On-site Wastewater Management Training Course

Site Assessment: Desktop Study

Land Capability Assessment or Site and Soil Evaluation (SSE)

Aim:

- Identify and consider site-specific attributes significant in the selection, design, location and sizing of an onsite wastewater management system
- Assess the capacity of the land to sustainably manage sewage within lot boundaries (containment)
- Quantify risk and gather relevant information to inform the design process and formulate a sustainable design solution

SSE Objectives

- To demonstrate the site has sufficient suitable area to:
  - Safely install the selected treatment system and (effluent) land application system, while
  - Achieving appropriate buffers
- To demonstrate the soil is appropriate and of sufficient depth to:
  - Install the preferred effluent application system, and
  - Treat the quantity and quality of effluent to be applied

Land Capability Classification

- Land capability also introduces engineering, social and economic considerations
- Designs should aim to be:
  - Sustainable (long-term benefit)
  - Achievable (practically constructable)
  - Acceptable (Owner and Regulator)
  - Affordable (value for money)

Stages of Data Collection

- Desktop study
- Site and soil check
- Soil description and profile assessment
- Calculations
- Collection of additional data
- Identify site and soil opportunities and constraints
- Selection of appropriate system/s

SSE Description

SSE (DPHI, 2025 and AS/NZS 1547) refers to the procedural investigation of land for the purposes of evaluating its potential for onsite wastewater management, including land application of effluent

- Should be undertaken by an appropriately qualified person with specific experience in wastewater applications
- Councils may require written verification of qualifications, experience, professional affiliations and professional indemnity insurance

SSE Procedure

Specific advice regarding field investigation procedures, constraint analysis, risk mitigation and reporting can be found at:

- NSW **Onsite Wastewater Management Guidelines** (DPHI, 2025) – Section 4
- AS/NZS 1547:2012 **On-site domestic wastewater management** – Appendix D
- **Designing and Installing On-Site Wastewater Management Systems** – Current Recommended Practice (WaterNSW 2023) – Section 2

Level of Investigation

The guidance recommends different 'levels of investigation' depending on project intent, scale or stage of the planning process:

- **Subdivision or Rezoning** – focus on regional or site-wide implications of OWMS (soil characterisation, climate effects, system suitability, minimum lot sizes, natural feature buffers, cumulative impacts, wastewater servicing approach, planning considerations etc.)
- **Single-lot Development** – at this scale investigation will focus on site-specific attributes (site buffers, soil controls, drainage etc.), EAA soil suitability, optimising OWMS (treatment / application) options and considering construction and management issues

Desktop Study

- Undertaken in consultation with the Site owner
- Collate previously mapped information to develop a preliminary overview of the site (constraints map)
- Identify data gaps for further investigation
- Identify unsuitable site or soil conditions for OWM
- Target locations for soil boreholes or test pits
- Suitable first step for all levels of investigation for development, from rezoning, to subdivision, to individual lot design

Site Features to Consider

- Table 4-1 NSW Onsite Wastewater Guidelines identifies the range of site features to consider, with supporting information
- Describes relevance of site feature to particular OWMS attributes (treatment system / EAA type)
  - Relevance of features may be variable; important to consider all regardless
- Includes risk matrix describing range of limitation associated with each site feature / OWMS attribute combination

Site Feature	Relevant System(s)	Risk Rating			Restrictive Feature
		Minor Limitation	Moderate Limitation	Major Limitation	
Geology/ regolith	All EAA systems	N/A	N/A	Major geological discontinuities, fractured or highly porous bedrock or regolith	Groundwater pollution hazard
Shallow bedrock	In ground treatment systems and all EAA systems	N/A	N/A	Bedrock at shallower depth than tanks or effluent application systems	Difficult excavation Low saturated hydraulic conductivity Shallow limiting layer (see Table 4-5)
Rocks and rock outcrops (% of land surface containing rocks (floaters) >0.2m diameter)	All EAA systems	<10%	10-20%	>20%	Limits EAA system performance Provides preferential flow paths Difficult excavation
Fill	All OWMS	No fill	Fill present	N/A	Subsidence Variable permeability
Landform	All OWMS	Hill crests, divergent slopes and plains	Convergent slopes and foot slopes	Drainage plains and incised channels	Groundwater pollution hazard Resurfacing hazard
Slope %	Subsurface irrigation	0 - 20	20 - 30	>30	Difficult installation Linear Loading Rate (LLR) Run-off Erosion
	Surface irrigation	0 - 5	5 - 10	>10	Difficult installation LLR Run-off Erosion
	Evapotranspiration Absorption (ETA)/ Absorption system: trench	0 - 10	10 - 20	>20	Difficult installation LLR Run-off Erosion
	ETA/ Absorption system: bed	0 - 5	5 - 10	>10	Difficult installation LLR Run-off Erosion

