SOIL AND WATER ASSESSMENT
FOR
WINTERGREEN FARM
3329 OXLEY HIGHWAY SOMERTON NSW 2340

Prepared for: Wintergreen Farm
Department of Planning, Housing and Infrastructure
NSW EPA
Tamworth Regional Council

Prepared by: [redacted] Environmental Scientist
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Report No: 251021_SoilWater_Rev4
June 2025
(Released: 27 June 2025)

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Engineering a Sustainable Future for Our Environment

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DOCUMENT REVISION RECORD

Revision	Date	Description	Checked	Approved
1	09-05-2025	Draft / Rev1	[redacted]	
2	12-06-2025	Draft / Rev2		
3	13-06-2025	Draft / Rev3		
4	27-06-2025	Rev4		

DOCUMENT DISTRIBUTION

Revision	Issue Date	Issued To	Issued By
1	09-05-2025	Wintergreen Farm Pty Ltd	Benbow Environmental
2	12-06-2025	Wintergreen Farm Pty Ltd	Benbow Environmental
3	13-06-2025	Wintergreen Farm Pty Ltd	Benbow Environmental
4	27-06-2025	Wintergreen Farm Pty Ltd	Benbow Environmental

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1. INTRODUCTION

Benbow Environmental has been commissioned by Wintergreen Farm Pty Ltd to prepare a Soil and Water Assessment for the proposed expansion of their existing poultry farm, located at 3329 Oxley Highway, Somerton, NSW, 2340 (legally described as Lot 10 DP261839). This document supplements the Environmental Impact Statement for the proposed development.

Currently, the Site accommodates 240,000 birds in six sheds. The proposed development is seeking to expand operations to accommodate 810,510 birds within a total of fourteen (14) sheds. The assessment is a qualitative study that addresses the potential impacts to soil and water from construction and operational activities at the Site.

1.1 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS (SEARS)

On 5th April 2025, SEARs No. 1982 was issued for the proposed development. The following Table 1-1, provides the requirements sought by the Department of Planning, Housing and Infrastructure, the NSW Environment Protection Authority and the Tamworth Regional Council.

Table 1-1: Soil and Water SEARs

Requirement	Comment
Department of Planning, Housing and Infrastructure	
A description of local soils, topography, drainage and landscapes details of water usage for the proposal including existing and proposed water licencing requirements in accordance with the Water Act 1912 and/or the Water Management Act 2000.	Section 4.1
Details of sediment and erosion controls.	Section 3.8
A detailed site water balance.	Section 3.5.1
A description of the measures proposed to ensure the development can operate in accordance with the requirements of any relevant Water Sharing Plan or water source embargo.	Section 3
An assessment in accordance with ASSMAC Guidelines for the presence and extent of acid sulfate soils (ASS) and potential acid sulfate soils (PASS) on the site and, where relevant, appropriate mitigation measures.	Section 4.1.3
Details of the proposed stormwater and wastewater management systems (including sewage), including any proposed application to land.	Section 3.6
An assessment of potential impacts on the quality and quantity of surface and groundwater resources consistent with relevant guidelines, including details on any water monitoring program and measures to mitigate impacts.	Section 3.7
A description and appraisal of impact mitigation and monitoring measures.	Section 5
An assessment of flood risk on the site. The assessment should determine: the flood hazard in the area; address the impact of flooding on the proposed development, and the development's impact (including filling) on flood behaviour of the site and adjacent lands; and address adequate egress and safety in a flood event.	Section 3.7.6
NSW EPA	
Water management systems and the protection of surface waters and groundwater from runoff, and management of contaminated wash water from shed cleaning and if applicable, free-range yards.	Section 3.6

Requirement	Comment
Identify and assess the potential impacts to surface waters from the proposal and detail the management and mitigation measures for those impacts. Regard is to be given to the management of proposed surface water management systems during any concurrent construction and operational activities.	Section 3.7

1.2 SCOPE OF WORKS

The is a qualitative assessment, with the scope detailed as follows:

- Review of relevant plans and documentation relating to the site and proposed development;
- Addressing the key issues for "soil and water" identified in the Tamworth Regional Council Pre-Lodgement requirements including:
  - A description of local soils, topography, drainage and landscapes;
  - The details of stormwater, leachate and wastewater management;
  - The details of flood risk and mitigation measures;
  - The details of sediment and erosion controls;
  - A detailed site water balance;
  - The details of water usage including water supply and licenses;
  - An assessment of impacts to surface resources and flooding impacts;
  - Identification of the probability of the occurrence of acid sulfate soils at the site and determination of whether an acid sulfate soil management plan in accordance with ASS MAC guidelines is required; and
  - A description and appraisal of impact mitigation and monitoring measures.

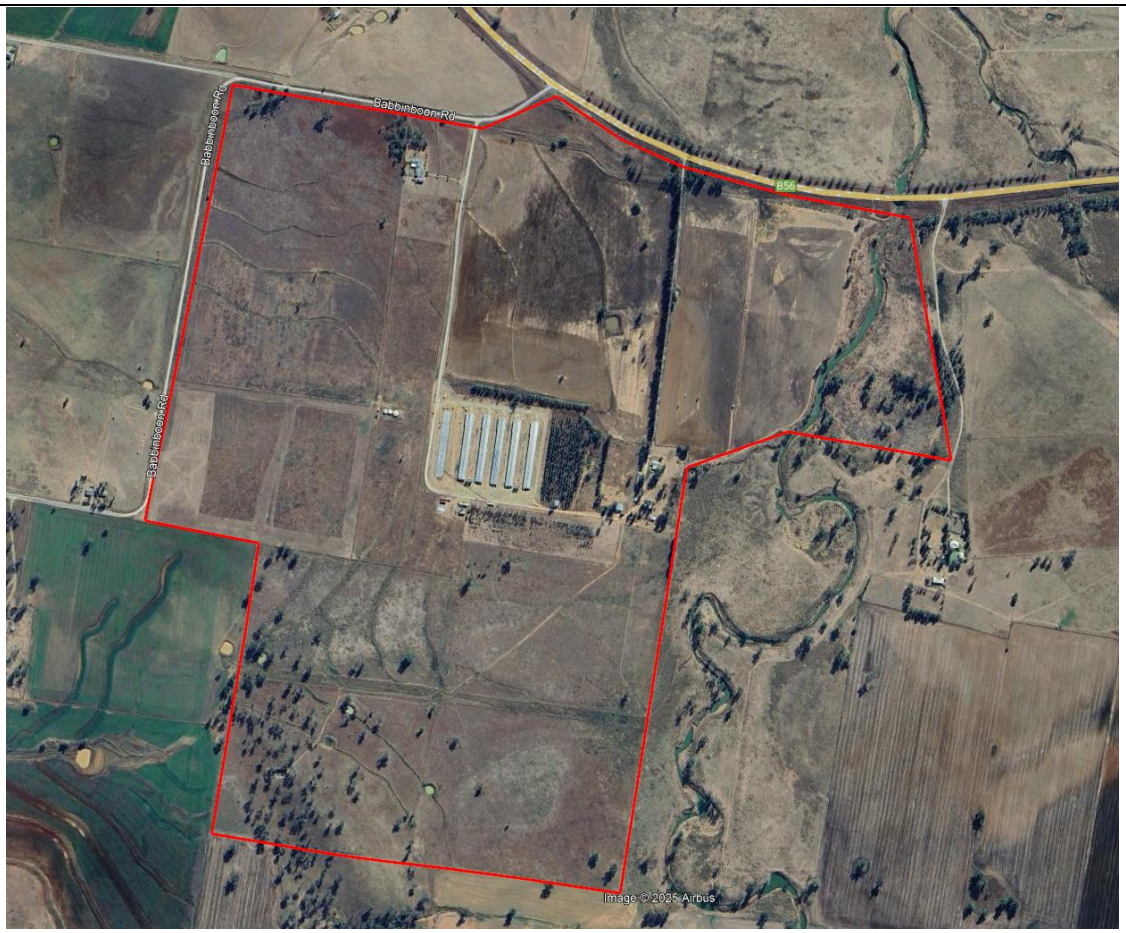
The report has been prepared based on the information provided by the client and from publicly available data regarding regional soil and water information

No soil or water sampling or analysis was undertaken as part of this assessment. Recommendations for further studies to support the findings of this report are provided where considered necessary.

