COUNTRY-WIDE WATER pty ltd
Environmental Wastewater Management

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SITE & SOIL WASTEWATER EVALUATION REPORT

FOR

PROPOSED *EFFLUENT DISPOSAL* FOR

Proposed New Dwelling .

Evergreen Wastewater
Lot 146 Bushland Road , Riverbend
Qld 4280

Issue No. 1
8th May 2020

CLIENT:
Evergreen Wastewater

PREPARED & DESIGNED BY:

David Lonergan
Cert IV Domestic Waste Water & Environmental Plumbing . (Qld).
Building Services : Designer Hydraulic : Accreditation No : CC6068 G (Tas).
QBCC : Hydraulic Services Designer . QBCC Lic No : 1305650 , Lic No: 66575 , Lic No : 50064
GCCC Site & Soil Evaluator Registration No : ER075

Country-Wide Water Pty. Ltd.
Professional Indemnity Insurance Policy No : 005705

ABN: 60 561 482 213

QBCC Lic No : 1305650

David M Lonergan Tas Accreditation No CC6068 G (Building Services : Designer Hydraulic).
Qualified in the States of : Queensland & Tasmania .
- ☒ Site Soil Evaluation
- ☒ On-site Sewerage Systems Designer
- ☒ Effluent Disposal Systems Designer
- ☒ Industrial Waste Water Filtration

Member
- ☒ Australian Society of Soil Science
- ☒ International Water Association
- ☒ Irrigation Australia

FILE No. CWW.2125.20

1 Introduction

1.1 Site Evaluator : David Lonergan : Hydraulic Services Designer .

Country-Wide Water Pty Ltd has been engaged by Evergreen Wastewater to conduct a site and soil evaluation and provide an on-site Wastewater Management Report for the Proposed Three Bedroom Dwelling within the property described as Lot 146 on SL 11068 which is situated at Lot 146 Bushland Road , Riverbend . 4280 . Qld .

1.2 Site Details

Location

Site Address:	**Lot 146 Bushland Road , Riverbend, Qld 4280**
RP Description:	Lot 146 on SL 11068
Ward :	Division 11 .
Council :	**Logan City Council**
Site Area:	165,920 m2
Dwelling Sizing:	Proposed Dwelling . Three Bedrooms
Building Envelope Sizing:	N/A
Other Buildings Structures Present:	Proposed Three Bedroom Dwelling .

1.3 Report References

- AS/NZS 1547:2012 – On-Site Domestic Wastewater Management
- QPC – Queensland Plumbing and Wastewater Code Version 1 . 2019
- Local Council (On-Site Sewerage Facility) Guidelines

1.4 Report Objectives

a) Identify sources and quantities of domestic effluent from the site.

b) Examine and identify the existing soil conditions in relation to any proposed effluent disposal and its suitability.

c) Provide information on any site constraints that may affect a proposed land application area.

d) Identify any environmental considerations and possible impact.

e) Provide detailed site specific recommendations for the treatment of wastewater and provide the most effective land application system for the effluent disposal installation.

1.5 Scope of Work

In order to provide to the client an effective solution in regards to on site wastewater management the following scope of work has been undertaken.

a) A desktop study including a review of the proposed or existing development, site plans, aerial photographs, soil mapping of the area and geology charts.

b) A site visit inspection was carried out by the site evaluator and an inspection of the surrounding environment to ascertain a proposed land application area and any potential on-site wastewater management constraints.

c) The site evaluator has carried out Three (3) borehole tests to a depth of 900 mm below the ground level. Borehole tests to obtain recovery of the soil samples at horizon depths of 150mm . 300mm , 450mm , 600mm , 900mm . 1200mm. As required to prepare the required soil evaluation report.

2 Site and Soil Assessment Report

The site evaluator has identified the following tabled characteristics on the 26th day of Feb in the year 2020.

These tabled characteristics relate to the proposed land application area.

