Angora Feedlot – Revised Level 1 Odour Assessment

Angora Feedlot Pty Ltd

1 November 2024

1 INTRODUCTION

An application to expand the Angora Feedlot was submitted to Tamworth Regional Council (TRC) on 5 April 2024. The proposed expansion was an increase to the capacity of the existing feedlot from 1,000 head to approximately 1,400 head and the construction of four rows of new pens with a capacity of 8,100 head. This resulted in a combined capacity of 9,500 head. With the proposed cattle type this equated to 7,240 standard cattle units (SCU).

As a result of submissions from the neighbours, a request from the Environment Protection Authority, a greater understanding of the odour complaint history, and a more informed understanding of how the topography has influenced these complaints, the proposed development has been reduced.

The proposed feedlot has been reduced to a capacity of 4,000 head. The cattle type has also been adjusted to reflect the cattle type currently fed at the feedlot. A larger expansion would have allowed for the feeding of larger cattle for a different market, but this will not be possible with the reduced capacity. Based on the exit weight of 450 kg, the equivalent number of SCU is 3,240. It is noted that there is a discrepancy between the NSW SCU calculation and the calculation in the *National Beef Cattle Feedlot Environmental Code of Practice* (Code of Practice). The NSW EPA identify cattle weight at turn-off and the Code of Practice identifies an average liveweight across all cattle. This discrepancy is a result of the incorporation of information from the *Reference Manual for Establishment and Operation of Beef Cattle Feedlots in Queensland* (2000), which has now been corrected in Queensland legislation to align with the Code of Practice. The reference manual is no longer referred to in Queensland and has been superseded by the *National Guidelines for Beef Cattle Feedlots in Australia* (2012).

Refer to Appendix A for the amended site plans.

This document has been prepared to provide an updated Level 1 odour impact assessment in accordance with the *Technical Notes: Assessment and management of odour from stationary sources in NSW* (NSW S-Factor Guidelines). It also supplements and supersedes relevant sections of the original Environmental Impact Statement (EIS), submitted with the application.

2 ODOUR IMPACT ASSESSMENT CHECKLIST

Generally, this document addresses the odour impact assessment check list on page 40 of the *Technical framework: assessment and management of odour from stationary sources in NSW*.

2.1 POTENTIAL ODOUR SOURCES AND LOCATIONS

All odour sources from feedlots are diffuse, area-based sources such as the pen and yard surface, drains, manure and composting areas, sedimentation basin, effluent pond. While there is some potential for odour to be generated by feedmills associated with feedlots, this is only caused where processing activities such as steam flaking and tempering are undertaken. Regardless, for the purposes of this odour assessment, all components of the 'feedlot complex' have been considered as odour emission sources as part of the Level 1 assessment.

While there is some odour produced during effluent irrigation and manure spreading, as per the Code of Practice, they are not part of the feedlot complex. Generally, odour impacts from these activities are mitigated through the consideration of time of day, temperature, and wind conditions. The management of these activities is described in the submitted Environmental Management Plan (EMP).

The generation of odour from diffuse sources within the feedlot complex occurs regardless of operating hours. Odour in feedlots is primarily influenced by the moisture of the manure on the pen pad and composting areas along with inflows into the sedimentation basin and effluent pond. As such, it is strongly influenced by manure accumulation and rainfall.

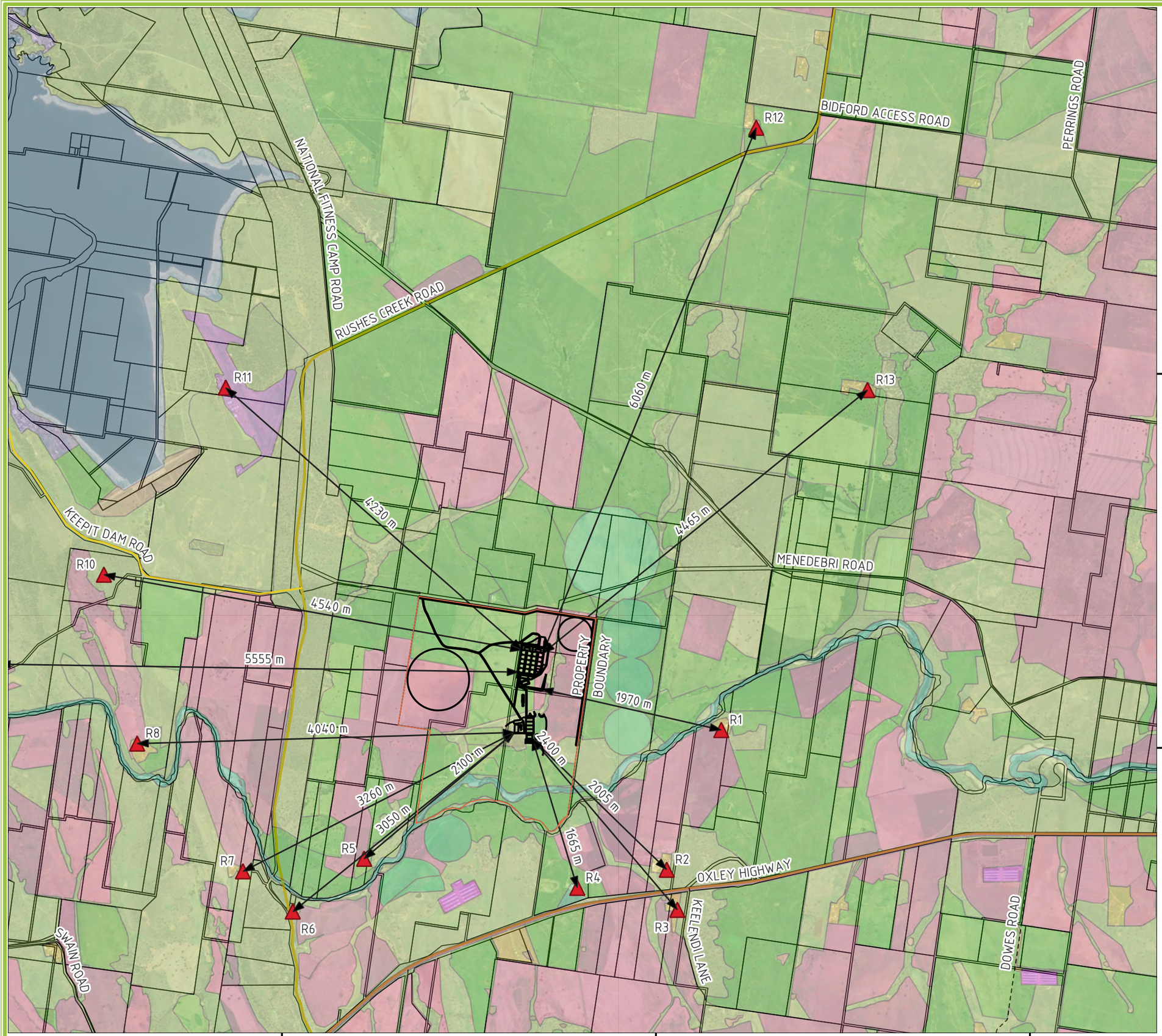
The location of all of these odour sources has been identified in the amended site plans (Appendix A).

2.2 SENSITIVE RECEPTORS

Nearby sensitive receptors (legal dwellings) were identified on Figure B2 in Appendix B of the original EIS. However, a receptor along Rushes Creek Road, near the Peel River, was missed on the original figure. This has been corrected (Figure 1).

As the properties in the local area are zoned as RU1, and located within the Namoi Regional Jobs Precinct, which supports the growth of sustainable intensive agriculture, a change in land use or subdivision in the local area is unlikely.

The community of Somerton has also been considered in the Level 1 assessment. According to the 2021 census, it has a population of 272 people which was consistent with the 2016 census population of 277 people. This change does not indicate that substantial growth in the population of Somerton should be expected. The edge of Somerton is approximately 7.6 km from the existing effluent pond.



Agricultural Development Services
Australia Pty Ltd (AgDSA)
ABN: 30 639 923 434

0.48 0 0.48 0.96 1.44 1.92 KM

SPATIAL REFERENCE
GDA 2020 MGA ZONE 56
DATUM: GDA 2020
MAP UNITS: METRE
SCALE 1:40,000 AT A3

LEGEND

SITE SPECIFIC
SITE LAYOUT - PROPOSED
PROPERTY BOUNDARY
SENSITIVE RECEPTORS
DISTANCE TO RECEPTORS
Sensitive_Receptors

NSW
SOILS
NSW LANDUSE 2017
1.2.0 Managed resource protection
2.1.0 Grazing native vegetation
3.2.0 Grazing modified pastures
3.3.0 Cropping
4.3.0 Irrigated cropping
4.4.0 Irrigated perennial horticulture
5.2.0 Intensive animal production
5.4.0 Residential and farm infrastructure
5.5.0 Services
5.7.0 Transport and communication
6.1.0 Lake
6.2.0 Reservoir/dam
6.3.0 River

BTC-001
ANGORA FEEDLOT PTY LTD

RANNOCK BURN RD,
RUSHES CREEK NSW 2346

SENSITIVE RECEPTORS AND
LANDUSE PLAN

FIGURE B2

2.3 WEATHER CONDITIONS AND SITE FEATURES

Based on the submissions received, and feedback from EPA, there are two key considerations which are resulting in greater than expected odour impacts from the nearby poultry farm. Advice from EPA and odour consultants with experience with poultry farm odour in the area have identified that still wind conditions are very common in the area. In these conditions, odour moves to the lowest point of the landscape. The Peel River has a deep but narrow bed and banks, in which odour would normally be contained and move downstream along the river. In the area around the feedlot, there are no clear confining side walls to the valley. In such a situation, odour would not normally impact sensitive receptors at a similar or higher elevation compared to the feedlot.