2. SITE DETAILS AND PROPOSED DEVELOPMENT

The site is located in a rural area and is located approximately 30 km northwest of Tamworth. The site is surrounded by existing agricultural/rural landscapes, consistent with the primary production land use of the region. The site location is shown in Figure 2-1.

Figure 2-1: The Site Location



Source: Google Earth 2023

↑N Not to scale	LEGEND: Site boundary	Benbow Environment 27-29 Sherwood Street Northmead NSW 2152

2.1 DESCRIPTION OF THE SITE

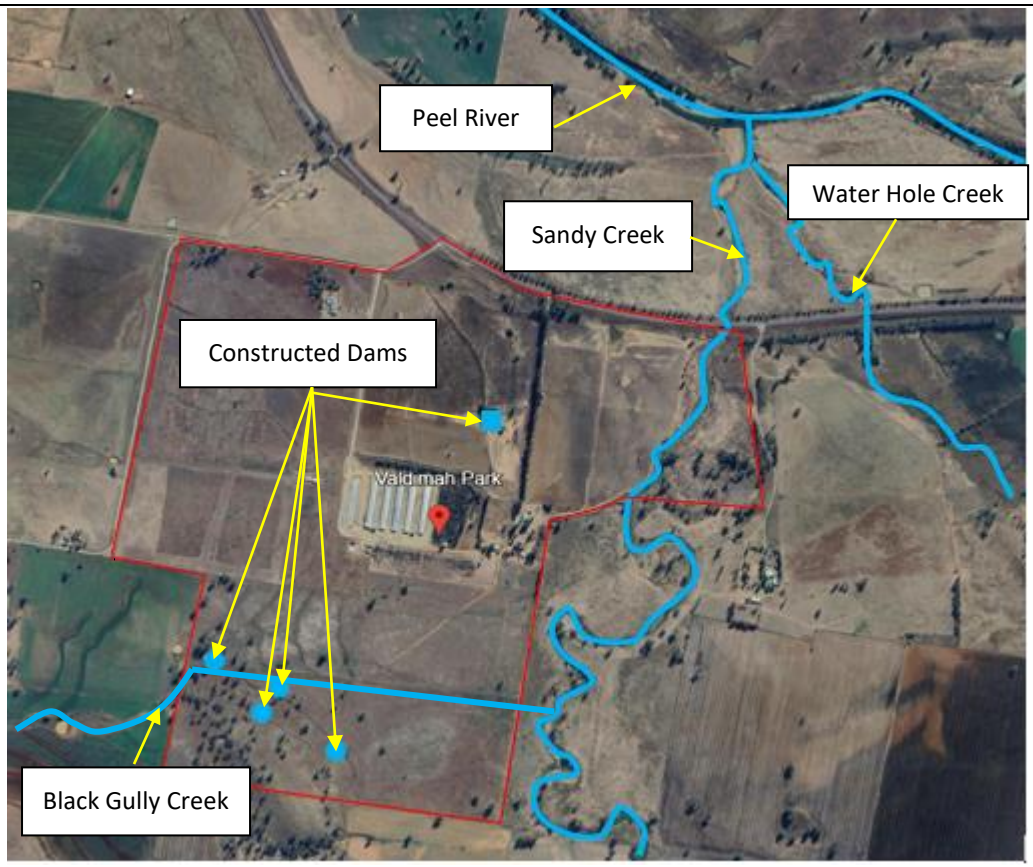
The land parcel covers an area of approximately 2,150,000,m^2 (215 ha), comprising mainly of cleared land, with the existing poultry sheds situated in the middle of the site. The Site is accessed from the Oxley Highway (B56) at its northern boundary, via an internal tree-lined, unsealed road. The Site's only natural waterbody is Sandy Creek, that runs through the Site's northeastern corner. The topography of the Site presents an overall falling slope from an elevation of 350 m (AHD) at the southwestern corner, towards the Site's north-east and south-east boundaries, with a fall of 25-30 m.

2.2 NEAREST WATERWAYS

The land parcel itself contains a number of small creeks that flow through the site. Sandy Creek, located in the Site's east, exits through its northeastern corner then into the Peel River, located above the Site. Another creek, Black Gully, which is a modified drainage line and located in the Site's southern half, flows easterly across the width of the land parcel and then into Sandy Creek. Sandy Creek's headwaters are located in the Melville Range Nature Reserve approx. thirteen (13) km south of the Site. The creek flows north until it connects to the Peel River approximately 700 m north of the Site. The Peel River is an easterly flowing stream, eventually joining the Namoi River. Water Hole Creek is another tributary of Sandy Creek, located east of Sandy Creek.

The Site contains five small earthen dams in the Site's south, southwest and north and appear to be independent from the local waterways. According to Google Earth images, the dams are interconnected by extended drainage channels that discharge into Black Gully Creek. As noted, the southwest corner of the site is elevated, allowing these drainage lines to capture overland flow from the sloping terrain. Given the region's relatively low average annual rainfall of approximately 600 mm, water can be collected anyway as needed. These waterbodies are visualised below in Figure 2-2.

Figure 2-2: Location of the Nearest Waterbodies to the Site



Source: Google Earth 2023

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Not to scale

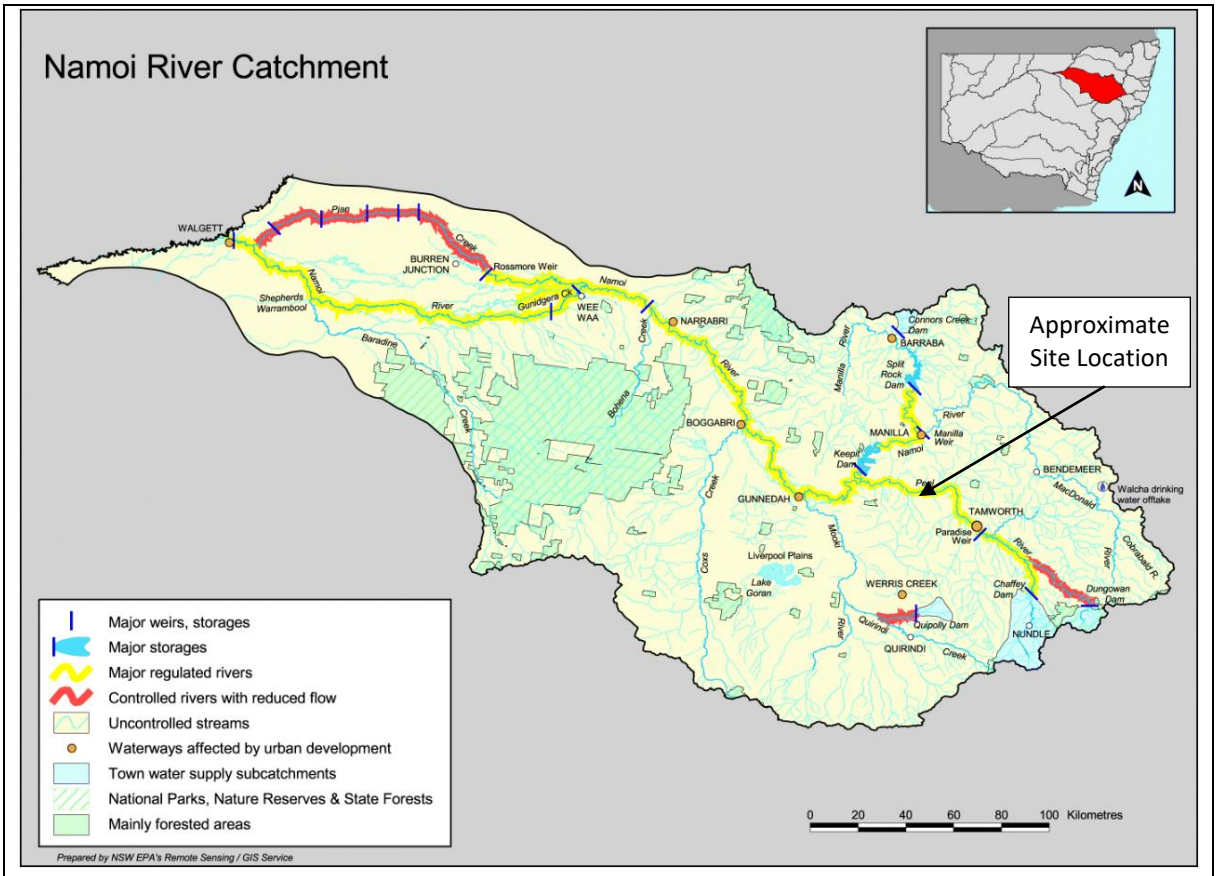
LEGEND:
Site boundary

Benbow Environment
27-29 Sherwood Street
Northmead NSW 2152

2.3 CATCHMENT MANAGEMENT PLAN

The Site is located within the Namoi River Catchment. The site's approximate location can be seen below in Figure 2-3.