2.1 Soil & Site Characteristics

Table 1 Soil & Site Characteristics

Feature	Description
Slope	2%-3%
Configuration	Linear Planar
Vegetation Present Detail Existing	Full / Filtered Sunlight , Open Area , Scattered Trees , Light Turf Coverage
Exposure	Full & Filtered Sunlight .
Run-off Potential	
Environmental concerns present water-ways etc.	N/A
Buildings/Structures	Proposed Three Bedroom Dwelling
Site Drainage	Imperfectly Drained
Aspect	Sloped
Other	Owner to maintain the LAA

2.2 Site Soil Characteristics

On site the site evaluator has carried out a total of Three (3) borehole tests using a Dormer 75mm diameter soil Auger to aid in the determination of a soil textural classification assessment. The site soil characteristics identified during the site soil evaluation are detailed in table 2.2 below. **Hydraulic Powered Auger Used On Site .**

2.3 Soil Characteristics

Table 2: Soil Characteristics

Borehole	Depth (m)	Soil Type (Description)	Structure	Category	Dispersive
1	0.0 → 0.3	Clay Loam Soils	Moderately Structured	Cat 4	No
	0.3 → 0.6	Clay Loam Soils	Moderately Structured	Cat 4	No
	0.6 → 0.9	Clay Loam Soils	Moderately Structured	Cat 4	No
2	0.0 → 0.3	Clay Loam Soils	Moderately Structured	Cat 4	No
	0.3 → 0.6	Clay Loam Soils	Moderately Structured	Cat 4	No
	0.6 → 0.9	Clay Loam Soils	Moderately Structured	Cat 4	No
3	0.0 → 0.3	Clay Loam Soils	Moderately Structured	Cat 4	No
	0.3 → 0.6	Clay Loam Soils	Moderately Structured	Cat 4	No
	0.6 → 0.9	Clay Loam Soils	Moderately Structured	Cat 4	No

The sub-soil examined during the site evaluators site inspection and testing have been classified in accordance with **AS/NZS 1547:2012 as Clay Loam Soils. Category Four (4) . These soils are described as Moderately Structured , Imperfectly Drained with an indicative permeability of 0.5 - 1.5 AS/NZS 1547.2012 recommends a DIR : 3.5 mm /day of mm per for Clay Loam Soils . Slope 2% - 3% , Full / Filtered Sunlight , Open Area Available , Light Grass Coverage**

2.4 Site Separation Distances

The recommended separation distances for land application areas are specified in the Queensland Plumbing & Wastewater Code (QPW). The tables below provide this information. Site specific separation distances are detailed on the attached plan that relates to this specific site soil assessment.

Table 3: Setback distances for (subsurface) land application area for a greywater treatment plant or an on-site sewage treatment plan

Feature	Horizontal Separation Distance (mtrs)
Distance from the edge of trench/bed excavation or subsurface irrigation distribution pipework to the nearest point of the feature.	**Up Slope Down Slope Level**

Feature	Horizontal Separation Distance (mtrs)		
Property boundaries, pedestrian paths, footings of buildings, walkways, recreation areas, retaining wall, footings.	2	4	2
In ground swimming pools.	6	6	6
In ground potable water tank.	6 *	6 *	6 *

Table 3.5 (surface spray)

Setback Distances : Surface Irrigated Land Application Areas : Advanced Secondary On Site Sewerage Treatment Plants

Feature	Horizontal Separation Distance (mtrs)
Distance from the edge of surface spray / irrigation distribution pipework to the nearest point of the feature.	**Metres**
Property boundaries, pedestrian paths, and walkways .	2
Water edge of In ground swimming pools.	6
In ground potable water tank. Dwellings , recreation areas	6 * 10

* Note:- For primary effluent the distance from an in-ground potable water tank must be 15 mtrs.

Table 4: Setback distances for on-site sewerage facilities and greywater use facilities. (Protection of surface water and groundwater)

Feature	Separation	Distance	(metres)
For On-Site – see Appendix 1	**Advanced Secondary**	**Secondary**	**Primary ***
For Greywater – see T1A or T1B	High	Medium	Low
Top of bank of permanent water course; or Top of bank of Intermittent water course; or Top of bank of a lake, bay or estuary or, Top water level of a surface water source used for agriculture , aquaculture or stock purposes or; Easement boundary of unlined open stormwater drainage channel or drain. Bore or a dam used or likely to used for human and or domestic consumption	10	30	50
Unsaturated soil depth to a permanent water table (vertically)	0.3	0.6	1.2

* Note:- Primary effluent typically has a BOD (Biochemical Oxygen Demand) of between 120-240 mg/L and Total Suspended Solids of between 65-180 mg/L.