However, a ridge line to the west of Rushes Creek Road, blocks the movement of air along the Peel River and causes the river to meander back on itself. According to submissions and the EPA, this is causing odour from the poultry farm to accumulate to the east of this blockage. In cool conditions, this odour will sink to the lowest point. However, according to the EPA, when the temperature increases, this odour then rises, impacting receptors at a higher elevation than the poultry farm. Essentially, the wind conditions and temperature inversions are causing odour to move up hill.

Generally, the landscape consists of a mixture of grassed paddocks with scattered trees and some cropped land, with or without scattered trees. The vegetation considerations are incorporated into the Level 1 assessment individually for each sensitive receptor.

2.4 LEVEL 1 ODOUR IMPACT ASSESSMENT

A level 1 odour impact assessment, completed in accordance with the NSW S-Factor Guidelines, was included in the original EIS. However, this assessment has been updated to result in the of valley drainage impacts. A justification for each of the S Factors is provided below. The methodology is detailed in the NSW S-Factor Guidelines and has not been restated.

Feedlot Class and Capacity

The proposed feedlot will maintain the existing stocking density of 15.9 m^2/SCU in the existing four pens, but operate at a stocking density of 18.7 m^2/SCU for the 18 proposed pens. This will result in an average stocking density of 18.0 m^2/SCU across both existing and proposed pens. This has been reduced from the average stocking density of 14.7m^2/SCU proposed in the original EIS. The feedlot will be operated as a Class 1 feedlot with a maximum of 12 weeks between pen cleaning. This will be reflected in the EMP.

The feedlot capacity of 4,000 head, with a turn off weight of 450 kg, results in a capacity of 3,240 SCU using a conversion of 0.81 SCU/head.

S1 – Stocking Density

The locality has a rainfall of less than 750 mm. So a Class 1 feedlot at a stoking density of 18.0 m^2/SCU results in an interpolated S1 factor of 44.8.

S2 – Receptors

The two key S2 values are for the nearby single rural residences and the town of Somerton. While there are some public use areas around Lake Keepit, these are at a greater distance than most of the

nearby rural residences. As such, they have not been included because they would be less restrictive than nearby residences.

The S2 factor is 0.3 for single rural residences is and 1.1 (Medium town) for Somerton.

S3 – Terrain

Whilst there are various terrains that would normally be applied to some of the receptors, to ensure a conservative assessment, the S3 factor of 2.0 has been applied to all receptors. As per the NSW S-Factor Guideline, this would normally only apply to receptors downhill of the feedlot.

Site-specific wind data from an appropriate weather station (ultrasonic) is not available for the property. As such, valley drainage has been conservatively applied.

S4 – Vegetation

Vegetation coverage varies across the surrounding landscape with a mixture of grassed paddocks with scattered trees and cultivation. The dominant vegetation type between the feedlot and each receptor has been individually assessed. Receptors 1, 2, and 3 have had a crops only vegetation factor (1.0) applied. Receptors 4-8 have had the 'few trees, long grass' factor (0.9) applied. All other receptors are at such a distance that the vegetation factor does not influence compliance.

S5 – Wind frequency

Given the application of the valley drainage assumption, which partly considers the extent of still conditions, normal wind conditions (1.0) has been applied to all receptors. Still conditions do not change the frequency of wind towards or away from any receptor. If wind speed and direction are influential on a receptor, then the valley drainage S3 value cannot be applied. Regardless, wind speed and direction plots for Tamworth Airport do not indicate high-frequency winds towards any receptors.

Cumulative Factor

To ensure consideration of the nearby poultry farm, a cumulative factor of 1.2 (120 %) has been applied. It is noted that the NSW S-Factor Guidelines only require the cumulative factor to be applied to two feedlots in close proximity and does not discuss other intensive livestock activities.

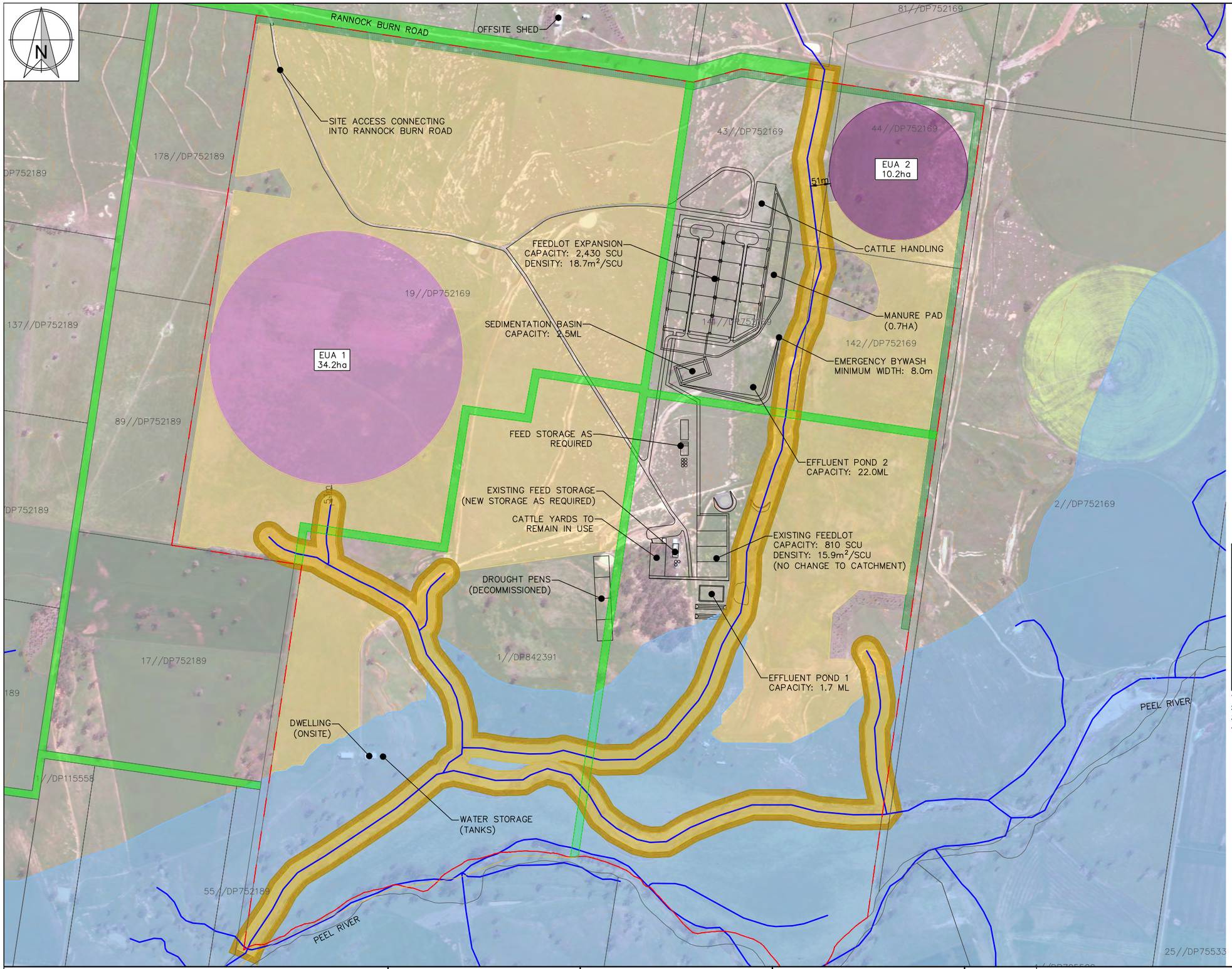
S-Factor Calculation

The abovementioned S-Factors have been utilised in accordance with the NSW S-Factor Guideline to determine compliance of the reconfigured feedlot with the *Technical framework: Assessment and management of odour from stationary sources in NSW* (Table 1). As many of the receptors have the same S-Factors, the distance to the nearest of these groups has been identified in Table 1.

