Regulations specify maximum allowable external noise levels at noise sensitive, commercial and industrial premises.

The Regulations (Regulation 7) define prescribed standards for noise emissions as follows:

> *7. (1) Noise emitted from any premises or public place when received at other premises –*
>
> > *(a) Must not cause or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind*
> >
> > *(b) Must be free of –*
> >
> > > *(i) Tonality (e.g. whining or droning)*
> > >
> > > *(ii) Impulsiveness (e.g. sirens)*
> > >
> > > *(iii) Modulation (e.g. banging or thumping)*

The assigned levels for noise sensitive premises (Regulation 8) are shown in Table 9-1.

Assigned noise levels (Table 9-1) are set differently for noise sensitive, commercial and industrial and utility premises. For noise sensitive premises an influencing factor (IF) is incorporated into the assigned noise levels. IF depends on land use zonings within circles of 100 m and 450 m radius from the noise receiver, including:

- Proportion of industrial land use zonings,
- Proportion of commercial zonings, and
- Presence of major roads (more than 15,000 vehicles per day) or secondary (6,000 to 15,000 vehicles per day).

For this assessment, it has been assumed that IF will be zero (based on the absence of major and secondary roads). The resultant assigned levels used for this assessment of the AMP are shown in Table 9-3.

As motorsport events are scheduled to occur during either the day or evening period (refer Table 3-1), the L_{A10} assigned level of 45 dBA day and 40 dBA evening criteria have been used in this assessment.

In the absence of existing noise level contribution from existing noise sources in the area other than the proposed Albany Motorsport Park, the assessment has been conducted such that the Albany Motorsport Park will not significantly contribute to received noise levels. As such, a 5 dBA penalty has been included, such that compliance with the L_{A10} assigned level of 40 dBA day and 35 dBA evening demonstrate that the Albany Motorsport Park will not significantly contribute to received noise levels.

Table 9-1: Assigned noise levels (dBA)

Type of premise receiving noise	Time of day	Assigned level		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ Max}$
Noise sensitive [2]	7.00 am to 7.00 pm Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	9.00 am to 7.00 pm Sunday and public holidays (Sunday)	40 + IF	50 + IF	65 + IF
	7.00 pm to 10.00 pm all days (Evenings)	40 + IF	50 + IF	55 + IF
	10.00 pm on any day to 7.00 am Monday to Saturday and 9.00 am Sunday and public holidays (Night)	35 + IF	45 + IF	55 + IF
Noise sensitive [3]	All hours	60	75	80

IF = influencing factor

Tonality, impulsiveness and modulation are defined in Regulation 9. Noise is to be taken to be free of these characteristics if:

a. The characteristics cannot be reasonably and practicably removed by techniques other than attenuating the overall level of noise emission.

b. The noise emission complies with the standard after the adjustments of Table 9-2 are made to the noise emission as measured at the point of reception.

Table 9-2: Adjustment for intrusive or dominant noise characteristics [4]

Tonality [5]	Impulsiveness [5]	Modulation [5]
+5 dB	+5 dB	+5 dB

Table 9-3: Assigned noise levels (dBA) for AMP

Type of premise receiving noise	Time of day	Assigned level		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ Max}$
Noise sensitive	7.00 am to 7.00 pm Monday to Saturday (Day)	45	55	65
	9.00 am to 7.00 pm Sunday and public holidays (Sunday)	40	50	65
	7.00 pm to 10.00 pm all days (Evenings)	40	50	55
	10.00 pm on any day to 7.00 am Monday to Saturday and 9.00 am Sunday and public holidays (Night)	35	45	55

[2] Highly sensitive areas include a building, or a part of a building, on the premises that is used for a noise sensitive purpose and any other part of the premises within 15 metres of that building or that part of the building.

[3] Any area other than highly sensitive area.

[4] Adjustment applies where noise emission is not music.

[5] Adjustments are cumulative to a maximum of 15 dB.

9.2 Closest sensitive receptors

Based on a review of aerial photography and site reconnaissance, there are three existing residences in the vicinity of the proposed AMP. These are shown in Figure 9-1, labelled SR01, SR02 and SR03. The red, orange and yellow contours represent 1000 m, 2000 m and 3000 m from the AMP boundary.

- SR01 is approx. 1,400 m from the drag strip and 2,200 m from the motocross track,
- SR02 is approx. 2,600 m from the motocross track and 3,700 m from the drag strip, and
- SR03 is approx. 3,500 m from the motocross track and 4,200 m from the drag strip.

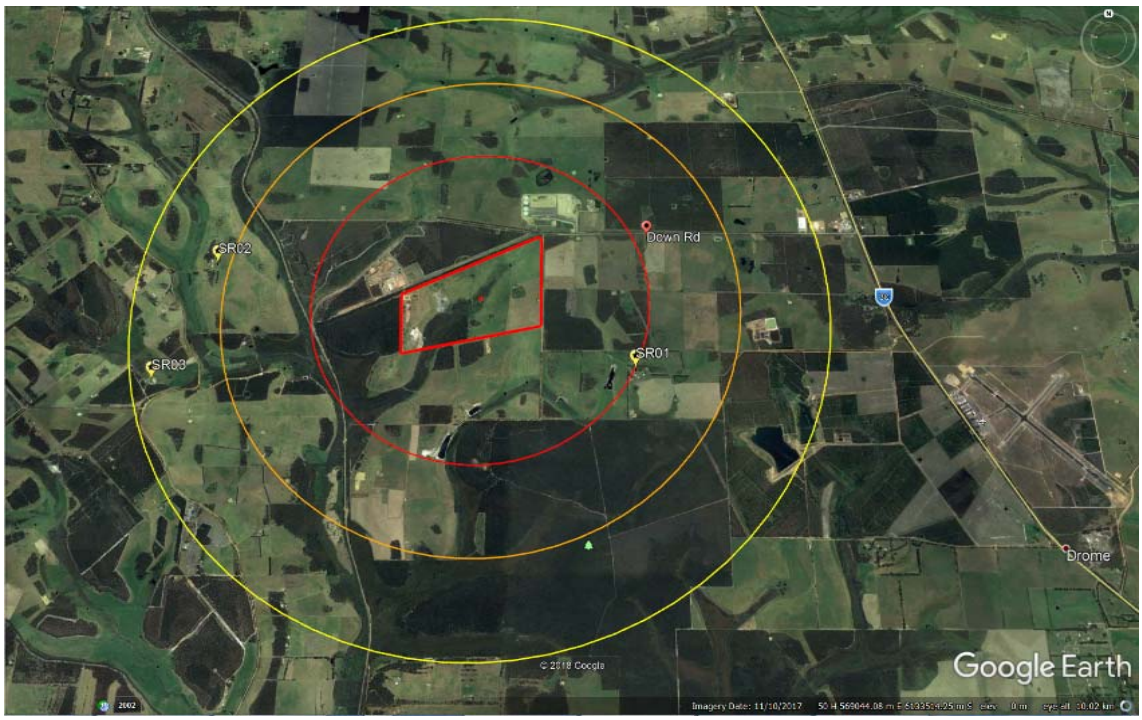


Figure 9-1: Closest receptors for AMP noise assessment

9.3 Noise modelling

CadnaA, by Datakustik, is a computer program for the calculation, assessment and prognosis of noise exposure. CadnaA calculates environmental noise propagation according to the ISO 9613-2 algorithm.

The ISO 9613-2 algorithm also takes into account the presence of a well-developed moderate ground based temperature inversion, such as commonly occurs on clear, calm nights or downwind conditions which are favourable to sound propagation. As a result, predicted received noise levels are expected to represent a worst case scenario.

CadnaA considers local characteristics, site sources and the location of the receptor areas to predict noise levels. The method specified consists specifically of octave-band algorithms (with nominal mid band frequencies from 31.5 Hz to 8 kHz) for calculating the attenuation of sound.

9.3.1 Topography and ground absorption effects

In line with the location of Albany Motorsport Park, surrounding ground topography was modelled using 5 m ground contours.

A default ground absorption of 1.0 as specified in ISO 9613 was used in the modelling. In GHD's experience this has generally been found to be appropriate.

9.3.2 Noise sources

Noise sources from Albany Motorsport Park will be primarily from vehicles competing and preparing for various motorsport events, spectators and public address system.

Proposed events at Albany Motorsport Park include:

- Motocross events, to be held during the day period (between 8:00 am to 6:00 pm).
- Multi use track events, such as car test and tune days, car speed events, bike test and tune days, bike speed events and drifting days, to be held during the day and evening (between 6:00 pm to 10:00 pm).
- Drag racing practice days, drag racing competitions and burnout days, to be held during the day or evening.

It is important to note that no events are proposed to occur during the night period (between 10:00 pm to 7:00 am).

Noise levels for various vehicle types are outlined in Table 9-4. Sound power levels for the various vehicle types are provided in Table 9-5.

Table 9-4: Noise levels for various vehicle types

Vehicle type	Sound power level (dBA)	Operating time
Motocross bike - Seniors	129	Day
Motocross bike – Juniors	114	Day
Stock race car	120	Day/Evening
Drag race car	125	Day/Evening
4WD off road	105	Day

Table 9-5: Sound power levels (dBA) for various vehicle types

Vehicle type	Sound power level (dBA)									
	31.5	63	125	250	500	1000	2000	4000	8000	dBA
Motocross bike - Seniors	-	82	102	113	116	118	120	114	100	129
Motocross bike – Juniors	-	75	81	92	102	103	104	100	91	114
Stock race car	118	122	132	125	109	110	105	91	96	120
Drag race car	123	127	137	130	114	115	110	96	101	125
4WD off road					105					

9.4 Noise modelling results

The calculated noise levels at the nearest noise sensitive premises were assessed to determine if predicted noise emissions complied with the assigned night time L_{A10} day and evening noise levels of 40 and 35 dBA, respectively.

In the absence of existing noise level contribution from other noise sources in the vicinity of Albany Motorsport Park, the assessment has been conducted such that Albany Motorsport Park will not significantly contribute to received noise levels. As such, compliance with the assigned day and evening L_{A10} noise levels of 40 dBA and 35 dBA demonstrates that Albany Motorsport Park will not significantly contribute to received noise levels.

There are three residences within close proximity to Albany Motorsport Park (Figure 9-1). For the purpose of this assessment, it has been assumed that if compliance is achieved at the nearest residences, compliance would be achieved further away.

Predicted day noise levels from various motorsport events are presented in Table 9-6. These results show that 40 dBA is predicted to be complied with at the closest residences (SR01, SR02 and SR03) for all event types except for at SR01. Noise levels are predicted to marginally exceed (by 1 dBA) the day criterion at SR01 when either a combined motocross and drag racing (MX + DR) or combined drag racing and multi-use track racing, such as circuit racing (DR + MUT), events are held.

Table 9-6: Predicted day L_{A10} noise levels

Event	SR01	SR02	SR03
Motocross (MX)	38	37	33
Multi use track (MUT)	37	29	28
Drag racing (DR)	38	27	25
4WD training (4WD)	15	16	13
MX + MUT *	40	37	34
MX + DR *	41	37	34
DR + MUT *	40	31	30

* includes 4WD training, however, 4WD training has no influence on received noise levels, as significantly quieter than other motorsport events.

Predicted evening noise levels from various motorsport events are presented in Table 9-7. These results show that 35 dBA is predicted to be complied with at two of the closest residences (SR02 and SR03) for all event types. Noise levels are predicted to exceed by up to 6 dBA the evening criterion at SR01 when either a drag racing or multi use track racing, or combination event, are held.

Table 9-7: Predicted evening L_{A10} noise levels

Event	SR01	SR02	SR03
Multi use track (MUT)	37	29	28
Drag racing (DR)	38	27	25
MUT + DR	41	31	30

The results presented in Table 9-6 and Table 9-7 demonstrate that for some event combinations, there may be occasions when the predicted noise levels from Albany Motorsport Park may exceed the assigned noise levels.

As such, it is recommended that Albany Motorsport Park prepare and submit a Noise Management Plan, in line with the requirements outlined in *Guide to Management of Noise from Motor Sport Venues* (DER, 2014).