Site Feature	Relevant System(s)	Risk Rating			Restrictive Feature
		Minor Limitation	Moderate Limitation	Major Limitation	
	Mound	0 - 10	10 - 15	>15	Difficult installation Large volume of sand required. Risk of toe seepage
Erosion potential	All EAA systems	No signs of erosion potential present Well vegetated	Absence of vegetation	Signs of erosion present, e.g. rills, mass movement and slope failure	Soil degradation Transport System failure
Run-on and upslope seepage	All EAA systems	None	Some - diversion possible	High - diversion not practical	System inundation Transport of effluent off-site
Flood potential	All treatment systems	Vents, openings, and electrical components above 1 in 100-year flood contour	N/A	Vents, openings, and electrical components below 1 in 100-year flood contour	Transport of effluent off-site System failure and electrocution hazard
	All EAA systems	Rare; above 1 in 20-year flood contour	N/A	Frequent; below 1 in 20-year flood contour	System inundation. Transport of effluent off-site
Site drainage	All effluent application systems	No visible signs of surface dampness	N/A	Visible signs of surface dampness, e.g. moisture-tolerant vegetation (sedges and ferns), seeps, springs	Groundwater pollution hazard Resurfacing hazard
Exposure	All effluent application systems	High sun and wind exposure	N/A	Low sun and wind exposure	Poor evapotranspiration
Land area	All systems	Area is available	N/A	Area is not available	Health risk Pollution risk
Buffer distance	All effluent application systems	(see Section 4.3.2 and Table 4.2)	N/A	N/A	Health risk Pollution risk

NOTES
Sites with major limitations are generally **not** suitable for land application of effluent. Risk reduction measures must be applied to reduce to minor limitation.

Data of Interest

- Cadastre and planning mapping (lot boundaries, roads, land zoning and planning specifications)
- Topographic mapping (contours, landscape position, landform and surface hydrology)
- Imagery (aerial photos – current and historic)
- Geological and soil mapping (soil landscapes, soil test data)
- Groundwater resources (domestic and public supply bores and wells)

Data of Interest

- Land use mapping (adjacent and regional context e.g. agriculture)
- Environmental overlays (flooding, bushfire, ecology and drinking water catchments)
- Location of services (water, electricity, gas etc.)
- Plans or strategies relating to OWM (development strategies, lot size requirements, backlog sewer)
- Site development (existing, approved or proposed)

Additional Data

- Climate data (rainfall and evaporation) – 30 years
- Local knowledge OWMS limitations (poor soils, shallow rock, groundwater, seasonal inundation)
- Owner discussion:
  - Resourcing / capacity and understanding
  - Existing OWMS (capacity and operability)
  - Existing services or usage patterns, not mapped
  - Future-proofing or planning

Site Imagery

Information sources include:

- Satellite imagery www.google.com/earth/
  - Free to download and activate
- Nearmap
  - Subscription service
- Provides information on location (latitude/longitude), elevation and has capacity for measurement and historical imagery
- Images can be rotated for different views (including Street View)

Google Earth

Topographic Maps

Show:

- Landscape
- Contours
- Anthropogenic (human) features
- Waterbodies and drainage lines
- Cadastral boundaries
- Grid references
- 1:25,000 maps have 10m contours

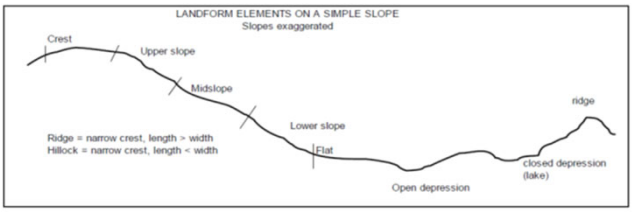
Topographic Maps

Topographic map SIX Maps

Interactive Spatial Data - Australia

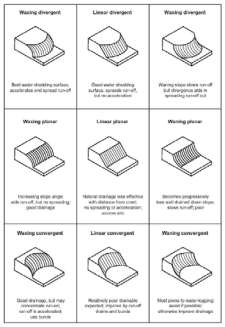
- Geoscience Australia www.ga.gov.au
  - GA Portal – Geological, boreholes, minerals, ASRIS (soils), digital elevation
- Elvis – Elevation and Depth – Foundation Spatial Data elevation.fsdf.org.au
  - Digital Elevation Model, Point Cloud and Bathymetry – used to generate contours
  - LIDAR data available to 0.5-1.0m resolution