Table 1 – S-Factor Calculation

Receptor	S1	S2	S3	S4	S5	Separation Distances	
						Cumulative (120 %)	Available (m)
R1-R3	44.8	0.3	2.0	1.0	1.0	1,836	>1,970
R4-R12	44.8	0.3	2.0	0.9	1.0	1,652	>1,665
Somerton	44.8	1.1	1.0	0.9	1.0	3,029	7,600

APPENDIX A – AMENDED SITE PLANS



LEGEND

- PROPERTY BOUNDARY
- CADASTRAL BOUNDARY
- CONTOUR EXISTING (5.0m INTERVAL)
- CROWN ROAD EASEMENT
- BUFFER (DRAINAGE LINE – 25m)
- BUFFER (DRAINAGE LINE – 40m)
- MAPPED STREAM ORDER
- EFFLUENT REUSE AREA (PRIMARY 34.2 HA)
- EFFLUENT REUSE AREA (SECONDARY 10.2 HA)
- MANURE REUSE AREA (154.4 HA)
- VEGETATION SCREEN
- FEEDLOT
- FLOOD MODELLING (TAMWORTH REGIONAL COUNCIL)

NOTES:

1. AERIAL IMAGE SOURCED THROUGH AUTOCAD MICROSOFT BING MAPPING. IMAGE ACCESS 07/10/2021, IMAGE DATE UNKNOWN.
2. CADASTRAL BOUNDARIES & WATERCOURSE DATA LAYERS HAVE BEEN SOURCED FROM THE SEED PORTAL. DATA EXTRACTED 28/09/2021.
3. EXISTING CONTOUR DATA OBTAINED FROM THE ELVIS PLATFORM OF PUBLICLY AVAILABLE LIDAR.
4. FEATURES MAY HAVE BEEN DIGITISED FROM PLANS OR AERIAL PHOTOGRAPHS AND ACCURACY IS LIMITED.
5. THE EXISTING FEEDLOT HAS A CAPACITY OF 1,000 HEAD AT A STOCKING DENSITY OF 12.85m²/HEAD
6. THERE IS TO BE NO CHANGE TO THE CONTROLLED DRAINAGE AREA (CDA) OF THE EXISTING FACILITY.
7. EFFLUENT MANAGEMENT
   - 7.1. SEDIMENT BASIN: 2.5ML
   - 7.2. EFFLUENT POND: 22.0ML.
8. FLOOD INUNDATION AREA SOURCED FROM TAMWORTH REGIONAL COUNCIL (TRC) DEVELOPMENT CONTROL PLAN 2010–FLOOD AFFECTED LAND SHEET 6 OF 25.

FEEDLOT CAPACITY

ROW	CAPACITY–SCU[1] (@ 18.0m2/SCU[2])	CAPACITY–HEAD[1,3] (0.81 SCU/HEAD)
EXISTING	810	1,000
ROW 1	405	500
ROW 2	675	835
ROW 3	675	835
ROW 4	675	835
COMBINED	3,240 SCU	4,000 HEAD[4]

[1]ROW CAPACITIES ROUNDED TO THE NEAREST 5 SCU/HEAD.
[2]18.0m²/SCU IS THE AVERAGE ACROSS THE FEEDLOT.
[3]CALCULATION BASED ON A 450KG EXIT WEIGHT.
[4]CAPACITY OF 4,005 HEAD ROUNDED DOWN TO 4,000 HEAD.

CLIENT
ANGORA FEEDLOT PTY LTD

PROJECT
ANGORA FEEDLOT EXPANSION

LOCATION
RANNOCK BURN ROAD, RUSHES CREEK NSW 2346

SHEET TITLE
PROPERTY PLAN – 4,000 HEAD (AERIAL IMAGERY)

AgDSA
AGRICULTURAL DEVELOPMENT SERVICES AUSTRALIA
PO BOX 292
TOOWOOMBA QLD 4350
PH: +61 418 446 245
E: contact@agdsa.com.au

SCALE
0 100 200 300m
SCALE 1:5,000 (A1) 1:10,000 (A3)

ANGORA FEEDLOT PTY LTD

DESIGNED: TJS
CHECKED: MRN
PROJECT MANAGER: MRN

DRAFT – FOR CLIENT REVIEW

DATE	REV	DESCRIPTION	APP
31/10/2024	D2	UPDATE SHEET NAME, MODIFY CAPACITY & CHANGE PEN DEPTH FROM 50.0 TO 52.5M	MRN
30/10/2024	D1	ORIGINAL DRAFT ISSUE OF REDUCED CAPACITY TO MEET NSW EPA REQUEST	MRN

REVISIONS

JOB CODE: BTC–001
SHEET NUMBER: A501
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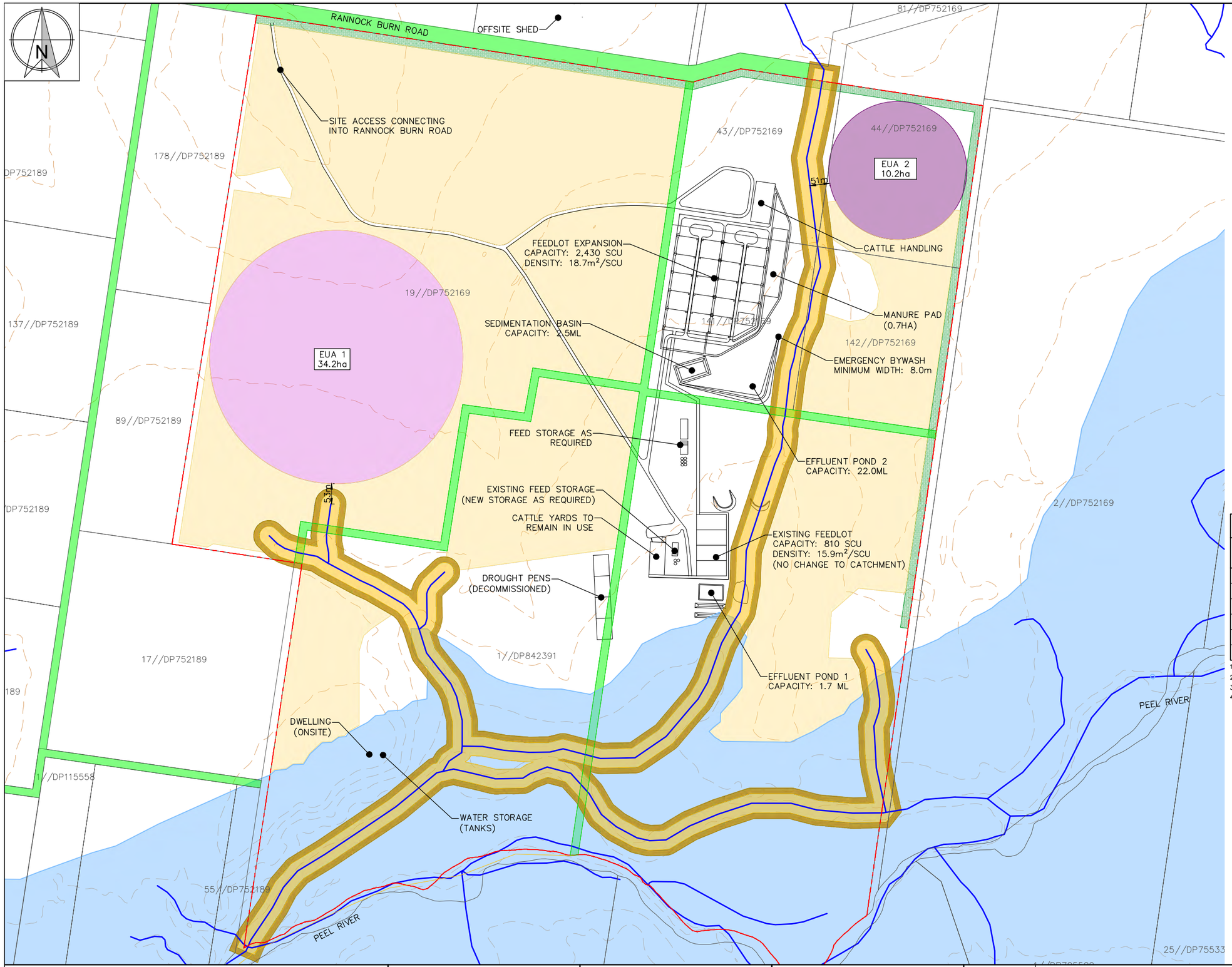

LEGEND

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CLIENT
ANGORA FEEDLOT PTY LTD

PROJECT
ANGORA FEEDLOT EXPANSION

LOCATION
RANNOCK BURN ROAD, RUSHES CREEK NSW 2346

SHEET TITLE
PROPERTY PLAN – 4,000 HEAD

AgDSA
AGRICULTURAL DEVELOPMENT SERVICES AUSTRALIA
PO BOX 292
TOOWOOMBA QLD 4350
PH: +61 418 446 245
E: contact@agdsa.com.au

SCALE
0 100 200 300m
SCALE 1:5,000 (A1) 1:10,000 (A3)

