

# Proposed Cudgera Creek Caravan Park

Review of Effluent Management Plan

Final Report

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Prepared for Tweed Shire Council

**environmental science & engineering**

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# 1 Introduction

## 1.1 Background

This report presents the findings of a review of the True Water (June 2024) *Effluent Management Plan* (the **EMP**) written to support a development application for a proposed caravan park located at Lot 250 DP 755701 1183 Cudgera Creek Road, Cudgera Creek, NSW (the **Site**). The review has been commissioned by Tweed Shire Council (**Council**) as part of the development assessment process pursuant to Section 4.15 of the *Environmental Planning and Assessment Act 1979* (NSW) (**EPAA**).

## 1.2 Referral Detail

Referral details are provided in Table 1.

**Table 1:** Referral detail.

Item	Description
<b>DA number</b>	DA24/0352
<b>Date referred</b>	1/08/2024
<b>Application description</b>	Integrated Development – demolition of existing structures and erection of a caravan park containing 267 long term sites and 12 short term sites, clubhouse, outbuildings and associated road.
<b>Site location</b>	1183 Cudgera Creek Road, Cudgera Creek, NSW.
<b>Council referral officer</b>	Lindsay McGavin
<b>Documents reviewed</b>	<p>Reports / assessments:</p> <ul style="list-style-type: none"> <li>True Water Australia (June 2024) <i>Effluent Management Plan – Pottsville Caravan Park, Wastewater Treatment System (WWTS) (EMP)</i>.</li> <li>BMT (April 2024) <i>Flood Impact Assessment – 1183 Cudgera Creek Road, Cudgera, NSW</i>.</li> <li>BMT (May 2024) <i>Flood Response Assessment Plan – Pottsville Caravan Park (DRAFT)</i>.</li> <li>Biodiversity Australia Pty Ltd (April 2024) <i>Mosquito Management Plan – Cudgera Creek Road, Cudgera Creek</i>.</li> <li>Qualtest (April 2024) <i>Proposed Development Preliminary Geotechnical Assessment – 1183 Cudgera Creek, Cudgera Creek</i>.</li> <li>Planit Consulting (July 2024) <i>Statement of Environmental Effects – Provision of a Caravan Park and Road, 1183 Cudgera Creek Road, Cudgera Creek</i>.</li> <li>ADW Johnson (May 2024) <i>Stormwater Management Plan – Proposed Caravan Park, 1183 Cudgera Creek Road, Cudgera Creek</i>.</li> </ul> <p>Plans:</p> <ul style="list-style-type: none"> <li>Concept engineering plan set prepared by ADW Johnson (ref 240532) dated 24 May 2024.</li> <li>Cudgera (sic) Creek Carvan (sic) Park Wastewater Treatment Plant set prepared by True Water Australia (no reference) dated 21 February 2024.</li> </ul>

### 1.3 Proposed Development

Review of the concept engineering plans (ADW Johnson, May 2024) and EMP, shows that the proposed development includes the following:

1. 279 new caravan sites, consisting of 12 short-term sites and 267 long-term sites.
2. Community facilities building.
3. New sealed access roads connecting the Site to Cudgera Creek Road and Tom Merchant Drive (total road length approximately 1.5 km).
4. Internal sealed road network with kerb and gutter drainage.
5. Associated onsite sewage treatment, wet weather effluent storage and disposal.
6. Provision of services infrastructure (potable water, power, telecommunications, etc.).
7. Stormwater management basins.
8. Associated earthworks and landscaping.

### 1.4 Site Description

The Site is described in Table 2.

