



Certificate of Accreditation

On-Site Wastewater Management System

This Certificate of Accreditation is hereby issued by the Director of Building Control pursuant to Section 18(1) of the *Building Act 2016* (accreditation of products).

System:	Eljen – GEOTEXTILE Sand Filter System (GSF) with associated septic tank and pump chamber (8EP)
Manufacturer:	Eljen Corporation 90 Meadow Rd Windsor CT USA 06095
Supplier:	Eljen Pacific Pty Ltd
Of:	16 The Lee Devonport, TAS 7310

This is to certify that the Eljen A42 GSF sand filter with full liner, associated septic tank and pump chamber as described in Schedule 1, is accredited as a Secondary wastewater management system meeting the water quality limits set out in AS 1546.3 2017 to a limited capacity of 8EP. This accreditation is subject to the conditions and permitted uses specified in Schedule 2, and the National Construction Code.



Peter John Graham
Director of Building Control
Consumer, Building and Occupational Services
Department of Justice

Date of Issue: 27 September 2021

Certificate Number: DOC/21/72850

This Certificate of Accreditation is in force until 27 September 2026, unless withdrawn earlier at the discretion of the Director of Building Control

Document Development History

Version	Date	Application	Sections amended
1.0	27/09/21	Eljen GSF sand filter with associated septic tank and pump chamber	Original release

Schedule I: Specification

Normative

System Description

The Eljen GSF System of this accreditation comprises a 4000 L baffled septic tank fitted with a bristle-type outlet filter, followed by pressure-dosing (via a 1000 L pump well and pump) to the fully lined GSF treatment bed 6.4m x 2.73m.

The Eljen GSFA42 system is designed to treat the wastewater from a single residential dwelling limited to 8EP with the following hydraulic loads, 1200L/day.

Informative

General

The GSF treatment bed consists of a series of polypropylene media modules to support biological growth (Figure 1), supported by a bed of specified sand (ASTM C33 compliant particle size distribution: Table I) to a depth of 300mm, underlain by a graded layer of gravel aggregate material (10mm minimum particle size). The GSF Module is designed with the following characteristics:

- provide increased surface area for biological treatment of nutrients and contaminants;
- Open air channels support aerobic bacterial growth on the module's geotextile fabric interface, and promotes oxygen in the system;
- An anti-siltation geotextile fabric covers the top and sides of the Module to protect the system from the migration of fines;
- Surface area for enhanced biomat development.

The Eljen GSF system works on the combined principles of primary settling followed by aerobic treatment. All household wastewater enters the tank through the inlet (shown on the left hand side of the diagram below) and settles into the septic tank.

The volume of sludge was measured in all chambers of the septic tank and the effluent pump sump at the end of the testing period as per AS1546.3: 2017.

Table 10. Sludge accumulation testing results for the GSF STS.

Tank (chamber)	Sludge depth (cm)	Chamber volume (L)	Sludge accumulation vs. chamber volume (%)
Septic tank (1 st chamber)	53*	2,730	25
Septic tank (2 nd chamber)	38	1,270	16
Septic tank (pump-out chamber)	0	900	0
GSF bed effluent pump sump	0	100	0

* Final surface crust thickness on 1st chamber of septic tank was approx. 15 cm

Electricity consumption during the testing evaluation period was recorded electronically and was as follows:

- Average daily electricity consumption = 0.15 kWh/d
- Average flow-specific electricity consumption = 0.12 kWh/1,000 L of treated effluent

