ELF FARM SUPPLIES

MUSHROOM SUBSTRATE PLANT, MULGRAVE

WATER MANAGEMENT PLAN

Issue 04

JULY 17, 2024

WATER MANAGEMENT PLAN

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1 INTRODUCTION

1.1 BACKGROUND AND PURPOSE

The Water Management Plan (WMP) for Elf Farm Supplies' mushroom substrate plant at Mulgrave responds to Condition 17 of Schedule 3 of the project approval issued on behalf of the Minister for Planning and Infrastructure on 11 January, 2012.

Issue 1 of the WMP, dated June 2012, was approved by the Department of Planning and Infrastructure on 12 July 2012.

On 14 March 2016, the Planning and Assessment Commission approved a project modification (MOD 1). The MOD 1 works completed to date include:

(i) install tunnels to process substrate in the pre-wet stage in lieu of a large shed;
(ii) use ammonia scrubbers and a biofilter for odour management in lieu of bioscrubbers;
(iii) provide additional tunnels for phase 2/3 processing; and
(iv) enclose other operations and storage for improved capture of exhaust air emissions.

The MOD 1 approval inserted a new condition 17A in Schedule 3 requiring an updated WMP to be prepared to include the MOD 1 changes and to be submitted for approval prior to commencement of operation of MOD 1. The updated WMP (Issue 2) was submitted as required on 18th May 2018. By that stage a further application for modification (MOD 3) had been submitted. The Department decided to place consideration of Issue 2 of the WMP on hold until the determination of MOD 3. More recently the Department has advised a preference that management plans "should reflect the ground reality of what currently exists at the site, rather than the 'final' approved layout".

The Department advised on 25 March 2020 that the MOD 3 application had been approved by the Independent Planning Commission. MOD 3 includes changes to the stormwater system and catchment layout. As the MOD 3 amendments have yet to be undertaken, this further update of the WMP, Issue 3, presents water management as it currently exists on the site consistent with the MOD 1 approval.

June 2024 MOD4 application was submitted seeking approval to construct four additional processing tunnels, replace the biofilter with a new biofilter less liable to be affected by flooding, repurpose older mothballed tunnels, construct various storage sheds and install miscellaneous conveyors, roofing, water management infrastructure and landscaping.

This update has been triggered by the variation to Environmental protection licence (EPL) -6229 dated 7th June 2024.

1.2 CURRENT PLANT LAYOUT

Figure 1 shows the current layout of the substrate plant following MOD 1 changes.

Figure 1 – SITE PLAN

2 Water Sources

Mushroom substrate production is a water-intensive process. Operational water is obtained from several sources:

- Water for use in the Phase 1 process is pumped from South Creek in accordance with licences administered by the WaterNSW. Creek water is pumped to a 120,000 litre water tank located beside the maintenance workshop. The Sydney Water service is also connected as a backup to provide operational water should the South Creek source be unavailable.

- Potable water used for the Phase 2/3 processing area is sourced from the metered Sydney Water supply. The Phase 2/3 processing area requires clean water to minimise the risk of contaminating the pasteurised substrate.

- Potable water for the office, staff amenities, maintenance workshop and cooling towers is also supplied from Sydney Water. Fire hose reels are also connected to this supply. Fire hydrants are connected to the Sydney Water fire mains.

- Rainfall runoff from the sealed work area around the raw materials storage shed, old Phase 1 tunnel/working hall building and the bale wetting shed drains to the water recycle pit adding to the supply of operational water.

- The north east farm dam and sediment retention basins on the property collect building roof water and site drainage water. This water is not currently used in the operation but would be available for use with future capital investment and licensing, where appropriate.

3 Operational Water Use

Figure 2 is an operational water flow chart for the plant.

3.1 Bale Wetting

The bale wetting operation is carried out indoors, as constructed by MOD 1. The water recycle pit is located immediately beside the bale wetting shed.