**Table 2:** Site description.

Parameter	Details
<b>Lot and DP</b>	Lot 250 DP 755701
<b>Site area</b>	Approximately 119.9 ha (True Water, 2024)
<b>Land zoning</b>	RU1 – Primary Production RU2 – Rural Landscape.
<b>Existing development</b>	Site infrastructure includes two dwellings, associated sheds, pools, driveway accesses, fences and agricultural areas with associated drainage.
<b>Adjacent environment</b>	Site is bounded by Cudgera Creek and Cudgera Creek Road to the south, rural properties to the north and west and Tom Merchant Drive and existing remnant bushland to the east. Existing surrounding development consists of predominantly residential development to the south and north east.
<b>Topography</b>	Site topography is dominated by a central north / south oriented ridge and the surrounding Cudgera Creek floodplain. Grades vary between 0 – 20%. Site elevation ranges between approximately 1 mAHD in the vicinity of Cudgera Creek to approximately 23 mAHD at the top of the ridge.
<b>Vegetation</b>	Site vegetation is largely introduced grasses and crops with some scattered trees. Remnant bushland exists to the east.
<b>Drainage</b>	Cudgera Creek borders Site to the south. Cudgera Creek is a 4 <sup>th</sup> order watercourse at the Site. An existing mapped watercourse draining from Christies Creek (approximately 2 km north of the site) across the Cudgera Creek

Parameter	Details
	floodplain borders Site to the north. The Site also contains several mapped watercourses and farm drains.
<b>Groundwater</b>	<p>Applicant's assessment has not outlined details of any on-site or nearby registered bores. A registered bore search shows one bore is located on Site however no bore details are available.</p> <p>Given the low lying land character, groundwater is expected to be relatively shallow, with levels coinciding with surface water levels in Cudgera Creek, Christies Creek and farm drains.</p>
<b>Geology</b>	Local geology consists of Quaternary coastal, estuarine and alluvial deposits, overlying bedrock which is likely to be feldspathic and lithic meta-arenite, metasiltstone, mudstone, shales, chert, jasper, basic metavolcanic rocks, pillow lava deposits and conglomerates of the Carboniferous Neranleigh-Fernvale beds formation.
<b>Soils Landscapes</b>	<p>Site soil landscapes include:</p> <ul style="list-style-type: none"> <li>Cobaki (generally in areas proposed to be used for effluent disposal) – Extensive marine plains and estuarine infills with potential Acid Sulphate Soils (<b>ASS</b>) at &gt; 2 m below ground level. Waterlogging, flood hazard and permanently high water table listed as landscape limitations. Soils consist of up to 0.2 m of sapric clay loam overlying more than 1.0 m of massive plastic medium clays and marine clays.</li> <li>Billinudgel (generally associated with the ridgeline) – Deep moderately well drained red podzolic soils on metamorphics of the Neranleigh-Fernvale Group. Hardsetting, highly erodible, very strongly acidic and moderately dispersive soils and steep slopes, mass movement and water erosion hazards. Soils consist of 0.3 m of silty clay loam overlying up to 1 m of hardsetting plastic light to heavy clay then bedrock.</li> </ul>
<b>Hydrology and drainage</b>	Cudgera Creek runs through southern portion of Site (site access from Cudgera Creek Road crosses Cudgera Creek). Hydrolines consisting of existing farm drain along northern Site boundary which drains smaller existing farm drains on Site and adjacent land to the north. This farm drain also connects to Christies Creek approximately 800 m north of Site. Two mapped watercourses (hydrolines) drain the main Site ridgeline to Cudgera Creek to the south east.
<b>Flooding</b>	Review of BMT (2024) flood assessment shows site extensively impacted by frequent flooding – most of the proposed effluent disposal area is located below the 20% Annual Exceedance Probability ( <b>AEP</b> ) peak flood level.

## 2 Section 4.15 Assessment

### 2.1 Site Suitability

A preliminary assessment of site suitability for the proposed effluent management system is summarised in Table 3.