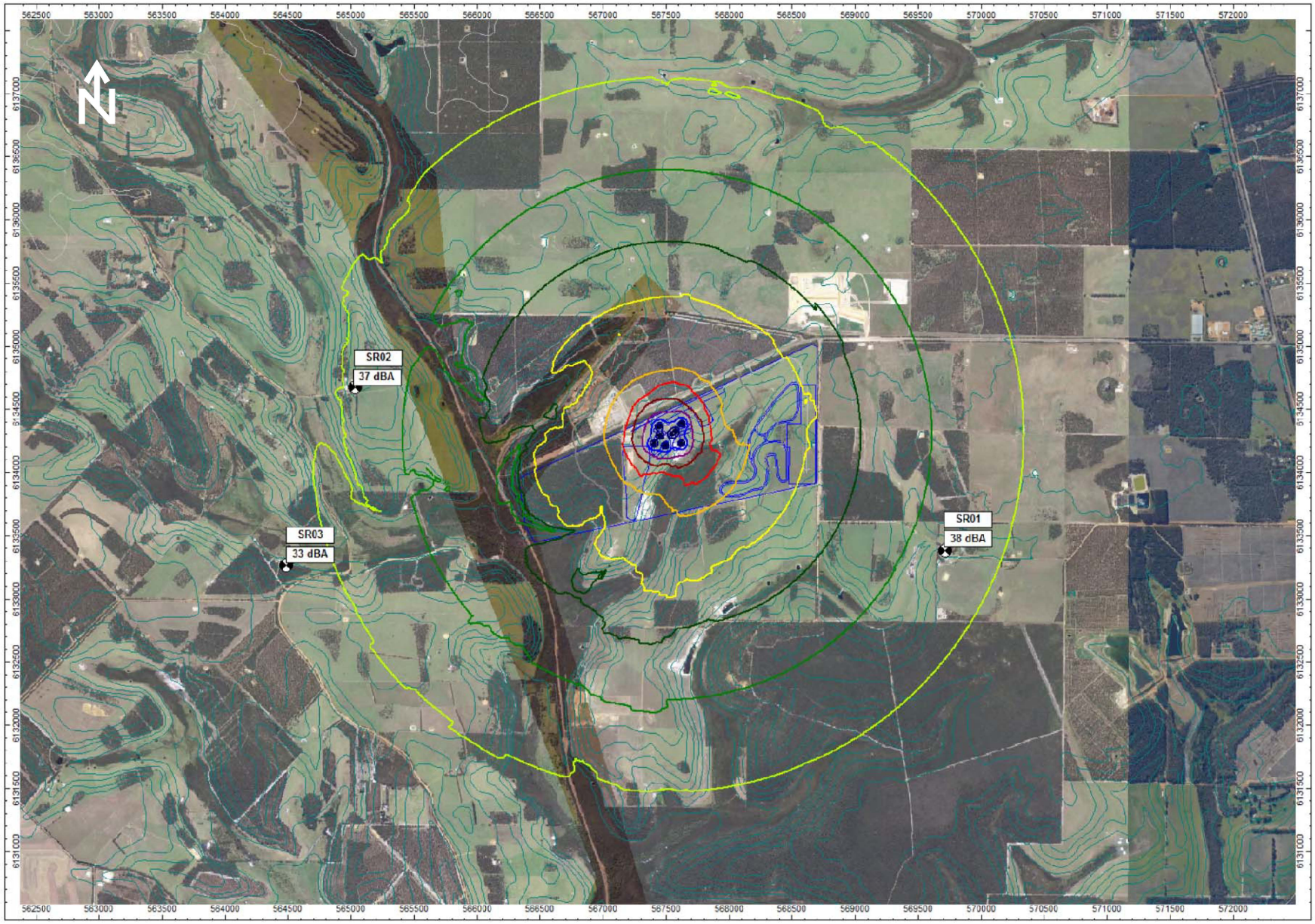
As part of the proposed Albany Local Planning Scheme No.1 amendment for the Project Site (refer section 4.1), the City of Albany should also consider extending the existing industrial noise buffer IA4BA (refer section 2.3) to incorporate the cumulative noise impacts of the Mirambeena TPP and AMP. Whilst this would not be a requirement under the *Environmental Protection (Noise) Regulations 1997*, it would provide the City with the ability to restrict incompatible land uses and residential development in proximity to the AMP.

PREDICTED NOISE LEVELS

- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA
- 75 dBA
- 80 dBA
- 85 dBA
- 90 dBA

LEGEND

- Noise sensitive receptor
- Line noise source
- Point noise source
- Development area boundary
- Evening assigned level (35 dBA)
- Day assigned level (40 dBA)



SCALE

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Metres (at A3)

CREATED	CHECKED	APPROVED
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MAP PROJECTION: Universal Transverse Mercator
HORIZONTAL DATUM: Geocentric Datum of Australia (GDA)
GRID: Map Grid of Australia 1994, Zone 50

DATE	FILE LOCATION
18.09.2018	N:\AU\Albany WA\Projects\61\37331\Technical\Noise

REVISION	DRAWING NO.
0	

ALBANY MOTORSPORT PARK

Noise Assessment

PREDICTED NOISE LEVELS
MOTOCROSS EVENT

Noise contours: LA10
Grid height: 1.5 m
ISO 9613 conditions

FIGURE 9-2

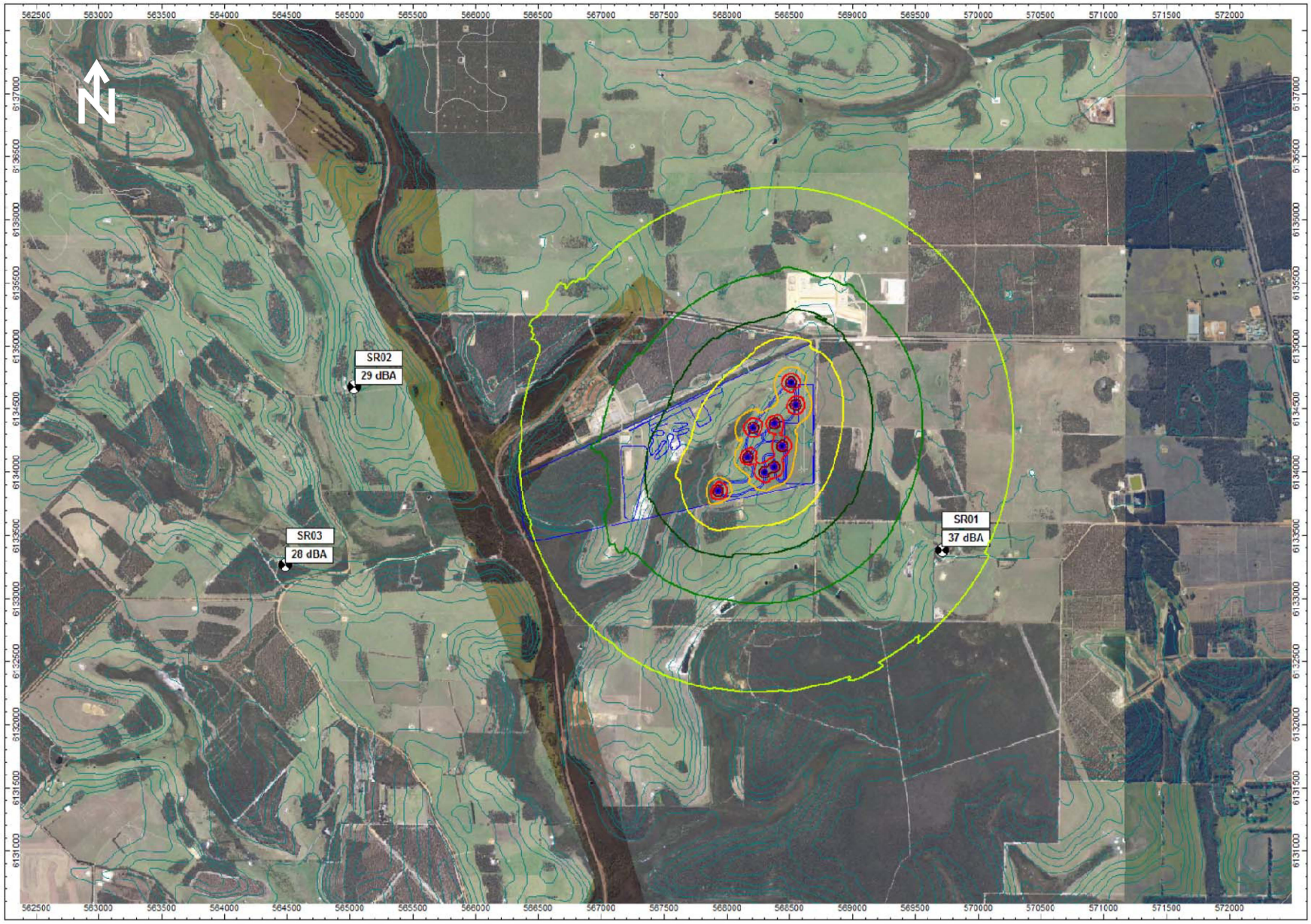
GHD CLIENTS | PEOPLE | PERFORMANCE

PREDICTED NOISE LEVELS

- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA
- 75 dBA
- 80 dBA
- 85 dBA
- 90 dBA

LEGEND

- Noise sensitive receptor
- Line noise source
- Point noise source
- Development area boundary
- Evening assigned level (35 dBA)
- Day assigned level (40 dBA)



SCALE

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Metres (at A3)

CREATED	CHECKED	APPROVED
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MAP PROJECTION:	Universal Transverse Mercator
HORIZONTAL DATUM:	Geocentric Datum of Australia (GDA)
GRID:	Map Grid of Australia 1994, Zone 50

DATE	FILE LOCATION
18.09.2018	N:\AU\Albany WA\Projects\61\37331\Technical\Noise

REVISION	DRAWING NO.
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ALBANY MOTORSPORT PARK

Noise Assessment

PREDICTED NOISE LEVELS
MULTI USE TRACK EVENT

Noise contours: LA10
Grid height: 1.5 m
ISO 9613 conditions

FIGURE 9-3

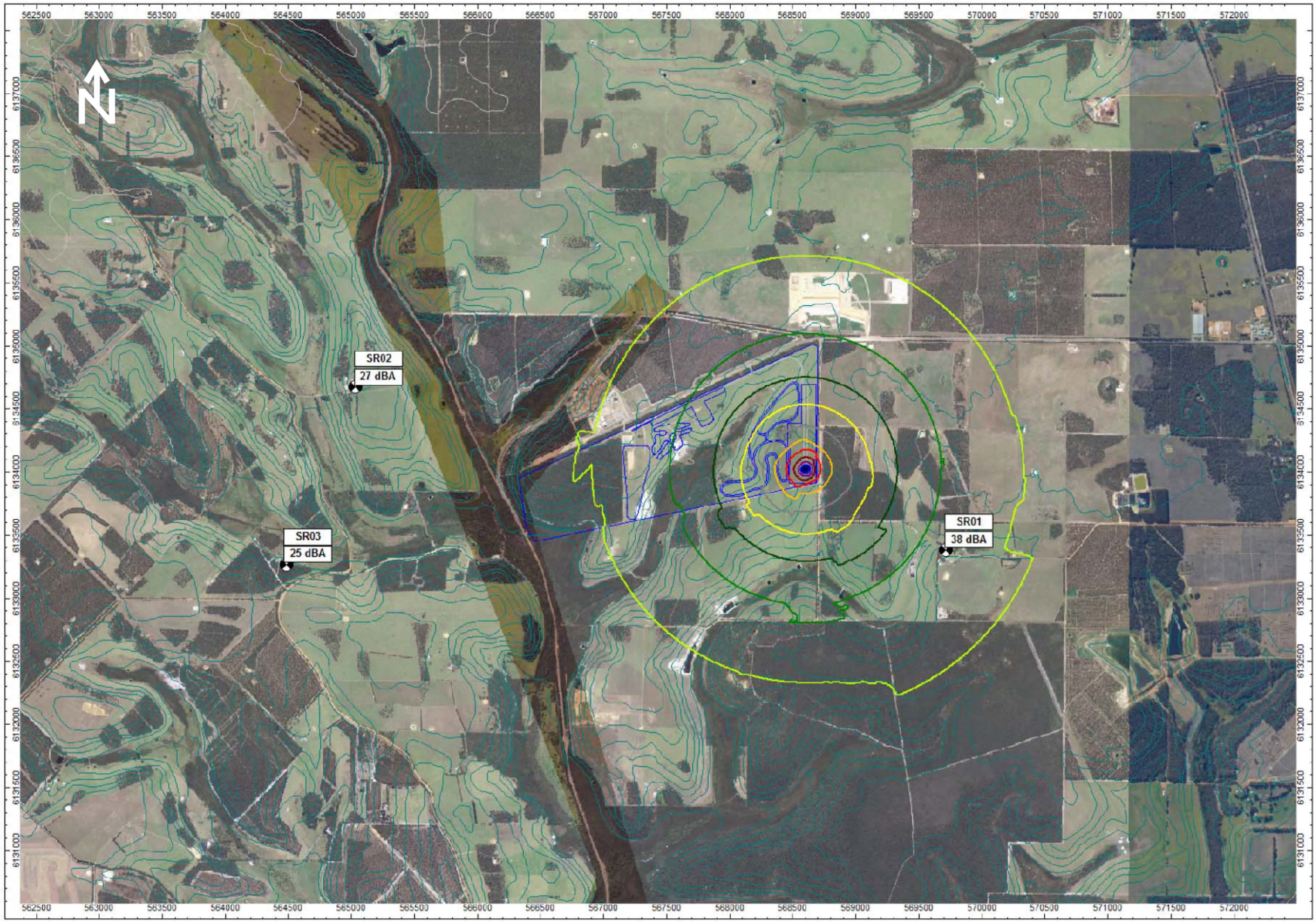
GHD CLIENTS | PEOPLE | PERFORMANCE

PREDICTED NOISE LEVELS

- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA
- 75 dBA
- 80 dBA
- 85 dBA
- 90 dBA