The straw bale wetting operation uses a circulatory system with water being pumped from the main water recycle pit and sprayed over the stacked straw bales. Surplus water drains from the bales and flows back to the recycling pit for recirculation. A gross solids trap is installed in the drain leading to the pit to reduce the volume of solid material entering the pit and allow easy cleaning. Standby pumps are installed in the pit to reduce the risk of interruption to service. The pumps and spray nozzles are designed to allow solids to pass through, minimising the likelihood of blockage. An aeration pump is installed in the pit to oxygenate the water and maintain aerobic conditions.

The water recycle pit is de-sludged. Material removed is added to the processing substrate.

3.2 Pre-Wet & Phase 1

Water for use in the pre-wet and Phase 1 process is drawn from the 120 000L creek water storage tank. If the level reaches the minimum set level, process water is drawn from the creek supply until the set level is restored.

Water is used in the processing area for bale wetting, addition to the pre-wet mixture, addition to composting material in the Phase 1 tunnel building and for daily wash down in the Phase 1 buildings and work area. Wash down water collects in the recycle pit for reuse in the process. There is no wastewater generated from the Phase 1 process.

3.3 PHASE 2 AND 3

Phase 2/3 processing requires water for wash down, tunnel humidifying, steam boiler operation and adding to substrate if required. There is no wastewater from the Phase 2/3 operation as all drainage and condensate water is pumped to the Phase 1 recycle storage tank for reuse in Phase 1 processing.

3.4 BLOCKING

Blocking process uses the majority of water for the cleaning process. Water may be added to the substrate if required. There is no wastewater from the Blocking operation as all drainage is pumped to the Phase 1 recycle storage tank for reuse in Phase 1 processing.

3.5 COOLING PLANT

Cooling towers require water to operate. Blowdown water is sent to sewer and the majority of water is lost through the operational evaporation.

3.6 OFFICE AND STAFF AMENITIES

Town water is used in office and staff amenities. Wastewater from these areas is discharged to the sewer.

3.7 OPERATIONAL WATER REQUIREMENT ESTIMATES

Table 1 provides an estimate of water usage at the substrate plant currently.

Water Use	**Source**	**Estimated Water Consumption** **Current production (1,800 t/w)**[1]
Bale Wetting/Phase 1 processing area	Main source South Creek	100 megalitres /year
Phase 2/3 buildings	Town water supply	50 megalitres/year
Potable uses	Town water supply	200 kilolitres/year
Plant Cooling Systems	Town water Supply	100 megalitres /year