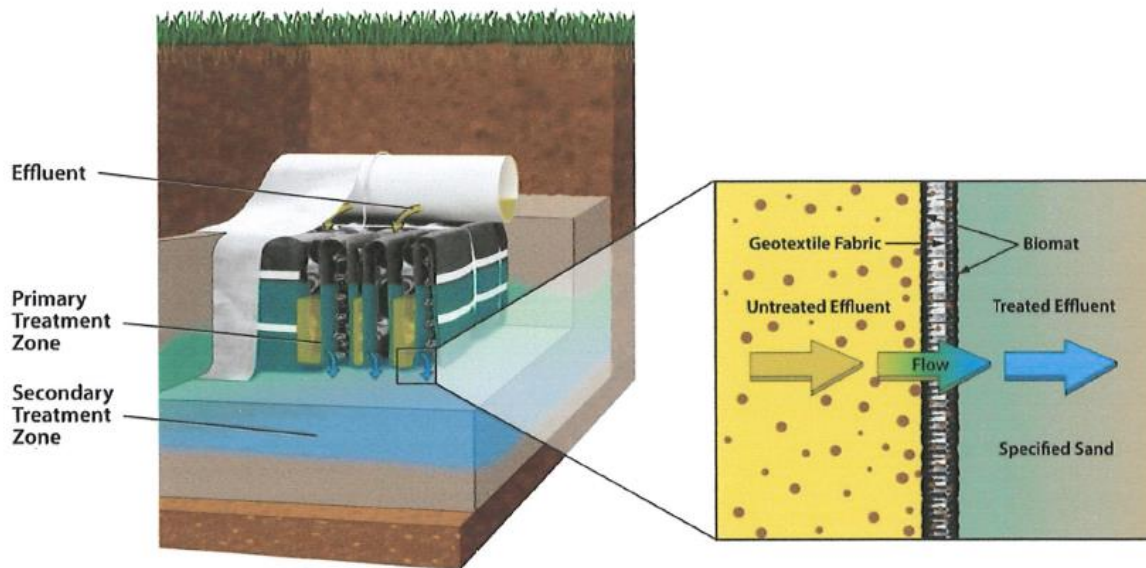


Figure 1. Schematic overview of Eljen GSF system, showing effluent distribution to Modules (gravity wastewater distribution shown) and specified sand layer.

For treatment system schematic drawings and flow path, refer to Appendix A.

Schedule 2: Conditions of Accreditation

1.0 Definitions

In this schedule:

AS/NZS 1547 means the Joint Australian/New Zealand Standard 'AS/NZS 1547:2012 On-site domestic-wastewater management'

AS/NZS 1546.3 means the Joint Australian/New Zealand Standard 'AS/NZS 1546.3:2017 On-site domestic wastewater treatment systems, Part 3: Secondary treatment systems'

AS/NZS 3000 means the Joint Australian/New Zealand Standard 'AS/NZS 3000 Wiring rules'

AS/NZS 5667 means the Joint Australian/New Zealand Standard 'AS/NZS 5667.1:1998 Water quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and preservation and handling of samples'

STS means Secondary Treatment System. A wastewater treatment system which produces treated effluent of a secondary standard (as specified in AS 1546.3:2017 Tables 2.1 & 2.2)

BOD₅ means '5-day Biochemical Oxygen Demand'

Council means 'the Municipal Council having jurisdiction'

Commissioned means 'when the test results from a NATA Certified Laboratory show that the water quality requirements for the STS have been met and all pre-commissioning tests have been carried out in accordance with AS/NZS 1547 on all associated equipment and the sub-surface irrigation system' (where installed)

Designer means 'a person who has a specialty in the area of designing on-site waste water management system installations and may include but not be restricted to appropriately trained professional engineers, soil scientists, land surveyors and plumbers'

Director means 'the Director of Building Control'

E. coli means 'Escherichia coli of the family Enterobacteriaceae which is a bacterium used in public health as an indicator of faecal pollution'

g/m³ means grams per cubic metre

Informative defines as only for information and guidance;

Manufacturer means 'Eljen Corporation'

Normative defines as mandatory and includes the application of Schedule 2, which is an integral part of the Certificate of Accreditation

NATA means 'National Association of Testing Authorities'

PCA means 'Plumbing Code of Australia 2019'

Permit means 'a Permit issued by the permit authority pursuant to section 169 of the *Building Act 2016*'

Permit authority means 'a person or body authorised for that purpose by the *council* of the municipal area in which the on-site waste water management system is installed'

Supplier means 'the party that is responsible for ensuring that products meet and, if applicable, continue to meet, the requirements on which the certification is based.' The supplier for the system is Eljen Pacific Pty Ltd;

System means Eljen GSF/A42

TSS means 'Total Suspended Solids'.

