LOCHARD ENERGY

MAY 2022

WINTON ENERGY RESERVE 1 FACILITY

SURFACE WATER AND DRAINAGE STRATEGY

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Winton Energy Reserve 1 Facility
Surface Water and Drainage Strategy

Lochard Energy

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ABBREVIATIONS

AEP	Annual Exceedance Probability
ANZG 2018	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)
ANZECC 2000	Australian and New Zealand guidelines for fresh and marine water quality (2000)
BESS	Battery Energy Storage System
BoM	Bureau of Meteorology
BPEM	Urban stormwater best practice environmental guidelines
CaLP Act	Catchment and Land Protection Act 1994
DELWP	Department of Environment Land Water Planning
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPC	Engineering, Procurement and Construction
ERS	Environment Reference Standard
FO	Floodway Overlay
FZ	Farming Zone
GED	General Environmental Duty
Goulburn Broken CMA	Goulburn Broken Catchment Management Authority
Goulburn Broken RCS	Goulburn Broken Regional Catchment Strategy 2013 -2019
GPG	Gas-fired Power Generation
ISC	Index of Stream Condition
LSIO	Land Subject to Inundation Overlay
mAHD	meters Australian Height Datum
MAR	Mean Annual Rainfall
MNES	Matters of National Environmental Significance
NWQMS	National Water Quality Management Strategy
RFO	Rural Flood Overlay
SBO	Special Building Overlay
TSS	Total suspended solids
TP	Total phosphorus
TN	Total nitrogen
UFZ	Urban Floodway Zone

VPPs Victoria Planning Provisions

EXECUTIVE SUMMARY

INTRODUCTION

This report provides the surface water and drainage strategy for the Energy Reserve 1 Facility proposed by Lochard Energy (the project). It summarises applicable surface water policies, legislation and elaborates on the conditions of flooding, water quality and drainage for existing and proposed site conditions. A conceptual drainage layout plan based on contour data and the proposed project layout is provided in Appendix B.

SURFACE WATER AND DRAINAGE CRITERIA

The project is located within the Goulburn Broken catchment, with the Goulburn Broken Catchment Management Authority (Goulburn Broken CMA) managing and regulating local surface water approvals. Based on a review of relevant legislation, Commonwealth, State and local policies and guidelines, surface water and drainage criteria were identified, as follows:

- Drainage Discharge Criteria

  The Battery Energy Storage System (BESS) and Gas-fired Power Generation (GPG) facility is required to comply with the flow volume set out in *Publication 1739.1: Urban Stormwater Management Guideline (2021)* and presented in Table 3.4 of this report.

  An outfall location for the project at the existing culvert and channel in the western portion of the site has been identified. Obtaining the necessary licencing approvals from Goulburn Broken CMA for new outfall location will need to take place prior to construction phase.

- Water Quality Discharge Criteria

  The BESS and GPG facility is to comply with water quality discharge criteria set out in *Publication 1739.1: Urban Stormwater Management Guideline (2021)* and presented in Table 3.4 of this report. In addition to the *Urban Stormwater Management Guideline (2021),* recommendations for water quality controls are presented in the WSP report *Envelop of Effects.*

  The *Envelop of Effects* report outlined design requirements including wastewater collection and clean stormwater bunds, swales and surface flow to surrounding lands in a manner that does not overload or mix with contaminated water drainage systems. It also recommends treated and separated water from oily wastewater should have less than 10mg/L oil during a 5% Annual Exceedance Probability (AEP) rainfall event.

  The discharge location from the subject site to the surrounding catchment will direct treated water towards the contributing catchment of the Winton wetland. Additional water quality criteria may be required following consultation with the Goulburn Broken CMA.

CONCEPT SURFACE WATER AND DRAINAGE STRATEGY

The proposed site layout does not interact with designated watercourses or floodplains. Therefore, no transverse drainage or mitigation measures are required to maintain existing waterways or floodplains.

There are two distinct areas for development at the project, hence the approach for the management of stormwater is addressed separately for the BESS and GPG facility.

BESS AND GPG FACILITY

As per the *Urban Stormwater Management Guideline (2021),* the mean annual rainfall (MAR) at the project corresponds to a percentage reduction of infiltration. Based on the Bureau of Meteorology (BoM) Station data, the average annual rainfall at the project is 600 mm, which corresponds to a required harvest of 29% of this MAR.

The removal of dam storages may also increase runoff rates from existing conditions.

Increases to pollutant loads need to be assessed and mitigated prior to discharge off site using Water Sensitive Road Design (WSRD) elements, such as swales, bioretention systems, basins and wetlands, as part of the design phase. In addition to WSRD elements, the *Envelop of Effects* identified oil spill mitigation approaches at the Battery Energy Storage System, gas power generation, transformers and switchyard area.

An outfall location at the existing culvert and channel in the western portion of the site has been identified, refer to Appendix B. Mitigation measures to manage potential increases in surface water runoff and WSUD measures should be targeted upstream of this discharge location.

Consultation with Goulburn Broken CMA is recommended to determine if additional water quality criteria are required for this project.

CONCEPT DRAINAGE LAYOUT

At this stage of the design, potential new drainage infrastructure required to collect, convey and where required, treat stormwater across the site is to comprise of:

- Pits and underground pipe network at the eastern portion of the site (location of hardstands, internal roads, buildings, etc.). Where kerbs are provided, inlet pits (either side-entry pits or grated side-entry pits) should be specified at the low point of the access road.
- Runoff collected via the pit and pipes are to be directed towards the northern boundary of the site. The underground pipes will grade toward the western portion of the site.
- A treatment point is proposed to the west of the BESS with the aim of monitoring water quality and providing primary or secondary treatment where needed of the runoff from the bunded area.
- The outlet from the underground ground pipe network is to discharge to a swale on the western portion of the site.
- The proposed swale will treat, attenuate and convey runoff towards the outlet location. Additional WSUD features (such as a basin, wetland, etc) may be required following water quality modelling results.
- A detention basin provided upstream of the site outlet to meet the *Urban Stormwater Management Guideline (2021)* flow volume requirement.

The sizing of the proposed drainage infrastructure and location will depend on hydraulic modelling results and the final layout and ground elevations at the site. The conceptual drainage layout is shown in Appendix B.

RECOMMENDATIONS FOR NEXT DESIGN STAGE

- Hydrologic and hydraulic modelling of the proposed drainage network to identify pipe sizes, pit locations and pipe gradients.
- WSRD and management and disposal controls for accidental oil leakage at the BESS and GPG facility is to be incorporated into the drainage design prior to runoff discharging offsite. The allocation of space for new drainage infrastructure, an oil/water separator system and WSUD treatment elements (including swales and rainwater harvesting infrastructure) should be included in future design layouts. Water quality and water balance modelling (MUSIC) is required to quantify the sizing and effectiveness of WSUD features and rainwater harvesting infrastructure.
- Water quality data for the drainage channel downstream of the proposed outlet location is not available. To establish a baseline of water quality in the downstream channel, it is recommended monitoring should commence prior to construction and preferably for a period of 18 months.
- The proposed outlet discharges to a drainage channel that connects to the Winton Wetland complex. In consultation with Goulburn Broken CMA, determine if water quality criteria in addition to those outlined in the *Urban Stormwater Management Guideline (2021)* are required.

- A suite of surface water mitigation measures should be incorporated into Environmental Management Plans for each of the construction, operational and decommissioning phases of the project. Mitigation measures include preparing an erosion and sediment control plan and staging construction to minimise the risk of soil erosion and sediment laden runoff.

1 PROJECT BACKGROUND

Lochard Energy commissioned WSP Australia Pty Limited (WSP) to undertake a surface water and drainage strategy to support planning applications and approvals for the proposed Energy Reserve 1 Facility at 386 Lee Road, Winton, Victoria (the project), which involves the installation of an energy storage facility.