Figure 2-3: Map showing the Namoi River Catchment



Source: NSW EPA Remote Sensing for NSW Water Quality and River Flow Objectives

↑N Not to scale		Benbow Environmental 27-29 Sherwood Street, Northmead NSW 2152

2.4 RAINFALL

The Bureau of Metrology's (BoM) Intensity Frequency Duration (IFD) Design Rainfall Depth (mm) for the site area is provided in Table 2-1 below, based on the 2016 Rainfall IFD Data System.

Table 2-1: Annual Exceedance Probability (AEP) Depth -30.976488°, 150.662650°

Duration	63.20%	50%	20%	10%	5%	2%	1%
1 min	1.82	2.06	2.83	3.37	3.91	4.64	5.22
2 min	3.08	3.46	4.70	5.61	6.53	7.72	8.66
3 min	4.29	4.82	6.56	7.81	9.07	10.7	12.0
4 min	5.37	6.05	8.26	9.83	11.4	13.5	15.1
5 min	6.34	7.16	9.79	11.6	13.5	16.0	17.9

Table 2-1: Annual Exceedance Probability (AEP) Depth -30.976488°, 150.662650°

Duration	63.20%	50%	20%	10%	5%	2%	1%
10 min	9.96	11.3	15.5	18.5	21.4	25.5	28.6
15 min	12.4	14.0	19.3	23.0	26.7	31.8	35.8
20 min	14.2	16.0	22.1	26.3	30.6	36.4	41.1
25 min	15.6	17.6	24.2	28.9	33.6	40.0	45.1
30 min	16.7	18.9	26.0	31.0	36.0	42.9	48.4
45 min	19.3	21.8	29.8	35.6	41.4	49.2	55.5
1 hour	21.3	23.9	32.6	38.8	45.1	53.7	60.4
1.5 hour	24.1	27.1	36.7	43.5	50.5	59.9	67.4
2 hour	26.4	29.5	39.8	47.1	54.5	64.5	72.5
3 hour	29.8	33.3	44.6	52.6	60.7	71.7	80.4
4.5 hour	33.7	37.6	50.2	59.0	67.9	80.1	89.7
6 hour	36.8	41.1	54.8	64.3	73.9	87.0	97.5
9 hour	41.7	46.6	62.1	72.9	83.8	98.8	111
12 hour	45.5	50.8	67.9	79.9	92.0	109	122
18 hour	51.2	57.3	77.0	91.0	105	125	141

2.5 PROPOSED DEVELOPMENT

The existing site accommodates 240,000 birds. The proposed development is seeking to expand operations to accommodate 810,510 birds within a total of fourteen (14) sheds. Each existing shed has an internal floor area of 2,323 m^2 with the proposed sheds having a slightly larger internal floor area of 2,970 m^2.

The stocking density of approximately 34 kg per square metre will apply to all fourteen (14) sheds. This corresponds to a maximum capacity of 49,945 birds for the existing sheds and 63,855 birds for the proposed sheds.

2.6 OPERATIONAL DETAILS

Each shed would go through a 9 -10 week production cycle, consisting of approximately 7-8 weeks of a growing phase and a two week break in between each growing phase. Typically, birds are collected for harvesting during the fifth, seventh and last (seventh or eighth) week in the growth cycle. The RSPCA stipulated stocking density requires no more than 34 kg per m^2. The birds are weighed towards the last weeks of their growing phase to ensure thinning out occurs and the RSPCA stocking density is not exceeded.

In the two (2) week break period, at the end of every growing phase, a full shed clean out is undertaken and usually completed in two (2) days. The clean out involves the mechanical removal of all spent litter from the sheds and its immediate disposal. The litter is collected by contractors, loaded directly onto trucks and transported off site for further processing elsewhere (usually used as a valuable by-product for other forms of agricultural activities). Shed clean out is immediately followed by disinfection.

Wood shavings and straw are most commonly used as litter material. Nipple drinkers fitted with catch-cups are used to supply drinking water to the birds, while pneumatically controlled pipelines deliver chicken feed from hoppers.

2.7 EXISTING SITE CONTAMINATION

A Preliminary Site Investigation undertaken by Benbow Environmental in April 2025 (Ref: 251021_PSI_Rev1) found, based on the available evidence, that the current risk of contamination to the soils and groundwater within the proposed development is considered as low. A Detailed Site Investigation was not considered as warranted.

3. WATER ASSESSMENT

This section provides the water assessment for the proposed development.

3.1 LICENSING REQUIREMENTS

The two key pieces of legislation for the management of water in NSW are the *Water Act 1912* and the *Water Management Act 2000*.

3.1.1 Water Act 1912

Licences for water conservation, irrigation, water supply or drainage as well as changing the course of a river can be applied for under the *Water Act 1912*.

The proposed development does not involve works for water conservation, irrigation, water supply or drainage and does not involve works that would change the course of a river, therefore, the *Water Act 1912* does not apply.

3.1.2 Water Management Act 2000

The *Water Management Act 2000* provides requirements for water extraction, water use, floodplain and drainage management, the construction of works such as dams and weirs, and undertaking activities on or near water sources in NSW. Approvals for the extraction and use of water, construction of works relating to water use and controlled activities carried out on waterfront land can be obtained under the Act.

Clause 91(2) of the Water Management Act, 2000 (WMA Act) requires an activity approval to carry out a controlled activity in, on or under waterfront land. The following definitions apply:

> ***"controlled activity"*** *means:*
>
> *a) the erection of a building or the carrying out of a work (within the meaning of the Environmental Planning and Assessment Act 1979), or*
> *b) the removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise, or*
> *c) the deposition of material (whether or not extractive material) on land, whether by way of landfill operations or otherwise, or*
> *d) the carrying out of any other activity that affects the quantity or flow of water in a water source.*
>
> ***"waterfront land"*** *means:*
>
> *a) the bed of any river, together with any land lying between the bed of the river and a line drawn parallel to, and the prescribed distance inland of, the highest bank of the river, or*
> *(a1) the bed of any lake, together with any land lying between the bed of the lake and a line drawn parallel to, and the prescribed distance inland of, the shore of the lake, or*
> *(a2) the bed of any estuary, together with any land lying between the bed of the estuary and a line drawn parallel to, and the prescribed distance inland of, the mean high-water mark of the estuary, or*

b) if the regulations so provide, the bed of the coastal waters of the State, and any land lying between the shoreline of the coastal waters and a line drawn parallel to, and the prescribed distance inland of, the mean high water mark of the coastal waters, where the prescribed distance is 40 metres or (if the regulations prescribe a lesser distance, either generally or in relation to a particular location or class of locations) that lesser distance. Land that falls into 2 or more of the categories referred to in paragraphs (a), (a1) and (a2) may be waterfront land by virtue of any of the paragraphs relevant to that land.

The closest potential waterbody to the proposed development is Black Gully, which is an anthropogenic drainage line or channel some 160 m below the proposed development. The channel is dry except during and shortly after, rain events, when it collects overland flow from land on either side (north and south). Collected water drains easterly, exiting the Site before entering Sandy Creek.