2.5 On-Site Evaluation Assessment and Calculations

On-site soil test procedures and evaluation at the site have determined that the most suitable form of on-site sewerage treatment is to installed **HSTP . Aqua Nova NR Advanced Secondary (8EP) . CEA 05/2015 .**

On-site soil testing procedures and evaluation of the land application area available, it is recommended that the following form of effluent disposal be adopted : **Surface Spray With Reserve Area Noted**

Wastewater Flow Calculations

Site: Lot 146 Bushland Road , Riverbend, Qld, 4280

Table 5 - proposed three bedroom dwelling -

Number Bedrooms	Population Equivalent	Typical Wastewater Flow L/person/day	Daily Wastewater Flow (L/day)	Weekly Wastewater Flow (L/week)	DIR mm Day	LAA Sizing
3	5	120	600		DIR . 3.5 mm /day	171m2

The Effluent Disposal System Will Be Installed As Min 226 m2.

The following Calculations will apply:

SITE SOILS
Category Four (4), Clay Loam Soils, Moderately Structured, Imperfectly Drained, Ksat : 0.5-1.5, DIR : 3.5mm/Day, Slope : 2% - 3% @ LAA, Full / Filtered Sunlight, Open Area, Light Grass Coverage.

CALCULATIONS
Proposed Three (3) Bedroom Dwelling
Hence : Five (5) Persons 5EP
Hence : 5 x 120L per Person per Day = 600L/Day
Hence : 600L/Day Divide by DIR : 3.5mm/Day = 171
LAND APPLICATION AREA
Surface Spray QCV Valve System 226m2
Install As : Two (2) QCV Valve System
Install As : Hose Length 5.5m + 0.5m Plume - Radius
See Plan

H.S.T.P.
Proposed Aqua Nova NR Advanced Secondary Sewerage Treatment Plant (8EP) CEA 05/2015
NOTE
- LAA to Be Installed In Open Grassed Area

2.6 Proposed Land Application Area Required :

The area that will be required for the land application of effluent disposal via standard surface spray irrigation has been calculated to be **Installed As Min : 226 m2**. Refer to the design drawings supplied with this report for the required installation criteria.

The above calculation along with the design provided is to be seen as a minimum requirement.

3 Site Wastewater Management

3.1 On-Site Wastewater Treatment System

It is proposed that an aerobic wastewater treatment plant be installed to cater for all wastewater produced by the proposed three (3) bedroom at the location Lot 146 Bushland Road , Riverbend, Qld, 4280.

Table 6 below shows the effluent quality criteria for advanced secondary treated effluent.

Table 6: Advanced Secondary Effluent Quality

Parameter	Level
Biochemical Oxygen Demand (BODs)	10mg/L
Total Suspended Solids (SS)	10mg/L
Total Nitrogen (TN)	10mg/L
Total Phosphorous (TP)	5mg/L
Thermotolerant Coliform (org/100mL)	10 organisms

Note: - Under Section 91 of the Plumbing and Drainage Act. Chief Executive Approval is required for an On-Site Sewerage Treatment Plant where the sewerage generated on the property is less than that of 21 equivalent persons. Performance criteria - refer to the Queensland Plumbing and Wastewater Code Part 5 P1,P2, P3, P4 . Version 1. 2019 .

The Chief Executive Approval number will be noted on the effluent disposal design plans that make up part of this said report.