ANGORA FEEDLOT PTY LTD

DESIGNED: TJS
CHECKED: MRN
PROJECT MANAGER: MRN

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REVISIONS

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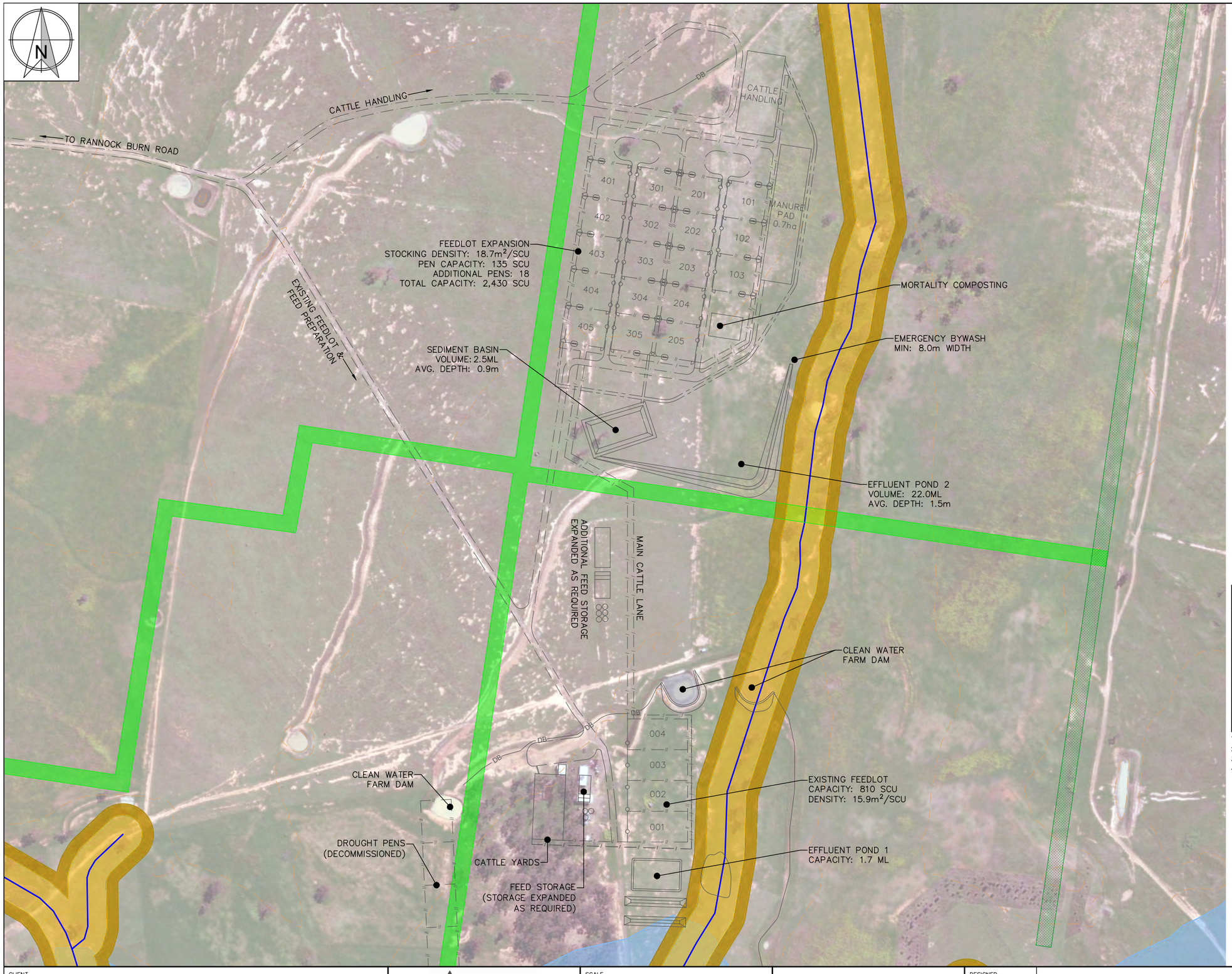

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- CROWN ROAD EASEMENT
- VEGETATION SCREEN
- PEN FENCE
- CATTLE LANE
- FEED BUNK
- EFFLUENT DRAIN
- FEED ROAD
- CLEAN WATER DIVERSION BANK
- TRC FLOOD MODELLING

NOTES:

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8. FLOOD INUNDATION AREA SOURCED FROM TAMWORTH REGIONAL COUNCIL (TRC) DEVELOPMENT CONTROL PLAN 2010–FLOOD AFFECTED LAND SHEET 6 OF 25.

DESIGN: PENS

1.	PENS 48.0 (W) x 52.5m (L)	= 2,520 m²/PEN
2.	STOCKING DENSITY	= 18.7 m²/SCU
4.	INDIVIDUAL PEN CAPACITY	= 135 SCU
5.	BUNK SPACE	= 356 mm/SCU

FEEDLOT CAPACITY

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ANGORA FEEDLOT PTY LTD

PROJECT
ANGORA FEEDLOT EXPANSION

LOCATION
RANNOCK BURN ROAD, RUSHES CREEK NSW 2346

SHEET TITLE
CONCEPT PLAN – 4,000 HEAD

AgDSA
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PO BOX 292
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SCALE
0 60 120 180m
SCALE 1:3,000 (A1) 1:6,000 (A3)

ANGORA FEEDLOT PTY LTD

DESIGNED TJS
CHECKED MRN
PROJECT MANAGER MRN

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REVISIONS

JOB CODE
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SHEET NUMBER
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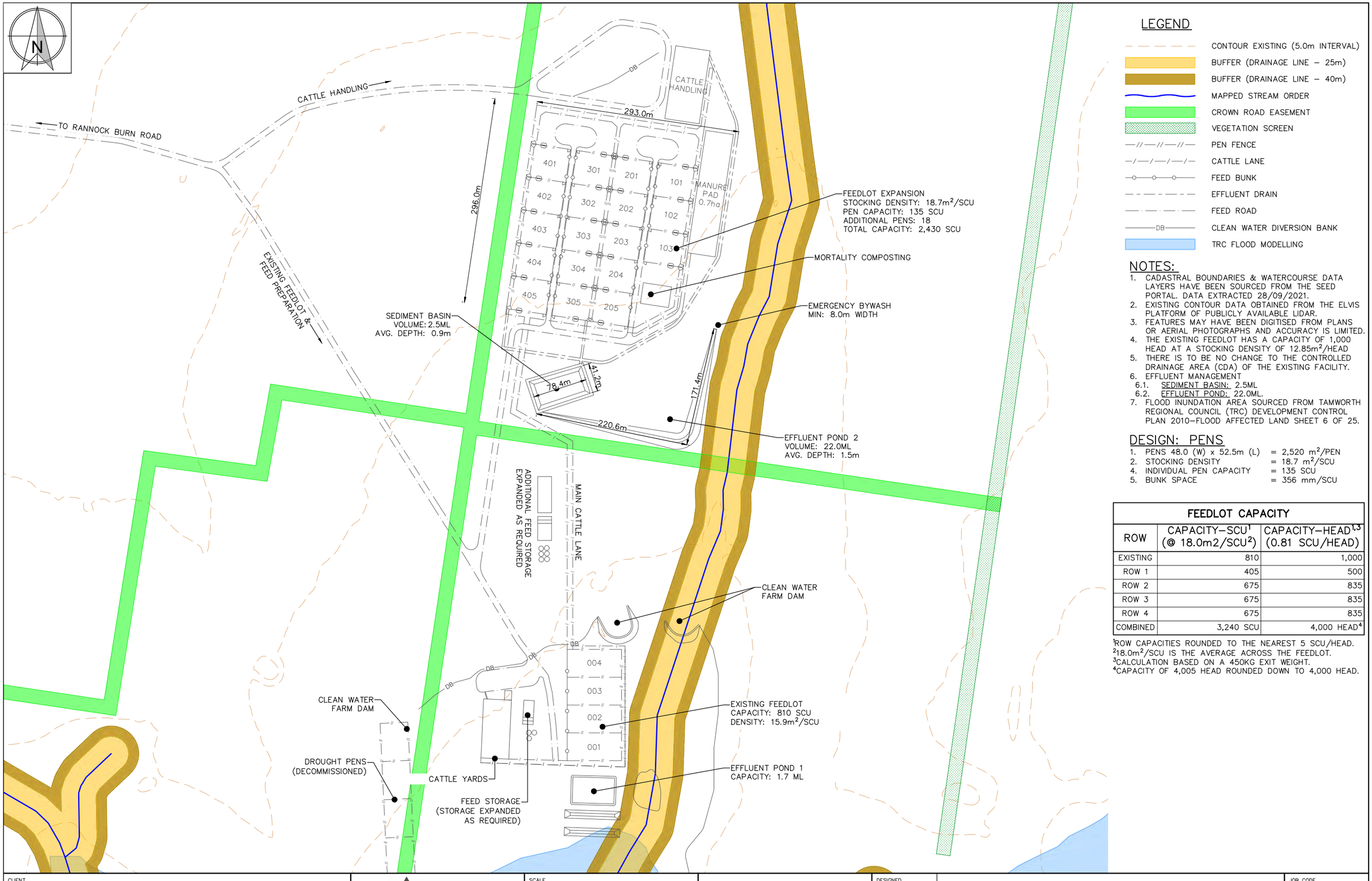

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- EFFLUENT DRAIN
- FEED ROAD
- DB — CLEAN WATER DIVERSION BANK
- TRC FLOOD MODELLING

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CLIENT
ANGORA FEEDLOT PTY LTD

PROJECT
ANGORA FEEDLOT EXPANSION

LOCATION
RANNOCK BURN ROAD, RUSHES CREEK NSW 2346

SHEET TITLE
DESIGN PLAN – 4,000 HEAD

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SCALE
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REVISIONS