2.0 General

- 2.1 This Certificate of Accreditation is valid up until the date nominated on the front page of this accreditation. Any application for variation or renewal must be accompanied by Product Certification to AS/NZS 1546.3 that has been issued by a JAS-ANZ accredited Conformity Assessment Body (CAB) and other required documentation in accordance with the latest Application for Accreditation Form. The Certificate of Accreditation may be withdrawn by the Director at any time and is not transferable
- 2.2 This certificate supersedes all previously issued certificates.
- 2.3 The *system* must be supplied, constructed and installed in accordance with the design assembly submitted and accredited by the *Director*.
- 2.4 The *system* must not be installed in a plumbing installation other than in accordance with the conditions of permit issued by the *Permit Authority*.
- 2.5 Each *system* must be permanently and legibly marked on a non-corrosive metal plaque or equivalent, attached to the lid with the following information:
- The brand and model name or designation of the system
 - The manufacturer's name or registered trademark
 - Top load limitations, and
 - The month and year of manufacture.
- 2.6 The *supplier* must supply the owner and occupier, of each installation, with a user manual setting out the following:
1. the treatment process
 2. procedures to be followed in the event of a system failure
 3. emergency contact number
 4. care, operation, monitoring and maintenance requirements, and
 5. inspection and sampling procedures to be followed as part of the on-going monitoring and program required by the permit authority.
- 2.7 Any proposed modifications to the *system's* specified processes, equipment, materials, fittings or manuals must have prior authorisation in writing from the *Director* and may be subject to additional verification or testing.
- 2.8 Each application to a *permit authority* to install a *system* must be accompanied by a site design report.
- 2.9 A design and soil evaluation report must be provided in accordance with AS/NZS 1547 for any land application component.
- 2.10 The *supplier* must provide the following information to each *permit authority* where it is intended to install a *system* in their jurisdiction:
- Statement of warranty
 - Statement of service life
 - Quality Assurance Certification
 - Installation Manual
 - Service Manual
 - Owner's Manual
 - Service Report Form
 - Engineering Drawings on A3 format
 - Detailed Specifications
 - Certificate of Accreditation and Schedules.

- 2.11 This Certificate of Accreditation is valid for five (5) years from the date of issue or until withdrawn by the *Director*.
- 2.12 At each anniversary of the accreditation date the *supplier* must submit to the *Director* a list of all *systems* installed in Tasmania during the previous 12 months. The *Director* may randomly select up to 10% of the installed *systems* in any one calendar year. The *Director* will nominate a NATA accredited laboratory for all sampling and will be tested for BOD₅ and TSS and E.coli. The sampling and testing of the selected *systems* is to be done at the *supplier's* expense. The following results must be reported to the *Director*:
- Address of premises
 - Date inspected and sampled
 - Sample identification number
 - E.coli
 - BOD₅
 - TSS, and
 - Service history.
- 2.13 Where a *system* has been found not to operate satisfactorily during its serviceable life, and as a result require modification to achieve the required water quality limits, all installed *systems* are to be modified accordingly.
- 2.14 When granting a *permit* the *permit authority* is to satisfy itself that the *designer's* choice of the *system* configuration is optimal for the proposed use and site conditions.
- 2.15 The *system* must not be deployed to areas where seasonal climatic conditions will negatively affect its proper operation (refer to *manufacturer's* specifications).
- 2.16 Prior to the granting of a *permit* to install a *system* the following reports (see AS/NZS 1547 Clause 7.4) must be submitted with an application to the *permit authority*.

Site-and-soil evaluation report

The site and soil evaluation report is to detail results of an assessment of the individual lot(s) for the public health, environmental, legal and economic factors which are likely to impinge on the location and design of a land-application. (Refer to AS/NZS 1547 Clause 5.2.4 and Appendices B, C, D, E & G).