LEGEND

- Noise sensitive receptor
- Line noise source
- Point noise source
- Development area boundary
- Evening assigned level (35 dBA)
- Day assigned level (40 dBA)



SCALE

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Metres (at A3)

CREATED	CHECKED	APPROVED
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MAP PROJECTION:	Universal Transverse Mercator
HORIZONTAL DATUM:	Geocentric Datum of Australia (GDA)
GRID:	Map Grid of Australia 1994, Zone 50

DATE	FILE LOCATION
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REVISION	DRAWING NO.
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ALBANY MOTORSPORT PARK

Noise Assessment

PREDICTED NOISE LEVELS
DRAG RACE EVENT

Noise contours: LA10
Grid height: 1.5 m
ISO 9613 conditions

FIGURE 9-4

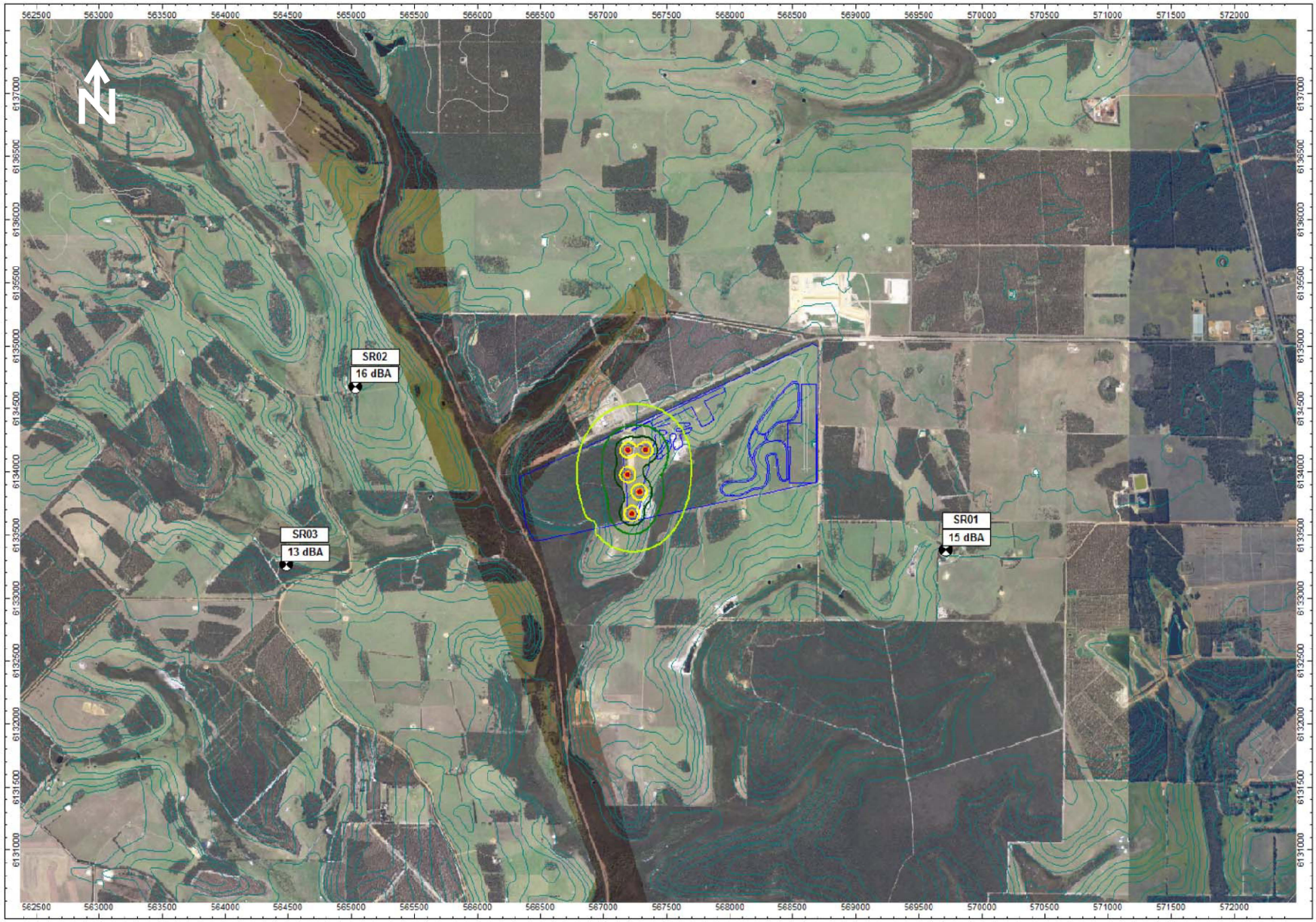
GHD CLIENTS | PEOPLE | PERFORMANCE

PREDICTED NOISE LEVELS

- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA
- 75 dBA
- 80 dBA
- 85 dBA
- 90 dBA

LEGEND

- Noise sensitive receptor
- Line noise source
- Point noise source
- Development area boundary
- Evening assigned level (35 dBA)
- Day assigned level (40 dBA)



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MAP PROJECTION:	Universal Transverse Mercator
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GRID:	Map Grid of Australia 1994, Zone 50

DATE	FILE LOCATION
18.09.2018	N:\AU\Albany WA\Projects\61\37331\Technical\Noise

REVISION	DRAWING NO.
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ALBANY MOTORSPORT PARK

Noise Assessment

PREDICTED NOISE LEVELS
4WD TRAINING

Noise contours: LA10
Grid height: 1.5 m
ISO 9613 conditions

FIGURE 9-5

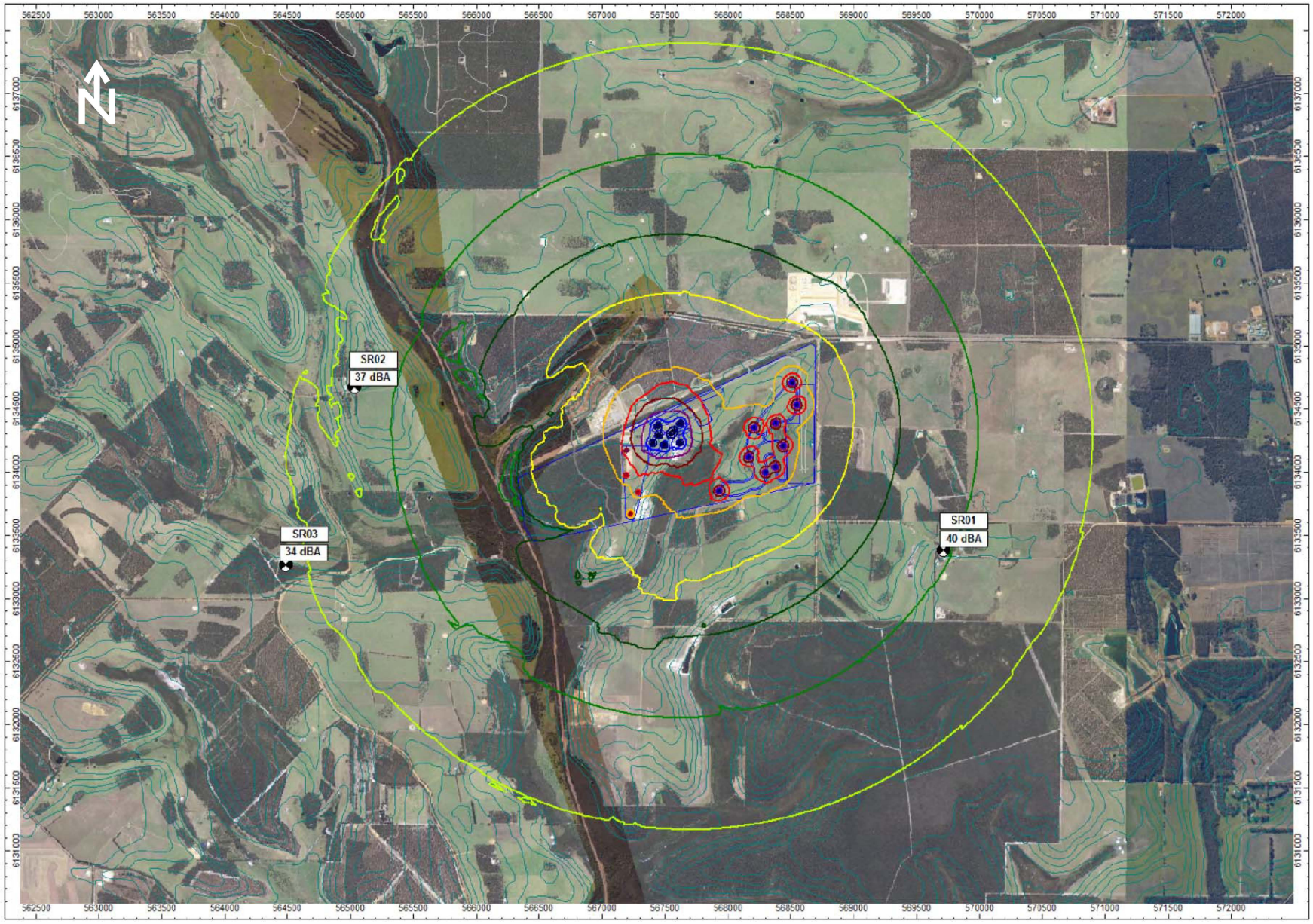
GHD CLIENTS | PEOPLE | PERFORMANCE

PREDICTED NOISE LEVELS

- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA
- 75 dBA
- 80 dBA
- 85 dBA
- 90 dBA

LEGEND

- Noise sensitive receptor
- Line noise source
- Point noise source
- Development area boundary
- Evening assigned level (35 dBA)
- Day assigned level (40 dBA)



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Metres (at A3)

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MAP PROJECTION:	Universal Transverse Mercator
HORIZONTAL DATUM:	Geocentric Datum of Australia (GDA)
GRID:	Map Grid of Australia 1994, Zone 50