This report summarises the findings of the surface water and drainage strategy, provides a concept drainage plan and recommendations for the next stage of design.

1.1 PROJECT DESCRIPTION

Lochard Energy (Iona Operations) Pty Ltd, an energy infrastructure company based in Australia, is seeking to develop the land for an energy hub at 386 Lee Road, Winton (the subject site). The proposed energy hub is known as Winton Energy Reserve 1 facility (the project).

The project will utilise hybrid technology with Li-Ion batteries and fast-start high-efficiency duel-fuel gas reciprocating engines and will comprise:

- A 200-megawatt (MW) Gas-Powered Generator (GPG) facility and adjoining ~200 metre (m) gas pipeline including metering station.
- A Battery Energy Storage System (BESS) facility. The BESS facility will supply and absorb 200MW real power with 400-megawatt-hour (MWh) energy storage capacity.
- A single electrical substation for both battery and GPG which then feeds into the local network.

A ~3 kilometre (km) 220-kilovolt (kV) underground transmission line from the Glenrowan Terminal Station (GTS) to the subject site.

The transmission line will cross the Hume Freeway and follow the existing AusNet easement northwest from the GTS. It will then head east within the road reserve of Lee Road before entering the subject site

The project is located approximately 9 km north east of Benalla and 175 km north east of Melbourne within the Rural City of Benalla (Local Government Area). A concept layout plan for the project is provided at Figure 1.1.

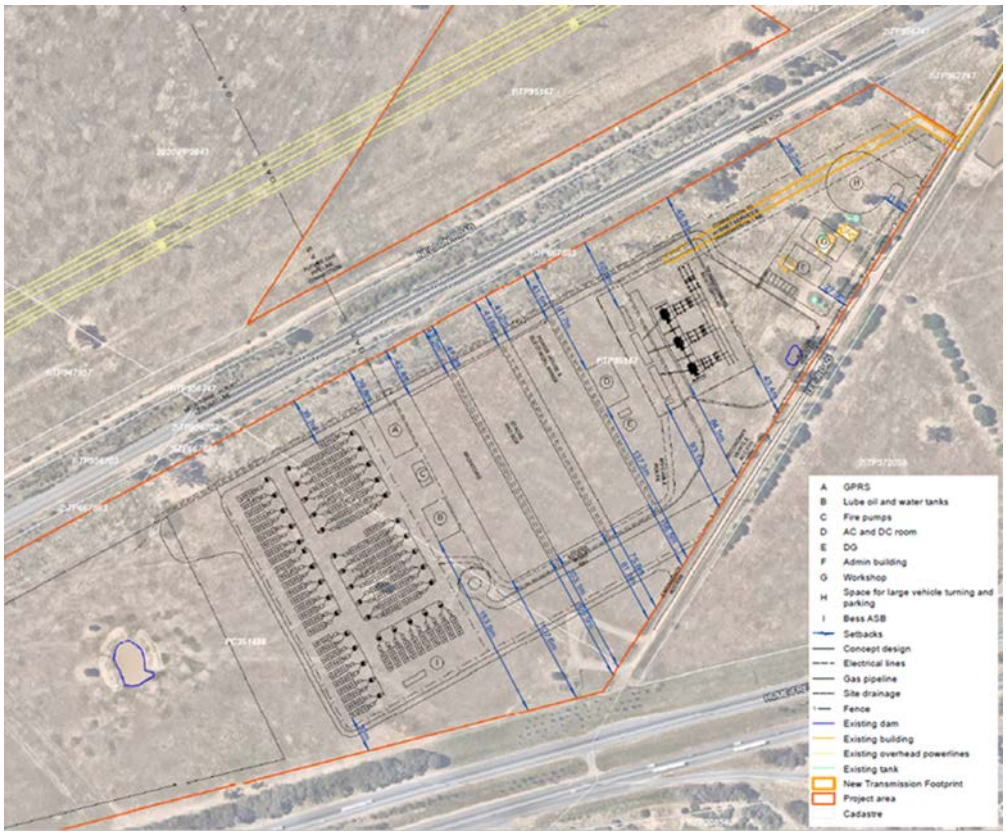

Figure 1.1 – Concept layout plan

1.2 PROJECT SCOPE

The following comprises the scope of the surface water and drainage strategy:

- Review of Legislation, Policy and guidelines.
- Review of previous relevant studies and available information relating the layout and design of the project.
- Determine flood protection, drainage and water quality management requirements for the project.
- Determine the existing surface water conditions at the project
- Determine the extent of interaction of the proposed infrastructure with existing open drains and other drainage features on and adjacent to the site.
- Develop a conceptual drainage layout plan for the project and identify potential new drainage infrastructure required to collect, convey and, where required, treat stormwater across the site.
- Recommendations for the next design stage.

2 METHODOLOGY

2.1 STUDY AREA

The study area for this surface water and drainage strategy includes:

- the project (new impervious areas),
- cross drainage from the sub-catchment that interacts with the project, and
- surface water sensitive receptors (including sensitive habitats) impacted by the project.

2.2 EXISTING CONDITIONS ASSESSMENT

The existing catchments/sub-catchments, key flow paths, drainage features and floodplains that interact with the project are defined and presented in Section 4.

A site assessment was undertaken by WSP ecologists on 25 June 2021 and involved mapping native vegetation patches and scattered trees. Due to Covid restrictions, a site visit was not carried out for this surface water assessment. A review of the existing surface water drainage and site characteristics was based on site photos taken on the 25 June 2021, aerial images and topographic survey maps (Veris April 2021) and the available information listed in Section 2.2.1.

2.2.1 AVAILABLE INFORMATION

Available information relevant to this concept drainage study is:

- Veris aerial photography survey, dated April 2021.
- Topographical survey (10m LiDAR contour data downloaded from the Department of Environment Land Water Planning website)
- Topographical survey (1m LiDAR contour data downloaded from the Geoscience Australia Elvis – Elevation and Depth – Foundation Spatial Data website)
- Veris Feature and Level project survey data (Drawing reference: 303278-BA, dated 31 May 2021)
- GIS drainage infrastructure (waterway channels, waterbodies)
- Planning scheme overlays
- Veris project boundaries survey, April 2021
- Proposed project layout plan (WSP, reference: PS125526-WSP-WIN-ELE-DRG-100 RevB), dated 3 March 2022
- Available water quality monitoring data at Lake Mokoan (source: Bureau of Meteorology and DELWP)

Surface water overview map showing some of the drainage features adjacent to the project is provided in Appendix A.

2.2.2 OTHER STUDIES

In December 2021, WSP prepared an *Envelop of Effects report* (reference: PS125526-BNE-POW-REP-002). The *Envelope of Effects* report outlines the worst-case dimensions and other environmental impacts from the facility. A summary of the proposed water quality recommendations as outlined in the *Envelop of Effects* report is presented in Section 5.2.3.

2.3 SURFACE WATER REQUIREMENTS

The key referral agencies for approvals relevant to surface water are Benalla Rural Council and Goulburn Broken Catchment Management Authority (Goulburn Broken CMA). A review of published guidelines by these authorities and other relevant State Authorities pertaining to flood protection, drainage discharge criteria and water quality discharge criteria is presented in Section 3.6.

2.4 CONCEPT SITE DRAINAGE STRATEGY

A concept drainage strategy and layout plan were developed based on a review of available information (Section 3) and is presented in Section 5.

The project will be constructed under an Engineering, Procurement and Construction (EPC) contract. The EPC contractor will complete the detailed engineering design for the project. Because of this procurement process, the concept drainage strategy is based on a qualitative assessment that identifies potential new flow paths, drainage infrastructure, treatment systems and outfall location.