Table 1 - SUMMARY OF WATER USE

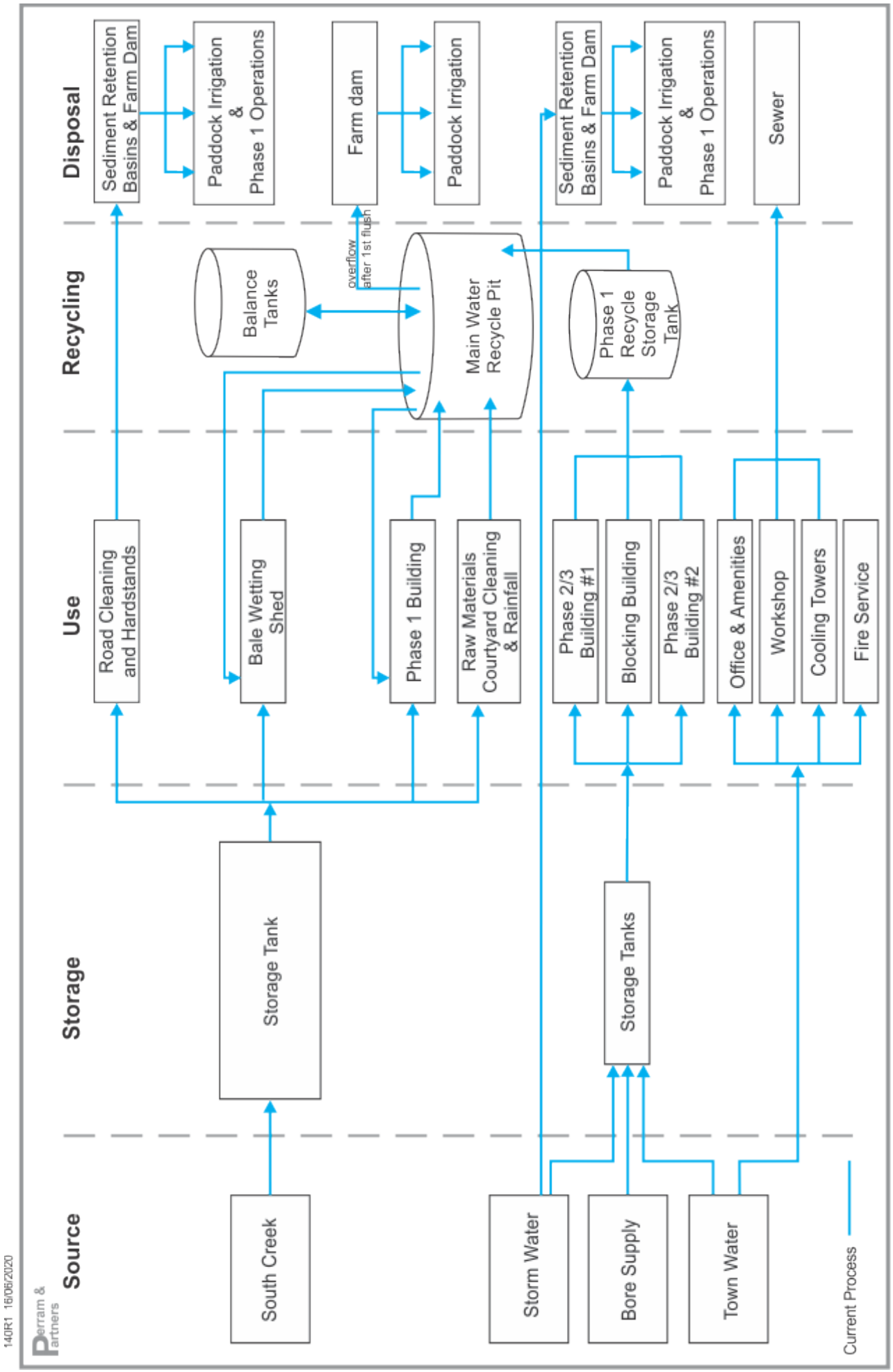


FIGURE 2 Substrate Plant Operational Water Flow Chart

Figure 2 – SUBSTRATE PLANT OPERATIONAL WATER FLOW CHART

4 OPERATIONAL WATER MANAGEMENT

4.1 WATER SUPPLY SOURCE PRIORITY

The priority for sourcing process water for Phase 1 operations is as follows:

(v) Water recycle pit - whenever the pit contains water above its normal operating level, extract water to the balance tanks to lower the level and restore holding capacity for stormwater;
(vi) 120,000 litre storage tank;
(vii) Bore supply (when of suitable quality);
(viii) Sydney Water supply. (town water)

4.2 PROCESS WATER CONTROL

The following procedures prevent the possibility of process water escaping to South Creek:

(i) Apply process water only at locations where there is a sealed operational surface so any spillage or surplus will drain to the collection system;
(ii) Maintain adequate holding capacity in the water recycle pit and balance tanks with the backup farm dam as described in section 4.4;
(iii) Clean the solids filter on the inlet to the water recycle pit when water flow is present (operational water or stormwater);
(iv) Remove any solids or sludge present in the collection pit as necessary to maintain pit operation; and
(v) Trained and competent staff to undertake the irrigation process.

4.3 WATER RECYCLE PIT

The water recycle pit has been designed with sufficient capacity to retain the first flush of rainfall runoff from operational surfaces of the site. The pit capacity was designed following requirements specified at the time by the EPA. Additional balance tanks have been installed to reduce the potential of emergency use of the farm dam.

Should the pit ever become full, water is pumped to balance tanks first and then once they are full, an inlet diverter redirects any subsequent runoff to the farm dam immediately west of the plant. This farm dam is configured so as not to receive water from any source other than diverted pit and/or Biofilter drainage and direct rainfall. Water collecting in this farm dam is disposed of by paddock irrigation. Irrigation procedures are described in section 4.5

Whenever rainfall results in surplus water being present in the water recycle pit and balance tanks, it is preferentially used for operational purposes, quickly restoring the capacity of the pit to collect water from subsequent rainfall.