Site Landform



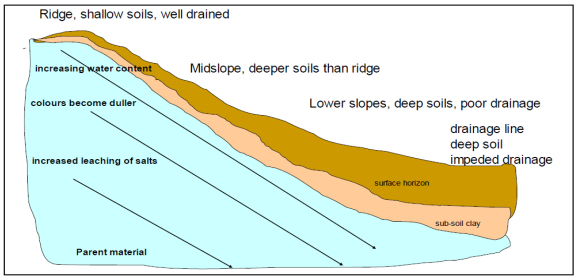
Landform elements on a simple slope

Slope Configuration



- AS/NZS 1547:2012
  - Slope (gradient and shape)
  - Terrain-Soil combinations; important to understand how surface water will flow in or near available EMA
  - Waxing / waning / linear
  - Converging or diverging

Soil Properties and Topography



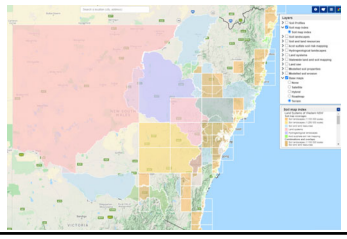
Position in landscape significant in soil profile characteristics

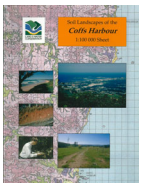
Soil Information Resources

- Atlas of Australian Resources, Volume 1 Soils and Land Use (Division of National Mapping, Canberra, 1980)
- NSW Soil Landscapes (1:100,000) (NSW Department of Land and Water Conservation)

Soil Landscape Maps

- Soil landscape maps of NSW available from:
  https://shop.regional.nsw.gov.au/collections/environment-energy-and-science/soil-landscapes





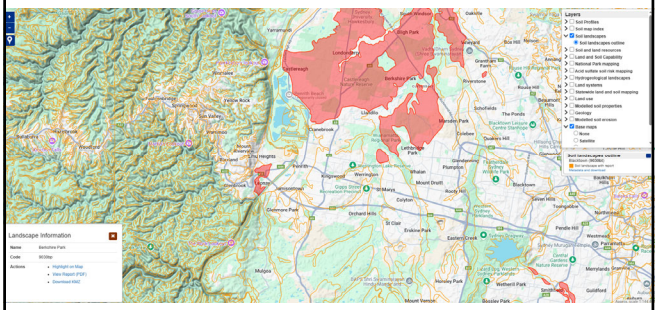
Soils Data Online

- NSW Soil and Land Information System (SALIS) provides a substantial database of information including soil descriptions
- SALIS can be accessed via:
  https://www.environment.nsw.gov.au/topics/land-and-soil/information/salis
  Or the eSPADE portal:
  https://www.environment.nsw.gov.au/eSpade2Webapp

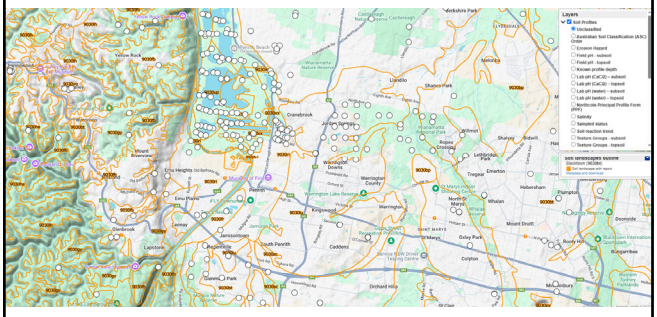
Soils Data Online

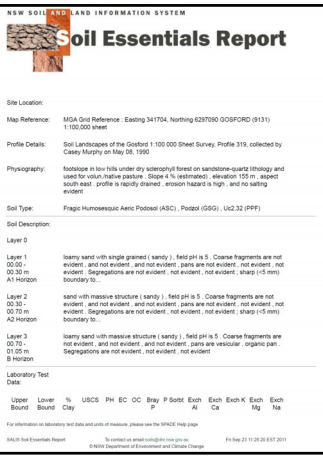
- Australian Soil Resource Information System (ASRIS) - retired in 2024
  - Metadata and limited file access still available
- Australian National Soil Information System (ANSIS) - TERN soil and landscape grid (90m resolution)
  https://www.csiro.au/en/research/natural-environment/land/Soil/ANSIS