2.5 ASSUMPTIONS / LIMITATIONS

The following items have been assumed:

- The desktop study only includes a review of readily available topographic and waterbody data, regional strategic plans, flood extent and level information.
- The concept site drainage strategy will need to be quantitively assessed at the next stage of design.
- Water quality modelling will need to be quantitively assessed at the next stage of design.
- Consultation with Goulburn Broken CMA is recommended to determine if additional water quality criteria are required for this project.

3 LEGISLATION, POLICY AND GUIDELINES

The surface water and drainage strategy is required to support the Development Planning Support Package for the proposed project to ensure it aligns with key strategic plans.

3.1 LEGISLATION

A summary of commonwealth legislative requirements relevant to surface water for this project is presented in Table 3.1

Table 3.1 Legislative Requirements Summary

DOCUMENT REFERENCE	SUMMARY	RELEVANCE TO THE PROJECT
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The *EPBC Act* prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas and species, population and communities and heritage items. Actions which would have, or is likely to have, a significant impact on the environment of Commonwealth land and/or 'Matters of National Environmental Significance' (MNES), are to be assessed through a referral process to the Commonwealth Department of the Environment. If the referral process determines a project is likely to have a significant impact on the environment, then approval from the Commonwealth Minister for the Environment would be required before construction works can commence.	WSP prepared an ecological assessment for the project, *Proposed Energy Reserve 1 Facility; Winton Ecological Impact Assessment*, dated August 2021 (reference: PS125526-RPT-ECO_REV0). The type and extent of vegetation communities, the fauna habitats and potential impact of the project on biodiversity values were identified in the ecological assessment. A summary of the surface water sensitive receptors, is presented in Section 4.
Environment Protection Act 2017 (Environment Protection Act)	The *Environment Protection Act 2017* provides a legal framework to protect the environment in Victoria, including the protection of air, land and water from pollution. The *Environment Protection Act 2017*, the *Environment Protection Regulations 2021* and Environment Reference Standard (ERS) introduced from 1 July 2021 provides a regulatory framework designed to prevent harm by eliminating or minimising risks of harm to human health and the environment. The *Environment Protection Act 2017* empowers the Environment Protection Authority Victoria (EPA Victoria) to implement regulations, maintain ERS, manage waste and protect the environment from pollution.	At each stage of the project, water quality should be protected. The ERS defines a range of environmental values for specific segments of the water environment. For surface water, this is based on a geographical region of the water body. The ERS values relevant to this project are outlined in Section 3.3.1.

	The *Environment Protection Act 2017* also introduces the concept of General Environmental Duty (GED) which regulates people or business engaged in an activity that may rise risks or harm to human health or the environment must eliminate those risks with reasonable practise. In addition to the above, the *Environment Protection Act 2017* regulates the discharge or emission of waste to water, land or air by a system of Works Approvals and licences. A breach of the GED could lead to criminal or civil penalties.	
Planning and Environment Act 1987	The *Planning and Environment Act 1987* establishes a framework for planning the use, development and protection of land in Victoria. Victoria Planning Provisions (VPPs) are set out in the Act to assist in proving a consistent and coordinated framework for planning schemes.	The project area is within the *Benalla Planning Scheme.* The type and purpose of overlays relevant to surface water is summarised in section 4.3.1.
Water Act 1989	The *Water Act 1989* provides the legal framework for water management and use across Victoria, including the issuing and allocation of water entitlements and the provision of water services by State-owned water corporations and catchment management authorities. Under the Act, general powers and obligations are given to catchment management authorities for their designated areas. Under the Act, *Goulburn Broken Management Authority* (Goulburn Broken CMA) have the power to make By-laws, including: • *By-law No. 3: Waterways Protection 2014 Goulburn Broken Catchment Management Authority.*	A permit application must be referred to the relevant floodplain management authority (Goulburn Broken CMA) to construct or carry out works within or in proximity of designated waterways and within flood overlays.
By-law No. 3: Waterways Protection 2014; Goulburn Broken Catchment Management Authority.	The objectives of By-Law No 3 Waterways Protection 2014, made under the *Water Act 1989*, are: • The control, management and authorisation of works and activities in, under, on or over designated waterways and designated land or works; • The protection and care of designated waterways and designated land or works; and • Conservation and preservation of flora, fauna and habitat in designated waterways and designated land or works	The By-Law prohibits works and certain activities on designated waterways or designated lands or works without a permit issued by Goulburn Broken CMA. The Project does not intersect with a designated waterway and surface water runoff from the Project does not discharge into a designated waterway.
Catchment and Land Protection Act 1994	Victoria's framework for the integrated management of catchments is established under the *Catchment and Land Protection Act 1994* (CaLP Act). Under	Landowners and managers have the responsibility to take all reasonable steps to prevent the growth and spread of

	the CaLP Act, landowners have a responsibility to avoid causing or contributing to land degradation, including taking all reasonable steps to conserve soil, protect water resources, eradicate regionally prohibited weeds, prevent the growth and spread of regionally controlled weeds and where possible, eradicate established pest animals, as declared under the CaLP Act.	regionally prevented and controlled weeds on their land. This is regulated by Agriculture Victoria.
Climate Change Act 2017	The Act sets the policy objectives and guiding principles to inform the decision-making in the state development to achieve long-term greenhouse reduction target. Strategic response to the Climate Change needs to be developed through adaptation action plans, emission reduction pledges and climate change strategies with the aim of contributing to carbon sequestration efforts.	Decision-making or actions under the *Water Act 1989* must have regard to climate change policy objectives. Consideration of a sustainable water strategy is guided by climate change policy objectives with the aims to: • manage the state's natural resources, ecosystems and biodiversity to promote their resilience • build the resilience of the state's infrastructure, built environment and communities through effective adaptation and disaster preparedness action.

3.2 COMMONWEALTH POLICY AND GUIDELINES

A summary of Commonwealth Policy and Guidelines relevant to surface water is presented Table 3.2.

Table 3.2 Commonwealth Policy and Guidelines

DOCUMENT REFERENCE	SUMMARY	RELEVANCE TO THE PROJECT
National Water Quality Management Strategy (NWQMS)	The *NWQMS* is a joint approach by the Australian and New Zealand governments to improving water quality in waterways. The objective of the *NWQMS* is to achieve sustainable use of water resources, by protecting and enhancing their quality, while maintaining economic and social development. The *NWQMS* provides a framework for the development and implementation of management plans for catchment, aquifer, coastal water and other water body, by community and government. The *NWQMS* includes several guidelines covering water quality benchmarks, groundwater management, diffuse and point sources, sewerage systems, effluent management, and water recycling.	Guidelines relevant to the project include: 1. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG 2018) 2. *Australian and New Zealand guidelines for fresh and marine water quality* (ANZECC 2000) 3. *Australian guidelines for water quality monitoring and reporting*. If the level of an environmental quality indicator or objective is not provided in State regulations, and

		in the absence of baseline water quality monitoring data, the environmental quality objective for that indicator becomes the levels specified in the ANZG 2018/ANZECC 2000 Guidelines.
Australian and New Zealand guidelines for fresh and marine water quality	The Australian and New Zealand Guidelines for Fresh and Marine Water Quality have been updated to incorporate new science and knowledge developed over the past 20 years (ANZG 2018). The updated ANZG 2018 guidelines supersede the ANZECC 2000. All guidance documents relating to the ANZEG 2018 are not yet published and, in the interim until all ANZEG 2018 publications are released, reference to ANZECC 2000 may be necessary. The ANZEG 2018 together with the ANZECC 2000 guidelines provide a: — framework for conserving ambient water quality in natural water resources (rivers, lakes, estuaries and marine waters); — guidance to understand the current health of the waterways in the vicinity of the project; — list a range of environmental values assigned to a described waterbody; and — long-term (default) trigger values for various levels of protection which have been considered when describing existing water quality and key indicators.	The site is in the *Murray Darling* drainage division of ANZEG 2018 guidelines. At the time of this report, the Murray Darling guideline was not published. For toxicant trigger values reference will be made to ANZECC 2000 guideline.