**Table 3:** Site suitability review.

Key Issue	Information Provided	MA Assessment and Comments
Site landform constraints	Effluent Management Plan (True Water, 2024) Sections 6 and 7.	<p>The EMP contains a limited site constraints assessment which makes several assumptions about site landform constraints which are not supported by any long-term assessment. Notable are assumptions about permanent groundwater levels, proximity to site drains and climate constraints being 'low risk' and insufficient detail provided to justify locating the effluent disposal area in an area subject to frequent flooding.</p> <p>An assessment of site landform based on NSW DEC (2004) guidelines should be completed. Such an assessment would likely conclude:</p> <ol style="list-style-type: none"> <li>1. Frequent flooding is a severe limitation for effluent irrigation as it limits irrigation opportunities, damages irrigation infrastructure and requires increased effluent storage volume to manage inundation periods.</li> <li>2. Site runoff / runoff from irrigation areas likely to be an issue given scale of proposed system and proximity to existing surface farm drains.</li> <li>3. Groundwater likely to be close to surface.</li> <li>4. ASS likely to present constraints for excavation of site soils during system construction (see comments below).</li> <li>5. Buffers may not be available between proposed effluent irrigation areas and surface drains (see comments below).</li> </ol>
Site soils constraints	<p>Effluent Management Plan (True Water, 2024) Sections 6.4 and 6.5.</p> <p>Preliminary Geotechnical Assessment (Qaltest 2024) Section 5.8.</p>	<p>EMP contains an insufficient assessment of site soils long-term suitability to sustainably assimilate applied effluent. The EMP relies on the Geotech Investigations (January 2024) <i>Subsurface Investigation for Proposed Development</i> assessment report, which also provides an insufficient assessment of site soils. The report is deficient in the following areas:</p> <ol style="list-style-type: none"> <li>1. Insufficient subsurface investigations in the area proposed to be used for effluent irrigation. A total of two (2) boreholes were completed within the proposed 10 ha irrigation field.</li> <li>2. No soil chemistry testing has been completed. It is therefore not possible to determine soil suitability to assimilate effluent hydraulic and</li> </ol>



Key Issue	Information Provided	MA Assessment and Comments
		<p>nutrient loads. Assessment would typically include laboratory analyses of the following soil parameters: pH, bulk density, electrical conductivity, sodicity (exchangeable sodium percentage), cation exchange capacity, phosphorus sorption and soil dispersiveness.</p> <p>3. Soils structure is described using the Unified Soils Classification System (USCS), contrary to the recommended assessment method given in AS/NZS 1547 (2012), which uses the textural classification scheme.</p> <p>4. Site soils in the effluent disposal area are noted to be 'silty to sandy clays, stiff and high plasticity'. The implication of this is that site soils on the Cudgera Creek floodplain are medium to heavy clay soils. These soils are typically not suited to effluent irrigation having low permeability and an increased chance of waterlogging and effluent resurfacing.</p> <p>Hydraulic conductivity testing confirms that soils in the proposed effluent irrigation area have low permeability.</p> <p>5. The EMP adopts a Design Irrigation Rate (<b>DIR</b>) of 0.7 mm/day, based on a total irrigation area of 10 ha, however the site plans show a effluent irrigation area of 5 ha. This would result in an average DIR of 1.3 mm/day.</p>
Nutrient, Biochemical Oxygen Demand and Salt Balancing	Effluent Management Plan (True Water, 2024) Sections 6.4, 6.5, 9.2 and Appendix J.	<p>The EMP contains insufficient details of nutrient, Biochemical Oxygen Demand (<b>BOD</b>) or salt balance modelling to justify that the proposed effluent irrigation area can sustainably assimilate loads long-term.</p> <p>The provided MEDLI modelling is not considered adequate for the following reasons:</p> <p>1. This model was prepared for use in Queensland and is not recognised as being compliant with NSW DEC (2004) guidelines.</p> <p>2. The soil chemistry used in modelling was assumed rather than being based on laboratory analyses of site soil samples.</p> <p>3. The MEDLI model used incorrect rainfall data (Beechmont Queensland as opposed to Murwillumbah as reported in Section 6.1 of the report). Beechmont is noted to have an average rainfall of 1,299 mm/year, which is approximately 270 mm less than the reported average annual rainfall of 1,576 mm/year for Murwillumbah. It is likely that the nutrient balance results obtained are incorrect.</p> <p>4. The MEDLI model salt balance is noted to be set to zero for all inputs and outputs. No salt balance modelling has been completed.</p>