Design report

The Design Report is to include the following:

- (a) Relevant aspects of the site-and-soil evaluation report.
- (b) A report on the selection of the land-application. (Refer to AS/NZS 1547, Clause 5.5.7).
- (c) A report on the selection of the wastewater-treatment system. (Refer to AS/NZS 1547 Clause 5.2.4 and Appendices B, C, D, E & G).
- (d) Sufficient information to show that the relevant performance requirements set out in the PCA have been met.
- (e) A loading certificate which sets out the design criteria and the limitations associated with use of the system and incorporates such matters as:
 - (i) System capacity (number of persons (EP) and daily flow)
 - (ii) Summary of design criteria
 - (iii) The location of and use of reserve areas
 - (iv) Use of water efficient fittings, fixtures, or appliances

- (v) Allowable variation from design flows (peak loading events)
- (vi) Consequences of changes in loading (due to varying wastewater characteristics)
- (vii) Consequences of overloading the system
- (viii) Consequences of underloading the system
- (ix) Consequences of lack of operation, maintenance and monitoring attention, and
- (x) Any other relevant considerations related to the use of the system.

2.17 The following reports must be submitted to the *permit authority* and owner and be made available to the *Director* upon request after *commissioning* of the *system*:

Installation and commissioning report

The Installation and Commissioning Report is to cover the 'as-constructed' records of the *system* installation together with the results of *commissioning* tests to demonstrate correct construction and installation. The report is to be provided to the owner and *permit authority* on completion of the work. (Refer to and AS/NZS 1547 Clause 6.2.5.4).

Inspection and Maintenance Report

2.18 Maintenance reports cover ongoing inspection and maintenance operations in order to monitor the operation of the installation. (Refer to AS/NZS 1547 Clause 6.3.5, Appendix T & U). Effluent distribution by sub-surface application may be permitted where the *Permit Authority* is satisfied that the application for a *permit* to install the *system* has demonstrated that the:

- (a) effluent can be retained within the authorised land application area
- (b) where applicable the land application has been designed and is capable of being installed and maintained in accordance with AS/NZS 1547
- (c) the location of the land application satisfies the relevant requirements of the State Policy on Water Quality Management 1997, and
- (d) the discharge is capable of satisfying the relevant water quality limits (see 5.2).

Product approval documentation

The following documents are referenced as part of this Accreditation:

Document	Document date
SAI Global Standardsmark Licence Certificate Number SMK41040 AS/NZS 1546. 3:2017 On-site domestic wastewater treatment units – Secondary Treatment Units	31/08/2021
Arris Pty Ltd – Report on the testing of the Eljen GSF A42 GSF to AS/NZS 1546.3:2017	Draft 25/06/2021 Final No date

3.0 Installation and Commissioning

- 3.1 The installation and operation of the *system* must comply with the conditions of accreditation.
- 3.2 All plumbing work carried out in connection with the *system* installation must satisfy the requirements of the *Building Act 2016* and be carried out by a registered plumber with appropriate training and qualifications.
- 3.3 All electrical work must be carried out by a licensed electrician and in accordance with relevant provisions of *AS/NZS 3000*.
- 3.4 The *system* requires a 240V AC power supply. A weather-proof isolating switch must be provided at the power outlet. The power supply must have its own clearly marked designated circuit breaker in the electricity supply fuse box.
- 3.5 Each *system* installation must be inspected and checked by the *designer* or the designer's agent. The *designer* on completion is to certify that the system has been constructed, installed and *commissioned* in accordance with its design, the conditions of accreditation and any additional requirements set out in the *permit*. (refer to *AS/NZS 1547* Clause 6.2.5)
Note: Where the *designer* is not available to supervise the installation the *designer* should obtain signed certification from the installing plumber stating that the installation has been constructed/installed and *commissioned* in accordance with its design, the conditions of accreditation and any additional requirements of the *council* and/or *permit authority*.
- 3.6 A report is to be prepared by the installing plumbing contractor detailing the inspection of the installation and the results of the *commissioning* tests and be accompanied by a certificate certifying that the system is operating and performing adequately (see 2.17).
- 3.7 Copies of the following reports/certificates must be submitted to the *council* and the owner as soon as practicable after the commissioning of the *system* and after each scheduled or unscheduled service or inspection for the period specified in the *permit*:
 - (a) The initial plant installation and commissioning report
 - (b) All required laboratory analytical test reports, and
 - (c) All inspection and maintenance reports.
- 3.8 Copies of any report or certificate required by the conditions of accreditation must be made available to the *Director* on request.
- 3.9 The *designer* is to provide a statement warning the user of which items and products that must not be placed in the *system*.