3.3 STATE POLICY AND GUIDELINES

No State policies or guidelines are relevant to surface water for this project.

3.3.1 ENVIRONMENT REFERENCE STANDARD

The Environment Reference Standard (ERS) is a regulatory standard made under the *Environment Protection Act 2017* with the aim to set out standards for environmental values that need to be achieved or maintained in Victoria. For surface water sector, the ERS classifies surface water segments based on types of surface water and aquatic reserves and defines the types and level of protection to the environmental values for each segment.

Based on the ERS segment definition, the project is classified within the segment *River and Streams – Central Foothills and Coastal Plains* and the subsegment of *Foothills of the Ovens, Broken and Goulburn basins*.

The application of ERS relevant to this project includes:

- Environmental value
- Environmental quality indicators and objectives

3.3.1.1 ENVIRONMENT VALUE

The environment values of inland waters (River and Streams) and segment of *Central Foothills and Coastal Plains* as set out in Table 5.5 Clause 18 in the ERS, are presented below:

- Water Dependent Ecosystems and Species: Slightly to Moderately Modified
- Human consumption after appropriate treatment
  - If water is sourced for supply
  - in a special water supply catchment area set out in Schedule 5 of the Catchment and Land Protection Act 1994; or
  - in accordance with the Safe Drinking Water Act 2003.
- Agriculture and Irrigation
- Human Consumption of Aquatic Foods
- Aquaculture
  - If the environmental quality is suitable and an aquaculture licence has been approved in accordance with the *Fisheries Act 1995*
- Industrial and Commercial
- Water based recreation
  - Primary Contact,
  - Secondary Contact
  - Aesthetic Enjoyment
- Traditional Owner Cultural Values

3.3.1.2 ENVIRONMENTAL QUALITY INDICATORS AND OBJECTIVES

As stated in Clause 19 of the ERS, water quality indicators and objectives are applicable for each segment. It is understood that if available local baseline water data shows higher environmental quality standard than the ERS standard, local baseline water data takes precedence over the water quality objectives in Table 5.7 and Table 5.18 of the ERS.

For this project, key environmental indicators and objectives for the environmental value of *River and Streams - Water dependent ecosystem and species* that set out in Table 5.8 of the ERS are tabulated in Table 3.3 of this report. In addition to *River and Stream* standards, the *Wetlands – lakes and swamps* segment is also applicable in this project as the Winton wetland reserve is located downstream of the project.

Other environmental values listed in Table 5.7 of the ERS are considered to receive minor impacts from the project as the project does not conduct activities that consume natural surface water resources, nor commit to pollution emission to surface water bodies.

Table 3.3 Environmental quality indicators and objectives for rivers and streams segment – *Central Foothills and Coastal Plains* and *Wetlands*

ENVIRONMENTAL QUALITY INDICATORS	CENTRAL FOOTHILLS AND COASTAL PLAINS *(SLIGHTLY TO MODERATELY MODIFIED)*	WETLAND TYPE
Total Phosphorus (µg/L)	75th percentile ≤50	75th percentile =100
Total Nitrogen (µg/L)	75th percentile ≤800	75th percentile =1500
Dissolved oxygen (percent saturation)	25th percentile ≥70 Maximum = 130	Minimum = 80 Maximum = 120
Turbidity (NTU)	75th percentile < 20	75th percentile =15
Electrical Conductivity (µS/cm@ 25 ˚C)	75th percentile ≤250	N/A
pH (pH units)	25th percentile > 6.4 75th percentile < 7.4	Minimum = 6.5 Maximum = 8.5
Toxicants Water (% protection)	95%	95%
Toxicants Sediment	Default Guideline Values from ANZEG 2018	Default Guideline Values from ANZEG 2018

3.3.2 URBAN STORMWATER MANAGEMENT GUIDELINE (EPA VICTORIA 2021)

The Publication 1739.1: *Urban Stormwater Management Guideline (2021)* was released in June of 2021 for the purpose of improving the management of urban stormwater in Victoria. This guide is provided for developers who create new impervious surfaces, such as roads, subdivisions and other developments. It supports these parties to minimise the risks to human health and the environment from their design, planning and development activities, as the general environmental duty (GED) requires. It also supports those involved in the assessment of urban stormwater treatment proposals.

The *Urban Stormwater Management Guideline (2021)* complements the *Urban stormwater best practice environmental guidelines (BPEM)* published by CSIRO in 1999 and adds to the state of knowledge established through previous guidance, including the BPEM and planning requirements.

As per the *Urban Stormwater Management Guideline (2021),* the current best practice performance objectives, post construction phase, for stormwater quality and flow regime impacts are summarised in Table 3.4.

Table 3.4 Quantitative performance objectives for urban stormwater

INDICATORS	TARGETED REDUCTION OF TYPICAL URBAN (ROAD) ANNUAL LOAD
Total suspended solids (TSS)	80% reduction of the typical urban annual load.
Total phosphorus (TP)	45% reduction of the typical urban annual load.

INDICATORS	TARGETED REDUCTION OF TYPICAL URBAN (ROAD) ANNUAL LOAD
Total nitrogen (TN)	45% reduction of the typical urban annual load.
Litter	70% reduction of the typical urban annual load.
Flow (water volume) Mean Annual Rainfall (MAR) (ml) Harvest / evapotranspiration (%)	 600 ml 29% (percentage of MAR runoff)

3.4 LOCAL POLICY AND GUIDELINES

A summary of the key regional strategic plans, local planning policies and catchment strategies relevant to this surface water and drainage strategy are summarised in Table 3.5.

Table 3.5 Local Policy and Guidelines

DOCUMENT REFERENCE	SUMMARY	KEY REQUIREMENT RELEVANT TO THE PROJECT
Benalla Planning Scheme	The *Benalla Planning Scheme* sets out policies and controls for guiding the use, development and protection of land within Benalla Rural City. It recognises the significance of existing cultural, environmental, and social values and facilitate a sustainable development in the local community.	The project area is within the jurisdiction of Benalla Rural City Council. Principles for project development includes: - Ensure environmental, cultural and landscape values of all water bodies and wetlands to be protected (*Clause 12.03 Water bodies and Wetlands)* - Identify lands are subject to flooding including land inundated by 1 in 100 year flood event (*Clause 13.03 Floodplain management* - Protect the water quality and maintain natural water bodies' functions (*Clause 14.02 Water)* The Project is not located within a declared special water supply catchment or an irrigation district. Policy documents referred to in the Benalla Planning Scheme relevant to this Project includes the *Urban Stormwater - Best Practice Environmental Management Guidelines (Victorian Stormwater Committee, 1999).*

DOCUMENT REFERENCE	SUMMARY	KEY REQUIREMENT RELEVANT TO THE PROJECT
Goulburn Broken Waterway Strategy 2014 -2022	This Strategy provides a framework and work programme for the management of rivers, estuaries and wetlands in the Goulburn Broken region to support their environmental, social, cultural and economic values.	The project is located within the productive plains defined in the regional work program. The Winton Wetland complex (Wetland ID: 4~20~WS1) is classified as formally recognised significance in local environmental value and priority waterways. The Winton Wetland Committee of Management is overseeing the long-term restoration and maintenance. Water quality is one of the parameters for measuring wetland condition.
Goulburn Broken Regional Floodplain Management Strategy 2018 -2028	The Strategy outlines how ecological and cultural values of the natural floodplains can be protected while also managing the risks to life, property and assets associated with flooding. This Strategy adopts the principle that waterways should, wherever possible, be allowed to flood naturally, maintaining connectivity to floodplains and their associated wetlands.	The project area is located within the Benalla Management Unit. Priorities of floodplain management for this management unit includes: - The preparation of flooding zones and overlays mapping by the Goulburn Broken CMA, in conjunction with Benalla Rural City council. - Further work using LiDAR and historical flood data to update flood mapping for Benalla Rural City Planning Scheme Amendment.
Goulburn Broken Regional Catchment Strategy 2013 -2019 *(Goulburn Broken RCS)*	This strategy provides a vision for the integrated management of natural resources in the Goulburn Broken Region. The goal of the *Goulburn Broken RCS* is to increase the protection, enhancement and restoration of valuable natural resources to improve the health and sustainable productivity of the Goulburn Broken catchment	The objectives for river, estuaries and floodplains relevant to this surface water impact assessment include: - Implement approaches developed from the strategic framework to sustain ecological function of riverine and estuarine floodplains and protect community infrastructure and values. - Reduce contamination load in waterways in long-terms perspectives - Reduce impacts of flooding on the built environment and natural ecosystem.