Soil Landscapes – Penrith Region



Soil Profiles – Penrith Region





Three reports:

Soil Essentials

Soil Profile

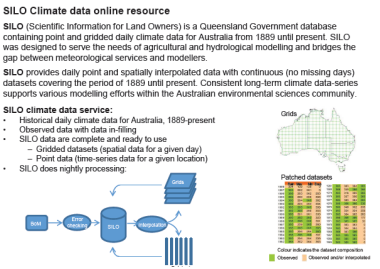
Soil Technical (increasing level of detail)

Climate Data

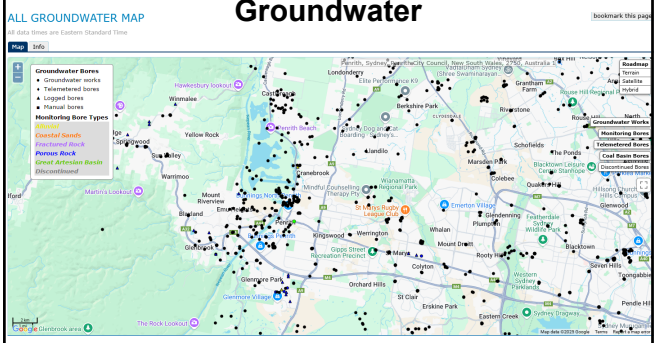
- Bureau of Meteorology www.bom.gov.au
- Rainfall
- Evaporation
- Consider data range (years) and location suitability
- Compile local climate data into zones across the council area based on topography
- SILO data drill is available if no suitable or local station

SILO Data Drill

- QLD DNR www.longpaddock.qld.gov.au/silo/



Groundwater



Groundwater bores around Penrith, NSW (WaterNSW)

Other Data Resources

NSW ePlanning portal
https://www.planningportal.nsw.gov.au/

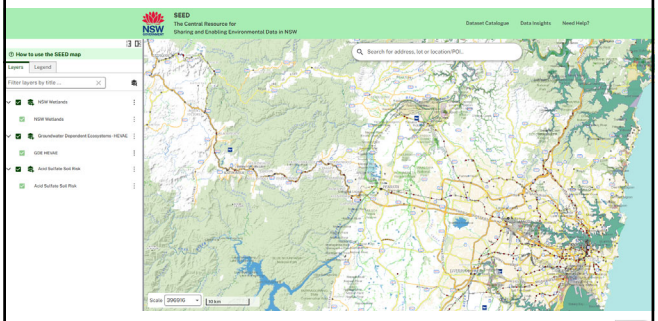
- Zoning Maps
- Hazard Maps (Flood, Bushfire etc.)
- Protection Maps (Vegetation, drinking water catchments etc.)
- Air photographs
- Local studies

Sensitive Receptors

NSW 'Sharing and Enabling Environmental Data' (SEED)
https://www.seed.nsw.gov.au/

- Acid Sulfate Soils
- Wetlands and Marine Reserves
- World Heritage Areas
- Priority Aquaculture Areas
- Endangered Ecological Communities (EEC)
- Threatened Species

Sensitive Receptors



Utility / Services Search

- Before You Dig Australia
  www.byda.com.au
- Asset location referral service
- Interactive map to order asset plans
- Protection of people and assets
- Certified locator database (Telstra)

Desktop Summary

- Tabulate data
- Assessment or rating – assign Level of 'limitation' for OWMS
  - Design on most limiting feature/s,
  - Engineer out limiting features, or
  - Provide mitigation to address limitation.
- Designs should aim to reduce all Site limitations to 'low' or 'minor'

Buffers or Setbacks

- Provide mitigation against unidentified or unintended hazards
- Reduce potential pathways for human and environmental exposure
- Valuable and cost-effective risk management strategy for OWMS
- Previous NSW Guideline (DLG, 1998) prescribed 'minimum' acceptable buffers to site features
- Still common to many Council policies