The northly flowing Sandy Creek is the closest natural waterbody to the proposed development, with its closest point some 200 m away. It has a meandering channel and flows roughly parallel to the Site's eastern boundary.

The proposed development is not within 40 metres of either Black Gully or Sandy Creek. Therefore, the proposed development does not require a controlled activity approval under the Water Management Act 2000.

3.1.3 Water Sharing Plans

One water sharing plan applies to the area where the subject site is located. This is the:

- NAMOI ALLUVIAL GROUNDWATER SOURCES 2020;

This does apply to the proposed development.

3.2 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997

Clause 120 of the *Protection of the Environment Operations Act 1997* states the following:

120 Prohibition of pollution of waters
(1) A person who pollutes any waters is guilty of an offence.
Note. An offence against subsection (1) committed by a corporation is an offence attracting special executive liability for a director or other person involved in the management of the corporation—see section 169.
(2) In this section:
pollute waters includes cause or permit any waters to be polluted.

The proposed development will not breach the above clause due to the proposed mitigation measures and safeguards that are to be implemented as described throughout this report.

3.3 TAMWORTH REGIONAL LOCAL ENVIRONMENTAL PLAN 2010

Clause 5.21 of the *Tamworth Regional Local Environmental Plan 2010* provides requirements for developments which are in flood planning area. The objective of this clause is to minimise risk to

life and property associated with the use of land and to allow development on land that is compatible with the land's flood hazard as well as ensuring no adverse impacts on flood behaviour.

Flood planning

(*1) The objectives of this clause are as follows—*

(a) to minimise the flood risk to life and property associated with the use of land,

(b) to allow development on land that is compatible with the flood function and behaviour on the land, taking into account projected changes as a result of climate change,

(c) to avoid adverse or cumulative impacts on flood behaviour and the environment,

(d) to enable the safe occupation and efficient evacuation of people in the event of a flood.

(2) Development consent must not be granted to development on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development—

(a) is compatible with the flood function and behaviour on the land, and

(b) will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and

(c) will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and

(d) incorporates appropriate measures to manage risk to life in the event of a flood, and

(e) will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.

This Clause will be addressed in section 3.7.6.

3.4 TAMWORTH REGIONAL DEVELOPMENT CONTROL PLAN 2010

The proposed development is located within a flood planning area. Developments within flood planning areas are required to comply with the *Tamworth Regional Development Control Plan 2010 – Step 3- Development on Flood Affected Land.*

Is land flood affected?

Council has adopted the 1% annual exceedance probability (AEP) Flood plus 0.5 m as its Flood Planning Level (FPL).

Additionally, the flood planning level includes a sunny day failure event of Dungowan Dam plus 0.5 m for the properties between the Ogunbil Bridge and Dungowan Dam.
Land below the Flood Planning Level is referred to as the "flood planning area" (FPA).
Flood planning area as shown on the Flood Planning Area Maps and associated flood studies available on Council's website is defined as the most current information available to Council and may be derived and interpreted from a combination of the following:

1. Flood Studies identifying the 1% AEP flood undertaken in accordance with the Floodplain Development Manual, prepared by the NSW Government (as applicable at the time the Study was conducted);
2. Modelling undertaken for specific sites which identifies the 1% AEP flood

3. Historic flood inundation records held by Council as the highest know flood;
4. Information contained within an environmental planning instrument or policy;
5. Specific flood mapping for the site;
6. Mapping endorsed by the elected Council at an Ordinary Council Meeting.

The subject site is not subjected to flood impacts and further details is provided in section 3.7.6.

3.5 WATER USAGE & SUPPLY

The Site has a licence for a water sharing plan, the *Namoi Alluvial Groundwater Sources 2020*. Water is drawn from a well, with up to 120 megalitres pumped annually into storage tanks located on elevated ground, allowing gravity-fed distribution across the farm. Currently, the operational poultry sheds use approximately 36 megalitres per year, with water usage expected to increase to 84 megalitres once all proposed sheds are operational. In addition, some water falling onto the farm is captured and stored in a small dam located in the north neighbouring paddock, which is also used as a water source for few cattle on site.

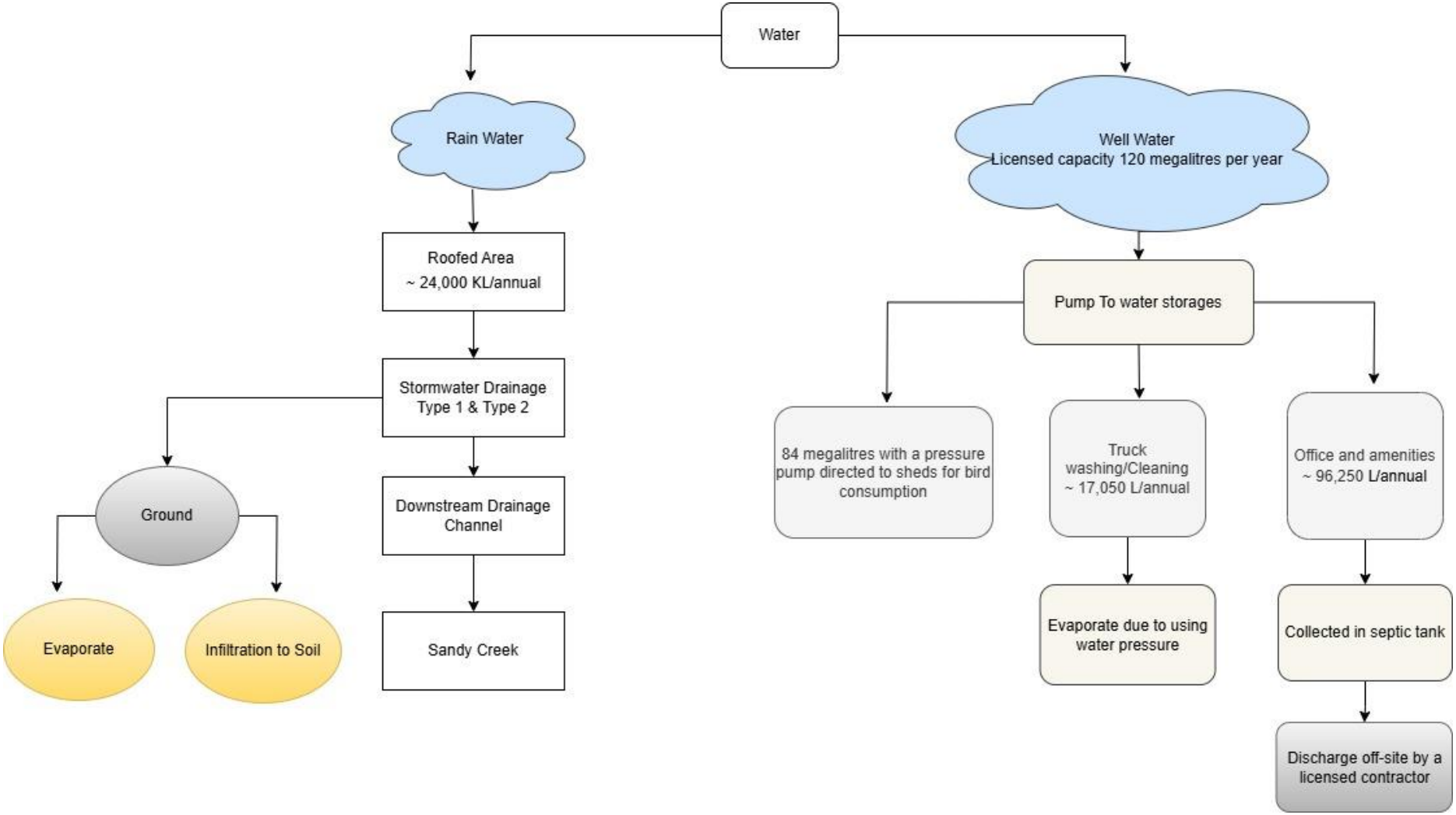
Water required for consumption by poultry, will be sourced from a well, which is pumped to water storage tanks and directed to the poultry sheds via a pressure pump. The Site contains a water treatment system that purifies and chlorinates the water, making it suitable for broiler consumption. Some water may be used, when required, for dust suppression.