3.4.1 OTHER GUIDELINES

A number of other surface water and drainage guidelines relevant to the next design stage of the Project include:

- EPA Publication No. 275. Construction Techniques for Sediment Pollution Control (EPA Victoria 1991)
- Integrated Water Management Framework for Victoria (DELWP, 2017)
- Water for Victoria (Water Plan) (DELWP 2016)

- Australian Rainfall and Runoff (2019)
- Melbourne Water MUSIC Guidelines

3.5 PREVIOUS STUDIES

3.5.1.1 HARVESTING RUNOFF ONSITE – EXISTING SITE DAMS

The 2021 water supply optioneering report investigated harvesting runoff onsite as a source of water for the Project. The Winton catchment is within the Broken River Basin and managed by Goulburn-Murray Water. The capture and use of surface water in Victoria are controlled by the purchase of licences and trading allocations. In assessing licence applications for the use of captured water onsite, Goulburn-Murray Water considers the need of water requirements in the downstream catchment.

Should Goulburn-Murray Water approve the use of the onsite dams for commercial purposes, Lochard Energy will be required to source an 'Unregulated water entitlement' from the Victorian Water Register. An application can be made for either a permanent or temporary (5 year) allocation.

To accurately determine the dam storage volume required to supply 45kL per day to the Project a detailed water balance model of the catchment and available site storage is recommended. A preliminary estimate of annual water harvest at the site by SLR is 50 ML/annum (137 kL/day). Pumping and pre-treatment of water (to remove the sediment and colloidal clay) from the dams would be required to utilise dam water in the Facility process.

3.5.1.2 REPORT RECOMMENDATION

The report recommends that pumping from the Benalla WWTP and utilising the dams are the most cost-effective options with the latter requiring securing a temporary or permanent allocation of water from the Victorian Water Register.

3.5.2 ENVELOPE OF EFFECTS REPORT

WSP prepared an *Envelop of Effects report* (reference: PS125526-BNE-POW-REP-002), dated December 2021. The *Envelope of Effects* report outlines the worst-case dimensions and other environmental impacts from the facility.

The project will be constructed under an Engineering, Procurement and Construction (EPC) contract and as such the EPC contractor will prepare the detailed design for the project. The *Envelop of Effects* report identifies sources of potential surface water contamination and presents recommendations for the management and disposal of contaminated water. The proposed water quality recommendations from the Envelop of Effects report are incorporated into the water quality recommendations presented in Section 5.2.3.

3.6 SURFACE WATER CRITERIA

Based on the review of available information the following are the recommendations for flood protection criteria:

- **Flood Protection Requirements**

  The Department of Environment, Land, Water and Planning (DELWP) released the *Victorian Solar Energy Facilities Design and Development Guideline* August 2019.

  The guideline provides measures the proponent can implement to reduce flood damage, including:

  - minimising grading or levelling of the site, to avoid changes to overland water flow and discharge patterns
  - avoiding locations within the immediate floodplain or a watercourse or river system
  - elevating structures above the floodplain as recommended by the relevant Flood Management Authority.

— **Drainage discharge requirements**

The BESS and GPG facility is required to comply with the flow volume set out in *Publication 1739.1: Urban Stormwater Management Guideline (2021)* and presented in Table 3.4 of this report.

— **Water quality discharge requirements**

The BESS and GPG facility is to comply with water criteria set out in *Publication 1739.1: Urban Stormwater Management Guideline (2021)* and presented in Table 3.4 of this report. In addition to the *Urban Stormwater Management Guideline (2021),* recommendations for water quality controls are presented in the *Envelop of Effects* report. The *Envelop of Effects* report recommends treated and separated water from oily wastewater should have less than 10 mg/L oil during a 5% Annual Exceedance Probability (AEP) rainfall event.

The discharge location from the project to the surrounding catchment will direct treated water towards the contributing catchment of the Winton wetland. Additional water quality criteria may be required following consultation with the Goulburn Broken CMA.

4 EXISTING CONDITIONS

4.1 CATCHMENT DESCRIPTION

The Project is in the Goulburn Broken catchment, which covers 2.4 million hectares from the north outskirts of Melbourne to the River Murray on the border with New South Wales. The catchment encompasses biodiverse ecosystems that provide various terrestrial and aquatic habitats for flora and faunas. The Goulburn River Basin is the largest river basin in Victoria covering 1.6 million hectares.

Wetlands are of significance in Goulburn Broken catchment. There are over 2,000 wetlands mapped and classified in the catchment area including large permanent lakes, floodplain billabongs and freshwater depressions. Natural wetlands have ecological functions in local areas including flood mitigation, agricultural irrigation, and providing habitats to wildlife.

4.1.1 WINTON WETLAND

Lake Mokoan, the largest wetland forming the Winton Wetlands, was constructed in 1971 and had a capacity of 365,000 ML. It was an off-river water storage designed to provide water to the Murray and Goulburn irrigation areas. Lake Mokoan was decommissioned in 2004 and is being restored to its natural wetland habitat. It is a current DELWP mapped wetland (wetland ID 67909).

Winton Creek Wetland Complex located approximately 300 m to the north of project boundary and is identified as high value waterway in the productive plains of the Goulburn Broken catchment waterway strategy. The Winton Wetlands Committee of Management is overseeing the restoration project (Goulburn Broken CMA, 2014).

There are many more individual wetlands within the Winton Wetland complex, including Bill Friday Swamp (wetland ID 67926) and Ashmeads Swamp (wetland ID 67925). Bill Friday Swamp is the closest wetlands to the study area, which is classified by DELWP as a temporary freshwater marsh and meadow, which is intermittently inundated.

While the Winton Wetlands is not classified as a RAMSAR wetland, it is located downstream of the project and may be hydraulically connected to the project via surface drainage and / or groundwater interaction.

4.2 EXISTING SITE DRAINAGE

The project is within former agricultural land, 9 km east of the township of Benalla and north of the Winton township in the north-eastern region of Victoria. The project comprises of approximately 40.35 hectare (ha) of land, which is separated into two land parcels, the northern lot and southern lot. The land parcels are separated by Nelson Road.

The northern lot is approximately 5.3 ha whilst the southern lot is approximately 35.05 ha. The project development area will be located within the southern lot.

There are no designated Goulburn Broken CMA waterways within the site boundary. The nearest designated waterways are Seven Mile Creek located 1.8 km to the west of the site and an un-named designated waterway located 190 m to the south of the site. Based on the review of site contours, surface water runoff from the site does not directly discharge to these designated waterways.

A summary of the existing site drainage condition and sensitive water receptors at the project is provided in the following sections. A map showing the existing surface water features at the project is presented in Appendix A.

4.2.1 EXISTING SITE DRAINAGE LAYOUT

Survey data prepared by Veris in April 2021 is referenced for understanding existing topography within the project boundary.