Risk-based Buffers

- DPHI, 2025 (Section 4.3.2) recommends risk-based buffer selection, using conservative minimum ranges (Table 4-3 and Table 4-2)
- Applied buffers should:
  - be based on local constraints (site, soil and system) to ensure protection of public health, the environment and amenity
  - allow reductions in applied buffer distances related to the mitigation of identified risks
  - refer to specific local requirements (e.g. POAAs)

Risk-based Buffers

- Table 4-4 (DPHI, 2025) sets out constraint scale 'ranges' for individual items with respect to relevant Site / system features
  - based on methodology and procedures described in AS/NZS 1547:2012 (Appendix R)
- Further reductions from adopted minimums 'may' be justified by:
  - nutrient attenuation modelling
  - viral die-off modelling

DPHI (2025) Buffers

Buffer distance range	Relevant site and system constraints	Constraint scale	
		Low	High
Property Boundaries			
1.5m – 15.0m	Effluent quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Slope	0-6% (surface effluent application) 0 -10% (subsurface effluent application)	>10% (surface effluent application) >30% (subsurface effluent application)
	Method of application	Subsurface or subsoil application	Surface/ above ground application
Buildings			
2.0m – 6.0m	Effluent quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Slope	0-6% (surface effluent application) 0 -10% (subsurface effluent application)	>10% (surface effluent application) >30% (subsurface effluent application)
	Method of application	Subsurface or subsoil application	Surface/ above ground application
Retaining Wall/ Embankment Cutting			
Greatest of 3.0m or 45° angle from toe of wall	Slope	0-6% (surface effluent application) 0 -10% (subsurface effluent application)	>10% (surface effluent application) >30% (subsurface effluent application)
	Flood potential	Above 1 in 20-year flood contour	Below 1 in 20-year flood contour
	Geology/ Soil	Category 3 and 4 soils, low porosity regolith, deep, uniform soils	Category 1 and 6 soils, fractured rock, gravel aquifers, high porosity regolith
Path/ Walkway			
1.5m – 6.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Fall direction	Downgradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
	Method of Application	Subsurface or subsoil application	Surface/ above ground application
Swimming Pool/ Recreational Area/ Market Garden			
3.0m – 15.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Fall direction	Downgradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
	Method of Application	Subsurface or subsoil application	Surface/ above ground application

DPHI (2025) Buffers

Buffer distance range	Relevant site and system constraints	Constraint scale	
		Low	High
In-ground water tanks and services (water, electrical, telecommunications and plumbing)			
3.0m – 15.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Fall direction	Downgradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
Permanent Surface Water Body			
50.0m – 100.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Surface water pollution hazard	Category 1 to 3 soils no surface water down gradient within 100m; low rainfall area	Category 4 to 6 soils permanent surface water <50m down gradient; high rainfall; high resource/ environmental value
	Slope	0-6% (surface effluent application) 0 -10% (subsurface effluent application)	>10% (surface effluent application) >30% (subsurface effluent application)
	Fall direction	Downgradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
	Drainage	No visible signs of saturation	Visible seepage; moisture tolerant vegetation; low lying area
	Flood Potential	Above 1 in 20-year flood contour	Below 1 in 20-year flood contour
	Application Method	Subsurface or subsoil application	Surface/ above ground application
Intermittent water bodies, farm dams, roadside drainage, drainage depressions			
15.0m – 40.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Surface water pollution hazard	Category 1 to 3 soils no surface water down gradient within 40m; low rainfall area	Category 4 to 6 soils intermittent surface water <20m down gradient; high rainfall; high resource/environmental value
	Slope	0-6% (surface effluent application), 0 -10% (subsurface effluent application)	>10% (surface effluent application), >30% (subsurface effluent application)
	Fall direction	Downgradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
	Drainage	No visible signs of saturation	Visible seepage; moisture tolerant vegetation; low lying area
	Flood Potential	Above 1 in 20-year flood contour	Below 1 in 20-year flood contour