For emergency purposes, water can be sourced from Sandy Creek, via a pump installed in the creek within the Site's northeastern area.

3.5.1 Site Water Balance

The following Figure 3-1 shows the site's water balance

Figure 3-1: Water Balance Diagram



3.6 STORMWATER & WASTEWATER MANAGEMENT

3.6.1 Stormwater System

Five (5) predevelopment basins described as "*Dams*" along with Black Gully Creek captures overland flow in the farm's southern paddocks. However, the majority of overland flow from the poultry farm area, is directed to the dam located in the neighbouring paddock northeast of the sheds. This dam serves as a water source for the property's cattle and ensures that water captured from land housing the poultry sheds, is contained on-site. As such, there is no off-site discharge of precipitation from this area, and runoff is effectively managed through passive collection and reuse within the farm system. In addition, the site gently slopes towards the south, with the northern, western, and eastern sections being relatively flat.

3.6.2 Site Drainage

The drainage system primarily consists of drainage swales and channels, with swales (designated as "Stormwater Drainage Swale Type 1" and "Type 2") located alongside and between the sheds. These swales collect runoff from the shed roofs and adjacent area. Then, the runoff is directed toward a larger downstream stormwater drainage channel. This main channel is designed to handle the cumulative flow from all swales and has a deeper, wider cross-section to accommodate higher volumes of water.

Sandy Creek in the eastern side of the site functions as a natural drainage outlet and is capable of receiving stormwater flows from the site without altering the surrounding hydrological system. Downstream stormwater drainage channel ultimately discharge into Sandy Creek. The proposed drainage system layout is provided in Attachment 2.

3.6.3 Sewage and Wastewater

Sewage generated by on-site amenities at the Wintergreen Farm will be connected to a septic system and pump out via a tanker by a licensed contractor on a regular basis. This sewage waste would be disposed off-site by the contractor in accordance with relevant standard, guidelines and control approvals if a pump out is installed otherwise waste will be disposed by the usual onsite transpiration arrangements.

Shed floors are washed down using low-volume, high-pressure water that is kept within the shed confines. Due to the low volume of water used, any water remaining on the shed pad is evaporated by the ventilation system. Runoff generated from vehicle washdown generally evaporates due to the small quantity of water used.

3.7 Assessment of Potential Impacts on Water

Assessment of potential impacts of the proposed development to surface water resources, and flooding is presented in this section.

It is important to highlight the fact that the poultry sheds operate as a closed system – chickens, feed, water and littler remain inside the sheds and stormwater remains outside. There is no mixing of stormwater with the contents of the sheds.

3.7.1 Potential Pollutants

This section identifies potential surface water pollutants of concern at the site, the relevant source materials, the potential receptors and the potential exposure pathways.

The primary environmental concern anticipated on the poultry farm is the generation of organic waste material such as bird manure, feathers, waste from shed cleaning, uneaten feed and other organic matter. Surface water runoff, particularly during rainfall events, represents a potential release mechanism, as it can mobilize and transport these organic wastes, along with associated pollutants such as nutrients and pathogens, off-site and into nearby waterbodies.

Potential contaminants and potential risks will be:

- A potential risk for surface soil contamination from chemical spillages surrounding the chemical storage area (Diesel, Petrol and disinfections).
- Potential contamination risk (low) from air dispersal of odour;

A conceptual site model (CSM) has been prepared in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure* as amened in 2013.

The CSM is a representation of site-related information regarding surface water contamination sources, receptors and exposure pathways between those sources and receptors.

The CSM is presented below in Table 3-1.

Table 3-1: Conceptual Site Model

Known and Potential Primary Sources of Contamination	Primary Release Mechanism	Potentially Impacted Media	Contaminants of Potential Concern	Potential Receptors		Exposure Pathways		Risk of Contamination
				Human	Environment	Human	Environment	
Use and storage of hazardous materials (fuels, oils, paints, chemicals etc)	Spills/leaks	Soil, Ground and Surface water	Hydrocarbons, Heavy metals	Site personnel, Neighbouring premises if contaminants migrate off-site	Soil, waterways, Native habitats	Dermal contact, inhalation of dust and vapours, ingestion	Soil, Ground and Surface water	Low to Moderate
Vehicles / machinery parked/stored onsite	Spills/leaks	Soil, Ground and Surface water	Hydrocarbons, heavy metals	Site personnel, Neighbouring premises if contaminants migrate off-site	Soil, waterways, Native habitats	Dermal contact, inhalation of dust and vapours, ingestion	Surface and ground water	Low
Historical use of agricultural pesticides	Disturbance of soil	Soil, ground and surface water	Heavy metals, Organochlorines (OC) and Organophosphate (OP) pesticides	Site personnel, Neighbouring premises if contaminants migrate off-site	Soil, waterways, Native habitats	Dermal contact, dust inhalation, ingestion	Soil, Ground and Surface water	Low to Moderate
Legacy contaminants Lead-based paint, ACM, PCBs	Disturbance of soils, disturbance of lead-paint surfaces, disturbance of historical appliances containing PCBs	Soil and Surface water	Lead, ACM polychlorinated biphenyls	Site personnel, Neighbouring premises if lead migrates off-site	Soil, waterways, Native habitats	Dermal contact, inhalation (dust or soil), ingestion	Soils, Surface and ground water	Low to moderate
Offsite contaminant sources	Migration via groundwater or surface water	Soil, Groundwater, Surface water	Fertilizers, Pesticides	Site personnel	Site environment (creeks, native vegetation)	Dermal contact, dust inhalation, ingestion	Soils, Surface and ground water	Low to Moderate

3.7.2 Catchment Impacts

The major impacts to the catchment from the proposed development are associated with the surface water impacts. These are assessed in the following sections.

3.7.3 Surface Water Impacts

3.7.3.1 Potential Polluting Operations and Mitigation Measures

Based on the operations and infrastructure associated with the proposed development area, the assessment of the potential impacts on surface water and mitigation measures is discussed below:

- Leaks or spills of diesel, lubricating oils or petrol onto the ground being captured by stormwater thus contaminating surface waters as well as soil. Diesel fuel, oil and petrol will be used in the facility's equipment and machinery. Vehicles and machinery will be fuelled via a pump connected to a secure and bunded diesel storage container set well away from the poultry farm activities and drainage areas. In addition, there will be spill kits available next to chemical storage areas.

- Wastes releases entering and contaminating the site's stormwater.

- Runoff from surface areas can carry pollutants such as sediment, oils, and chemicals into nearby surface water bodies. All drainage and stormwater points are maintained and lined with larger rocks and gravel with the purpose of reducing water velocity and volume of surface runoff entering nearby streams or other waterways during heavy rainfall events. Implementing regular inspections to ensure that pollution control measures are functioning correctly and to identify any maintenance issues is highly recommended.

- In heavy flood events, rainfall runoff can enter poultry sheds, where it mixes with litter such as manure and may subsequently flow out, increasing the risk of surface water pollution as contaminants are carried into nearby water bodies. The poultry sheds will have fully sealed concrete flooring. The proposed sheds will be located well away from the river and outside the flood-impacted area, based on observational data and the Council's unqualified flooding map of the site (see section 3.7.6).

- Wash down water from poultry sheds may contain contaminants such as manure, feathers, litter residues, and cleaning chemicals. This wastewater poses a risk of surface water pollution through runoff or accidental discharge. All wastewater will be collected by a sump and will be removed from the Site by a licensed contractor.

3.7.4 Ground Water Impacts

The proposed development is expected to have negligible impact on groundwater. A pumping test conducts in regular basis to ensure that pumping does not cause excessive drawdown of the local water table, which could affect neighbouring bores, wells or ecosystems, while also determining sustainable yield and aquifer characteristics. Existing groundwater pumping test of the well associated with the land have clearly established that groundwater levels are 6 to 7 m deep. These tests are provided in Attachment 1. No significant excavation works are planned for

the site and the recorded depths are well below any ground disturbance or infiltration that would occur as part of the proposed development.