Key Issue	Information Provided	MA Assessment and Comments
		5. No comment is made in the EMP regarding the impact of BOD loading.
ASS	Effluent Management Plan (True Water, 2024) Sections 6.5 and 7.	<p>The EMP recommends that the effluent irrigation area is mapped as having Class 4 ASS. Council mapping shows the area has Class 3 ASS (Figure 3).</p> <p>An ASS management plan should be prepared demonstrating that construction and operation of the effluent irrigation area will not mobilise ASS or cause detrimental impacts to receiving environments.</p>
Groundwater	Effluent Management Plan (True Water, 2024) Sections 6.6 and 6.7.	<p>The EMP does not adequately address potential groundwater related issues in terms of likely impacts from effluent application on local groundwater quality. Specific deficiencies include:</p> <ol style="list-style-type: none"> <li>1. Reliance on a single groundwater level taken in 1997 from a bore located 800 m west of the Site to justify the conclusion that site groundwater is more than 4 m below ground level in the vicinity of the proposed effluent irrigation area.</li> <li>2. No monitoring of groundwater levels or quality has been completed to inform baseline conditions and mitigation measures for ensuring that impacts on groundwater from effluent application are adequately mitigated.</li> <li>3. No management measures are provided to demonstrate how effluent will be prevented from contaminating site groundwater when levels are high (e.g. immediately following flooding events and prolonged rainfall).</li> <li>4. NSW DEC (2004) recommends that where supporting technical groundwater advice is not provided, effluent should not be applied to land where the groundwater table is less than 10 m below ground level or where the irrigation area is within 1 km of a town water supply bore.</li> <li>5. Risks from effluent irrigation to groundwater are not properly assessed.</li> </ol>
Surface water	<p>Effluent Management Plan (True Water, 2024) Sections 6.7.</p> <p>Stormwater Management Plan (ADW Johnson 2024) Section 4 – Stormwater Quality.</p>	<p>The EMP and Stormwater Management Plan (ADW Johnson, May 2024) do not provide an adequate assessment of likely impacts of effluent irrigation on site surface water drainage and downstream surface water receiving environments. Specific deficiencies include:</p> <ol style="list-style-type: none"> <li>1. No monitoring of surface water quality has been completed to inform baseline conditions and mitigation measures for mitigating likely impacts.</li> <li>2. The EMP and stormwater management reports do not detail how runoff from upslope areas to effluent irrigation areas is proposed to be dealt with, noting that the access road drainage is</li> </ol>

Key Issue	Information Provided	MA Assessment and Comments
		<p>proposed to be directed to the open space directly south of and upslope of the effluent irrigation area (BMT, 2024).</p> <ol style="list-style-type: none"> <li>MUSIC model does not consider surface runoff frequency or quality of runoff from effluent irrigation areas.</li> <li>System management, irrigation prevention and mitigation measures in the event of effluent resurfacing and / or waterlogging of soils is not provided.</li> <li>Risks to water quality of receiving environments from effluent irrigation areas are not properly assessed.</li> </ol>
Flood Liability	<p>BMT (2024) provides detailed results of flood modelling showing existing and proposed flood conditions in 20% AEP, 1% AEP and PMF events.</p> <p>Effluent Management Plan (True Water, 2024) Section 6.8 considers flood impacts.</p>	<p>The Site is flood prone (Figure 4). Justification of irrigating effluent onto flood prone land given in the EMP is inadequate. The EMP notes that the risk of flooding is to be mitigated through effluent storage, however proposed storage is inadequately sized (see effluent storage issue below) and this does not detail how effluent is to be managed in the event of frequent flooding and likely waterlogged soils and high groundwater levels following flooding events.</p> <p>The following is noted:</p> <ol style="list-style-type: none"> <li>The BMT (2024) flood report shows that the proposed effluent irrigation areas are inundated in the 20% Annual Exceedance Probability (<b>AEP</b>) event. This indicates that the effluent irrigation areas will be subject to frequent flooding.</li> <li>NSW DEC (2004) guidelines recommend that sites with frequent flooding present a severe limitation to effluent irrigation.</li> </ol>
Site Climate	Effluent Management Plan (True Water, 2024) Sections 6.1 and 7.	<p>The EMP details average annual site rainfall as 1,576.3 mm and average annual site pan evaporation as 1,466.1 (based on Bureau of Meteorology figures for Murwillumbah and Hinze Dam respectively). Review of EMP Table 6.1 shows that average rainfall exceeds pan evaporation for up to seven months per year. It is therefore highly likely that there will be several months per year on average where wet weather will prevent effluent irrigation and effluent will need to be either stored or removed from the site by pump-out tanker.</p>
Buffers	Effluent Management Plan (True Water, 2024) contains generic comment in Section 11.	<p>The EMP does not demonstrate that minimum vertical buffers are provided between groundwater levels and effluent irrigation areas.</p> <p>Horizontal buffers are largely achieved, however proximity of the effluent irrigation area to existing surface drains is not assessed.</p> <p>Buffers between sewage treatment works and effluent storage lagoons and proposed caravan</p>