4.4 FARM DAM MANAGEMENT

This farm dam is managed to remain as close to dry as practicable. Condition 17B of Schedule 3 of the project approval requires that the farm dam not be used to receive process water. Under normal conditions, the farm dam will receive some water from direct rainfall and groundwater. Irrigation will occur whenever water has collected in the farm dam to the west of the plant, as described in section 4.5.2.

Condition 17C permits that the farm dam may be used during an emergency, including high rainfall event or plant breakdown. On any such occasion, the condition requires that the Department be notified as soon as

practicable after becoming aware of the incident and in writing within seven days of the event. By correspondence dated 21 August 2017, the Department has required that the EPA be notified at the same time as the Department. Condition R4.1 of the current Environment Protection Licence . We must retain records detailing irrigation of waste water from the dam at the premises for four years.

In summary notification requirements are as follows:

(i) DPIE and EPA – as soon as practicable and in writing within seven days of any emergency use of the farm dam located west of the plant. This includes the use of the farm dam during high rainfall events;

notification are as follows:

DPIE: Major Projects portal

EPA: info@epa.nsw.gov.au

4.5 IRRIGATION PLAN

4.5.1 Irrigation Area

The area to the west of the substrate plant, extending to South Creek includes a small contour bank in the northern part. This bank defines an area used for irrigating any water collecting in the overflow farm dam located to the immediate west of the plant and is shown in Figure 3. The irrigation area contains a series of furrows running east-west to help spread the irrigated water across the surface.

The contour bank is provided on the north and west side of the irrigation area to prevent irrigated water draining directly to South Creek. The bank serves a second purpose during flood events. Following a flood peak when floodwater is receding towards the creek, the bank will retain water inhibiting flow directly in contact with the ground where any solids contained in previously irrigated water may be present.

4.5.2 Irrigation Process

It has been agreed to maintain the farm dam as close to empty as possible at all times. Consequently, the farm dam is inspected following any significant rainfall and any plant emergency involving the water management system. Such an emergency would be rare but could include equipment breakdown or malfunction or fire. For the most part, irrigation involves disposing of rainwater accumulating in the farm dam.

Irrigation can occur when:

(i) there is water in the farm dam above the level of the discharge pump inlet;
(ii) the irrigation area has been inspected and confirmed not to be saturated, as per farm dam pumping procedure, included in the appendix;
(iii) weather conditions are suitable; and

During irrigation, farm dam water is released into the irrigation furrows from a series of outlets at ground level. The discharge area is monitored during the process to confirm that irrigated water does not reach the contour bank and accumulate on the surface. Should this begin to occur, irrigation is ceased until conditions improve. Irrigation is undertaken during daylight hours and while trained staff are present at the plant to monitor the operation.

Details of each irrigation episode are recorded at the plant. There is provision for farm dam water to be removed by tanker should conditions remain unsuitable for irrigation for an extended period.

5 STORMWATER MANAGEMENT

A stormwater management plan for the substrate plant was prepared by Barker Ryan Stewart (BRS) and included in the Environmental Assessment for the project application (Perram & Partners 2010). BRS updated the stormwater management plan for the MOD3 application.

5.1 STORMWATER DRAINAGE

Existing stormwater drainage at the site includes the following features:

(i) roof water collected from major structures at the site is drained to various destinations, as follows:
   a. to three stormwater detention basins, one discharging to a reed bed in the north east corner of the property and the other two discharging to the South Creek flood plain;
   b. directly to the north east reed bed; or
   c. to a basin west of the plant next to farm dam;
   d. near the southern boundary, discharging to the neighbouring market garden which has a large storage farm dam;

(ii) surface water from hard surface areas and roadways on the site is directed to the stormwater detention basins,

(iii) surface water from the Phase 1 operational area of the site drains to the water recycle pit, from which it is re-used in the process.

A catchment plan prepared by Barker Ryan Stewart is included in the appendix.