DATE	FILE LOCATION
18.09.2018	N:\AU\Albany WA\Projects\61\37331\Technical\Noise

REVISION	DRAWING NO.
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ALBANY MOTORSPORT PARK

Noise Assessment

PREDICTED NOISE LEVELS
MOTOCROSS AND MULTI USE TRACK EVENTS

Noise contours: LA10
Grid height: 1.5 m
ISO 9613 conditions

FIGURE 9-6

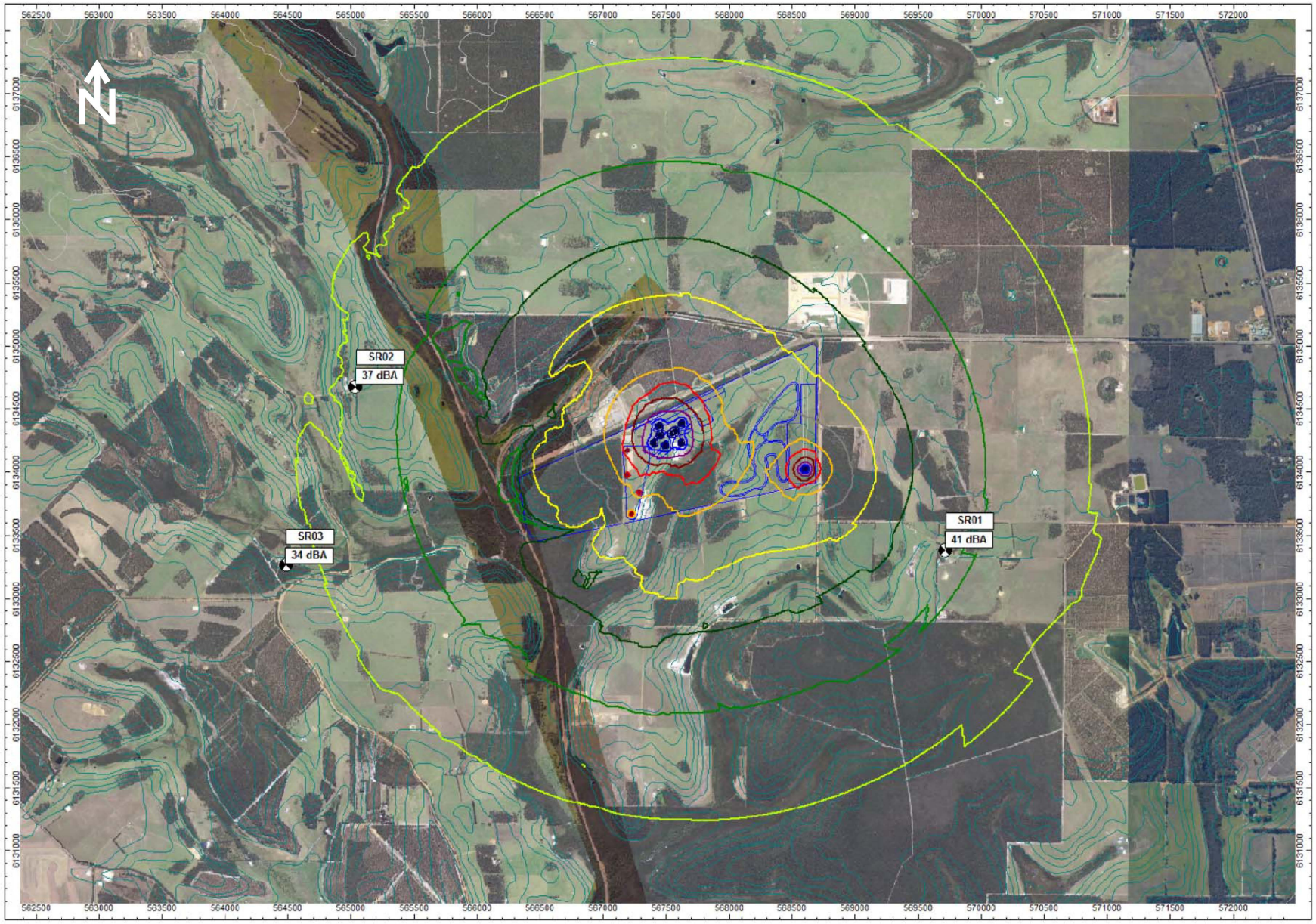
GHD CLIENTS | PEOPLE | PERFORMANCE

PREDICTED NOISE LEVELS

- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA
- 75 dBA
- 80 dBA
- 85 dBA
- 90 dBA

LEGEND

- Noise sensitive receptor
- Line noise source
- Point noise source
- Development area boundary
- Evening assigned level (35 dBA)
- Day assigned level (40 dBA)



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Metres (at A3)

CREATED	CHECKED	APPROVED
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MAP PROJECTION: Universal Transverse Mercator
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GRID: Map Grid of Australia 1994, Zone 50

DATE	FILE LOCATION
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REVISION	DRAWING NO.
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ALBANY MOTORSPORT PARK

Noise Assessment

PREDICTED NOISE LEVELS
MOTOCROSS AND DRAG RACE EVENTS

Noise contours: LA10
Grid height: 1.5 m
ISO 9613 conditions

FIGURE 9-7

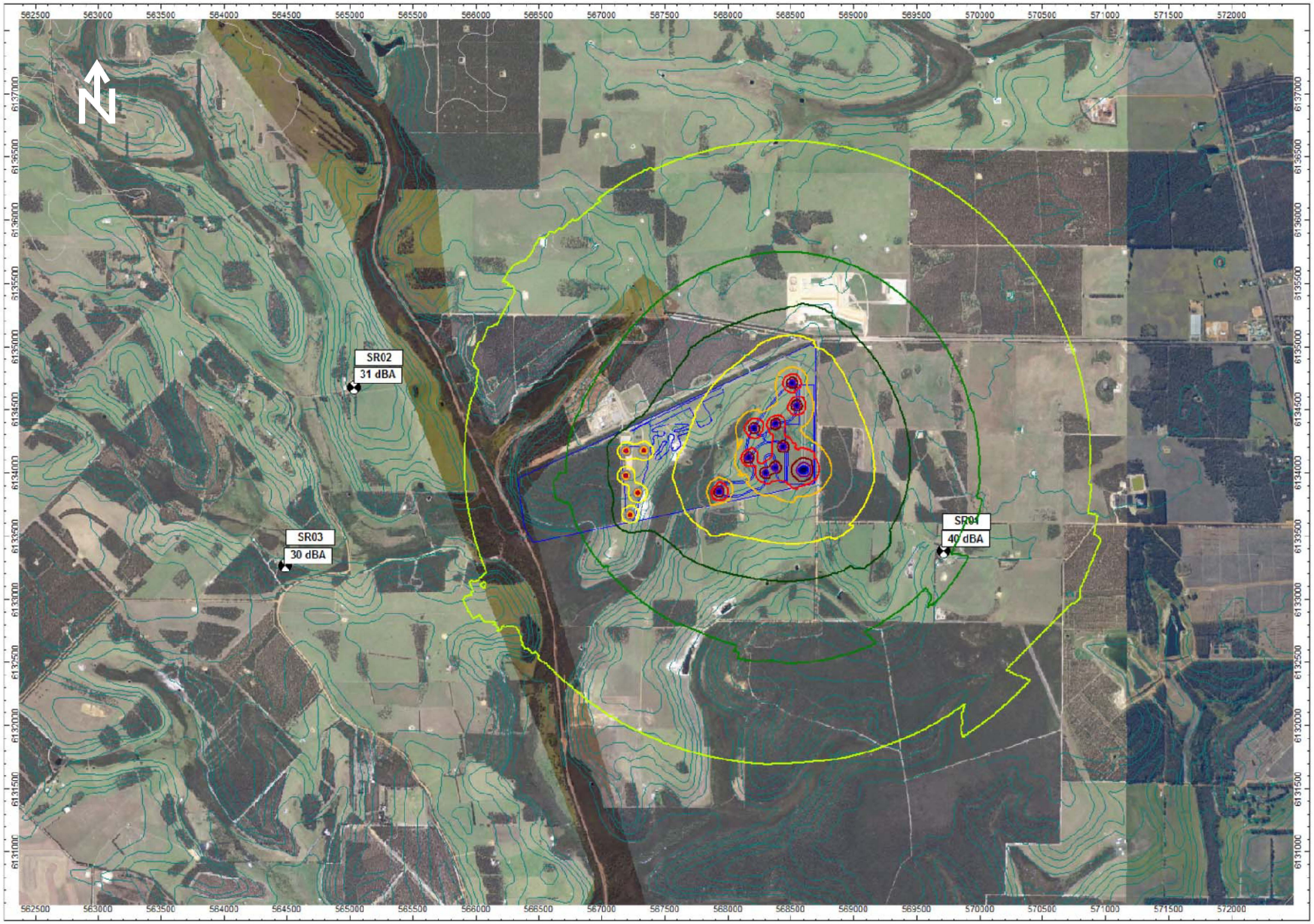
GHD CLIENTS | PEOPLE | PERFORMANCE

PREDICTED NOISE LEVELS

- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA
- 75 dBA
- 80 dBA
- 85 dBA
- 90 dBA

LEGEND

- Noise sensitive receptor
- Line noise source
- Point noise source
- Development area boundary
- Evening assigned level (35 dBA)
- Day assigned level (40 dBA)



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Metres (at A3)

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REVISION	DRAWING NO.
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ALBANY MOTORSPORT PARK

Noise Assessment

PREDICTED NOISE LEVELS
DRAG RACE AND MULTI USE TRACK EVENTS

Noise contours: LA10
Grid height: 1.5 m
ISO 9613 conditions

FIGURE 9-8

GHD CLIENTS | PEOPLE | PERFORMANCE

9.5 Preliminary noise management plan

The *Environmental Protection (Noise) Regulations 1997* set assigned (allowable) noise levels for various types of premises that receive noise from other premises. There are many activities that occur in the community that cannot, however, reasonably and practicably meet those assigned levels, but retain a degree of acceptance, either because of the temporary nature of the activity or the perceived community benefit.

In the case of a motorsport venue, good land use planning may be able to avoid noise problems in the first place – this may involve selection of a site for a new venue that is well away from sensitive receivers, or preventing encroachment by new residences into the noise-affected area around the venue.

Where a motorsport venue cannot practicably comply with the assigned noise levels, Division 3 of the Regulations allows the venue occupier to apply for a special approval. Under this approval the noise emissions from the venue are permitted to exceed the assigned levels in the Regulations provided the venue operates in accordance with an approved noise management plan (NMP) for the venue.

The NMP is usually prepared by the motorsport venue for approval by the Local Government Chief Executive Officer (CEO), as delegated under the Regulations, in order that the decision be made at the local level.

The requirements of an NMP for a motorsport venue are outlined in Table 9-8, with examples of a previously developed NMP provided as guidance for the Albany Motorsport Park.

Table 9-8: Requirements of a motorsport venue NMP

Requirement	Example of information required
Venue details	Name of venue Location of venue Occupier of venue Affiliations Venue maps
Types of racing activities covered by the NMP	Club race meetings State Title race meetings Practice sessions Vehicle tests Exhibitions / Blue Ribbon events Special events
Classes of vehicles	Motorcycles Late model sedans Sprint cars Super sedans Special exhibition vehicles Various other vehicles of smaller engine capacity
Scheduled race meetings and practice sessions	The following limits apply to scheduled race meetings and practice sessions at the speedway: 1. A race meeting or practice session can only take place between DATE and DATE ('season'). 2. Racing can only take place at a race meeting or practice session.

Requirement	Example of information required
	3. Racing vehicles are not to be operated at the venue at any time other than a race meeting or practice session. 4. No more than XX race meetings are to be held during a season. 5. Race meetings are to be held only on Friday or Saturday, except that a race meeting may be held on a Sunday preceding a public holiday. 6. In addition to the XX race meetings per season, a preliminary meeting may be held to conduct tests on racing vehicles to establish their compliance with this Noise Management Plan. 7. A race meeting can only be held on two consecutive days twice per season, that being either a Friday race meeting followed by a Saturday race meeting or a Saturday race meeting followed by a Sunday race meeting. 8. A race meeting can only be held on three consecutive days once per season, for the purpose of the 'State Titles' race meeting held over a long weekend during the season. 9. Races at a race meeting can only take place within a ten hour period on any one day. 10. The ten hour period must be between 9:00 am and 10.00 pm on any one day. 11. A practice session may be held in the six hour period immediately preceding the start of a race meeting, but is not to commence before 10.00 am. 12. In addition, a practice session may be held on Thursday once per season, for the purpose of the 'State Titles' race meeting held over a long weekend during the season.
Special events	Where a special event that is to be open to the public is proposed to be held at the venue, but the event cannot be conducted within the limits for scheduled race meetings and practice sessions, the occupier is to apply to the CEO for approval of the event under Regulation 18.
Access to race track	In order to prevent noise emissions due to unauthorised use of the race track by racing vehicles, the gates to the race track are to remain locked at all times other than: 1. In preparation for and during race meetings, practice sessions and special events approved by the CEO. 2. During maintenance or improvement of venue facilities.
Certification of racing vehicles	Each VEHICLE TYPE that is to race at a race meeting at the venue must have a current certificate indicating that its noise level does not exceed a noise limit ('noise limit') when tested in accordance with the noise test procedure. The noise level for a racing vehicle is to be obtained at or before the first meeting of the season at which that racing vehicle is entered to race. Vehicles that have been measured in accordance with accepted measurement procedures at another racing venue are deemed to have complied with the requirement for certification and testing for noise emissions providing the measurements have been conducted by a competent person. If the exhaust system or engine of a racing vehicle is modified or replaced after the level of noise emitted by the car had been measured, VENUE is to ensure that the level of noise emitted by the car is measured again and the vehicle complies before the car is raced at an event. Certification is valid for 12 months only.