JOB CODE
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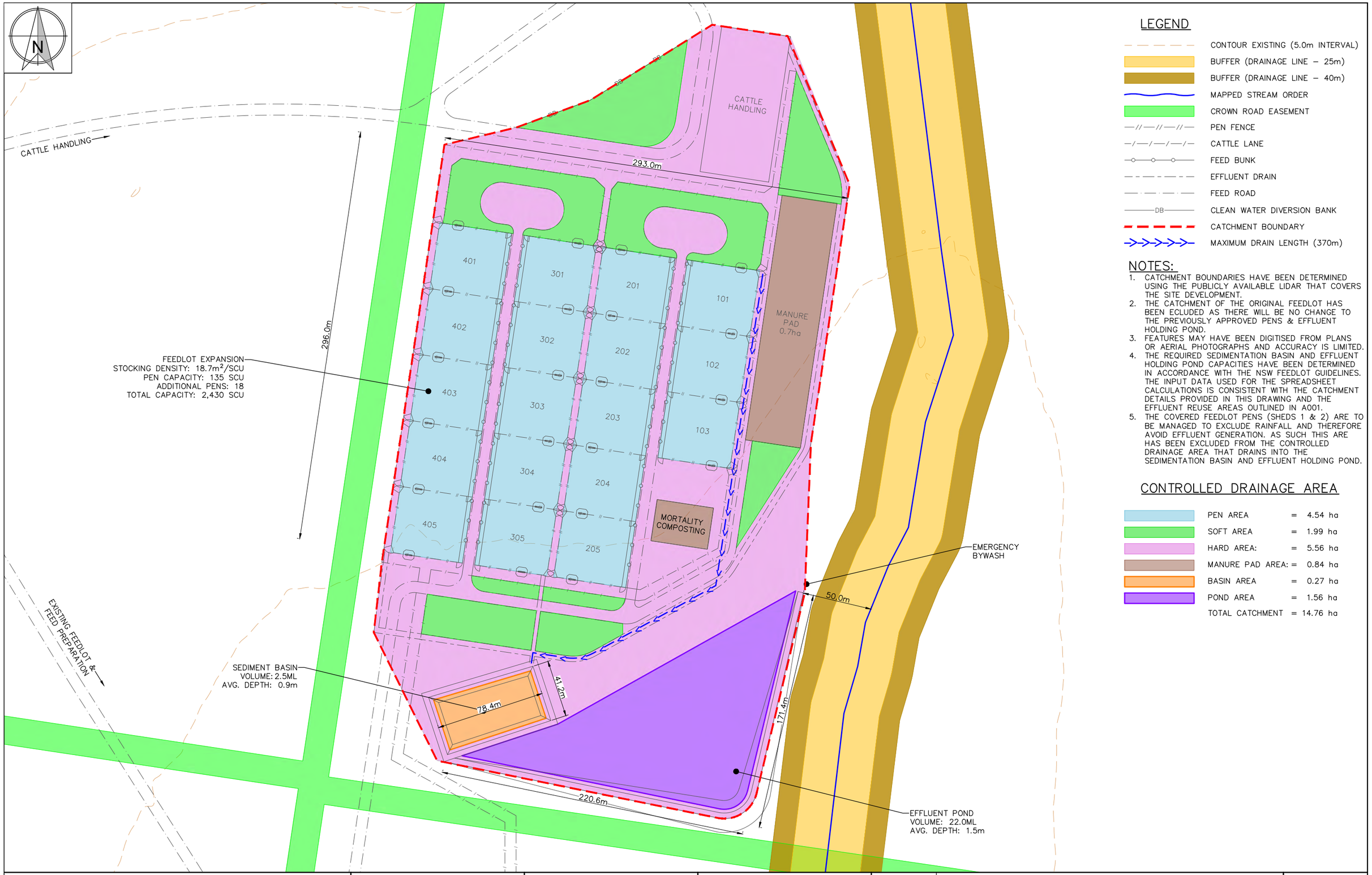
SHEET NUMBER
A504

CURRENT REVISION
DRAFT 2



LEGEND

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- BUFFER (DRAINAGE LINE – 40m)
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- CROWN ROAD EASEMENT
- PEN FENCE
- CATTLE LANE
- FEED BUNK
- EFFLUENT DRAIN
- FEED ROAD
- DB — CLEAN WATER DIVERSION BANK
- CATCHMENT BOUNDARY
- MAXIMUM DRAIN LENGTH (370m)

NOTES:

1. CATCHMENT BOUNDARIES HAVE BEEN DETERMINED USING THE PUBLICLY AVAILABLE LIDAR THAT COVERS THE SITE DEVELOPMENT.
2. THE CATCHMENT OF THE ORIGINAL FEEDLOT HAS BEEN ECLUDED AS THERE WILL BE NO CHANGE TO THE PREVIOUSLY APPROVED PENS & EFFLUENT HOLDING POND.
3. FEATURES MAY HAVE BEEN DIGITISED FROM PLANS OR AERIAL PHOTOGRAPHS AND ACCURACY IS LIMITED.
4. THE REQUIRED SEDIMENTATION BASIN AND EFFLUENT HOLDING POND CAPACITIES HAVE BEEN DETERMINED IN ACCORDANCE WITH THE NSW FEEDLOT GUIDELINES. THE INPUT DATA USED FOR THE SPREADSHEET CALCULATIONS IS CONSISTENT WITH THE CATCHMENT DETAILS PROVIDED IN THIS DRAWING AND THE EFFLUENT REUSE AREAS OUTLINED IN A001.
5. THE COVERED FEEDLOT PENS (SHEDS 1 & 2) ARE TO BE MANAGED TO EXCLUDE RAINFALL AND THEREFORE AVOID EFFLUENT GENERATION. AS SUCH THIS ARE HAS BEEN EXCLUDED FROM THE CONTROLLED DRAINAGE AREA THAT DRAINS INTO THE SEDIMENTATION BASIN AND EFFLUENT HOLDING POND.

CONTROLLED DRAINAGE AREA

PEN AREA	=	4.54 ha
SOFT AREA	=	1.99 ha
HARD AREA:	=	5.56 ha
MANURE PAD AREA:	=	0.84 ha
BASIN AREA	=	0.27 ha
POND AREA	=	1.56 ha
TOTAL CATCHMENT	=	14.76 ha

CLIENT
ANGORA FEEDLOT PTY LTD

PROJECT
ANGORA FEEDLOT EXPANSION

LOCATION
RANNOCK BURN ROAD, RUSHES CREEK NSW 2346

SHEET TITLE
CONTROLLED DRAINAGE PLAN – 4,000 HEAD

AgDSA
AGRICULTURAL DEVELOPMENT SERVICES AUSTRALIA
PO BOX 292
TOOWOOMBA QLD 4350
PH: +61 418 446 245
E: contact@agdsa.com.au

SCALE
0 25 50 75m
SCALE 1:1250 (A1) 1:2500 (A3)

ANGORA FEEDLOT PTY LTD

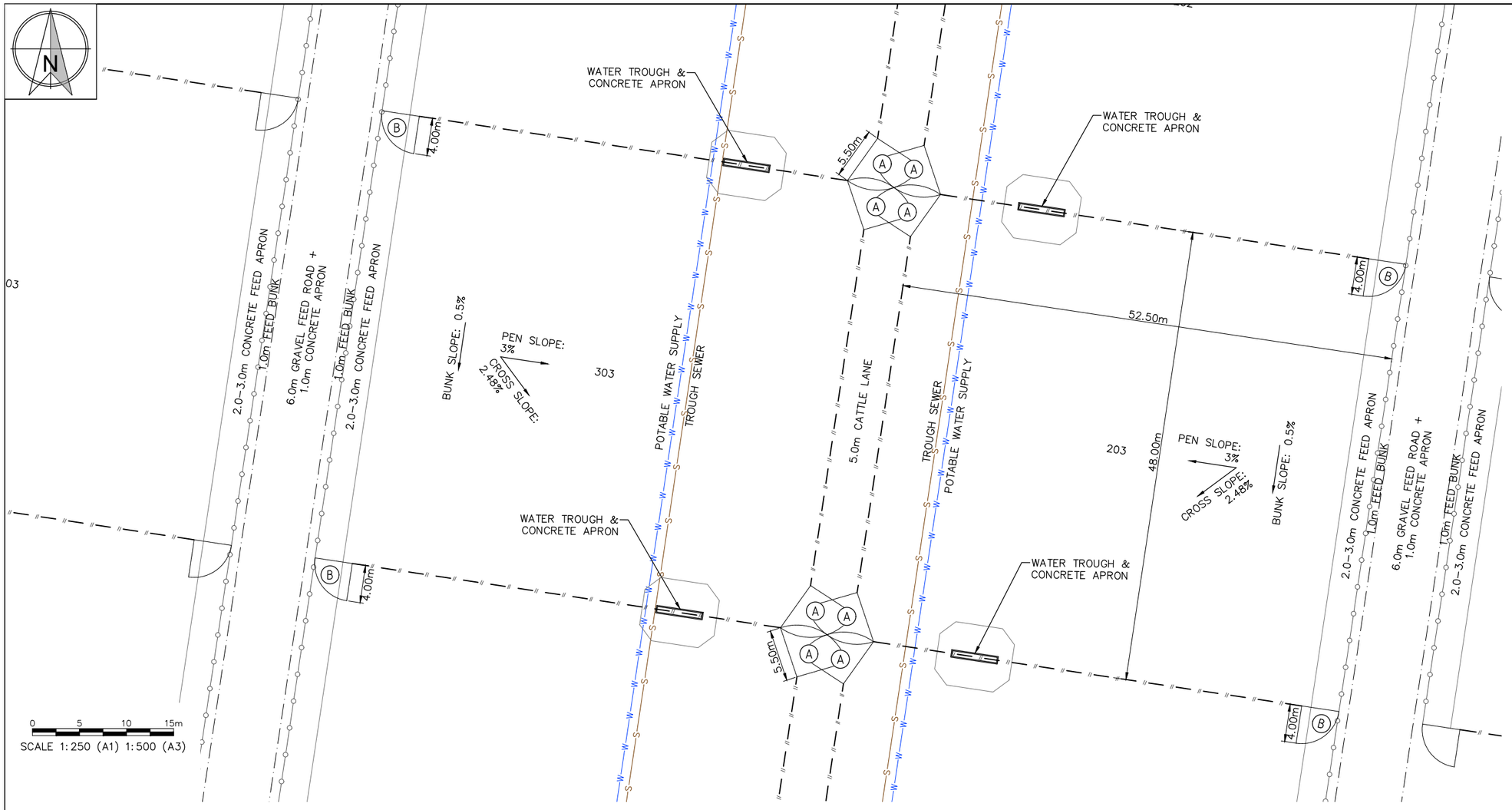
DESIGNED: TJS
CHECKED: MRN
PROJECT MANAGER: MRN