5.2 STORMWATER MANAGEMENT AND MAINTENANCE PROCEDURES

The stormwater system requires the following intervention to ensure continued correct operation:

(i) As soon as possible following rainfall, ensure that sufficient stormwater is removed from the water recycling pit to restore the requisite 29 cubic metres of available stormwater storage capacity;

(ii) Ensure the maximum water level in the pit for operational use in normal (dry) weather remains clearly marked;

(iii) Irrigate stormwater from the farm dam west of the site, consistent with the irrigation plan below as soon as possible when water collects in the farm dam;

(iv) After daily operations, return the operational areas of the site to a clean state to minimise the number of solid materials capable of being washed into the water recycle pit;

(v) Maintain the water recycle pit indicated in section 4.3.
   a. clean the solids filter on the input to the water recycle pit when water flow is present (operational water or stormwater);
   b. remove any solids or sludge present in the recycle pit.

(vi) Remove accumulated sediment or sludge from the detention basins when required; and

(vii) Inspect and maintain vegetation in the reed bed and bio-retention basin as required, including harvesting and desludging, should this become necessary.

Perram & Partners

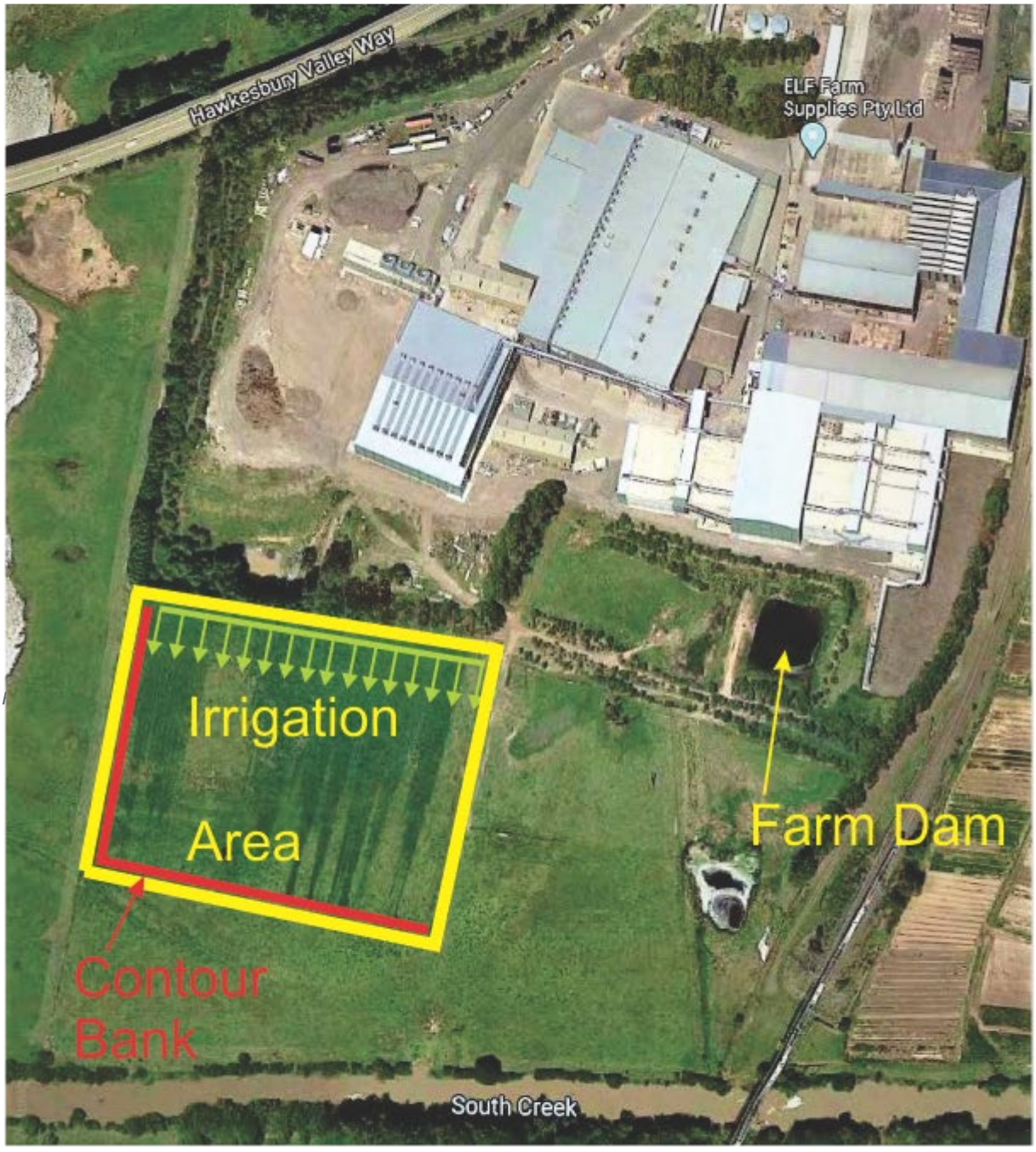


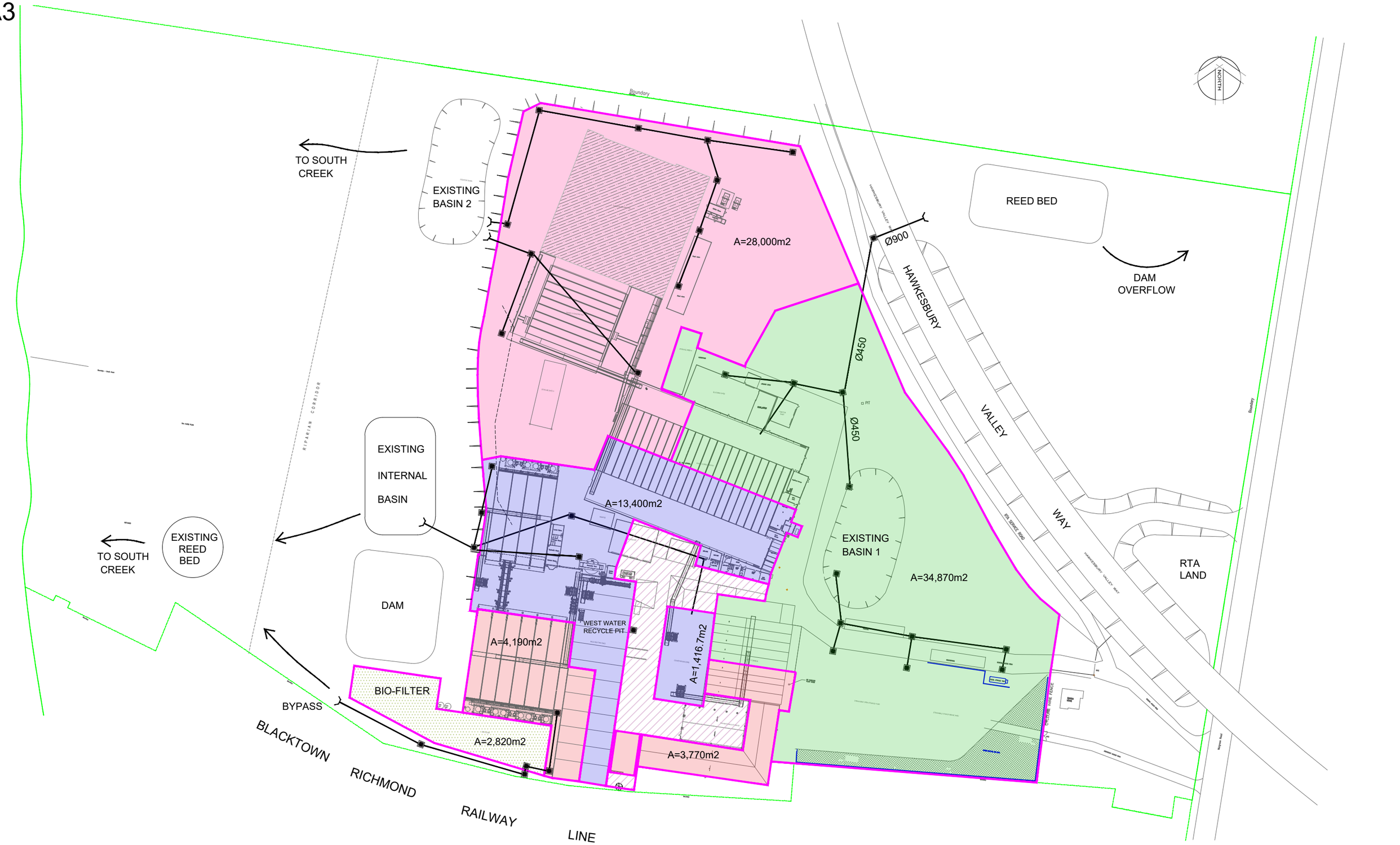
FIGURE 3 Irrigation Area

6 APPENDIX

Catchment plan, post MOD 1

farm dam pumping procedure