Requirement	Example of information required
	Information provided in the certificate shall include: 1. Engine and chassis identification number 2. Exhaust type 3. Owner of vehicle 4. Date and location of testing 5. Individual and average measured sound pressure level.
Measuring individual noise level of racing vehicles	The level of noise emitted by a racing vehicle (the tested vehicle) is to be measured while the tested vehicle completes three consecutive laps of VENUE within a period that is not greater than four times the average lap time record. Average lap times are to be calculated during the previous racing season for races at the VENUE in the class of racing vehicle to which the vehicle belongs. 1. The measurements shall be made at a point that is: – Inside the inner boundary of the speedway track in use by the vehicle racing – Not less than 29 metres and not more than 31 metres from the inner boundary – On, or as close as practicable to, the shorter axis of the speedway track 2. With the measuring microphone not less than 1.2 metres or more than 1.4 metres above the ground plane.
Calculation of average noise level	The level of noise emitted by a racing vehicle is taken to be the level obtained by: 1. Adding together the maximum level of noise measured for the vehicle on each of the laps 2. Dividing the total resulting from that addition by three
Instruments	Instruments used to measure noise emissions shall: 1. Be calibrated in accordance with and otherwise comply with Schedule 4 of the Environmental Protection (Noise) Regulations 1997 2. Be operated by a person who is approved by the CEO 3. Preferably be a Type 1, although Type 2 instruments are acceptable provided allowance is made for their measurement tolerances. 4. Copies of the calibration certificates must be provided to the CEO on request.
Responsibility for noise measurement and certification	The Manager VENUE will ensure that only competent persons utilising equipment conforming to the requirements of Section 5.3.3 are engaged as required to assess compliance. Also, that all noise measurements, calculation, certification and testing requirements are met for speedway events under the control of VENUE to the requirements of the CEO.
Record of tests	The operator is to record all results from tests carried and retain those results in a form that shows (for each test): 1. Details of the racing vehicle tested, including engine and chassis identification number and exhaust type 2. The racing vehicle's owner 3. The date and location of the test 4. The calculated lap time 5. The actual time for the three laps of the test

Requirement	Example of information required
Scrutiny of racing vehicles	1. A Chief Steward shall be designated for the duration of a race meeting and practice session to verify noise certificates and to evaluate noise emissions from race vehicles. 2. The Chief Steward may reject a certificate and require a new test if not satisfied with the noise test on which the certificate is based or if he considers that a racing vehicle has been modified to the extent that the certificate is no longer representative of noise emission from the vehicle. 3. If a racing vehicle at the VENUE emits a level of noise that is conspicuously louder than that of the other racing vehicles in the same class at the meeting, the Chief Steward may require that vehicle to immediately cease racing and may prevent that vehicle from further racing at the VENUE until that vehicle's noise level has been shown to comply with the noise limit.
Public address system noise	The public address (PA) system consists of loudspeaker towers placed around the track, facing towards the track and angled down towards the track. The loudspeakers are not to be moved or adjusted by any person without the approval of the Chief Steward. Noise emissions from the public address system at the speedway are to be under the control of the Chief Steward, who is to designate persons who are authorised to use the system. The public address system controls are to be set to provide a suitable audience sound level during the preliminary meeting each year, with the assistance of such persons as the Chief Steward requires, ensuring the minimum practicable 'spill' of sound into nearby noise sensitive areas. The public address cabinet is to be locked for access only by the Chief Steward and his authorised assistants at all other times. The public address system will only be used during race meetings; it is not to be used during practice sessions or at any other time except in the case of an emergency.
Review of racing activities in response to noise complaint	If complaints are made during a racing activity the occupier will review racing activities to reduce noise where practicable for the remainder of that event.
Written instruction to members	The club management committee shall provide all club members with a written instruction explaining the noise issues and the members' responsibility to maintain the noise limitation requirements.
Notice of racing activities	Notice of the program for racing activities for a season is to be published and distributed to members of the public as follows: 1. The notice is to be published in the LOCAL NEWSPAPER, showing proposed dates of racing activities (where known) for the coming season and the telephone number for noise complaints. 2. In addition to (1), the notice is to be delivered to the address of each noise sensitive premises at locations within 1 km of the venue. 3. The notice is to be published and delivered during MONTH of the year in which the season starts. 4. A change to the racing program is to be published in the LOCAL NEWSPAPER and a notice provided in accordance with (2) above within four weeks before the changed meeting is to occur. 5. Notice of a special event approved by the CEO is to be given in accordance with the conditions of the approval.

Requirement	Example of information required
Complaint procedure	A designated telephone line will be manned during racing activities for the receipt of noise complaints. 1. A complaint received will be recorded on the noise complaint form (Attachment 3). 2. All complaints will be treated with due consideration and investigated and responded to as appropriate. 3. The occupier will as far as practicable provide advice to the complainant within 48 hours as to the outcomes of the investigation and where appropriate, any proposed modifications to operations. 4. The results of complaint investigations, details of measures taken or considered to reduce noise emissions and an outline of the responses given to the complainant shall be recorded on the noise complaint form. 5. Completed noise complaint forms will be retained at the speedway for the period of the approval and made available to the CEO on request. 6. Noise complaint details are to be provided to the LOCAL GOVT on the next business day following receipt of the complaint.
Record of vehicle tests	The occupier is to retain records of all tests of race vehicles for a period of two years.
Record of loud racing vehicles	The occupier is to make a record of all racing vehicles that have been required to cease racing by the steward and retain that record for two years in a form that shows: 1. Details of the racing vehicle required to cease racing. 2. The racing vehicle's owner. 3. The date and time at which the request to cease racing occurred. 4. The action taken by the driver of the racing vehicle following the request. 5. The action taken by the owner of the racing vehicle to remedy the excessive noise emissions.
Records to be forwarded on request	If requested to do so in writing by the CEO, the occupier is to forward a copy of all or any of the records within 21 days of the request.
Responsibilities	Club Committee: Appointment of Chief Steward Development of program for scheduled race meetings Chief Steward: Implementation of this Noise Management Plan Designation and training of stewards Control of public address system Head Scrutineer: Scrutiny of racing vehicles

10. Traffic investigation

10.1 Road network

As described in section 2.1, the Project Site is bounded by Down Road West to the north and Down Road South to the east.

10.1.1 Down Road

Down Road connects with Albany Highway to the east. It is a single carriageway road approximately nine metres (m) wide with one lane in each direction.

It is designated as an Access Road under the Main Roads WA Road Information Mapping system and is under the control of the City of Albany. A speed limit of 110 kilometres per hour (km/h) applies.

The western end of the AMP site is located opposite the exit from the Plantation Energy site and the APEC woodchip facility.

10.1.2 Albany Highway

Albany Highway is under the control of Main Roads WA and is designated a Primary Distributor. A speed limit of 110 km/h applies.

The intersection of Down Road / Albany Highway has been upgraded to accommodate traffic associated with CBH, Plantation Energy and APEC and includes a right and left turn lane in Albany Highway, a continuous left turn lane from Down Road into Albany Highway, and a right turn acceleration lane from Down Road onto Albany Highway.

10.1.3 Restricted Access Vehicle network

Down Road forms part of the Restricted Access Vehicle (RAV) network 7 and accommodates multi combination vehicles up to 36.5 m in length. Down Road accommodates RAVs serving the CBH grain storage facility, Plantation Energy and the APEC wood chipping facility.

Albany Highway also forms part of the RAV network 7 and accommodates multi combination vehicles up to 36.5 m in length.

10.2 Traffic data

10.2.1 Existing traffic

Traffic data has been sourced from the Main Roads WA web site and the City of Albany.

Table 10-1: Average weekday and weekend traffic volumes (2017) – existing vehicles per day (vpd)

Location	Average weekday (vpd)	Trucks	Average weekend (vpd)	Trucks
Down Road	844	34%	419	40%
Albany Highway	4,950	20%	3,520	16%

Source: Main Roads WA Traffic Map.

The existing high percentage of trucks on Down Road reflects the activity associated with Plantation Energy, APEC and CBH facility.

10.2.2 Site generated traffic

The assessment assumes **500** spectators/competitors in total. Events with larger numbers will be subject to specific traffic management measures. The indicative use of the venue, based on the business plan for AMP, is shown in section 3.2.

Based on an overall attendance of 500 people, it is assumed two people per vehicle so 250 vehicles in and 250 vehicles out, of which, 5% (13) are heavy vehicles transporting competition vehicles.

Table 10-2: Site generates traffic (typical)

Vehicle type	In (vph)	Out (vph)
Light vehicle	237	237
Heavy vehicle	13	13
Total	250	250

A capacity assessment of Down Road using Highway Capacity software (HCS7) indicates a level of service B, assuming AMP and peak hour traffic movement occur at the same time. No capacity issues are therefore anticipated.

The intersection of Albany Highway / Down Road has been upgraded to accommodate CBH traffic and no further upgrade is anticipated to be required for general use of the AMP. Analysis has been undertaken assuming the AMP exit traffic occurs at the same time as the pm peak hour of the intersection and confirms no forecast delay or congestion.

Further analysis has been undertaken assuming a 1% growth rate on Albany Highway for ten years and the results indicate all levels of service remain the same for both the am and pm peak period. Refer to Appendix C for detailed calculations.

10.3 Crash data (1 January 2013 – 31 December 2017)

Albany Highway / Down Road

A review of the Main Roads WA crash analysis reporting system (CARS) indicates one reported crash in 2013. The intersection has been upgraded recently.

Down Road (Albany Highway to end SLK 5.05)

There have been no reported crashes along Down Road in the five-year period. The crash assessment indicates there are no current reported safety issues at the Albany Highway / Down Road intersection or along Down Road.

10.4 Site access

Two access points are proposed to serve the Project Site from Down Road West. Entry to the AMP would be via the eastern entry point only. The western entry point is for separate controlled access (by Plantation Energy sub-Lessee) to the small dam in the north-west corner of the site.

Traffic volumes on Down Road are approximately 840 vpd, of which, approximately 34% are trucks (large multi combination vehicles). In order to minimise the impacts on large trucks using Down Road during weekday use, a left turn lane in Down Road West should be provided at the access location. Austroads Guide to Road Design indicates the length of the turn lane should be 180 m at 110 km/h or 120 m if a posted speed of 80 km/h is adopted (Table 10-3).

The current speed limit on Down Road is 110 km/h. It is considered this is too high in view of the likely activity associated with the proposed AMP and should be reduced to a maximum of 80 km/h. Main Roads WA will need to be consulted regarding this matter.

Site access should be constructed to accommodate construction traffic prior to the site construction phase.

Table 10-3: Deceleration lane lengths (Austroads)

Design speed of approach	Length of deceleration D – including diverge taper T									
	Stop condition1		Design speed of exit curve (km/h)2							
Road (km/h)	0	0	20	30	40	50	60	70	80	90
	Comf. 2.5 m/s^2	Max. 3.5 m/s^2	Comfortable average rate of deceleration 2.5m/s^2							
50	40	30	30	25	15					
60	55	40	50	40	30	15				
70	75	55	70	60	50	40	20			
80	100	70	95	85	75	60	45	25		
90	125	90	120	110	100	85	70	50	25	
100	155	110	150	140	130	115	100	80	55	30
110	185	135	180	175	160	150	130	110	90	60

Assuming a posted speed of 80 km/h on Down Road, the sight distance at the access location will require 5 m × 214 m. Adequate clearing will need to be undertaken if required (Figure 10-1 and Table 10-4).