Surface elevation varies between 176 m AHD in the east to 169 m AHD in the north and west. Surface gradients at the site are shallow, except at the existing dam embankments.

Sizing of stormwater culverts were not included in the Veris survey.

South of Nelson Rd, surface water runoff flows from the relative higher elevation from east to north and also from west to the approach to Nelson Rd. Three downstream water dams are located at the western portion of the project and are currently used to retain some stormwater runoff for farming purposes. Surface water runoff north of Nelson Rd is northbound and captured by an existing dam at north of project boundary.

4.2.2 SITE VISIT – DRAINAGE CHARACTERISTICS

The existing site comprises vacant undeveloped land with a residential property in the north east end of the southern lot. An existing gas pipeline and power transmission is located within the site

In general, the site has relatively gentle gradients, with site photos indicating the surface becomes waterlogged in winter, refer to Photo 4.1, Photo 4.2, Photo 4.3 and Photo 4.4.

There are mature trees and rushes at locations throughout the site.

Photo 4.1 Surface water ponding

Photo 4.2 Surface water ponding

Photo 4.3 Surface water ponding

Photo 4.4 Water ponding in a channelized area to the north of the proposed project area

The key hydrology features at the site are the four farm dams located across the project site. Surface water runoff from the site is directly via overland flow paths towards the existing farm dams. The dams are bunded with an inlet channel. The WSP Preliminary Groundwater Assessment, dated September 2021, noted groundwater baseflow discharge does not occur in the small surface water features near the proposed BESS and GPG portion of the site.

There are no designated watercourses within the site boundary.

Photo 4.5 Farm Dam located onsite

Photo 4.6 Bunded wall of farm dam

4.2.3 WATER SENSITIVE RECEPTORS

WSP prepared an ecological assessment for the project, *Proposed Energy Reserve 1 Facility; Winton Ecological Impact Assessment*, dated August 2021 (reference: PS125526-RPT-ECO_REV0). Based on a review of available information and a site assessment (dated 25 June 2021), the type and extent of vegetation communities, the fauna habitats and potential impact of the project on biodiversity values were identified.

In terms of surface water sensitive receptors, the channelised seasonally wet depression was identified in the report. This long shallow swale is across the north of the study area and that provides shallow and *Tall Marsh EVC 821* habitat. This seasonally wet shallow swale provides habitat for native frogs, reptiles, birds local to the study area and dispersing throughout the landscape. It is possible the Growling Grass Frog may utilise the Tall Marsh channel.

4.3 FLOOD CONDITIONS

4.3.1 PLANNING OVERLAY

The Project is within a Farming Zone (FZ) planning overlay and does not intersect planning scheme overlays relevant to surface water including Land Subject to Inundation Overlay (LSIO), Special Building Overlay (SBO), Rural Flood Overlay (RFO) and Floodway Overlay (FO).

4.3.2 GOULBURN BROKEN COMMUNITY FLOOD INTELLIGENCE PORTAL

The *Goulburn Broken Community Flood Intelligence Portal* has been developed with local councils to help improve the flood resilience of the catchment's community, property, infrastructure and environment. According to interactive flood maps within the *Goulburn Broken Community Flood Intelligence Portal,* the Project does not intersect with a known floodplain.

4.4 CLIMATIC CONDITIONS

The local area rainfall climate data is characterised as temperate area with reference to two weather stations close to the project:

- Station at Shadforth Station (ID: 082002)

- Benalla Airport station (ID: 082170)

The station at Shadforth Station monitored rainfall data from 1886 to 2006 with a mean annual rainfall of 671.3 mm per year. The Benalla Airport station started to collect data from 2006 to present with a mean annual rainfall of 600.5 mm per year. Wet and dry seasons can be identified in local area as precipitation is not distributed evenly within a year. Higher rainfall is expected in winter seasons (June, July and August). Monthly climate averages are summarised in Table 4.1 and Table 4.2.

Table 4.1 Monthly rainfall averages at Shadforth Station

MONTH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
Rainfall (mm)	40.7	35.9	43.7	49.2	63.4	73.7	72.0	71.3	63.3	64.7	48.0	42.8

Table 4.2 Monthly rainfall averages at Benalla Airport

MONTH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
Rainfall (mm)	39.4	41.8	55.0	47.9	46.8	54.0	67.0	57.7	43.0	36.3	48.3	51.7

4.5 WATER QUALITY

4.5.1 *RIVER AND STREAM - WINTON CREEK*

River and stream condition in Victoria is assessed using the Index of Stream Condition (ISC). The ISC is an integrated measurement for the environmental condition of river reaches regarding in the aspects of hydrology, water quality, streamside vegetation, bed and bank condition. The Index of Stream Condition – The Third Benchmark of Victorian River Condition ('ISC3') (Department of Environment and Primary Industry, 2013) report provides a summary of river health for major rivers and stream in Victoria using data collected over a six-year period from 2004-2010.

The ISC3 report summarized the stream condition of Winton Creek and the ISC score for the Winton Creek is summarised in Table 4.3.

Table 4.3 Winton Creek ISC

BASIN	REACH ID	REACH LENGTH	HYDROLOGY	PHSICAL FORM	STREAM SIDE ZONE	WATER QUALITY	AQUATIC LIFE	ISC SCORE	CONDITION
Broken Basin	20	24.1km	7	9	6	-	7	34	Moderate

4.5.2 *WETLAND CONDITIONS*

Wetlands condition in Victoria can be derived from the Waterwatch Portal, a science program assists in waterways management through monitoring physical and chemical condition of waterways in Victoria, in which wetlands conditions are measured in the aspects of dissolved Oxygen, Electrical conductivity, Nitrate, pH, Turbidity, Total Phosphors, Rainfall and Temperature.

Winton Wetlands at Bill Friday Swamp (Site Code: GB_WWI007) is the closest monitoring site to the project located approximately 450 m south of the project. It was activated since 2011. Monitoring data of this site is summarized

Table 4.4 Winton Wetland water quality at Bill Friday Swamp

PARAMETERS	Dissolved oxygen (ppm)	Turbidity (NTU)	Electrical conductivity (µs/cm)	pH	total phosphorus as p (mg/l)	Nitrate – nitrogen (mg/l)	Temperature – water (° c)
Maximum	12.6	85	681	8.3	0.55	0.9	28.4
Minimum	4.8	7.5	143	6.7	0.02	0.2	12

5 CONCEPT DRAINAGE STRATEGY

5.1 PROPOSED SITE LAYOUT

Changes to the site condition that impacts on surface water include new hardstand areas, internal sealed access roads, kerbs and site fencing.. The site is relatively gentle contour slopes however, it is anticipated minor changes to site contours will be required for the proposed development. The project layout plan is presented in Figure 1.1.

It is noted this project will be delivered as an EPC contract and as such the EPC contractor will prepare the detailed project layout plan.

5.2 PROPOSED DRAINAGE STRATEGY

5.2.1 FLOOD IMPACT ASSESSMENT

The project does not interact with designated watercourses or floodplains. Therefore, no transverse drainage or mitigation measures are required to maintain existing waterways or floodplains.

5.2.2 STORMWATER MANAGEMENT - QUANTITY

BESS AND GPG FACILITY

Increases in surface water runoff expected from the introduction of new impervious hardstand areas (such as buildings and internal roads). The *Urban Stormwater Management Guideline (2021)* best practice performance objective for stormwater flow regime impacts includes a percentage reduction of the mean annual rainfall at site for infiltration. Based on the two available BoM Station data, the average annual rainfall (MAR) is between 600.5 mm and 671.3 mm. Assuming the more conservative MAR of 600 mm, according to Table 3.4, the project is required to harvest 29% of this MAR.