4.0 Maintenance and monitoring

4.1 Each installation must be serviced and monitored at intervals in accordance with the conditions of accreditation, the conditions of the *permit's maintenance schedule*, the *designer's requirements* and *manufacturer's requirements*.

Notes:

- (1) Only a licensed plumber can carry out the maintenance and required monitoring of the *system* other than electrical work unless licensed to do so.
- (2) The licensed plumber may need to complete training by the *supplier* before carrying out any maintenance on the *system*.

4.2 The owner of the *system* must enter into and maintain a maintenance contract with a licensed plumbing wastewater servicing contractor and provide council with a copy of that contract.

4.3 The *system* must be operated and maintained to ensure it performs continuously and without any intervention between normal service intervals.

4.4 A service report is to be prepared by the plumbing contractor who carried out the work detailing the inspection of the installation and the results of all servicing tests and conditions at the completion of all scheduled or unscheduled services or inspections.

4.5 The service report is to be accompanied by a signed certificate certifying that the *system* is operating and performing adequately.

4.6 A copy of the service report and certificate is to be provided to the occupant and *council*. Each service report is to contain a statement reminding the user of which items and products that must not be placed in the *system*.

4.7 Each service must include monitoring the operation of the *system* and associated land application.

4.8 Maintenance must be carried out on all mechanical, electrical and functioning components of the *system* as appropriate.

4.9 The monitoring, servicing and reporting of the installation must include but not be restricted to the following matters, as appropriate:

- (a) Reporting on weather conditions, ambient temperature, effluent temperature
- (b) Odour
- (c) Check and test pump
- (d) Check and test alarm system
- (e) Check slime growth on membranes and report the on condition of membranes
- (f) Check and report operation of sludge return, sludge level and de-sludging;
- (g) Check and record water meter reading (if fitted)
- (h) Check and record operation of irrigation area, irrigation fittings
- (i) Check and clean/replace irrigation filters
- (j) Check and report on water quality (testing for pH, Turbidity, EC and dissolved oxygen)
- (k) Cleaning of the following items at above the waterline:
 - (i) filter
 - (ii) pipework

- (iii) valves
- (iv) walls of chambers.

5.0 Performance

5.1 Hydraulic and Organic Loading:

The system is accredited for treatment of domestic wastewater as defined in ASI546.3:2017 clause 1.8.7 limited to 8EP with the following MAXIMUM hydraulic and organic loads:

Model	Hydraulic load (L/day)	Biochemical Oxygen Demand (g/day)
Eljen GSFA42	1200	700

5.2 Hydraulic and Organic Loading:

Treated effluent from the system must not exceed the following limits (90% of samples):

For sub-surface irrigation:	
5-day Biochemical Oxygen Demand (BOD ₅)	20 mg/L (max. 30 mg/L)
Total Suspended Solids (TSS)	30 g/m ³ (max. 45 mg/L)