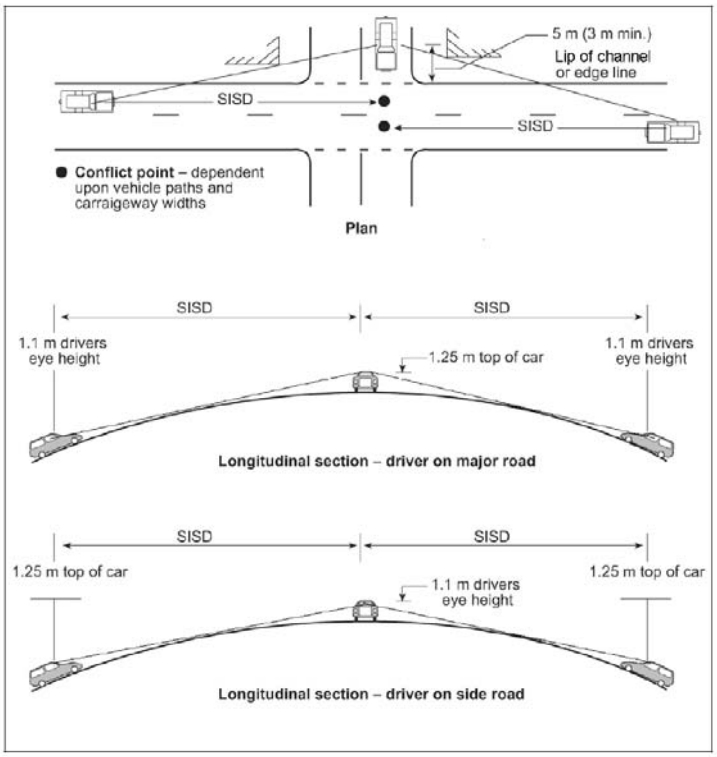

Figure 10-1: Safe intersection sight distance

Table 10-4: Safe intersection sight distance based on design speed

Design speed (km/h)	Based on safe intersection sight distance for cars1 h1 = 1.1; h2 = 1.25, d = 0.362; Observation time = 3 s					
	R_T = 1.5s[3]		R_T = 2.0s		R_T = 2.5s	
	SISD (m)	K	SISD (m)	K	SISD (m)	K
40	67	4.9	73	6	-	-
50	90	8.6	97	10	-	-
60	114	14	123	16	-	-
70	141	22	151	25	-	-
80	170	31	181	35	-	-
90	201	43	214	49	226	55
100	234	59	248	66	262	74
110	-	-	285	87	300	97
120	-	-	324	112	341	124
130	-	-	365	143	383	157

If a speed limit of 110 km/h is maintained, a review of aerial photography would indicate a suitable location for the eastern access is approximately 240 m west of Down Road North, or 150-200 m if the speed limit is reduced to 80 km/h.

10.5 Parking

Two car parking areas are proposed to accommodate general event demand. Based on 500 spectators/competitors, an overall provision of 250-300 bays is forecast to be required. For larger events, overspill parking areas are provided which will be controlled and managed by event staff. All parking demand will be contained within the site.

10.6 Traffic management for larger events

For larger events, careful planning will be required to accommodate the safe and orderly entry, exit and parking for competitors and spectators. This report does not cover detailed traffic management planning however, the planning will need to include:

- Consultation with Main Roads WA regarding requirements for the Albany Highway / Down Road intersection.
- Consultation with the City of Albany.
- Consultation with the Department of Fire and Emergency Services and WA Police.
- Consultation with adjacent businesses in Down Road.
- Variable Message Sign (VMS) requirements on Albany Highway.
- Directional signage to parking areas.
- Illumination of access and parking areas.
- Community notices, radio, newspaper, social media, etc.
- Speed limits and traffic control in Down Road.
- Emergency access requirements.
- Requirements for satellite parking and bus transfers.

Note: There are likely to be other considerations in addition to the above list.

10.7 Consultation

Preliminary consultation was undertaken with Main Roads WA (MRWA) and the City of Albany regarding the proposed traffic control measures. Responses to these queries are summarised in Table 10-5

Table 10-5: MRWA and City of Albany consultation

Query / issue	MRWA	City of Albany
In view of the access point to the AMP being in close proximity to CBH, APEC and Plantation Energy, would you consider reducing the speed limit on Down Road from 110 km/h to 80 km/h?	Yes, MRWA Great Southern Region would support a reduction in speed limit to 80 km/h, from say west of the entry to the CBH site. The change in speed limit would also need to be accompanied by some other directional signage for the AMP to assist in causing drivers to slow down. Final decision of speed limit changes are made by the MRWA Perth office, not the Regional office.	Yes, CoA is supportive. Again, from a point west of the CBH site entry.
Does Main Roads have any issue or concern with the existing Down Road/Albany Highway intersection noting it has recently been upgraded?	No, the existing Down Road/Albany Highway intersection does not require additional treatments.	-
Specific traffic management will be required for large events. Does Main Roads WA have any concerns?	MRWA has no concerns about specific traffic management for large events at the Down Road/Albany Highway intersection.	-
A left turn lane is likely to be required in Down Road West at the access point, is the City supportive?	-	Yes.

10.8 Summary

The reported crash history does not indicate a safety issue on Down Road or its intersection with Albany Highway.

Assuming competitor/spectator numbers of 500, the site is anticipated to generate 250 vph in and 250 vph out at the start and finish of events. No adverse impacts are anticipated for Down Road or its intersection with Albany Highway.

It is considered that the speed limit on Down Road near the site should be reduced from 110 km/h to a maximum of 80 km/h (west of the CBH entry) and should be progressed with Main Roads WA and the City of Albany. Complementary directional signage on Down Road should be installed for the AMP to assist in causing drivers to slow down.

If a speed limit of 110 km/h is maintained, a review of aerial photography would indicate a suitable location for the eastern access is approximately 240 m west of Down Road North, or 150-200 m if an 80 km/h speed limit is adopted.

Site access should include a deceleration lane suitable for the posted speed limit.

Traffic management as required will need to be planned and undertaken for events with competitor/ spectator numbers in excess of 500 in consultation with the City of Albany and Main Roads WA. Regular consultation should be undertaken with CBH, Plantation Energy, APEC and other businesses on Down Road to advise when large events are planned.

All parking should be contained on site and should be clearly signed for users.

11. Power and communications servicing

11.1 Existing services (DBYD information)

The following summarises the information received from the Western Power and Telstra in response to 'dial before you dig' (DBYD) enquiries. Plans that have been received are attached in Appendix H.

11.1.1 Power infrastructure

Adjacent to the Project Site is an existing 22 kV, three phase overhead power line, which includes an underslung overhead earth wire. This 22 kV power line is the ALB 518.0 Mt Barker line and emanates from Albany Zone Substation, which is located some 10 km from the site. Refer to Figure 11-1.

Figure 11-1: Existing 22 kV overhead power lines on Project Site (parallel to Down Road South)

On the Project Site, the 22 kV power line is located within the property boundary and therefore will need to be considered when working and operating within the vicinity of this network. Typical safety clearance from this network is 10 metres either side of the power pole. Any works near this power line should be done in consultation with Western Power.

On Down Road West, there is an existing 200 kVA PTTx (Pole Top Transformer) currently servicing the property on the northern side of the road, opposite to the Project Site and is located some 400 metres west from the Down Road intersection. On preliminary investigations, it would appear this existing 200 kVA transformer is located too far from the motocross part of the project to be of use. In saying this, it also appears the power supply to the two areas of the AMP needs to be from two separate Western Power supplies.

It is expected that a new padmount transformer with high voltage switchgear will be required in order to provide a large enough supply for both AMP areas. Western Power will provide the design documentation for the power connection and the Customer's supply point will be the transformer low voltage (LV) frame.

11.1.2 Communications

In reviewing the DBYD plans, there are Telstra communication cables with P6 and P8 pits along Down Road West, which could be the service connection point for the subject site. It also appears there is existing fibre within the Telstra network. An application into Telstra via their Smart Communities web portal will need to be made, to allow Telstra to provide a cost for this service, and again it would appear two separate connections will be required.

The Project Site is reasonably well serviced by 3G and 4G mobile phone coverage, as shown below in Figure 11-2 (Telstra, 2018). Some loss of service seems to occur in the valleys of the Project Site.

Figure 11-2: Telstra mobile network coverage

11.2 Preliminary estimate of power and communications requirements

It is understood that available facilities at the proposed AMP will include:

- Toilets,
- Medical / first aid station,
- Manager's office,
- Meeting / briefing room,
- Kitchen to prepare and sell food,
- Grounds maintenance workshop,
- Vehicle scrutineers' workshop,
- Control tower,
- Spectator viewing area,
- Grassed area with BBQs,
- Parking areas, and
- Tyre warmers and lighting.

It is also understood that temporary power will be provided by way of generators for larger events.

Initial maximum demand for the Project Site, calculated using PowerCAD and based upon the above preliminary power demands, is estimated to be 480 Amps per phase for the Multi-use Track area and some 200 Amps for the Motocross Track area. More definitive information on the loads will need to be provided to calculate the final maximum demand, including diversity factors within this calculation.

11.2.1 Communications

Telstra is likely to levy a fee to upgrade the existing network in order to create any new services. Sometime in the future, this network will eventually become owned by NBN Co and therefore future discussions will require a submission into Telstra and NBN Co to ensure timely delivery of advice and services.

11.3 Timeframes and cost

11.3.1 Timing

Table 11-1 summarises the timeline for design, approval and construction of required power infrastructure by Western Power.

Table 11-1: Western Power timeframes

	Item description	Estimated timeframe
0.	Authorisation to submit application to Western Power	
1.	Supply application submission. Requires: Single Line Diagram Load profile AS 6100 compliance (i.e. motors)	2 weeks
2.	Western Power to provide design (once all information has been provided)	6 weeks
3.	Quote to be reviewed and paid by Client	1 week
4.	Client to engage electrician (for CT metering etc.)	2 weeks
5.	Western Power works (subject to scheduling by Western Power) and Client to survey site.	8 weeks
		19 weeks

Telstra's timeline to provide their quotation from the time the Smart Communities application is made, is approximately 8 weeks and then 12 weeks for construction. Costs for Telstra communication services connection is difficult to ascertain, especially in the Country areas. GHD has managed to source a Telstra contact and an email has been sent, requesting an order of costs for the Telstra connection either copper or fibre to the premise (FTTP) and we are awaiting their response.

11.3.2 Cost

The below order of magnitude cost is provided pre-design and as such requires verification through the detailed design process.

- Western Power Application fee: $6,000 (this will be part of the quote that Western Power issue).
- Western Power Quote Motocross Track: $232,500 (based on full cost recoverable)**.
- Western Power Quote Multi-use Track: $258,000 (based on full cost recoverable)**.

** Western Power provides a revenue offset calculation, which could potentially reduce the above costs. This revenue offset calculation is difficult to ascertain until the maximum demands have been finalised; however it will be part of the SP (South Country Project) application process.

Some notes and exclusions:

- The existing 200 kVA pole top transformer (PTTx) on Down Road West is located too far from the motocross track area to be of use, so a new transformer is required for this area too.
- Based on sole use transformers and that all final electrical submains will be more than 400 metres from each motor track site area, in order to comply with zoning policies.
- The costs are based on the existing 22 kV powerline remaining inside the Project Site property (i.e. no relocation required).
- There are revenue offsets that could potentially lower the upfront costs, however this can only be calculated once the final maximum demands are determined.
- The SMSB (site main switchboard) costs are roughly estimated from GHD's experience, and these boards will be part of the private electrician's scope of works.
- Once the maximum demand has been determined, then the Western Power supply arrangement including the size of the transformers can be confirmed.
- Western Power will typically install a high voltage (HV) Switch when connecting a transformer to the power lines, being the worse cost scenario.
- The existing power supply to the Plantation Energy dam needs to be confirmed, as there is a risk that if private mains are crossing the road, then this would not comply with WAER (Western Australian Electrical Requirements).
- Subject to Western Power design and network information that is not currently known.

12. Summary of site feasibility assessment

12.1 Risk assessment

To summarise, assess and prioritise the site feasibility issues investigated in the preceding chapters, GHD has undertaken a preliminary risk assessment, using the City of Albany's *Risk & Opportunity Management Framework* (2018), as illustrated below.

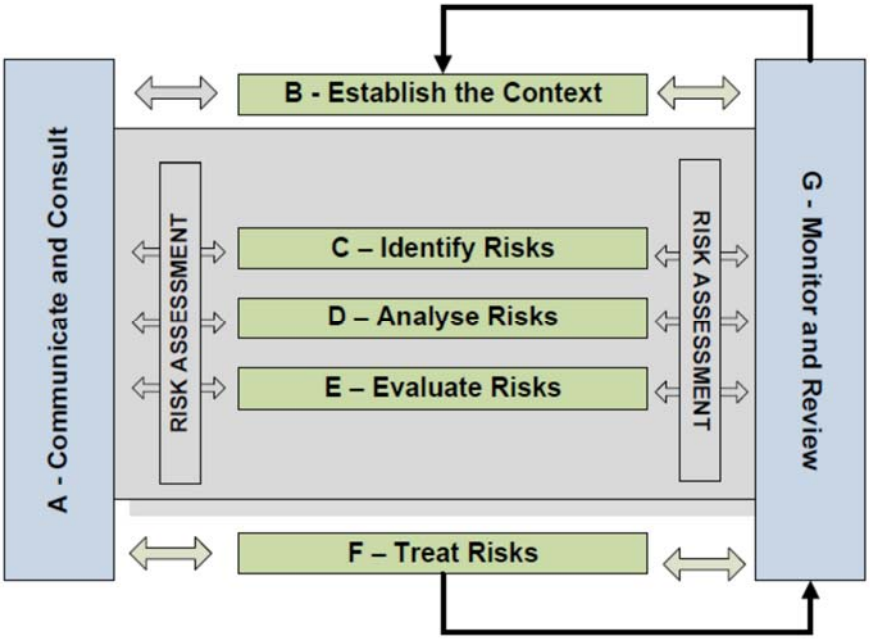

Figure 12-1: CoA risk and opportunity management process (CoA, 2018)

The risk assessment captures the risk issues identified in the preceding chapters and categorises them according to the following *Consequence* categories:

- Business interruption,
- Community,
- Environment,
- Financial,
- Legal and compliance,
- Organisation's operations,
- People health and safety,
- Property, and
- Reputation.