The proposed layout plan for the BESS and GPG Facility (WSP reference: PS125526-WSP-WIN-ELE-DRG-100 RevB), dated 3 March 2022 shows the wetter areas along the northern boundary of the site will not be impacted by the Project. The increase in runoff rates due to the new hardstand areas and the removal of dam storages will need to be assessed at the next design stage.

An outfall location at the existing culvert and channel in the western portion of the site has been identified. Obtaining the necessary licencing approvals from Goulburn Broken CMA for new outfall locations will need to take place prior to construction phase.

5.2.3 STORMWATER MANAGEMENT - QUALITY

BESS AND GPG FACILITY

Surface water runoff from the hardstands, buildings and sealed road areas are classified as urban runoff and as such will increase the stormwater pollutant loads within the local catchment.

The Project is required to demonstrate the proposed works will meet the best practice performance objectives as per the *Urban Stormwater Management Guideline (2021).* The best practice performance objectives for stormwater quality and flow regime impacts are summarised in Table 3.4. Increases to pollutant loads need to be assessed and mitigated prior to discharge off site using Water Sensitive Road Design (WSRD) elements, such as swales, bioretention systems, basins and wetlands, as part of the design phase.

In addition to the *Urban Stormwater Management Guideline (2021),* the *Envelop of Effects* report presented a spills risk assessment together with management and disposal controls for accidental oil leakage at the BESS and GPG facility. The BESS, gas power generation, transformers and switchyard area were identified as low oil spill risk areas. The proposed

oil spill mitigation approach includes equipping bunds or tanks to capture oil, installing an oil/water separator system and separating oily water disposal from clean stormwater, to minimize stormwater contamination by onsite oil leakage. Discharge criteria for treated and separated water from oily wastewater should be less than 10mg/L oil during a 5% Annual Exceedance Probability (AEP) (1 in 20-year) rainfall event.

The WSUD measures should targeted upstream of the proposed discharge location.

In addition to WSUDs and the low oil risk areas identified in the *Envelop of Effects* report, there is potential for surface water quality impacts from uncontrolled fuel and chemicals spills during construction and from vehicles. This risk will be mitigated by including appropriate infrastructure to capture, contain and manage any accidental spills or leaks.

Consultation with Goulburn Broken CMA is recommended to determine if additional water quality criteria are required for this project.

5.3 CONCEPT DRAINAGE STRATEGY

The EPC contractor will prepare the detailed project design that will include a detailed drainage layout. At this stage of the design, a drainage strategy for potential new drainage infrastructure required to collect, convey and where required, treat stormwater across the site is to consider:

- Pits and underground pipe network at the eastern portion of the site (location of hardstands, internal roads, buildings, etc.). Where kerbs are provided, inlet pits (either side-entry pits or grated side-entry pits) should be specified at the low point of the access road. Runoff collected via the pit and pipes are to be directed towards the northern boundary of the site and discharge towards a swale on the western portion of the site. This follows the natural gradient of the site.
- Depending on the final site contours, pumping may be required at the proposed bunded areas to pump the collected oily wastewater to an oil/water separator and treatment system. The separated clean water then will be directed to join the stormwater pit and pipe network while the separated oil will be stored at the oil tank and transported off site for disposal. The oil/water separator or treatment point is proposed immediately to the west of the BESS with the aim of providing treatment from bunded areas prior to discharge towards the western portion of the site.
- WSUD design can also be considered at this treatment point to safeguard stormwater quality prior to flowing towards the proposed surface water outlet point..
- At the western portion of the site, rainfall will infiltrate into vegetated areas. Rainfall that is not infiltrated will be directed overland towards a swale at the northern boundary. This follows the natural contours of the site.
- The proposed swale will treat, attenuate and convey runoff towards the existing culvert and channel at the western portion of the site. Additional WSUD features (such as a basin, wetland, etc) may be required following water quality modelling results.
- A rainwater harvesting or water re-use scheme to meet the *Urban Stormwater Management Guideline (2021)* flow volume is requirement. The increased runoff volume by new proposed impervious layers can be estimated in water balance modelling. To mitigate the increased stormwater runoff volume onsite, the proposed WSUD design should consider a new detention basin or investigate if the existing farm dams can be modified to meet EPA rainwater detention requirements. Stormwater collected onsite maybe reused for equipment washdown, other general usage or treated and used as a source of water supply for the facility.

The sizing of the proposed drainage infrastructure and location will depend on hydraulic modelling results and the final layout and ground elevations at the site. The concept drainage layout is shown in Appendix B.

5.4 CONSTRUCTION PHASE – WATER MANAGEMENT

Erosion from construction sites have the potential to contribute to large sediment loads to downstream areas. Potential sediment transport due to erosion of exposed soil results in negative impact to surface water quality. The erosion and sediment control practice need to be conducted to minimise land disturbance, soil erosion, and the discharge of sediment to surface water runoff. The concept Erosion and Sediment Control Plan (ESCP) will need to be developed in accordance with the requirements of the Best Practice Erosion and Sediment Control Guidelines, IECA (2008) and meet the following objectives:

- Management of onsite overland flow
- Overland flow will be collected, conveyed, and treated to meet IECA flow volume and sediment discharge standards prior to discharge offsite.
- Vegetation regrowth onsite
- Vegetation replantation is to be integrated into the WSUD design to maintain the stormwater runoff patterns and provide primary treatment for sediment control.
- Implementing soil erosion protection measures
- Early planning, design and implementation of erosion protection measures, such as minimizing areas of soil exposure during construction, placement of detention basin to slow flow velocity and dissipate flow energy, and isolation of construction workspace in wet season.
- Minimising disturbance on soil and stormwater runoff and applying mitigation measures where needed.

Water quality data for the drainage channel downstream of the proposed outlet location is not available. To establish a baseline of water quality in the downstream channel, it is recommended monitoring should commence prior to construction and preferably for a period of 18 months.

6 RECOMMENDATIONS

Based on this surface water and drainage strategy, the recommendations for future detail design stages include:

- Hydrologic and hydraulic modelling of the proposed drainage network to identify pipe sizes, pit locations and pipe gradients.
- WSRD and management and disposal controls for accidental oil leakage at the BESS and GPG facility is to be incorporated into the drainage design prior to runoff discharging offsite. The allocation of space for new drainage infrastructure, an oil/water separator system and WSUD treatment elements (including swales and rainwater harvesting infrastructure) should be included in future design layouts. Water quality and water balance modelling (MUSIC) is required to quantify the sizing and effectiveness of WSUD features and rainwater harvesting infrastructure.
- Water quality data for the drainage channel downstream of the proposed outlet location is not available. To establish a baseline of water quality in the downstream channel, it is recommended monitoring should commence prior to construction and preferably for a period of 18 months.
- The proposed outlet discharges to a drainage channel that connects to the Winton Wetland complex. In consultation with Goulburn Broken CMA, determine if water quality criteria in addition to those outlined in the *Urban Stormwater Management Guideline (2021*) are required.
- A suite of surface water mitigation measures should be incorporated into Environmental Management Plans for each of the construction, operational and decommissioning phases of the project. Mitigation measures include preparing an erosion and sediment control plan and staging construction to minimise the risk of soil erosion and sediment laden runoff.

7 CONCLUSIONS

The Lochard Energy Reserve 1 Facility (the project) is 9 km north east of Benalla, within the Goulburn Broken CMA management area.

The following are the key surface water and drainage characteristics of the site:

- There are no Goulburn Broken CMA designated watercourses within the project boundary.
- The project does not intersect with flood planning overlays or Goulburn Broken CMA defined floodplains.
- Based on the 2019 survey, no external transverse drainage channels intersect the site.
- The key hydrology features at the site are the four farm dams located across the project site. Surface water runoff from the site is directly via overland flow paths towards the existing farm dams. The dams are bunded with an inlet channel.
- While the site grades towards the northern boundary, site contours indicate gradients are shallow resulting in water logging of the site during wetter months.