6.0 On-going management

- 6.1 The mandatory servicing and monitoring is to commence 3 months after the plant is *commissioned*. The servicing and monitoring is to coincide with the permit authorities required on-going routine scheduled maintenance program.
- 6.2 In the event of failure to comply with the water quality limits set out in these conditions, fortnightly sampling and testing for *BOD₅*, *TSS* and *E.coli* must be carried out until the plant is *re-commissioned*.
- 6.3 The method of preserving and the handling of samples taken from the plant must satisfy the relevant requirements of *AS/NZS 5667*.
- 6.4 Copies of the following reports and certificates must be submitted to the *permit authority* and the owner as soon as practicable after the *commissioning* of the *system* and after each scheduled or unscheduled service for the period specified in the *permit*:
 - the initial plant installation and *commissioning* report
 - all laboratory analytical test reports; and
 - all inspection and maintenance reports
- 6.5 The system is to be de-sludged strictly in accordance with the *manufacturer's* recommendations and the sludge is to be disposed of in accordance with the Tasmanian Biosolids Reuse Guidelines and the conditions of *permit*.
- 6.6 Only persons with a waste transport business Environment Protection Notice are to be engaged for the removal, transporting and disposal of accumulated sludge removed from the *system*.
- 6.7 Any waste material removed from the system must be collected and disposed of or utilised by an approved facility or agency.
- 6.8 Measures are to be put in place during servicing that will protect the environment, personnel and any other persons who could be affected by the activity.

7.0 Permitted uses

- 7.1 The treated effluent is suitable for land application by way of the following forms:
- (i) sub-surface by: trenches, beds, mounds, evapo-transpiration in accordance with the relevant provisions of AS/NZS 1547.

Note: Each of the above forms of irrigation is subject to consent from the *permit authority* and the relevant provisions of AS/NZS 1547.

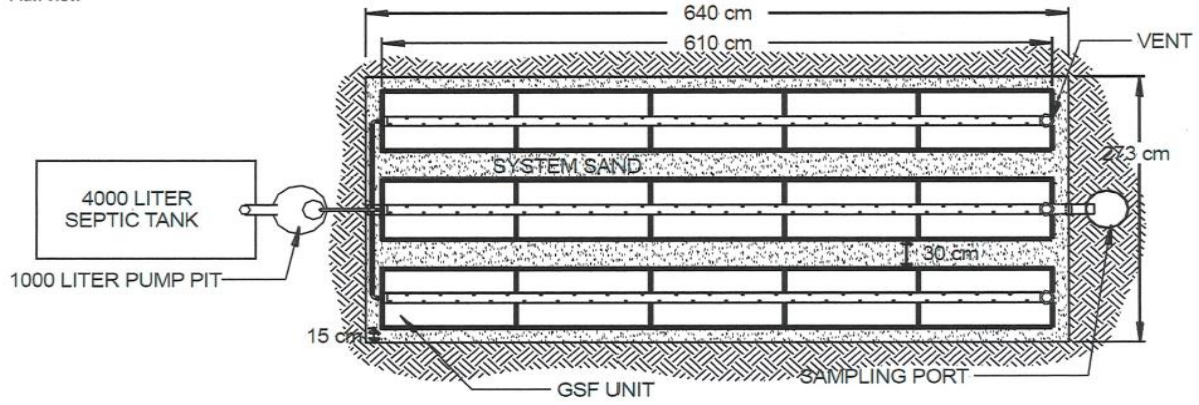
- 7.2 Where it is not practicable for effluent from the system to be applied in accordance with AS/NZS 1547 the method of discharge must satisfy contemporary relevant regulatory requirements to the satisfaction of the *permit authority*.

Appendix A

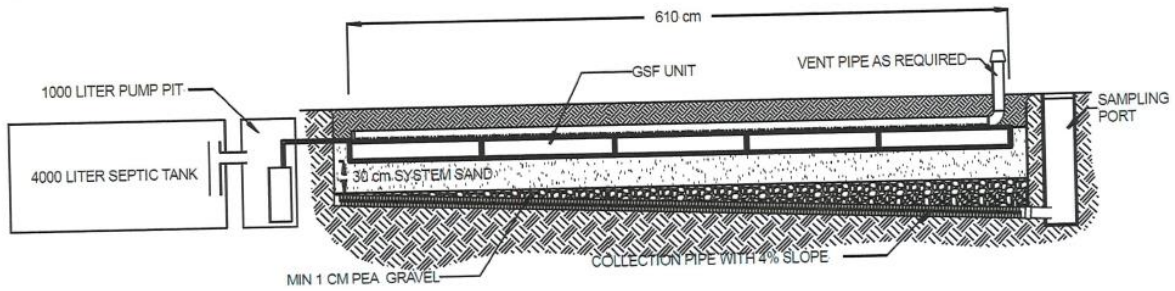
System Process

Appendix A Engineering drawings of the Eljen GSF secondary treatment system testing layout