Key Issue	Information Provided	MA Assessment and Comments
		sites appears to be inadequate when considering odour, noise and biting insect constraints.
Wet Weather Storage	Effluent Management Plan (True Water, 2024) Sections 9.2 and 9.6.	<p>The EMP fails to adequately address the requirement for wet weather storage. Specifically:</p> <ol style="list-style-type: none"> <li>1. Storage volume is undersized. The EMP states that 1 ML of storage or approximately 10 days of storage at peak dry weather design flow is provided, based on results of MEDLI modelling. This is likely to be undersized, given average site rainfall exceeds pan evaporation for up to seven months per year, MEDLI modelling used the incorrect rainfall values and does not consider the expected frequency of flooding of effluent irrigation areas and periods of elevated groundwater.</li> <li>2. NSW DEC (2004) recommends that wet weather storage should be designed to prevent overflows in 50% of years for low strength effluent. A detailed monthly wet weather storage balance should be undertaken to determine the minimum storage requirement. Justification that the impact of any overflows is acceptable has not been provided.</li> <li>3. Wet weather storages are proposed to be open lagoons. Direct rainfall will further reduce available volume for effluent storage. It is unclear from the EMP as to whether or not direct rainfall has been correctly factored into lagoon sizing.</li> <li>4. Wet weather storages pose a public health risk. Insufficient detail is provided in the attached engineering plans regarding preventing public access and emergency egress from storage lagoons.</li> <li>5. Wet weather storage lagoon overflows are likely to cause water pollution as defined in Section 120 of the <i>Protection of the Environment Operations Act 1997</i> (NSW). Overflows are likely to be considered unacceptable by NSW EPA and licensing conditions for operating the onsite wastewater management system will likely reflect this (zero discharge probable).</li> <li>6. Details of pest and odour management of standing effluent in lagoons is not provided, given relative close proximity of lagoons to caravan sites.</li> </ol>
Pathogen Transport	Effluent Management Plan (True Water, 2024) Appendix B.	<p>The EMP risk management plan states that the proposed wastewater treatment plant chlorine treatment is capable of 'suitable pathogen removal at free residual chlorine levels of &gt; 0.5 mg/L.</p> <p>However, the EMP contains no pathogen transport modelling or assessment demonstrating that the irrigation of effluent will not result in adverse risks</p>