DRAFT – FOR CLIENT REVIEW

DATE	REV	DESCRIPTION	APP.
31/10/2024	D2	UPDATE SHEET NAME, MODIFY CAPACITY & CHANGE PEN DEPTH FROM 50.0 TO 52.5M	MRN
30/10/2024	D1	ORIGINAL DRAFT ISSUE OF REDUCED CAPACITY TO MEET NSW EPA REQUEST	MRN

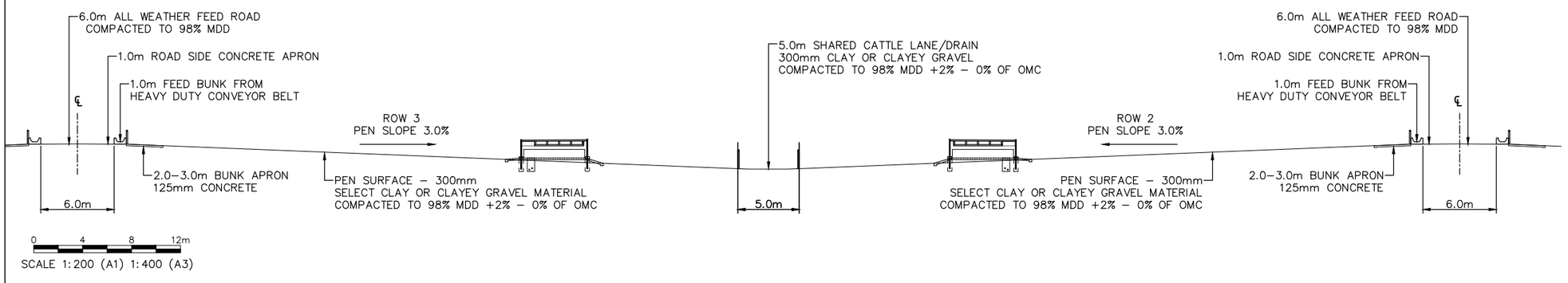
REVISIONS

JOB CODE: BTC–001
SHEET NUMBER: A505
CURRENT REVISION: DRAFT 2



SCALE 1:250 (A1) 1:500 (A3)

TYPICAL PLAN – PRODUCTION PENS



SCALE 1:200 (A1) 1:400 (A3)

TYPICAL SECTION – PRODUCTION PENS

LEGEND

- PEN FENCE
- CATTLE LANE
- FEED BUNK
- FEED ROAD
- (A) GATE – 4.0m ACROSS BUNK APRON
- (B) GATE – 5.5m CATTLE ACCESS
- WATER LINE
- TROUGH SEWER LINE

MATERIALS

1. THE MATERIALS USED FOR THE CONSTRUCTION OF THE COMPOST PAD SHALL BE CLASSIFIED AS EITHER CL, CI, CH, SC OR GC IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM. IT SHALL COMPLY WITH THE FOLLOWING PARTICLE SIZE & PLASTICITY LIMITS.
2. PARTICLE SIZE DISTRIBUTION

37.5	100
19.0	70–700
2.36	40–100
0.075	25–90

3. FINES PLASTICITY LIMITS FINES (PASSING 0.425mm)

LIQUID LIMIT:	30–60%
PLASTICITY INDEX:	>10%

CONSTRUCTION REQUIREMENTS

1. TOPSOIL STRIPPING SHALL BE UNDERTAKEN TO A SUITABLE DEPTH TO CLEAR THE SITE OF TREES, SCRUB, STUMPS, GRASS & ORGANIC MATTER.
2. AFTER TOPSOIL STRIPPING HOLES RESULTING FROM THE STRIPPING SHALL BE FILLED.
3. RIPPING TO A DEPTH OF 150mm IS TO BE UNDERTAKEN AND WATER ADDED TO ENSURE MATERIAL IS WITHIN ±2% OF THE OPTIMUM MOISTURE CONTENT (OMC).
4. AFTER WATERING COMPACTION IS TO BE UNDERTAKEN TO PRODUCE FIELD DRY DENSITY OF AT LEAST 98% OF THE STANDARD MAXIMUM DRY DENSITY (MDD).
5. SUITABLE FILL MATERIAL SHOULD BE PLACED IN LAYERS OF 200mm (PRIOR TO COMPACTION). EACH LAYER SHOULD BE TINED, WETTED TO ±2% OF OPTIMUM MOISTURE CONTENT (AS 1289 5.1.1) AND COMPACTED TO REACH THE REQUIRED COMPACTION RELATIVE TO THE MAXIMUM DRY DENSITY (AS1289 5.4.2).
6. THE FINAL SURFACE OF THE PAD MUST HAVE A MINIMUM CBR (CALIFORNIA BEARING RATIO) OF 20, & BE OF SUFFICIENT DEPTH TO ENSURE THE INTEGRITY OF THE STRUCTURE IS MAINTAINED THROUGHOUT THE GENERAL OPERATION OF THE FEEDLOT.
7. IRRESPECTIVE OF THE FINISHED PEN SURFACE, THE UNDERLYING SOILS MUST HAVE A MAXIMUM PERMEABILITY OF 1 x 10^{-9}m/s (0.1mm/day) FOR DISTILLED WATER WITH 1.0m OF PRESSURE HEAD.

DESIGN: PRODUCTION PENS

1.	STOCKING DENSITY	= 18.7 m^2/SCU
2.	BUNK SPACE	= 356 mm/SCU
3.	PENS 48.0 x 52.5m	= 2,520 m^2/PEN
4.	INDIVIDUAL PEN CAPACITY	= 135 SCU
5.	NEW PENS	= 18
6.	CAPACITY	= 2,430 SCU

DESIGN: GENERAL FACILITY

1. EXPANDED PRODUCTION CAPACITY = 3,240 SCU

CLIENT
ANGORA FEEDLOT PTY LTD

PROJECT
ANGORA FEEDLOT EXPANSION

LOCATION
RANNOCK BURN ROAD, RUSHES CREEK NSW 2346

SHEET TITLE
TYPICAL PEN DESIGN & CROSS SECTION

AgDSA
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PO BOX 292
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PH: +61 418 446 245
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SCALE
AS SHOWN

ANGORA FEEDLOT PTY LTD

DESIGNED TJS
CHECKED MRN
PROJECT MANAGER MRN

DRAFT – FOR CLIENT REVIEW

DATE	REV	DESCRIPTION	APP
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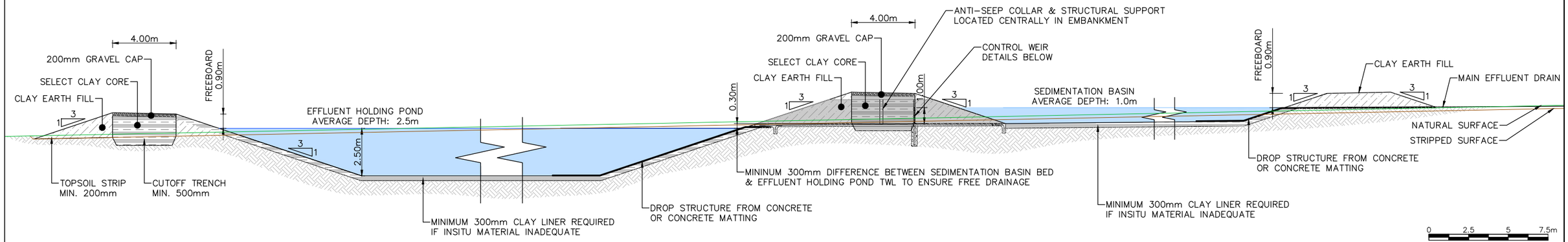
REVISIONS

JOB CODE
BTC–001

SHEET NUMBER
A506

CURRENT REVISION
DRAFT 2



TYPICAL CROSS SECTION THROUGH EFFLUENT MANAGEMENT SYSTEM

TABLES 1, 2 & 3 DETAIL POTENTIAL FLOW CAPACITIES OF VARIOUS DRAIN CONFIGURATIONS. A MINIMUM DRAIN WIDTH OF 2.5m IS RECOMMENDED TO ALLOW FOR EASE OF MAINTENANCE.

TABLE 1 – 0.50% DRAIN CAPACITY (m^3/s)

DEPTH (m)	DRAIN BED WIDTH (m)						
	2.0	2.5	3.0	3.5	4.0	4.5	5.0
0.10	0.130	0.16	0.19	0.22	0.25	0.28	0.31
0.20	0.430	0.53	0.62	0.72	0.81	0.91	1.01
0.30	0.910	1.09	1.27	1.46	1.65	1.83	2.02
0.40	1.560	1.85	2.15	2.44	2.74	3.04	3.35
0.50	2.410	2.83	3.25	3.68	4.11	*4.54	*4.98

DRAINS ASSUMED TO HAVE COMPACTED GRAVEL BASE & INTERNAL BATTERS OF 1:3.
* IDENTIFIES FLOW VELOCITIES GREATER THAN 1.5 m/s WHICH REQUIRE SPECIFIC DRAIN LINING.