3.7.5 Water Monitoring Program

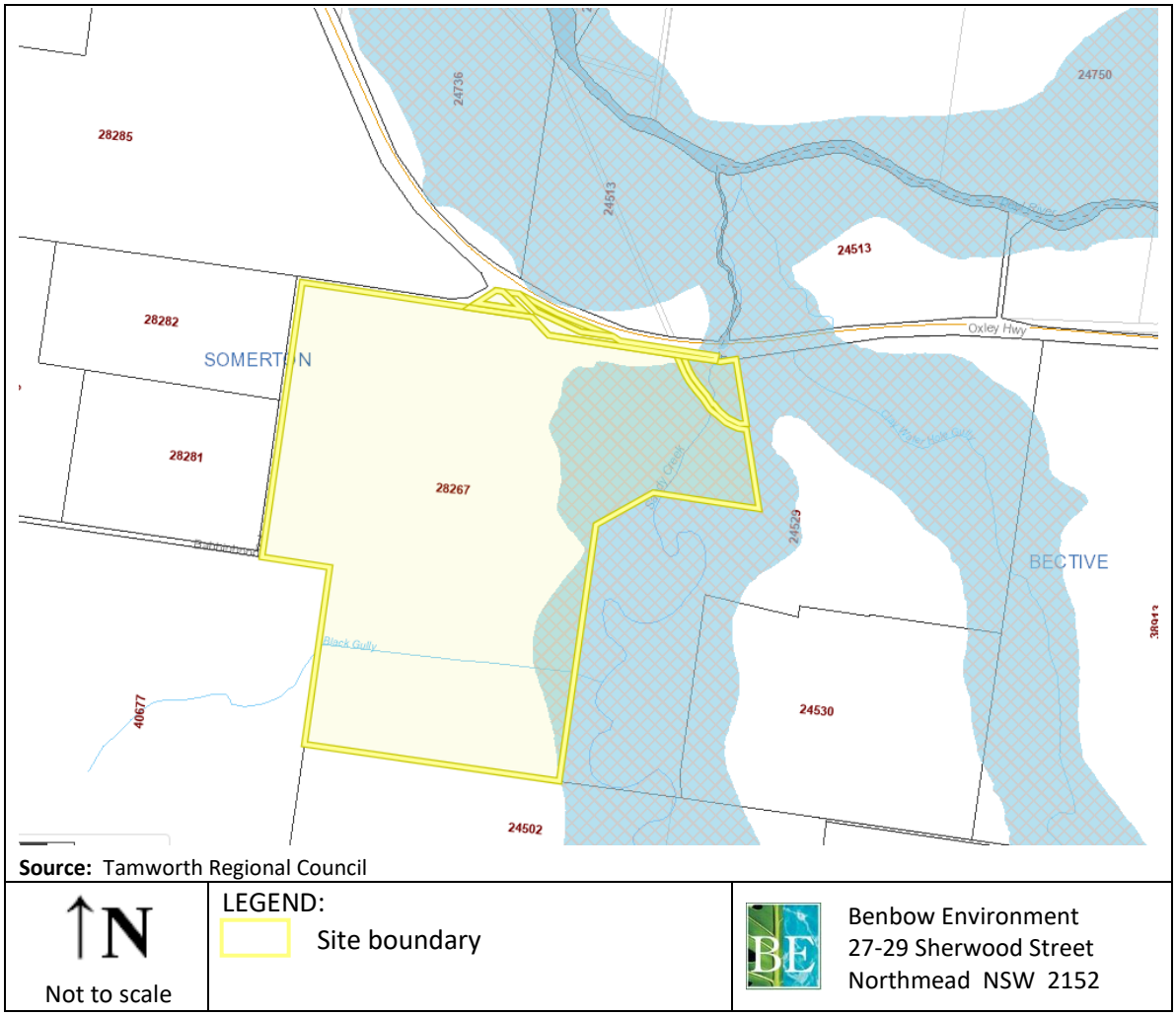
The Development will be a largely dry operation and because the primary source of water for the site is the on-site well, as such, the primary focus of the monitoring program will be on groundwater to ensure that any potential impacts from other site activities are appropriately managed. This will be undertaken in accordance with the latest Approved Methods for the Sampling and Analysis of Water Pollutants in NSW by a qualified environmental consultant.

3.7.6 Flooding

According to Planning Certificate 10.7, the land is within a flood planning area and subject to flood related development controls as set out in the provisions of the Tamworth Regional Local Environmental Plan (LEP) 2010 (Clause 5.21) and the Tamworth Regional Development Control Plan (DCP) 2010 (Development on Flood Affected Land). However, according to the e-Planning Spatial Viewer and Draft Tamworth Flood Risk Management Plan Vol.2, the site is not flood-impacted. The closest area at risk to the site is along the Peel River, located to the north of Tamworth, located approximately 14.84 km east of the site.

To gain a clearer understanding of the site's flood risk, an email was sent to Tamworth Regional Council requesting any available maps or information related to flood planning areas in Somerton, including flood levels. Information available on the Council's website or other relevant websites were not sufficient to determine whether the site is located within a flood-prone area or to identify specific flood levels. In response to the enquiry, the Council provided the map shown in the Figure 3-2. They advised that this map is a snippet from an internal, unverified flood study and should be considered anecdotal, as it has not been derived from formal modelling or comprehensive flood assessments. Based on the provided map, only the eastern portion of the site appears to be affected during flood events. The proposed location for the sheds is situated outside of this area and is unlikely to be impacted.

Figure 3-2: Unqualified Flooding Map of the Site



Source: Tamworth Regional Council

According to the *Assessment of Flood Risk in Various Towns and Villages – Final Draft, February 2007*, a major flood event occurred in February 1955, affecting the towns and villages of Moore and Somerton. This flood originated from the Peel River. Despite the significance of the event, only one house was reported to have been impacted, as most buildings in the area were located above the peak flood level recorded at that time. Based on this historical information, the site is considered unlikely to be flood affected.

In response to the general flood risk, Tamworth Regional Council has developed *Tamworth Regional Development Control Plan 2010* outlining specific development controls for properties within flood planning areas. These are provided in the following table.

Table 3-2: Development controls on flood control lots

Development Controls	Comments
Is land flood affected? *Council has adopted the 1% annual exceedance probability (AEP) Flood plus 0.5m as its Flood Planning Level (FPL).* *Additionally, the flood planning level includes the Sunny Day Failure of Dungowan Dam plus 0.5m for the properties between the the Ogunbil Bridge and Dungowan Dam.* *Land below the Flood Planning Level is referred to as the "flood planning area" (FPA).* *Flood planning area as shown on the Flood Planning Area Maps and associated flood studies available on Council's website is defined as the most current information available to Council and may be derived and interpreted from a combination of the following:* *1. Flood Studies identifying the 1% AEP flood undertaken in accordance with the Floodplain Development Manual, prepared by the NSW Government (as applicable at the time the Study was conducted)* *2. Modelling undertaken for specific sites which identifies the 1% AEP flood* *3. Historic flood inundation records held by Council as the highest know flood* *4. Information contained within an environmental planning instrument or policy* *5. Specific flood mapping for the site* *6. Mapping endorsed by the elected Council at an Ordinary Council Meeting.*	According to *Assessment of Flood Risk in Various Towns and Villages, Final draft, February 2007*, a significant flood event occurred in February 1955, impacting the towns/villages of Moore and Somerton. The flood originated from the Peel River. During this event, only one house was reported to have been flood-affected, as the majority of buildings in the area were situated above the maximum historical flood level recorded during the 1955 event.
Land Behind Levees *Development on land protected by the urban levee system is to include consideration of inundation resulting from a levee breach (failure of overtopping) or stormwater ponding when the river system is in flood.*	Not Applicable