3.2 Proposed Land Application Area for Effluent Disposal Installation & Maintenance

A land application system must be constructed, installed and maintained in such a manner as to:-

a) complete the treatment, uptake and absorption of the final effluent within the boundaries of the approved application area.

b) Avoid the likelihood of the creation of unpleasant odours or the accumulation of offensive matter.

c) Avoid the likelihood of the ingress of effluent, foul air or gasses entering buildings.

d) Avoid the likelihood of stormwater run-off entering the system.

e) Avoid the likelihood of root penetration or ingress of ground water entering the system.

f) Protect against internal contamination.

g) Provide adequate access for maintenance.

h) Provide and incorporate adequate provisions for effective cleaning.

i) Avoid the likelihood of unintended or uncontrolled discharge.

j) Avoid the likelihood of blockage and leakage.

k) Avoid the likelihood of damage from superimposed loads or ground movement.

l) Provide ventilation to avoid the likelihood of foul air and gasses from accumulating in the system.

m) Minimise nuisance eg noise to the occupants of neighbouring properties and

n) Ensure that the installation throughout its design life will continue to satisfy the requirements of items (a) to (m).

The above detailed performance criteria is in accordance with the Queensland Plumbing and Wastewater Code Part 3. P1.

The required designed effluent disposal method will be detailed with all required relevant information and installation criteria on the site specific effluent design plan. That is to say the method of effluent disposal will be site relevant and detailed in depth on the design plans that relate directly to that site location.

4 Servicing and Maintenance

4.1 The Manufacturer

The manufacturer of the On-Site Sewerage Treatment System shall provide a comprehensive and detailed operation and maintenance instructions to authorised service personnel. The manual must be written in English and it must be written so that it can be easily understood.

The supplier/manufacturer will provide a registered maintenance contract to the home owner in accordance with the normal required schedule maintenance of the installed on-site sewerage treatment system.

4.2 Land Application Maintenance

- On-site systems generally operate more efficiently when the wastewater load is minimised and 'shock loads' are avoided. Heavy water use activities such as laundering and showering should be evenly spread over the day and week.
- Only detergents that are low in sodium and phosphorus should be used. Do not allow large volumes of bleaches, disinfectants, whiteners or spot removers to enter the system.
- Do not allow large volumes of food and cooking oils to enter the system and do not install an in-sink macerator.
- The in-line strainer must be cleaned every few months to prevent clogging, and serviced by the service provider on all regular servicing .
- Quarterly servicing must include measurement of the sludge and scum levels, and a check of the outlet and inlet junctions for blockages.
- The service provider must flush and maintain the irrigation system quarterly .
- Surface water diversion mounds and drains must be regularly maintained to prevent stormwater entering the irrigation area.
- The grass must be regularly mowed and the clippings removed from the site to maintain the nutrient uptake rate within the irrigation area.

5 References and Data

5.1 Regulating Reference Material

- AS/NZS 1547:2012 – On-site domestic wastewater management. Standards Australia International Ltd and Standards NZ ISBN073373439.

- Queensland Plumbing and Wastewater Code Version 1 2019 . Department of Local Government, Planning, Sport and Recreation.
- Queensland Department of Natural Resources “On-site sewerage Facilities Guidelines for Vertical and Horizontal Separation Distance”.
- Refer to the Local Authority Standard Conditions and helpful hints for domestic wastewater treatment plant maintenance.

6 General

Should the location of the effluent disposal land application area not be installed in accordance with the guidelines set out in this report and or not in accordance with the attached detailed site plan notify Country-Wide Water Pty Ltd. Any amendments / additional plans required : redrawn due to new information or changes made to the design that may be required will be done so at the clients cost.

Installation : Responsibility of Installer : Installer must only use council approved plans / report . Plans are diagrammatic : it is the installers responsibility to ensure even and efficient distribution of effluent with no leakage from the land application area . Note Indexing valves or control valves may be required : installer to determine on site if not indicated in the report or plans provided .

HSTP to be installed to manufactures specifications and in accordance with the governing authority guidelines . Country-Wide Water Pty Ltd has been commissioned to design an appropriate effluent disposal design system for this property . The installation and ongoing maintenance of the HSTP and land application area is the responsibility of others .

Signed.

David M Lonergan : site & soil evaluator : QBCC Lic No 1305650 .

Country-Wide Water Pty Ltd