DPHI (2025) Buffers

Buffer distance range	Relevant site and system constraints	Constraint scale	
		Low	High
Bore/ Well			
15.0m – 100.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Groundwater pollution hazard	Category 5 and 6 soils, low resource/ environmental value	Category 1 and 2 soils, gravel aquifers, high resource/ environmental value
	Geology / Soil	Category 3 and 4 soils, low porosity regolith, deep, uniform soils	Category 1 and 6 soils, fractured rock, gravel aquifers, high porosity regolith
Groundwater			
0.6m – 1.5m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Groundwater pollution hazard	Category 5 and 6 soils, low resource/ environmental value	Category 1 and 2 soils, gravel aquifers, high resource/ environmental value
	Drainage	No visible signs of saturation	Visible seepage; moisture tolerant vegetation; low lying area
	Geology/ Soil	Category 3 and 4 soils, low porosity regolith, deep, uniform soils	Category 1 and 6 soils, fractured rock, gravel aquifers, high porosity regolith
	Landform	Hill crests, convex side slopes, and plains	Drainage plains and incised channels
	Method of Application	Subsurface or subsoil application	Surface/ above ground application
Bedrock/ Hardpan			
0.6m – 1.5m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Groundwater pollution hazard	Category 5 and 6 soils, low resource/ environmental value	Category 1 and 2 soils, gravel aquifers, high resource/ environmental value
	Method of Application	Subsurface or subsoil application	Surface/ above ground application

NOTES from Table 4-2 and 4-3:

1. Buffers for subsurface drip irrigation of a minimum of secondary treated effluent downslope of an upslope property boundary, may be reduced to 0.5 metre.
2. Buffers to recreational areas on existing lots may be removed if no suitable alternative area is available within the lot boundary and provided subsurface or subsoil application and a minimum of secondary treated effluent are used.
3. In drinking water extraction areas and oyster aquaculture areas, buffers should be set in consultation with Water Authorities and NSW Food Authority. Examples can be found in the 'Designing and Installing On-site Wastewater Management Systems (WaterNSW 2023a) and NSW Oyster Industry Sustainable Aquaculture Strategy (DPI 2021a).
4. This includes bores and wells with water used for potable use (e.g. within a dwelling). Reduced buffers must be justified by viral die-off modelling. In groundwater extraction areas for a potable supply, buffers should be set in consultation with Water Authorities.

AS/NZS 1547:2012 Buffers

TABLE R1
GUIDELINES FOR HORIZONTAL AND VERTICAL SETBACK DISTANCES
(to be used in conjunction with Table R2)

Site feature	Setback distance range (m) (See Note 1)	Site constraint items of specific concern (from Table R2) (see Note 1)
	Horizontal setback distance (m)	
Property boundary	1.5 – 50 (see Note 2)	A, D, J
Buildings/houses	2.0 – > 6 (see Note 3)	A, D, J
Surface water (see Note 4)	15 – 100	A, B, D, E, F, G, J
Bore, well (see Notes 5 and 6)	15 – 50	A, C, H, J
Recreational areas (Children's play areas, swimming pools and so on) (see Note 7)	3 – 15 (see Notes 8 and 9)	A, E, J
In-ground water tank	4 – 15 (see Note 10)	A, E, J
Retaining wall and Embankments, escarpments, cuttings (see Note 11)	3.0 m or 45° angle from toe of wall (whichever is greatest)	D, G, H
	Vertical setback distance (m)	
Groundwater (see Notes 5, 6, and 12)	0.6 – > 1.5	A, C, F, H, I, J
Hardpan or bedrock	0.5 – ≥ 1.5	A, C, J

NOTES:

1 The overall setback distance should be commensurate with the level of risk to public health and the environment. For example, the maximum setback distance should be adopted where site/system features are on the high end of the constraint scale. The setback distance should be based on an evaluation of the constraint items and corresponding sensitive features in Table R2 and how these interact to provide a pathway or barrier for wastewater movement.

2 Subject to local regulatory rules and design by a suitably qualified and experienced person, the separation of a drip line system from an upslope boundary, for slopes greater than 5%, may be reduced to 0.5 m.