Key Issue	Information Provided	MA Assessment and Comments
		to public health arising from pathogens entering site surface water or groundwater.
Site Contamination	Preliminary & Detailed Site Investigation (Qaltest, 2024) Sections 5 – 8 and Figures 5, 6 and 7.	The proposed effluent irrigation areas are in an area of the site historically used for farming. No site testing has been completed in the proposed effluent irrigation area to assess existing site contamination or risk of mobilisation of contaminants to surface water and groundwater.
Wastewater Generation Rates	Effluent Management Plan (True Water, 2024) Section 8.3.	<p>The EMP calculated an average wastewater generation rate of 65 kL/day and a peak daily wastewater generation rate of 100 kL/day based on projected site population and design rates in NSW Water Directorate (2017) guidelines. This appears to be an adequate assessment of likely wastewater generation rates.</p> <p>Proposed Sewage Treatment Plant (<b>STP</b>) will be designed to treat 1.25 times the peak daily wastewater generation rate (125 kL/day).</p>
Sewerage System	Pottsville Caravan Park – Engineering Plans (ADW Johnson, 2024) – no details provided of sewerage system.	No details of the internal site sewerage system are provided (presumably intended to be designed at detailed design). It is not possible to adequately assess system components (pump stations, mains, etc.) without conceptual designs.
Proposed Treatment System	Effluent Management Plan (True Water, 2024) Section 8 and Appendix A.	<p>The EMP provides details of a proposed Kubota Media Bed Biofilm Reactor (<b>MBBR</b>) STP with capacity to treat 100 kL/day. System effectiveness will depend on sewage influent characteristics, load and operation and maintenance.</p> <p>The proposed system is likely to be capable of adequately treating sewage generated by the development. However, there are risks which are not adequately addressed in the EMP, notably:</p> <ol style="list-style-type: none"> <li>1. Proximity of the STP to caravan sites regarding odour, noise and visual impacts.</li> <li>2. Design ground level at the STP compound is unclear. Review of the engineering plans suggest that the compound finished surface level is between 3 – 3.5 mAHD. Review of the ADW Johnson (2024) Stormwater Management Plan (<b>SMP</b>) indicates that proposed stormwater Basin D is located adjacent to the STP compound and has a design spillway level of 3.3 mAHD and a berm level of 3.6 mAHD. The 1% AEP design top water level in Basin D is 3.27 mAHD and review of the 1% AEP developed conditions flood levels show that both low flow outlets from Basin D are drowned in the 1% AEP flood.</li> </ol> <p>It is unclear from the plans if the STP has sufficient freeboard to the 1% AEP top water level in Basin D.</p> <ol style="list-style-type: none"> <li>3. Capacity of the STP to deal with ‘shock’ loads (e.g. during wet weather when inflows will be</li> </ol>

Key Issue	Information Provided	MA Assessment and Comments
		<p>higher). Flow balancing is not specifically mentioned in the EMP.</p> <p>4. The engineering plans are unclear as to whether the STP will have its own tanker stand area or whether pump out / desludging tankers will need to stand on the access road adjacent to the STP compound.</p>

## 2.2 Potential Environmental Impacts

Potential environmental impacts associated with the proposed effluent management system are summarised in Table 4.

**Table 4:** Potential environmental impacts.

Potential Environmental Impact	Information Provided	Assessment
Contamination of surface water	<p>Effluent Management Plan (True Water, 2024) Sections 6.7.</p> <p>Stormwater Management Plan (ADW Johnson 2024) Section 4 – Stormwater Quality.</p>	<p>Unacceptable risk of waterlogging / hydraulic overloading of soils as result of frequent flooding and wet weather.</p> <p>Unacceptable risk of effluent ponding and resurfacing from inability of soils to accept additional hydraulic loading.</p> <p>Risk of overflows from wet weather storages and STP during wet weather events not addressed.</p> <p>Increased nutrient levels in surface runoff and seepage from effluent management areas not determined.</p>
Contamination of groundwater	Effluent Management Plan (True Water, 2024) Sections 6.6 and 6.7.	<p>Risk of increased nutrients and pathogens being directed to groundwater with no assessment of either, including baseline conditions, provided.</p> <p>Subsequent risk to GDEs, environmental and public health.</p>
ASS	<p>Effluent Management Plan (True Water, 2024) Sections 6.5 and 7.</p> <p>Preliminary Geotechnical Assessment (Qaltest 2024)</p>	Risk of disturbance of ASS and subsequent impacts. ASS management plan not provided.
Vegetation impacts	Not provided.	<p>Changes to surface and groundwater flows and nutrient loads may potentially result in changes to vegetation composition and detrimental impacts on native vegetation.</p> <p>No arborist or ecological assessment provided.</p>

## 2.3 Potential Social Impacts

Potential social impacts arising from the proposed effluent management system are summarised in Table 5.