Development Controls	Comments
Access • *All lots created by subdivision must have safe vehicle access (H2 in Figure 6 AIDR 2017b) for events up to 1% AEP.* • *For development of existing lots, where flood free vehicle access is not possible, the development must be able to achieve access through maximum H3 hazard category as defined in Figure 6 AIDR 2017b for 1% AEP flood events.*	The proposed development is within an existing lot that is accessible via Babbinboon Road and the Oxley Highway. The primary access is from the Babbinboon Road, where the entrance has recently been sealed with asphalt, while the remainder of the internal road remains unsealed. Based on Figure 6 of AIDR (2017b), which defines the H3 hazard category for 1% AEP flood events as "unsafe for vehicles, children, and the elderly," the condition of the site and access roads is considered to be well above the minimum requirements associated with the H3 flood hazard category.
On-site Sewer Management • *Onsite sewer management facilities must be sited and designed to withstand flooding conditions (including consideration of structural adequacy, avoidance of inundation, and flushing/leaking into flowing flood waters). Tank and trench style of systems are not permitted on land affected by the Flood Planning Level.* • *All sewer fixtures must be located above the 1% AEP Flood.*	Sewage from on-site staff amenities at Wintergreen Farm will be managed using a sealed septic tank system, with waste collected regularly by a licensed contractor through a pump-out service. The system is fully enclosed and designed to prevent leaks or overflows, including during flood events, ensuring no discharge to the surrounding environment.
General Development Requirements • *No building or work (including land filling, fencing, excavation) shall be permitted on flood affected land where in the opinion of Council, such building or work will obstruct the movement of floodwater or cause concentration or diversion of floodwaters.* • *A survey plan prepared by a registered surveyor showing existing ground levels, finished ground levels, finished floor levels, flood levels and location of existing/proposed buildings and safe evacuation path on the site relative to AHD.* • *This information must be supplied for development within the FPA.*	The proposed poultry sheds will be prefabricated structures installed on concrete slabs within the existing developed area of the site. These works are limited in scale and will not alter the natural flow of floodwaters. Therefore, the development will not obstruct, concentrate, or divert floodwaters and complies with the relevant floodplain development controls. A site layout with all required information is prepared by Pagano Architects Pty Limited and provided in Attachment 3 of the EIS.

Development Controls	Comments
General Development below the 1% AEP flood level *• For any part of a building (new works) below the 1% AEP flood level, structural design must be in accordance with the NCC flood requirements. The "Flood Hazard Area" is the FPA. The "defined flood event" is the 1% AEP event. The "flood hazard level" is the FPL.* *• Development must be designed in accordance with the Australian Building Codes Board Standard - Construction of Buildings in Flood Hazards.* *• All materials used in construction shall be flood compatible.*	The development will be designed in accordance with the Australian Building Codes Board Standard – Construction of Buildings in Flood Hazard Areas. Furthermore, all construction materials selected for the project will be flood-compatible to ensure structural resilience and compliance with applicable standards.
Residential Development *• Floor levels of all habitable rooms, or rooms with connection to sewer infrastructure shall not be less than the flood planning level.* *• Upon completion and prior to the occupation (where relevant), a certificate by a registered surveyor showing the finished ground and floor levels conform to approved design levels shall be submitted to Council.* *• Additions to existing buildings below the FPA will only be permitted, with limitations, as follows:* *• where the floor level of the proposed addition is located below the FPL the maximum increase in floor area is not to exceed 10% of the floor area of the existing dwelling; or* *• where the floor level of the proposed addition is located above FPL but safe access is not available the increase in habitable floor space shall not exceed 100m2.* *• Where additions are more than 0.5m below the FPL Council must be satisfied that the addition will not increase risk to inhabitants in the event of a flood.* *• Rebuilding part of a dwelling may be permitted provided the building maintains the same dimensions which result in the same impact on flood behaviour.*	Not Applicable
Commercial/Retail/ Industrial Development *Development shall incorporate measures to seal or flood proof buildings, to avoid activities or fittings susceptible to flood damage, or to store the contents of buildings above the 1% AEP level.*	Due to the limited available information, the flood level for the site is unknown. According to Figure 3-2, the proposed shed locations are not situated within areas subject to flooding. However, the sheds will be constructed at an elevated level to minimise potential flood impact.

Development Controls	Comments
Subdivision *Residential subdivision will not be permitted where any lot to be created will be fully inundated by a 1% AEP event and the creation of such lot will create the potential for increased intensity of development within the flood planning area.*	Not Applicable
Landfilling *• Landfilling is not permitted within the floodway.* *• The volume of flood storage must be maintained when filling in the flood storage.* *• Land filling proposals are to demonstrate consideration of AS3798 .* *• Survey plan prepared by a registered surveyor is required, showing the contour levels of natural surface,* *any existing fill and the designed contour levels for the finished work.* *• A report certified by a consulting engineer is required to detail the impact of the proposed fill on adjoining* *properties and, where levee banks are proposed, and the methods of internal drainage.* *• Applications shall be accompanied by a construction management plan to show* *o source of fill, including contamination assessment* *o an assessment of the impact of haulage vehicles on roads* *o precondition report of all haulage routes* *o details of method of compaction of fill and associated impacts: control of dust, sedimentation, water quality impacts, noise and vibration* *o contingency for containment of fill in the event of a flood during placement*	Not Applicable
Non-residential rural buildings *• Not permitted in "floodways".* *• Floor areas shall be located no lower than 0.5 m below the FPL unless there are no alternative practical sites, in which case the building or structure must be designed to withstand the force of flowing floodwaters, including debris and buoyancy forces as appropriate and has been designed in accordance with the Australian Building Codes Board Standard - Construction of Buildings in Flood Hazards*	The proposed sheds are not in floodways (refer to Figure 3-2). The design of the structures will incorporate flood-resilient features to withstand the forces associated with flowing floodwaters, including debris impact and buoyancy forces. All structural elements will be engineered in compliance with the Australian Building Codes Board (ABCB) Standard for Construction of Buildings in Flood Hazard Areas to ensure safety and durability during flood events.

The construction activity associated with the proposed development is minimal and primarily involves the installation of concrete slabs, followed by the placement of prefabricated structures. As minimal earthwork is required to enable slab construction, the proposed development will not alter existing ground levels or surface water flow patterns. Consequently, it will have no impact on flood behaviour in the area.

Flooding can severely impact poultry farms by causing mortality among birds, damaging infrastructure, disrupting supply chains, and potentially impacting water quality and disease outbreaks. Floodwaters can restrict access to sheds, and floodwaters can impact stocking densities, according to the NSW Department of Primary Industries.

To minimize flood risks, the development should incorporate mitigation measures such as:

- An adequate drainage system is the most common planned response to reduce flood risks on farmed land;
- Limit water ponding and pooling, as recommended by the NSW Department of Primary Industries;
- Raising finished floor levels of structures above the designated Flood Planning Level; and
- Use durable, flood-resistant materials and construction techniques for all buildings and structures.

3.8 EROSION AND SEDIMENT CONTROLS

The Site is relatively flat, which helps to naturally limit the velocity of surface runoff. All drainage and stormwater discharge points are carefully maintained and reinforced with larger rocks and gravel. Additionally, the site is covered with grass and establish vegetated buffer zones around the sheds to reduce odour emissions help slow down runoff and trap sediment before it leaves the site. This treatment helps to slow any concentrated water flow, reduce erosion risk, and capture sediment, preventing it from being transported off-site into nearby watercourses or drainage systems. These measures contribute to effective stormwater management and environmental protection on-site.

4. SOIL ASSESSMENT

This soil assessment addresses the following:

- A description of the predicted local soils, site topography, drainage and landscape; and
- Consideration of any contaminated soil, including acid sulfate soils.

Reference is made to the Preliminary Site Investigation report Ref: (251021_PSI_Rev1) throughout this soil assessment.

4.1 EXISTING SOIL CONDITIONS

4.1.1 Local Soils

Geological Unit: The area is underlain by the Andesitic alluvium and colluvium derived from Carboniferous andesite members of the Merlewood and Namoi Formations. Andesite is a type of volcanic rock. Carboniferous rocks originated during the Carboniferous geological period (approx. between 359 to 299 million year ago).