TABLE R2
SITE CONSTRAINT SCALE FOR DEVELOPMENT OF SETBACK DISTANCES
(used as a guide in determining appropriate setback distances from ranges given in Table R1)

Item	Site/system feature	Constraint scale (see Note 1) LOWER ⟷ HIGHER Examples of constraint factors (see Note 2)		Sensitive features
A	Microbial quality of effluent (see Note 3)	Effluent quality consistently producing ≤ 10 cfu/100 mL E. coli (secondary treated effluent with disinfection)	Effluent quality consistently producing ≥ 10[6] cfu/100 mL E. coli (for example, primary treated effluent)	Groundwater and surface pollution hazard, public health hazard
B	Surface water (see Note 4)	Category 1 to 3 soils (see Note 5) no surface water down gradient within > 100 m, low rainfall area	Category 4 to 6 soils, permanent surface water <50 m down gradient, high rainfall area, high resource/environmental value (see Note 6)	Surface water pollution hazard for low permeable soils, low lying or poorly draining areas
C	Groundwater	Category 5 and 6 soils, low resource/environmental value	Category 1 and 2 soils, gravel aquifers, high resource/environmental value	Groundwater pollution hazard
D	Slope	0 – 6% (surface effluent application) 0 – 10% (subsurface effluent application)	> 10% (surface effluent application), > 30% subsurface effluent application	Off-site export of effluent, erosion
E	Position of land application area in landscape (see Note 6)	Downgradient of surface water, property boundary, recreational area	Upgradient of surface water, property boundary, recreational area	Surface water pollution hazard, off-site export of effluent
F	Drainage	Category 1 and 2 soils, gently sloping area	Category 6 soils, sites with visible seepage, moisture tolerant vegetation, low lying area	Groundwater pollution hazard
G	Flood potential	Above 1 in 20 year flood contour	Below 1 in 20 year flood contour	Off-site export of effluent, system failure, mechanical faults
H	Geology and soils	Category 3 and 4 soils, low porous regolith, deep, uniform soils	Category 1 and 6 soils, fractured rock, gravel aquifers, highly porous regolith	Groundwater pollution hazard for porous regolith and permeable soils
I	Landform	Hill crests, convex side slopes, and plains	Drainage plains and incise channels	Groundwater pollution hazard, resurfacing hazard
J	Application method	Drip irrigation or subsurface application of effluent	Surface/above ground application of effluent	Off-site export of effluent, surface water pollution

NOTES:

1 Scale shows the level of constraint to siting an on-site system due to the constraints identified by SSE evaluator or regulatory authority. See Figures R1 and R2 for examples of on-site system design boundaries and possible site constraints.

2 Examples of typical siting constraint factors that may be identified either by SSE evaluator or regulatory authority. Site constraints are not limited to this table. Other site constraints may be identified and taken into consideration when determining setback distances.

Centre for Environmental Training

cet

Risk-based Buffer example

		Constraint Item	Constraint Scale: Low Risk	Constraint Scale: High Risk
Permanent Surface Water Body	50.0m - 100.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
		Surface water pollution hazard	Category 1 to 3 soils no surface water down gradient within 100m; low rainfall area	Category 4 to 6 soils permanent surface water <50m down gradient; high rainfall; high resource/ environmental value
		Slope	0-6% (surface effluent application) 0 -10% (subsurface effluent application)	>10% (surface effluent application) >30% (subsurface effluent application)
		Fall direction	Downgradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
		Drainage	No visible signs of saturation	Visible seepage; moisture tolerant vegetation; low lying area
		Flood Potential	Above 1 in 20-year flood contour	Below 1 in 20-year flood contour
		Application Method	Subsurface or subsoil application	Surface/ above ground application

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Risk-based Buffer example

		Constraint Item	Constraint Scale: Low Risk	Constraint Scale: Moderate Risk	Constraint Scale: High Risk
Permanent Surface Water Body	50.0m - 100.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Secondary treated effluent. No disinfection and/or irregular servicing	Primary treated effluent
		Surface water pollution hazard	Category 1 to 3 soils no surface water down gradient within 100m; low rainfall area	Category 1 to 6 no surface water downgradient within 50m; moderate rainfall area	Category 4 to 6 soils permanent surface water <50m down gradient; high rainfall; high resource/ environmental value
		Slope	0-6% (surface effluent application) 0 -10% (subsurface effluent application)	7-10% (surface application) 10-30% (subsurface application)	>10% (surface effluent application) >30% (subsurface effluent application)
		Fall direction	Downgradient of surface water body, property boundary, recreational area	Cross-gradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
		Drainage	No visible signs of saturation	Mottling noted in subsoil with no signs of surface saturation	Visible seepage; moisture tolerant vegetation; low lying area
		Flood Potential	Above 1 in 20-year flood contour	--	Below 1 in 20-year flood contour
		Application Method	Subsurface or subsoil application	--	Surface/ above ground application
			50.0m	75.0m	100.0m