Based on the above existing conditions, no significant flood risk from external catchments or existing drainage features were identified.

In terms of surface water sensitive receptors, a channelised seasonally wet depression was identified within the site near the northern boundary and provides shallow and *Tall Marsh EVC 821* habitat. This seasonally wet shallow swale provides habitat for native frogs, reptiles, birds local to the study area and dispersing throughout the landscape.

The Winton Wetlands located downstream and north of the project is not classified as a RAMSAR wetland. However, the Winton Wetlands may be hydraulically connected via the outfall and drainage channel to the project. Individual wetlands are located within the Winton Wetland complex, the closest to the project is Bill Friday Swamp located approximately 350m.

Considering the potential for hydraulic connectivity between the project and sensitive receptors, consultation with Goulburn Broken CMA is recommended to determine if additional water quality requirements other than the *Urban Stormwater Management Guideline (2021*) is required.

Increases in surface water volumes may be caused by the removal of existing farm water dams and proposed impervious surfaces. A rainwater harvesting or water re-use scheme to meet the *Urban Stormwater Management Guideline (2021)* flow volume is required.

The Project is also required to demonstrate the proposed works will meet water quality objectives as per the *Urban Stormwater Management Guideline (2021).* The *Envelop of Effects* report presents a spills risk assessment together with management and disposal controls for oil leakage at the BESS and GPG facility.

Water quality data for the drainage channel downstream of the proposed outlet location is not available. To establish a baseline of water quality in the downstream channel, it is recommended monitoring should commence prior to construction and preferably for a period of 18 months.

8 LIMITATIONS

This Report is provided by WSP Australia Pty Limited (WSP) for Lochard Energy (Client) in response to specific instructions from the Client and in accordance with WSP's proposal dated 10 June 2021 and agreement with the Client dated 9 July 2021 (Agreement).

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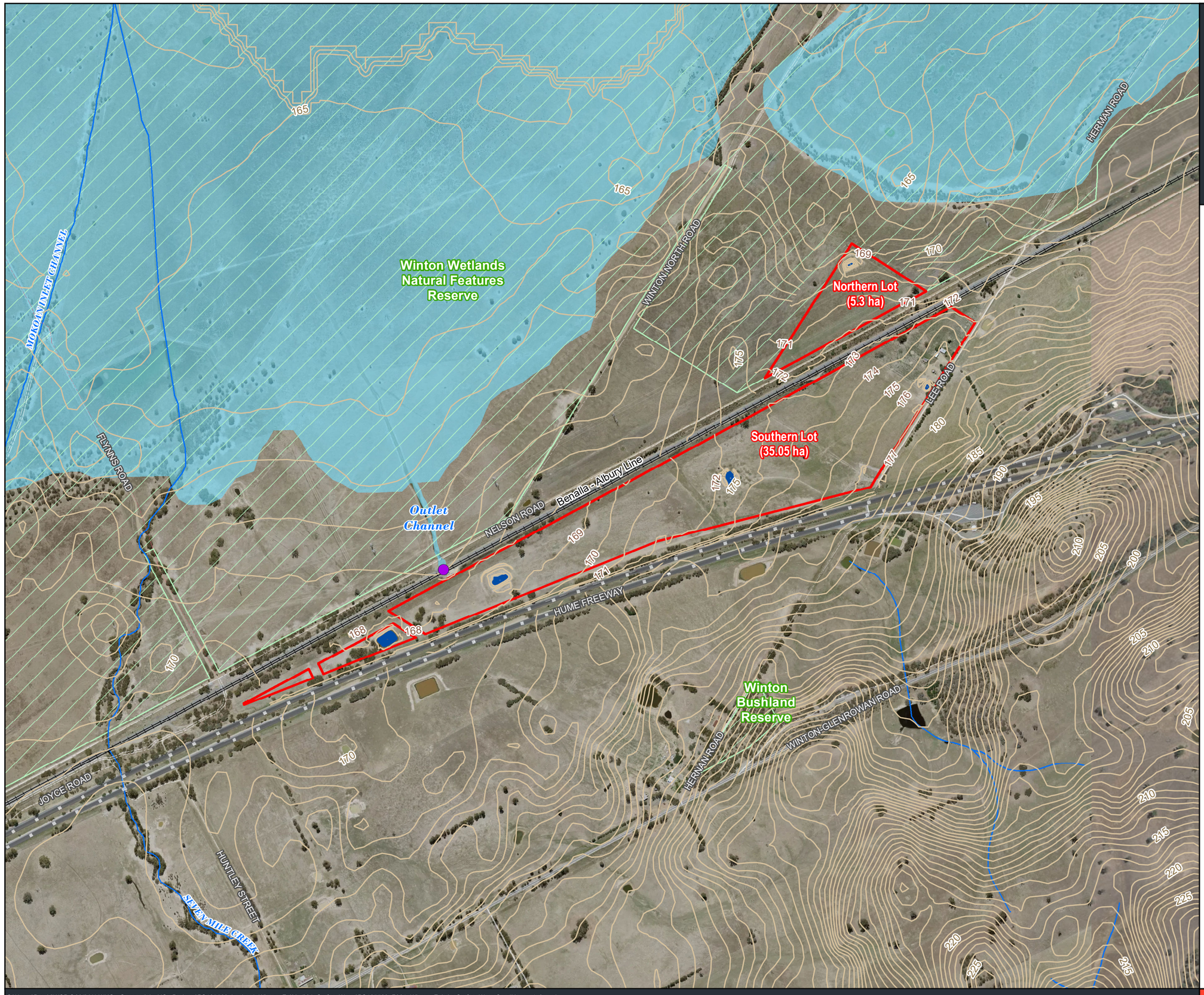
APPENDIX A

MAP OF EXISTING SURFACE WATER FEATURES



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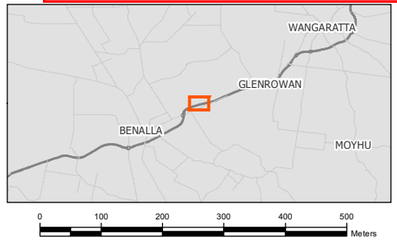
Lochard Energy
Reserve 1 Facility: Winton

Appendix A
Existing Surface Water Conditions

- Contour (1m interval)
- Existing Culvert
- Railway
- Watercourse
- Parks and Reserves
- Project Area
- Existing Farm Dam
- Waterbodies

ADVERTISED PLAN



Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:10,000 Date: 02/02/22

Data sources: DELWP, Geoscience Australia, MetroMap Imagery, WSP, Veris Feature and Level survey (Drawing reference: 303278-BA, dated 31 May 2021), Veris project boundary survey April 2021

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APPENDIX B

CONCEPT DRAINAGE PLAN

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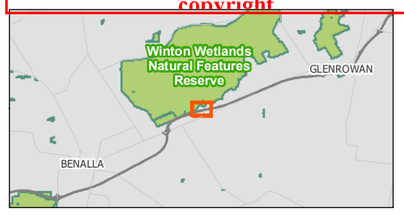
Appendix B
Concept Drainage Layout

- Drainage Flow Direction
- Contour (mAHD, 1m interval)
- Watercourse
- Project Area
- Fence
- Infrastructure
- MV Cable Route
- Road
- Bunded Area
- Proposed Drainage Infrastructure
- Parks and Reserves

ADVERTISED PLAN



Coordinate system: GDA2020 MGA Zone 55

Scale ratio correct when printed at A3

1:5,000 Date: 24/05/2022

Data sources: - DELWP, Geoscience Australia, MetroMap Imagery, WSP layout plan (Lee_Rd_BESS_SF_H2 Rev6 Model)', Veris Feature and Level survey (Drawing reference: 303278-BA, dated 31 May 2021) and Veris project boundary survey April 2021