A3



No.	DATE	AMENDMENT
B	21.12.2017	ISSUED FOR INFORMATION

BARKER STEWART
TOTAL PROJECT SOLUTIONS
PLANNING - PROJECT MANAGEMENT - ENGINEERING - CERTIFICATION
SYDNEY P: 02 9659 0005
CENTRAL COAST P: 02 4325 5255
HUNTER P: 02 4966 8388
ABN: 26 134 067 842
brs.com.au
mail@brs.com.au

Designed: GJ
Drawn: RW
Checked: GJ

Scales: Plan 1:2000
Horiz.
Vert.
X-Sect.

Datum: A.H.D.

Client: ELF FARM SUPPLIES PTY LTD

LGA: HAWKESBURY
Council Ref:

108 MULGRAVE ROAD, MULGRAVE
MUSHROOM SUBSTRATE PLANT EXTENSIONS
CATCHMENT PLAN

Plan No. 07166E20
REV. B
File Ref. 07166E20
SHEET 1 OF 1 SHEETS

# Farm Dam Pumping	**Elf Farm Pty Ltd** **Document Management System** ***EFS.ENV.002*** ***Revised: 17.07.2024***

1. Check current conditions of discharge area, (i.e. points iv and vi below) before proceeding.
2. If dam is full and conditions for pumping to paddock is not adequate, the contracted vacuum tanker below is required to remove the water and dispose to a licensed waste facility.
    a. Taylor Excavations and Haulage – Brett – 0409 912 690
3. Senior Manager will authorise a worker, trained in this procedure, to proceed to pump dam water in accordance with this procedure and document authorisation in register. (EFS.ENV.003)
4. Worker to document in register the following:
    a. Pump start/finish date and time;
    b. Task and Observations such as
        i. Walking pump out area;
        ii. Check discharge valves;
        iii. Flow rates
        iv. Ground saturation before and during pumping