**Table 5:** Potential social impacts.

Potential Social Impact	Information Provided	Assessment
Odour	Effluent Management Plan (True Water, 2024) Appendix B.	Proximity of STP and effluent ponds to caravan sites and likelihood of unacceptable odours not properly assessed. No consideration of odours from effluent storage ponds.
Noise	Effluent Management Plan (True Water, 2024) Appendix B.	Proximity of STP to caravan sites and likelihood of increased noise levels from STP operation and maintenance vehicle / tanker movements not assessed by acoustic assessment.
Traffic	Traffic Impact Assessment (Bitzios Consulting, April 2024).	Requirement for increased pump out tanker movements on site and on local road network, particularly during extended wet weather not assessed.
Pests	Mosquito Management Plan (Biodiversity Australia, April 2024).	Proposed assessment of mosquito / biting midge control requirements for wet weather storage ponds not provided.  Increased likelihood of pest species from construction of wet weather storage ponds.
Public safety	Effluent Management Plan (True Water, 2024) Appendix B.  Pottsville Caravan Park – Engineering Plans (ADW Johnson, 2024) – no details provided of sewerage system.	No details provided of public access restriction to wet weather storage ponds (e.g. pool fencing).
System failure	Effluent Management Plan (True Water, 2024) Appendix B.	Potential for considerable social impact on site residents and visitors from system failure. Notably would be the need for increased pump out with associated noise, odour and traffic impacts.

## 2.4 Compliance Assessment

A compliance assessment with relevant planning instruments and development controls is provided in Table 6 **Error! Reference source not found..**

**Table 6:** Compliance assessment.

Planning Instrument / Development Control	Relevant Clauses / Sections	Assessment
State Environmental Planning Policy (Resilience and Hazards) (2021)	2.7 Development on land within coastal wetlands  2.8 Development on land in proximity to coastal wetlands.	Site contains mapped coastal wetlands, coastal wetlands proximity area, coastal environment area and coastal use area (Figure 1).

Planning Instrument / Development Control	Relevant Clauses / Sections	Assessment
	<p>2.10 Development on land within coastal environment area</p> <p>2.11 Development on land within coastal use area</p>	<ul style="list-style-type: none"> <li>• Clause 2.7 – Not relevant. No onsite wastewater infrastructure proposed in mapped wetland..<sup>1</sup></li> <li>• Clause 2.8 – Not relevant. No onsite wastewater infrastructure proposed in mapped wetland proximity area..<sup>2</sup></li> <li>• Clause 2.10 – Onsite effluent irrigation area and sewage management within mapped Coastal Environment Area. Insufficient information provided to demonstrate proposed systems will not adversely impact on the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment..<sup>3</sup></li> <li>• Clause 2.11 – Wet weather storage lagoon within mapped Coastal Use Area. Insufficient information provided to demonstrate proposed development will not adversely impact on visual amenity and is of an appropriate scale..<sup>4</sup></li> </ul>
Tweed Local Environment Plan (2014)	<p>5.21 – Flood planning.</p> <p>5.22 – Special flood considerations.</p> <p>7.1 – Acid Sulfate Soils.</p> <p>7.10 – Essential Services.</p>	<ul style="list-style-type: none"> <li>• Clause 5.21 – Site is flood impacted. Effluent irrigation area and onsite wastewater management infrastructure are located in flood affected areas. Insufficient information is provided to show that proposed onsite wastewater infrastructure will not cause detrimental increases in potential flood affectation of other properties and will not adversely affect the environment..<sup>5</sup></li> <li>• Clause 5.22 – Onsite wastewater management infrastructure is within flood affected areas. Insufficient information is provided to demonstrate that the proposed onsite wastewater management system will not result in adverse environmental effects in the event of a flood..<sup>6</sup></li> <li>• Clause 7.1 – Onsite effluent irrigation area is located within area mapped as Class 3 ASS. Insufficient information is provided demonstrating that</li> </ul>

<sup>1</sup> State Environmental Planning Policy (Resilience and Hazards) 2021 c 2.7(4).