TABLE 2 – 0.75% DRAIN CAPACITY (m^3/s)

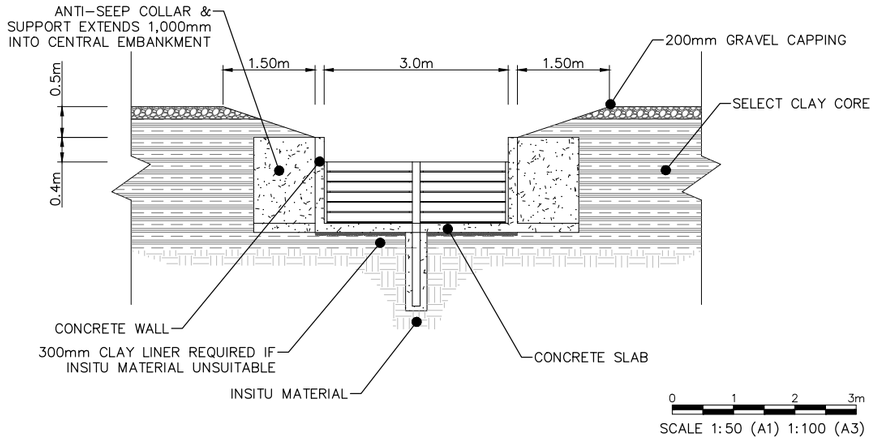
DEPTH (m)	DRAIN BED WIDTH (m)						
	2.0	2.5	3.0	3.5	4.0	4.5	5.0
0.10	0.160	0.190	0.230	0.270	0.310	0.340	0.380
0.20	0.530	0.650	0.760	0.880	1	1.110	1.230
0.30	1.110	1.330	1.560	1.790	2.020	2.250	2.480
0.40	1.910	*2.27	*2.63	*2.99	*3.36	*3.73	*4.10
0.50	*2.95	*3.46	*3.98	*4.51	*5.03	*5.56	*6.09

DRAINS ASSUMED TO HAVE COMPACTED GRAVEL BASE & INTERNAL BATTERS OF 1:3.
* IDENTIFIES FLOW VELOCITIES GREATER THAN 1.5 m/s WHICH REQUIRE SPECIFIC DRAIN LINING.

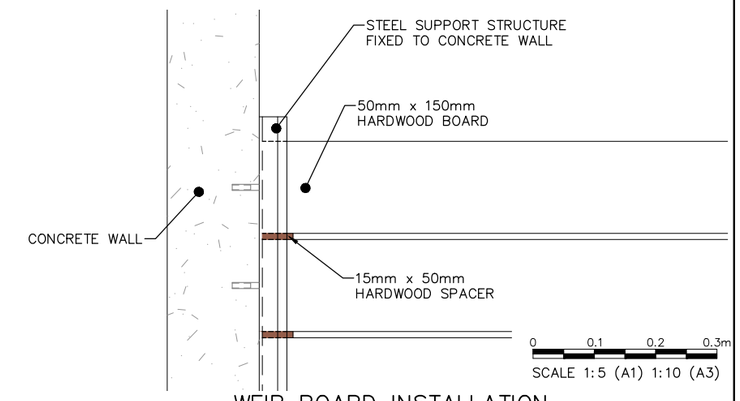
TABLE 3 – 1.0% DRAIN CAPACITY (m^3/s)

DEPTH (m)	DRAIN BED WIDTH (m)						
	2.0	2.5	3.0	3.5	4.0	4.5	5.0
0.10	0.180	0.22	0.27	0.31	0.35	0.40	0.44
0.20	0.610	0.75	0.88	1.01	1.15	1.29	1.42
0.30	1.280	*1.54	*1.80	*2.06	*2.33	*2.59	*2.86
0.40	*2.20	*2.62	*3.04	*3.46	*3.88	*4.31	*4.73
0.50	*3.40	*4.00	*4.60	*5.20	*5.81	*6.42	*7.02

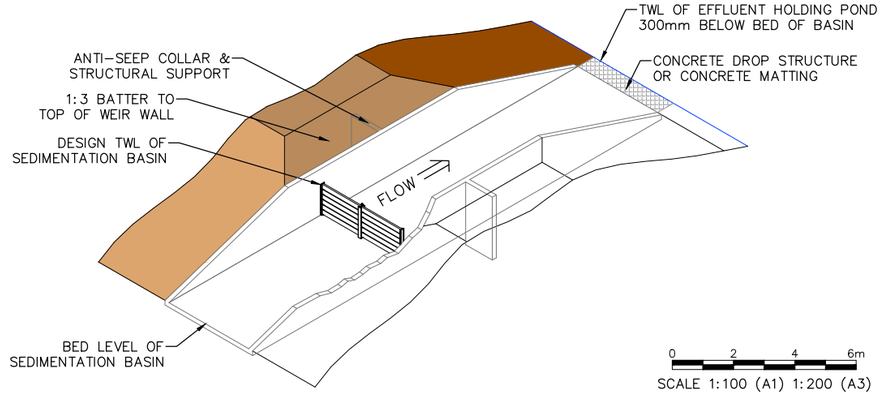
DRAINS ASSUMED TO HAVE COMPACTED GRAVEL BASE & INTERNAL BATTERS OF 1:3.
* IDENTIFIES FLOW VELOCITIES GREATER THAN 1.5 m/s WHICH REQUIRE SPECIFIC DRAIN LINING.



CONTROL WEIR – FRONT ELEVATION



WEIR BOARD INSTALLATION



WEIR INSTALLATION

TABLE 4 DETAILS THE CAPACITY OF VARIOUS RECTANGULAR WEIR CONFIGURATIONS. A MAXIMUM WEIR DEPTH OF 0.5m IS RECOMMENDED. WEIR WIDTH IS DIRECTLY PROPORTIONAL TO FLOW CAPACITY, THEREFORE, THE CAPACITY OF TWO 5.0m WEIR WIDTHS ARE EQUAL TO A SINGLE 10.0m WEIR.

TABLE 4 – WEIR CAPACITY (m^3/s)

DEPTH (m)	WEIR WIDTH (m)						
	2.0	2.5	3.0	3.5	4.0	4.5	5.0
0.1	0.11	0.13	0.16	0.19	0.22	0.24	0.27
0.2	0.30	0.38	0.46	0.53	0.61	0.68	0.76
0.3	0.56	0.70	0.84	0.98	1.12	1.26	1.40
0.4	0.86	1.08	1.29	1.51	1.72	1.94	2.15
0.5	1.20	1.50	1.80	2.10	2.40	2.70	3.01
0.6	1.58	1.98	2.37	2.77	3.16	3.56	3.95
0.7	1.99	2.49	2.99	3.48	3.98	4.48	4.98
0.8	2.43	3.04	3.65	4.26	4.87	5.47	6.08