***Parent Rock*:** Carboniferous andesite

Soil Landscape:
Soils derived from andesite generally from the unconsolidated sediment material from the crests slopes of the hills that are deposited at the foot slopes. within the sedimentary series, with sedimentary rocks, andesitic colluvium and minor andesite members forming the soils on the flanks of the hills. The andesitic colluvium of the foot slopes overlies various Carboniferous formations. Depth to underlying material was not determined.

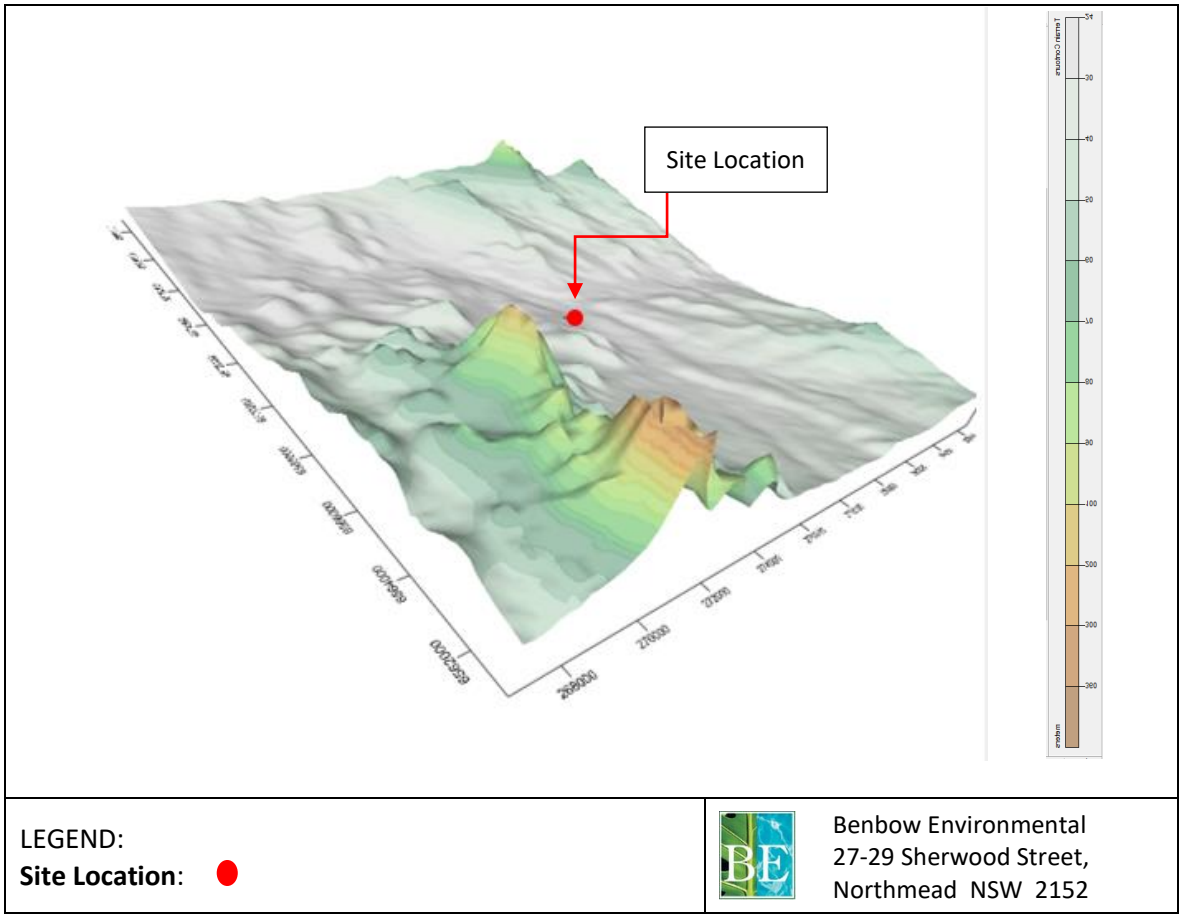
Soils:
Upper foot slopes have deep, imperfectly drained Brown Dermosols (NSG) or moderately deep, imperfectly drained Red Chromosols (Red-brown Earths). Mid-foot slopes generally have either moderately deep, moderately well-drained Brown Chromosols (Non-calcic Brown Soils) or very deep, moderately well-drained Brown Vertosols (Brown Clays). Lower slopes have very deep to giant, moderately well-drained Black Vertosols (Black Earths).

Limitations to Development—
Localised dieback; localised poor drainage; engineering hazard; gully erosion risk; inherent erosion risk; localised permanently high water tables; known discharge area; potential recharge area; high run-on; localised dryland salinity; localised seasonal waterlogging; sheet erosion risk.

4.1.2 Topography

A three-dimensional view of the local topography surrounding the site has been provided in Figure 4-1 with the terrain/vertical axis exaggerated by a factor of 10. It should be noted that this figure approximates the actual terrain based on information that has been digitised from local contour maps.

Figure 4-1: Local Topography with a Vertical Exaggeration Factor of 10



4.1.3 Acid Sulfate Soils

The CSIRO eSPADE interactive web portal shows the site is not located on or near expected acid sulfate soil. Therefore, ASS are not likely to be found onsite.

4.1.4 Erosion and Water Logging

The site has a low risk from water erosion and waterlogging due to existing vegetation consists mainly of long grasses with established trees lining the length of the main access road. No exposed soils are present. If soils need to be exposed during installation of the proposed water storage tanks or stormwater treatment system, it is recommended to install a silt fence at appropriate locations to prevent sediment runoff and soil loss during construction.

4.1.5 Existing Contaminated Soil

The findings of the Preliminary Site Investigation (251021_PSI_Rev1) demonstrate the soils in the area for the proposed development have a low risk of contamination. Therefore, conducting a Detailed Site Investigation (DSI) was deemed unnecessary.

4.2 POTENTIAL IMPACTS ON SOIL

Operation

The potential sources of contamination from the proposed expansion includes spills or leaks of fuels and oils from machinery used on-site, as well as organic waste such as manure, litter, and dead bird waste. These wastes have potential to contaminant stormwater falling on the site which could potentially migrate into the subsurface soils. Potential contaminants are outlined in Section 3.7.1.

- Potential spillages of diesel and petrol fluids, or lubricating oils could occur during refuelling and equipment maintenance; this risk would be minimised through proper procedures and training in appropriate methods and signage showing how to avoid spills and training of site workers. The proposed development would not stockpile any type of waste on site.

- Good housekeeping practices are important to prevent contamination. This includes inspection of the integrity of equipment, regular cleaning and sweeping of shed floors and areas where wastes and spillages could come into contact with stormwater.

5. SAFEGUARDS AND MITIGATION MEASURES

A summary of the soil and water environmental safeguards are provided as follows:

- Maintenance of erosion and sediment controls;
- Water quality testing of ground water;
- Maintenance of all stormwater infrastructure including drainage swales;
- Staff trained in spill response and emergency procedures, including flood emergency response and maintenance and EMP procedures; and
- Implementation of an Environmental Management Plan that includes regular workplace inspections to maintain a high standard of housekeeping.

5.1 MONITORING REGIME

A water monitoring program for ground water would be detailed in EMP and would include sampling methods, equipment, frequency, water quality indicators, laboratory testing requirements and methods. The monitoring regime should be revised after the first year of operations.

6. CONCLUDING REMARKS

Benbow Environmental has been engaged by Wintergreen Farm to undertake a Soil and Water assessment to support a proposed expansion of a poultry farm located at 3320 Oxley Highway, Somerton, NSW 2340 (legally described as 10/DP261839).

This assessment is a qualitative study that addresses the potential impacts to soil and water from the proposed operations. With the control measures and monitoring procedures recommended in this report, the potential impacts upon soil and water from the proposed development is considered low.

This concludes the report.

Environmental Scientist

Environmental Scientist

Principal Consultant

7. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use of Wintergreen Farm, as per our agreement for providing environmental services. Only Wintergreen Farm is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Wintergreen Farm for the purpose of preparing this report.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

8. REFERENCES

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