        v. Water approaching and flowing past "limit fence"
        vi. Weather conditions before and during pump out.
5. Register to be kept onsite for inspection by EPA officer.

Pumping procedure

1. Secure a full 20L jerry can of unleaded petrol in the back of the work ute.
2. Drive down to dam pump via designated driveway.
3. Fuel up pump tank from jerry can and prime pump.
4. Check discharge manifold valves are in correct position
5. Start pump and check its operation correctly
6. Walk to discharge area and check all valves and flow rates
7. Monitor conditions throughout the shift and document observations in register.
8. Turn off discharge valves when water level in each furrow is full.
9. Turn pump off when monitoring can't be conducted (i.e. end of shift) and before water level overflows end of all furrows at limit fence (discharge paddock fence line).
10. If Worker monitoring the pump out leaves site, the pump must be turned off prior or a handover of monitoring responsibility written in register.

Dam Pump

Discharge Manifold

Discharge Valves

Discharge furrows

End of furrows / limit fence

Farm Dam Pumping Register	**Elf Farm Pty Ltd** **Document Management System** ***EFS.ENV.003*** ***Revised 10.05.2016***

EPA Notification Date: _____

Authorised Person: _____ **Signature:** _____

Notified Pumping Duration: _____/_____/_____ **to** _____/_____/_____

Date	Time	Pump Start Time	Pump Finish Time	Ground saturation check	Weather condition check	Task, observations and comment	Worker initials