CLIENT
ANGORA FEEDLOT PTY LTD

PROJECT
ANGORA FEEDLOT EXPANSION

LOCATION
RANNOCK BURN ROAD, RUSHES CREEK NSW 2346

SHEET TITLE
TYPICAL EFFLUENT MANAGEMENT SYSTEM DESIGN

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SCALE
AS SHOWN

ANGORA FEEDLOT PTY LTD

DESIGNED TJS
CHECKED MRN
PROJECT MANAGER MRN

DRAFT – FOR CLIENT REVIEW

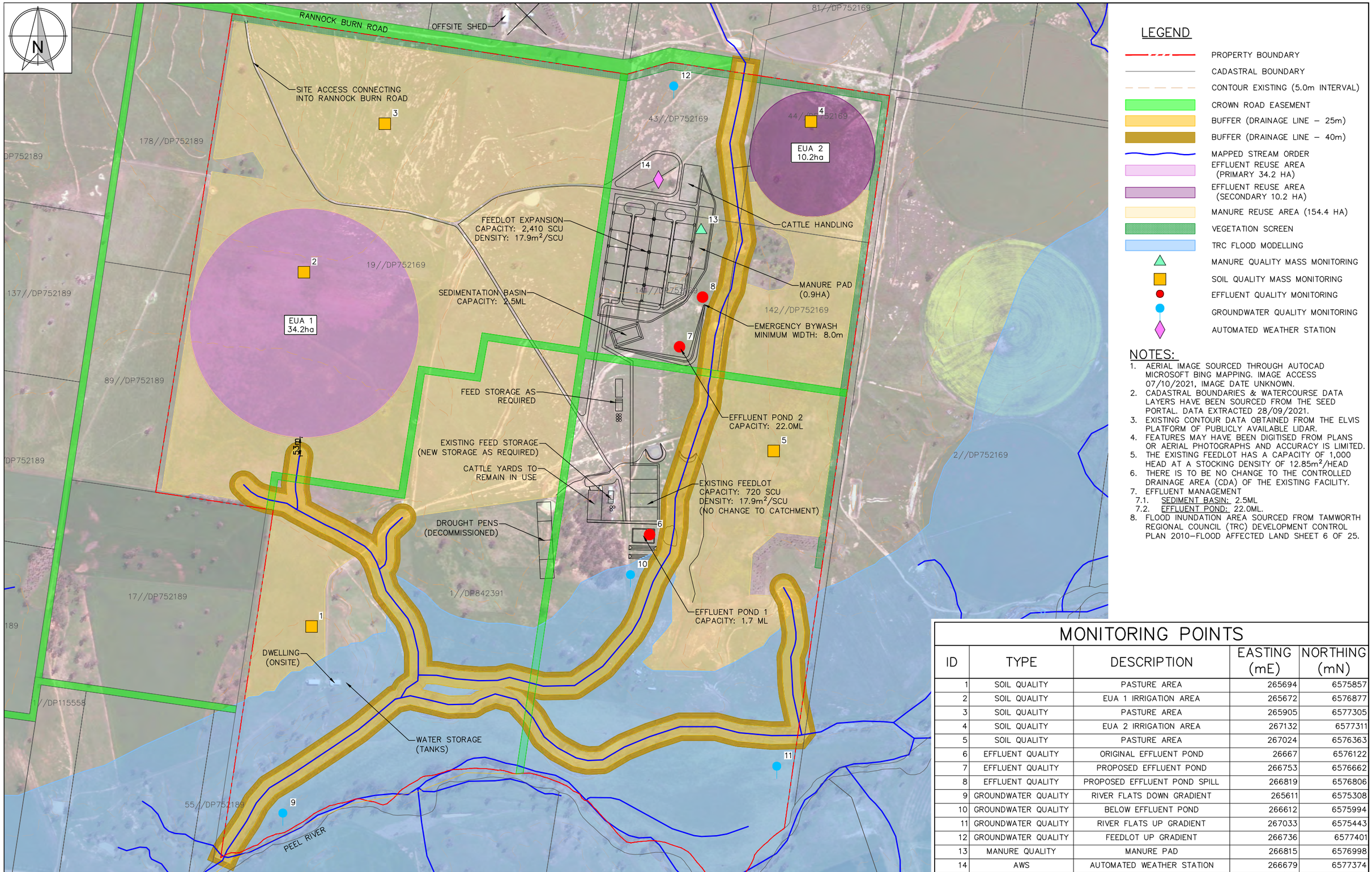
DATE	REV	DESCRIPTION	APP
31/10/2024	D2	UPDATE SHEET NAME, MODIFY CAPACITY & CHANGE PEN DEPTH FROM 50.0 TO 52.5M	MRN
30/10/2024	D1	ORIGINAL DRAFT ISSUE OF REDUCED CAPACITY TO MEET NSW EPA REQUEST	MRN

REVISIONS

JOB CODE
BTC-001

SHEET NUMBER
A507

CURRENT REVISION
DRAFT 2



LEGEND

- PROPERTY BOUNDARY
- CADASTRAL BOUNDARY
- CONTOUR EXISTING (5.0m INTERVAL)
- CROWN ROAD EASEMENT
- BUFFER (DRAINAGE LINE – 25m)
- BUFFER (DRAINAGE LINE – 40m)
- MAPPED STREAM ORDER
- EFFLUENT REUSE AREA (PRIMARY 34.2 HA)
- EFFLUENT REUSE AREA (SECONDARY 10.2 HA)
- MANURE REUSE AREA (154.4 HA)
- VEGETATION SCREEN
- TRC FLOOD MODELLING
- MANURE QUALITY MASS MONITORING
- SOIL QUALITY MASS MONITORING
- EFFLUENT QUALITY MONITORING
- GROUNDWATER QUALITY MONITORING
- AUTOMATED WEATHER STATION

NOTES:

1. AERIAL IMAGE SOURCED THROUGH AUTOCAD MICROSOFT BING MAPPING. IMAGE ACCESS 07/10/2021, IMAGE DATE UNKNOWN.
2. CADASTRAL BOUNDARIES & WATERCOURSE DATA LAYERS HAVE BEEN SOURCED FROM THE SEED PORTAL. DATA EXTRACTED 28/09/2021.
3. EXISTING CONTOUR DATA OBTAINED FROM THE ELVIS PLATFORM OF PUBLICLY AVAILABLE LIDAR.
4. FEATURES MAY HAVE BEEN DIGITISED FROM PLANS OR AERIAL PHOTOGRAPHS AND ACCURACY IS LIMITED.
5. THE EXISTING FEEDLOT HAS A CAPACITY OF 1,000 HEAD AT A STOCKING DENSITY OF 12.85m²/HEAD
6. THERE IS TO BE NO CHANGE TO THE CONTROLLED DRAINAGE AREA (CDA) OF THE EXISTING FACILITY.
7. EFFLUENT MANAGEMENT
   - 7.1. SEDIMENT BASIN: 2.5ML
   - 7.2. EFFLUENT POND: 22.0ML.
8. FLOOD INUNDATION AREA SOURCED FROM TAMWORTH REGIONAL COUNCIL (TRC) DEVELOPMENT CONTROL PLAN 2010–FLOOD AFFECTED LAND SHEET 6 OF 25.

MONITORING POINTS

ID	TYPE	DESCRIPTION	EASTING (mE)	NORTHING (mN)
1	SOIL QUALITY	PASTURE AREA	265694	6575857
2	SOIL QUALITY	EUA 1 IRRIGATION AREA	265672	6576877
3	SOIL QUALITY	PASTURE AREA	265905	6577305
4	SOIL QUALITY	EUA 2 IRRIGATION AREA	267132	6577311
5	SOIL QUALITY	PASTURE AREA	267024	6576363
6	EFFLUENT QUALITY	ORIGINAL EFFLUENT POND	26667	6576122
7	EFFLUENT QUALITY	PROPOSED EFFLUENT POND	266753	6576662
8	EFFLUENT QUALITY	PROPOSED EFFLUENT POND SPILL	266819	6576806
9	GROUNDWATER QUALITY	RIVER FLATS DOWN GRADIENT	265611	6575308
10	GROUNDWATER QUALITY	BELOW EFFLUENT POND	266612	6575994
11	GROUNDWATER QUALITY	RIVER FLATS UP GRADIENT	267033	6575443
12	GROUNDWATER QUALITY	FEEDLOT UP GRADIENT	266736	6577401
13	MANURE QUALITY	MANURE PAD	266815	6576998
14	AWS	AUTOMATED WEATHER STATION	266679	6577374

CLIENT
ANGORA FEEDLOT PTY LTD

PROJECT
ANGORA FEEDLOT EXPANSION

LOCATION
RANNOCK BURN ROAD, RUSHES CREEK NSW 2346

SHEET TITLE
ENVIRONMENTAL MONITORING PLAN – 4,000 HEAD

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PO BOX 292
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SCALE
0 100 200 300m
SCALE 1:5,000 (A1) 1:10,000 (A3)

ANGORA FEEDLOT PTY LTD

DESIGNED: TJS
CHECKED: MRN
PROJECT MANAGER: MRN

DRAFT – FOR CLIENT REVIEW

DATE	REV	DESCRIPTION	APP.
31/10/2024	D2	UPDATE SHEET NAME, MODIFY CAPACITY & CHANGE PEN DEPTH FROM 50.0 TO 52.5M	MRN
30/10/2024	D1	ORIGINAL DRAFT ISSUE OF REDUCED CAPACITY TO MEET NSW EPA REQUEST	MRN

REVISIONS

JOB CODE: BTC–001
SHEET NUMBER: A508
CURRENT REVISION: DRAFT 2

LEGEND

- PROPERTY BOUNDARY
- CADASTRAL BOUNDARY
- CONTOUR EXISTING (5.0m INTERVAL)
- CROWN ROAD EASEMENT
- MAPPED STREAM ORDER
- PROPOSED 8m WIDE ROAD CORRIDOR
- SURVEYED TREES

NOTES:

1. AERIAL IMAGE SOURCED THROUGH AUTOCAD MICROSOFT BING MAPPING. IMAGE ACCESS 07/10/2021, IMAGE DATE UNKNOWN.
2. CADASTRAL BOUNDARIES & WATERCOURSE DATA LAYERS HAVE BEEN SOURCED FROM THE SEED PORTAL. DATA EXTRACTED 28/09/2021.
3. EXISTING CONTOUR DATA OBTAINED FROM THE ELVIS PLATFORM OF PUBLICLY AVAILABLE LIDAR.
4. FEATURES MAY HAVE BEEN DIGITISED FROM PLANS OR AERIAL PHOTOGRAPHS AND ACCURACY IS LIMITED.
5. TREE LOCATIONS ALONG ROAD CORRIDOR HAVE BEEN SURVEYED AND GROUND TRUTHED.

DESIGN: ROAD CORRIDOR

1. ROAD WIDTH = 6.0 m
2. CORRIDOR WIDTH = 8.0 m

CLIENT
ANGORA FEEDLOT PTY LTD

PROJECT
ANGORA FEEDLOT EXPANSION

LOCATION
RANNOCK BURN ROAD, RUSHES CREEK NSW 2346

SHEET TITLE
ROAD UPGRADE – 4,000 HEAD

AgDSA
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SCALE
0 50 100 150m
SCALE 1:2,500 (A1) 1:5,000 (A3)

ANGORA FEEDLOT PTY LTD

DESIGNED: TJS
CHECKED: MRN
PROJECT MANAGER: MRN

DRAFT – FOR CLIENT REVIEW

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REVISIONS

JOB CODE: BTC–001
SHEET NUMBER: A509
CURRENT REVISION: DRAFT 2