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Risk-based Buffer example

		Constraint Item	Constraint Scale: Low Risk	Constraint Scale: Moderate Risk	Constraint Scale: High Risk
Permanent Surface Water Body	50.0m - 100.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Secondary treated effluent. No disinfection and/or irregular servicing	Primary treated effluent
		Surface water pollution hazard	Category 1 to 3 soils no surface water down gradient within 100m; low rainfall area	Category 1 to 6 no surface water downgradient within 50m; moderate rainfall area	Category 4 to 6 soils permanent surface water <50m down gradient; high rainfall; high resource/ environmental value
		Slope	0-6% (surface effluent application) 0 -10% (subsurface effluent application)	7-10% (surface application) 10-30% (subsurface application)	>10% (surface effluent application) >30% (subsurface effluent application)
		Fall direction	Downgradient of surface water body, property boundary, recreational area	Cross-gradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
		Drainage	No visible signs of saturation	Mottling noted in subsoil with no signs of surface saturation	Visible seepage; moisture tolerant vegetation; low lying area
		Flood Potential	Above 1 in 20-year flood contour	--	Below 1 in 20-year flood contour
		Application Method	Subsurface or subsoil application	--	Surface/ above ground application
			50.0m	**75.0m**	100.0m

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Preliminary Constraints Mapping

- Undertaken in advance of, and to prepare for, field study
- Guides field study
- Identifies data gaps to be filled by field study
- Most importantly, saves time and money

Into the Field We Go…….

Desktop Study – will have identified potentially suitable effluent management areas (EMAs).
A preliminary constraints map will also identify:

- Appropriate setback areas from natural or built features (existing and proposed)
- Identified physical constraints (e.g. bedrock, fill)
- Data gaps (areas for investigation)
- Regional soil landscapes (including boundaries)
- Recommended soil (test pit) locations
- Indicative groundwater depth

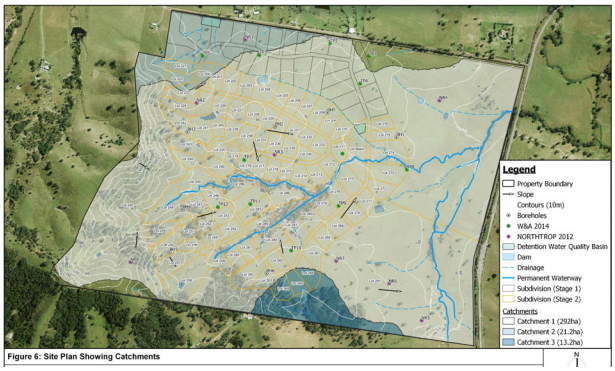

Figure 6: Site Plan Showing Catchments

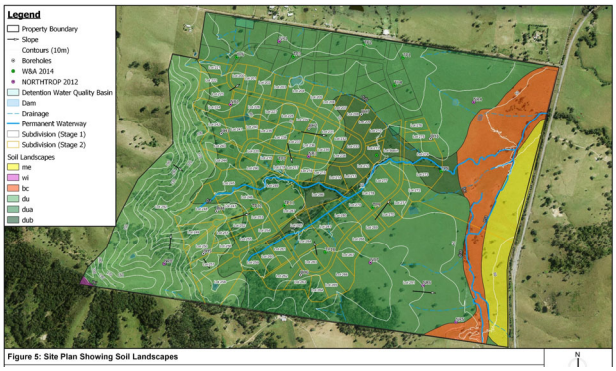

Figure 5: Site Plan Showing Soil Landscapes

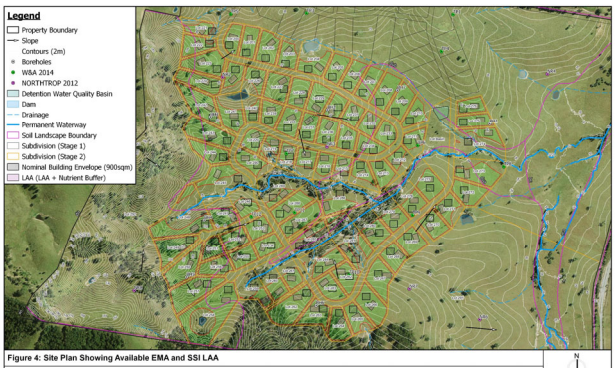

Figure 4: Site Plan Showing Available EMA and SSI LAA

Figure 3: Site Plan Showing Proposed OSSM