Each (unmitigated) risk is assessed within its category for consequences ranging from 'Insignificant' to 'Severe', and a likelihood ranging from 'Rare' to 'Almost certain'. Descriptors for each likelihood level and each consequence level within each category as documented in the *Risk & Opportunity Management Framework* (CoA, 2018). Where they exist, current risk controls are also documented.

The intersection of the likelihood and consequence ratings then determine the initial risk rating, as per the matrix shown in Figure 12-2.

LIKELIHOOD		CONSEQUENCES				
		1	2	3	4	5
		INSIGNIFICANT	MINOR	MODERATE	MAJOR	SEVERE
5	ALMOST CERTAIN	Medium (5)	High (10)	High b	Extreme (20)	Extreme (25)
4	LIKELY	Low (4)	Medium (8)	High (12)	High (16)	Extreme (20)
3	POSSIBLE	Low (3)	Medium (6)	Medium (9)	High (12)	High (15)
2	UNLIKELY	Low (2)	Low (4)	Medium (6)	Medium (8)	High (10)
1	RARE	Low (1)	Low (2)	Low (3)	Low (4)	Medium (5)

Figure 12-2: Risk rating matrix (CoA, 2018)

The risk assessment then captures the recommended remedial actions, controls and responsibility, with attention paid to the preferred hierarchy of controls (i.e. elimination > substitution > engineering control > administrative control > personal protective equipment). The residual risk is then assessed using the same risk rating matrix as Figure 12-2.

The residual risk level for each risk issue should then be considered according to the City's *risk acceptance criteria*, as shown below. The target is to reduce each risk issue to 'as low as reasonably practicable' (ALARP). For the purposes of this site feasibility assessment, this is interpreted to mean that all treated risks should have a residual risk level of 'Low / acceptable', or 'Medium / monitor'. In the latter case, the proposed remedial actions will require on-going monitoring to assure their effectiveness.

RISK ACCEPTANCE CRITERIA

** From the risk's rating, is the Management/Executive/Council willing to accept this risk?*
** Who will be responsible for accepting the level of risk?*

Level of Risk	Description	When is the risk acceptable?	Who is responsible*	Timeframe for Action
Low (1-4)	Acceptable	Risk acceptable with adequate controls, managed by routine procedures.	Responsible Officer *(as per risk register)*	Review controls every 6 months or As per risk register
Medium (5–9)	Monitor	Risk acceptable by observing, assessing and improving current controls and Council procedures.	Responsible Officer *(as per risk register)*	Review controls every 3 months or As per risk register
High (10 –16)	Urgent Attention Required	Risk acceptable by establishing and implementing new controls.	Executive Directors and CEO	Controls implemented within two weeks of reporting Review controls every month
Extreme (17-25)	Unacceptable	Risk only acceptable with excellent controls and all treatment plans to be explored and implemented where possible, managed by highest level of authority.	Audit & Risk Committee and Council	Controls implemented within 1 week of reporting Review of controls every 2 weeks

Figure 12-3: Risk acceptance criteria (CoA, 2018)

This preliminary risk assessment captured 20 material risk issues, based on the feasibility investigations of the preceding chapters. A summary of the initial and residual risk ratings is shown in Table 12-1, with the full risk assessment outlined in Table 12-2.

Table 12-1: Summary of risk assessment

Risk issue	Initial risk rating	Residual risk rating
Zoning of Project Site	High	Low
Bushfire Prone Area	High	Medium
Security of Project Site	High	Medium
Visual amenity impacts	High	Low
Loss of fauna habitat (Black Cockatoos)	High	Medium
Heritage impacts	Medium	Medium
Adverse geotechnical conditions	High	Medium
Waste materials dumped on site	Medium	Low
General construction phase impacts	Medium	Low
Erosion and sediment pollution to Wetland (construction and operation phases)	Extreme	Medium
Hydrocarbon / chemical pollution to Wetland	Extreme	Medium
Drinking water availability	High	Medium
On-site wastewater management	High	Low
Noise impacts	High	Medium
Traffic impacts from special events	High	Medium
Crash risk with heavy vehicles on Down Rd	High	Medium
Power availability	High	Low
Telecommunications availability	Medium	Low

Based on this assessment, it can be concluded that the Albany Motorsport Park proposal at Lot 5780, Down Road South does not have any technical obstructions to its feasibility, pending regulatory approvals and implementation of the recommended remedial and control actions.

Table 12-2: Albany Motorsport Park risk assessment

Guidewords	Risks (New & Existing)				Initial Risk Rating				Remedial Actions / Controls			Residual Risk Rating			
	Consequence Category	Risk Issue (Hazards or events that may have an impact on the project's objectives)	Asset Life Stage (when could the risk event occur?)	Current Controls	Consequence Rating	Likelihood	Risk Level		Actions or Improvements Recommended	Type of Control Measure	Responsible Party	Consequence Rating	Likelihood	Risk Level	
Position / Location	Legal & Compliance	Project Site is currently zoned 'Priority agriculture' under the Albany Local Planning Scheme 1. A motor sports park is not a compatible land use, and could not proceed.	Planning & Design	None.	3 - Moderate	A - Almost Certain	**15**	**Urgent attention req'd**	1. City of Albany to prepare a Scheme Amendment (standard or complex) to change zoning to 'Special Use'; for approval by WAPC and Minister. Also includes automatic referral to the EPA for assessment under the EP Act. 2. Include reference to the AMP in the Albany Local Planning Strategy, and particularly within Investigation Area 4 - Mirambeena SIA.	1 - Elimination	City of Albany	3 - Moderate	E - Rare	**3**	**Acceptable**
Fire / Explosion	Property	Project Site is located in a mapped Bushfire Prone Area, and will be classified as a "vulnerable land use" under SPP 3.7 *Planning in Bushfire Prone Areas* . Bushfire on the site, or adjacent properties, could damage site infrastructure, and/or cause injuries to people on the site.	Operation	Project Site is largely cleared, with multiple entry points and sealed road access (Down Rd).	4 - Major	C - Possible	**12**	**Urgent attention req'd**	1. Bushfire Management Plan to be developed for the Project Site. 2. Secondary road access to be provided from Down Rd, north to Redmond-Hay River Road. Will require easements through Lot 22 Down Road and Lot 5774 Redmond-Hay River Road. 3. Incorporate 'place of refuge' within the Project Site.	3 - Engineering Control	City of Albany, GSMG	4 - Major	D - Unlikely	**8**	**Monitor**
Security / Fencing	Property	Unauthorised / uncontrolled access to GSMSP, leading to theft, vandalisation, loss of revenue, and public safety concerns.	Operation	Standard farm fencing (approx. 900 mm high), with limited security treatments.	3 - Moderate	B - Likely	**12**	**Urgent attention req'd**	Security fencing (1800 mm high + 3 strands barbed wire) & gates around each separate area - i.e. 1) Motocross, 2) Multi-use track & drag strip, 3) 4WD/ATV area.	3 - Engineering Control	GSMG	3 - Moderate	D - Unlikely	**6**	**Monitor**
Visual Impacts	Environment	The GSMSP will permanently alter the visual amenity of the Project Site.	Operation	The Project Site is located adjacent to existing an Strategic Industrial Area with visual impacts. Limited nearby residents.	2 - Minor	A - Almost Certain	**10**	**Urgent attention req'd**	1. Construction Environmental Management Plan (CEMP) to mitigate construction phase impacts. 2. Site re-vegetation and beautification.	3 - Engineering Control	GSMG	2 - Minor	D - Unlikely	**4**	**Acceptable**
Flora / Fauna	Environment	The GSMSP will result in permanent loss of native vegetation (approx. 2 ha) that provides fauna habitat, potentially including habitat for the conservation significant Black Cockatoos and other species.	Construction	None.	4 - Major	B - Likely	**16**	**Urgent attention req'd**	1. Conduct a baseline flora and fauna survey (inc. targeted Black Cockatoo assessment) and undertake environmental offset calculations. 2. Negotiate need for and type of environmental offsets with DWER during Clearing Permit application - e.g. purchase offsets, nesting boxes, site re-vegetation to be negotiated as environmental offset. 3. Potentially conduct on-going vegetation monitoring (unlikely to be required).	4 - Administrative Control	GSMG	4 - Major	D - Unlikely	**8**	**Monitor**
Heritage	Legal & Compliance	Construction works on the site could reveal artefacts and/or sites of Aboriginal heritage significance. Would lead to suspension of works, additional costs for recovery and preservation of artefacts, or potentially re-design of site layout.	Construction	Search of Aboriginal Heritage Inquiry System completed.	3 - Moderate	D - Unlikely	**6**	**Monitor**	Project proposal has been referred to Wagyl Kaip by City of Albany, inviting comment.	4 - Administrative Control	Cityof Albany	3 - Moderate	D - Unlikely	**6**	**Monitor**
Excavation	Property	1. The site contains reactive clay soils. 2. The clayey soils will become difficult to handle and compact if water is allowed to enter them. 3. A perched water table may briefly develop in the upper layer of granular soils on this site following heavy rainfall.	Construction	Geotechnical data available from adjacent site (i.e. CBH).	3 - Moderate	B - Likely	**12**	**Urgent attention req'd**	1. Undertake further geotechnical and ASS investigations on site. 2. Appropriate drainage of excavations during construction. 3. Excavations in perched water table may require dewatering. 4. Avoid excavations following periods of high rainfall. 5. Footings and pavements designed to accommodate lower bearing capacity/CBR and higher shrink/swell movements.	3 - Engineering Control	City of Albany / GSMG, Constructor, Designer	3 - Moderate	D - Unlikely	**6**	**Monitor**