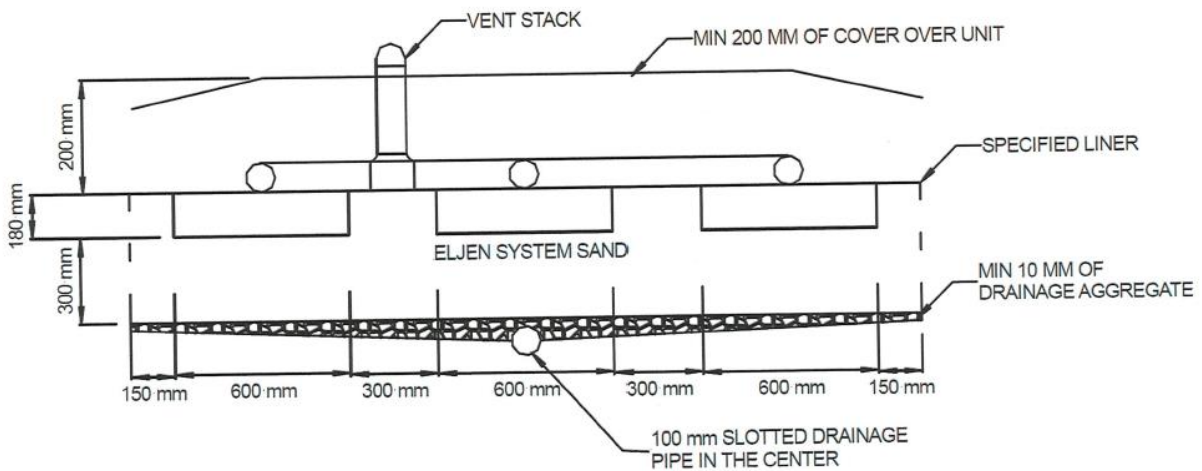
Plan view



Side view



Cross-sectional view



Appendix B

Sampling Procedure

Equipment Needed

Service technician is required to provide equipment as required to facilitate sampling including:

1. Sub surface sampler. Approx. 1.8m long with a sample taking or bottle holding device on the end. Commercial examples – Tank Sampler (Thermo Fischer), Series 6000 Jar Sampler (Ben Meadows), Grab Sampler Li (Rickly Hydrogeologic),
2. Hex drive bit and battery drill, or socket set and driver.

Sampler / Auditor is to provide:

1. Sterilised esky to transport the samples to the laboratory within 24hrs at a temp of less than 4 Degrees Celsius.
2. Approved Sampling bottles

Procedure

Please note that steps 1-6 below will be performed by a service technician upon request by the relevant Authority conducting the sampling / auditing. The service technician is also responsible for securing all plant and equipment upon completion of the sampling / auditing.

1. An accredited service technician unscrews and opens the motor box and effluent chamber, ensuring that there is nothing mechanically wrong with the system.
2. Turn the power to the system off at the GPO.
3. Prepare the sampler or sample bottle on the sampling stick.
4. Mark the sample pole at 1450mm from the sample inlet. Lower the sampler until the mark is level with the lip of the effluent chamber. This will ensure the sample is taken at the same level as the inlet to the irrigation pump.
5. Allow sampler or sample bottle to fill completely before raising from the sampling height.
6. Promptly fill, and or, seal the sample. Making sure not to contaminate the sample

The Sampler / Auditor is responsible for the following steps:

7. Label accordingly and place sample in sterilised esky at 4 degrees Celsius or lower.
8. Deliver to laboratory, complete with relevant Chain of Custody forms.
9. If further samples are required or you are sampling another plant, please sterilise equipment and repeat procedure.