Table 12-2: Albany Motorsport Park risk assessment

Guidewords	Risks (New & Existing)				Initial Risk Rating				Remedial Actions / Controls			Residual Risk Rating			
	Consequence Category	Risk Issue (Hazards or events that may have an impact on the project's objectives)	Asset Life Stage (when could the risk event occur?)	Current Controls	Consequence Rating	Likelihood	Risk Level		Actions or Improvements Recommended	Type of Control Measure	Responsible Party	Consequence Rating	Likelihood	Risk Level	
Contamination	Environment	Waste materials (e.g. used chemical drums, equipment, electrical cable, building rubble, etc.) currently stockpiled in north-western corner of site. May be a risk of asbestos-containing material, or other hazardous materials, causing environmental harm and/or injury/illness to people on site.	Construction	Private property, with secure access.	3 - Moderate	C - Possible	9	Monitor	All waste materials to be sampled (as per Landfill Waste Classification and Waste Definitions) and removed by sub-Lessees, and site 'made good'.	1 - Elimination	Lessees (Lindsay Black, Plantation Energy)	3 - Moderate	E - Rare	3	Acceptable
Dust / Fumes	Environment	General construction phase impacts (e.g. — dust, noise and vibration, visual amenity, fire, and pollution through the use of fuels, chemicals or from general construction litter) cause nuisance to nearby sensitive receptors.	Construction	None.	2 - Minor	B - Likely	8	Monitor	Construction Environmental Management Plan (CEMP) and operational phase Environmental Management Plan (EMP.	4 - Administrative Control	Constructor, GSMG	2 - Minor	D - Unlikely	4	Acceptable
Erosion	Environment	Runoff and sediment from excavations and track areas (esp. unsealed tracks) pollute surface water and Significant Wetland.	Construction	None.	4 - Major	A - Almost Certain	20	Unacceptable	1. Baseline water quality monitoring program. 2. Erosion and sediment control plan, inc. for construction activities.	3 - Engineering Control	GSMG, Constructor	4 - Major	D - Unlikely	8	Monitor
Erosion	Environment	Runoff and sediment from track areas (esp. unsealed tracks) pollute surface water and Significant Wetland.	Operation	None.	4 - Major	A - Almost Certain	20	Unacceptable	1. Baseline water quality monitoring program + on-going monitoring program with annual reporting to DWER and Water Corporation. 2. Minimum 50 m setback from boundary of Significant Wetland and water course. 3. Develop and implement a site Water Management Plan for on-going operational controls (inc. erosion and sediment control). 4. Vegetated swale drains and detention basins to attentuate flows and treatment of gross pollutants. 5. Diversion drains to take external catchment flow through the site to the water course.	3 - Engineering Control	GSMG	4 - Major	D - Unlikely	8	Monitor
Contamination	Environment	Hydrocarbons and other contaminants from pits and vehicle maintenance areas pollute Significant Wetland, surface water and groundwater.	Operation	None.	4 - Major	A - Almost Certain	20	Unacceptable	1. All pits and vehicle maintenance areas to be located > 200 m from boundary of 'Significant Wetland'. 2. Zero on-site fuel storage (i.e. all fuels must be brought in by partipants for events only). 3. All pits and vehicle maintenance areas to be impervious and bunded to drain directly to internal sumps for treatment (i.e. oil-water separators). 4. Develop and implement a site Water Management Plan for on-going operational controls. 5. Facilities to have 2 m clearance to max. groundwater level.	3 - Engineering Control	GSMG	4 - Major	D - Unlikely	8	Monitor
Utilities & Services	Community	Project Site currently has no safe potable water services for people / events on site.	Planning & Design	None.	3 - Moderate	A - Almost Certain	15	Urgent attention req'd	1. Install rainwater collection tanks + simple treatment units (i.e. filtration + UV disinfection) to meet demands associated with regular / typical events (i.e. < 500 people). 2. Cart in additional drinking water to fill tanks, if rainfall is insufficient. 3. Use water tankers for special events (i.e. >> 500 people).	1 - Elimination	GSMG	3 - Moderate	D - Unlikely	6	Monitor
Utilities & Services	Community	Project Site currently has no toilets or wastewater management, for people / events on site. Untreated wastewater would cause environmental damage to site water resources and PDWSA.	Planning & Design	None.	3 - Moderate	A - Almost Certain	15	Urgent attention req'd	1. Install ablutions and on-site secondary WWTP to meet demands associated with regular / typical events (i.e. < 500 people). 2. Use port-a-loos for special events (i.e. >> 500 people).	1 - Elimination	GSMG	3 - Moderate	E - Rare	3	Acceptable

Table 12-2: Albany Motorsport Park risk assessment

Guidewords	Risks (New & Existing)				Initial Risk Rating				Remedial Actions / Controls			Residual Risk Rating			
	Consequence Category	Risk Issue (Hazards or events that may have an impact on the project's objectives)	Asset Life Stage (when could the risk event occur?)	Current Controls	Consequence Rating	Likelihood	Risk Level		Actions or Improvements Recommended	Type of Control Measure	Responsible Party	Consequence Rating	Likelihood	Risk Level	
Noise	Community	1. Excessive noise from typical / regular motorsports events adversely impacts surrounding residents and community, leading to Council complaints. 2. Noise associated with GSMSP deters other development(s) in the surrounding area.	Operation	Existing noise buffer (IA4BA) associated with Mirambeena Timber Processing Precinct includes Lots 5780 (Project Site), 6026 (to east), 5781 (to south), 4117 (to west). Planning controls prevent incompatible uses within noise buffer.	3 - Moderate	B - Likely	**12**	**Urgent attention req'd**	1. Undertake detailed noise modelling, once site concept plan is finalised. 2. Develop and implement Noise Management Plan. 3. All events to cease by 10:00 pm. 4. Expand noise buffer IA4BA to incorporate cumulative noise impacts of Mirambeena TPP and AMP.	4 - Administrative Control	GSMG, City of Albany / DPLH	3 - Moderate	C - Possible	**9**	**Monitor**
Traffic	Community	Traffic associated with special events at GSMSP (i.e. >> 500 people) creates congestion and delays at Albany Highway / Down Road intersection. Delays to trucks to/from CBH, APEC and PE.	Operation	1. Northbound and southbound acceleration lanes for exit onto Albany Highway. 2. Left turn and right turn lanes from Albany Highway into Down Road.	3 - Moderate	A - Almost Certain	**15**	**Urgent attention req'd**	1. Community advertising for special events. Liaison with CBH, APEC, PE, etc. 2. Traffic management controls at Albany Highway / Down Road.	3 - Engineering Control	GSMG, City of Albany	3 - Moderate	C - Possible	**9**	**Monitor**
Traffic	People Health & Safety	Large trucks travelling along Down Road at high speed (110 km/h) could collide with vehicles entering and exiting the GSMSP, due to: 1. Insufficient sight distances. 2. Insufficient road space for vehicles to slow down for GSMSP site entry. Leads to injuries / fatalities, and road closure.	Operation	None.	5 - Severe	C - Possible	**15**	**Urgent attention req'd**	1. Reduce speed limit to 80 km/h, west of CBH site. 2. Install westbound left turn lane on Down Road (min. 120 m). 3. Install other signage for AMP. 4. AMP site access to be min. 200 m west of Down Rd North intersection.	3 - Engineering Control	City of Albany, MRWA	5 - Severe	E - Rare	**5**	**Monitor**
Energy / Electrical	Community	Project Site currently has no power supply. Any site activities would require portable generators, or similar.	Planning & Design	None.	2 - Minor	A - Almost Certain	**10**	**Urgent attention req'd**	1. Liaise with Western Power for power servicing to the Project Site, to meet demands associated with regular / typical events (i.e. < 500 people). 2. Hire additional portable generator(s) to meet demand for special events (i.e. >> 500 people)	1 - Elimination	GSMG	1 - Insignificant	C - Possible	**3**	**Acceptable**
Energy / Electrical	People Health & Safety	Electrocution and equipment damage caused by accidental contact with 22 kV overhead power lines. Disruption to power supply to APEC and PE.	Construction	None.	5 - Severe	C - Possible	**15**	**Urgent attention req'd**	1. Consultation with Western Power prior to any site works. 2. Safety clearance zone = 10 m from power lines. 3. Construction Management Plan. 4. Special event management plan - safety clearance zone in overflow parking area.	4 - Administrative Control	Constructor, GSMG	5 - Severe	E - Rare	**5**	**Monitor**
Communications	Community	Project Site currently has no telephone and internet services (apart from mobile phone coverage).	Planning & Design	Mobile phone coverage.	2 - Minor	B - Likely	**8**	**Monitor**	1. Liaise with Telstra / NBN Co. for telecomms servicing to the Project Site, to meet demands associated with regular / typical events (i.e. < 500 people).	1 - Elimination	GSMG	1 - Insignificant	D - Unlikely	**2**	**Acceptable**

12.2 Recommended remedial and control actions

Drawing on the risk assessment in section 12.1, the recommended remedial and control actions for the AMP proposal are outlined below according to the phase of development – i.e. planning, design development, construction and operation.

12.2.1 Planning phase (2018 to 2020)

The following planning phase actions are recommended:

1. City of Albany to include reference to the AMP in the *Albany Local Planning Strategy*, and particularly within Investigation Area 4 - Mirambeena SIA.
2. City of Albany and GSMG to continue the baseline water quality monitoring program.
3. GSMG and City of Albany to conduct a baseline flora and fauna survey (inc. targeted Black Cockatoo assessment) and undertake environmental offset calculations.
4. City of Albany to seek comment from Wagyl Kaip on the AMP proposal.
5. GSMG to arrange for all waste materials on site to be sampled (as per Landfill Waste Classification and Waste Definitions) and removed by sub-Lessees, and site 'made good'.
6. GSMG and City of Albany to prepare a Bushfire Management Plan for the Project Site, including:
   – Secondary road access from Down Road, north to Redmond-Hay River Road (requiring easements through Lot 22 Down Road and Lot 5774 Redmond-Hay River Road), and
   – 'Place of refuge' within the Project Site.
7. GSMG and City of Albany to seek MRWA approval for reduction of speed limit on Down Road to 80 km/h, west of CBH site. Also, install a westbound left turn lane on Down Road (min. 120 m length), together with directional signage for the AMP.
8. City of Albany to prepare a Scheme Amendment (standard or complex) to change zoning to 'Special Use'; for approval by WAPC and Minister. Also includes automatic referral to the EPA for assessment under the EP Act. The Scheme Amendment should consider expansion of noise buffer IA4BA to incorporate the cumulative noise impacts of the Mirambeena TPP and AMP.

12.2.2 Design development phase (2019 to 2021)

The following design development actions are recommended:

9. GSMG and City of Albany to undertake further geotechnical and ASS investigations on site. If necessary, the Designer is to accommodate footings and pavements with lower bearing capacity/CBR and higher shrink/swell movements.
10. Designer to incorporate all design elements of the Water Management Plan – i.e.:
    – Minimum 50 m setback from boundary of Significant Wetland and water course.
    – Vegetated swale drains and detention basins to attenuate flows and treatment of gross pollutants.
    – Diversion drains to take external catchment flow through/around the Project Site to the water course.
    – All pits and vehicle maintenance areas to be located > 200 m from boundary of Significant Wetland.
    – All pits and vehicle maintenance areas to be impervious and bunded to drain directly to internal sumps for treatment (i.e. oil-water separators).

– Facilities to have 2 m clearance to maximum groundwater level.

– Install rainwater collection tanks + simple treatment units (i.e. filtration + UV disinfection) to meet demands associated with regular / typical events (i.e. < 500 people). Cart in additional drinking water to fill tanks, if rainfall is insufficient. Use water tankers for special events (i.e. >> 500 people).

– Install ablutions and on-site secondary WWTPs to meet demands associated with regular / typical events (i.e. < 500 people). Use port-a-loos for special events (i.e. >> 500 people).

11. GSMG and Designer to liaise with Western Power and Telstra / NBN Co. for power and communications servicing to the Project Site, to meet demands associated with regular / typical events (i.e. < 500 people).

12. GSMG and Designer to undertake detailed noise modelling.

13. Designer and GSMG to incorporate security fencing (1800 mm high + 3 strands barbed wire) and gates around each separate area – i.e. 1) Motocross, 2) Multi-use track & drag strip, 3) 4WD/ATV area.

12.2.3 Construction phase (summer / autumn 2021)

The following construction actions are recommended:

14. GSMG and Constructor to prepare a Construction Environmental Management Plan (CEMP) to mitigate construction phase impacts, including:

– Erosion and sediment control.

– Appropriate drainage and dewatering of excavations during construction.

– Avoid excavations following periods of high rainfall.

– Consultation with Western Power prior to any site works and maintain safety clearance zone = 10 m from high voltage (HV) power lines.

15. GSMG and Constructor to undertake site re-vegetation and beautification.

12.2.4 Operational phase (post 2021)

The following operational actions are recommended:

16. GSMG to prepare an operational phase Environmental Management Plan (EMP), including:

– On-going water monitoring program with annual reporting to DWER and Water Corporation.

– On-going erosion and sediment controls.

– Zero on-site fuel storage (i.e. all fuels must be brought in by participants for events only).

– On-going vegetation monitoring (unlikely to be required).

17. GSMG to implement a Noise Management Plan, which includes cessation of all activities by 10:00 pm.

18. For special events (i.e. >> 500 people), GSMG to undertake:

– Community advertising and liaison with CBH, APEC, Plantation Energy and other Down Road businesses.

– Additional traffic management controls at Albany Highway / Down Road for special events, in liaison with Main Roads WA.

– Hire additional portable generator(s) to meet power demand.

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– Hydrographic Catchments – Catchments (DWER-028)
– Hydrographic Catchments – Subcatchments (DWER-030)
– Legislated Lands and Waters (DBCA-011)
– Pre-European Vegetation (DPIRD-006)
– Public Drinking Water Source Areas (DWER-033)
– Ramsar Sites (DBCA-010)
– RIWI Act, Groundwater Areas (DWER-019)
– RIWI Act, Rivers (DWER-036)
– RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
– Soil Landscape Mapping – Best Available (DPIRD-027)
– South Coast Significant Wetlands (DBCA-018)
– Surface Water Allocation Areas (DWAID) (DWER-039)
– Surface Water Allocation Subareas (DWAID) (DWER-040)
– Threatened Ecological Communities (DBCA-038)

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