<sup>2</sup> State Environmental Planning Policy (Resilience and Hazards) 2021 c 2.8(1).

<sup>3</sup> State Environmental Planning Policy (Resilience and Hazards) 2021 c 2.10(1)

<sup>4</sup> State Environmental Planning Policy (Resilience and Hazards) 2021 c 2.11(1)

<sup>5</sup> Tweed Local Environment Plan (2014) c 5.21(2).

<sup>6</sup> Tweed Local Environment Plan (2014) c 5.22(2)-(3).



Planning Instrument / Development Control	Relevant Clauses / Sections	Assessment
		<p>construction of effluent irrigation area will not disturb, expose or drain acid sulfate soils or cause environmental damage. No acid sulfate soils management plan has been provided.<sup>7</sup></p> <ul style="list-style-type: none"> <li>• Clause 7.10 – Insufficient information is provided to demonstrate that proposed onsite wastewater management is adequate for the disposal and management of sewage.<sup>8</sup></li> </ul>
Tweed Development Control Plan (2008)	<p>Part A – Section A1 Part A Clause 4.5 (Visual and Acoustic Privacy).</p> <p>Part A3 – Development on Flood Liable Land Clause A3.10 – Rural Areas.</p> <p>Part A6 – Biting Midge Control.</p> <p>Part A19 – Biodiversity and Habitat Management.</p>	<ul style="list-style-type: none"> <li>• Part A Section A1 Part A Clause 4.5 – Insufficient information is provided to determine if onsite wastewater management system pumps, blowers and other equipment complies with noise requirements.<sup>9</sup></li> <li>• Part A3 Clause A3.10.4 – Insufficient detail is provided regarding adverse impacts on flood behaviour and impacts on neighbouring properties arising from structures associated with onsite effluent irrigation area and earthworks for wet weather storage ponds.<sup>10</sup></li> <li>• Part A6 Clause A6.3.2 – Insufficient detail is given demonstrating appropriate biting insect controls for proposed onsite wet weather effluent storage lagoons, given the relative proximity of lagoons to caravan sites.<sup>11</sup></li> <li>• Part A19 Principles – Insufficient information provided regarding mitigation of potential impacts and cumulative impacts on biodiversity from proposed onsite wastewater management system.<sup>12</sup></li> </ul>
Tweed Development Design Specification D7 – Stormwater Quality (2020)	D7.07A – Water Quality Objectives	<ul style="list-style-type: none"> <li>• D7.07A - Occupational phase stormwater must achieve the water quality objectives for site runoff mean annual pollutant loads (TSS – 80%; TP – 60%, TN - 45% and GP – 90%). Insufficient consideration of runoff from proposed effluent irrigation areas to downstream receiving environments</li> </ul>

<sup>7</sup> Tweed Local Environment Plan (2014) c 7.1(1)-(3).

<sup>8</sup> Tweed Local Environment Plan (2014) c 7.10.

<sup>9</sup> Tweed Shire Council (2008) Development Control Plan, Section A1, Part A, p 41.

<sup>10</sup> Tweed Shire Council (2008) Development Control Plan, Section A3, c A3.10.4 p 42.

<sup>11</sup> Tweed Shire Council (2008) Development Control Plan, Section A6, p 10.

<sup>12</sup> Tweed Shire Council (2008) Development Control Plan, Section A19, P1, P13, P16, pp 15-17, p18.

Planning Instrument / Development Control	Relevant Clauses / Sections	Assessment
		and impacts on achieving water quality objectives. <sup>13</sup>
Tweed Flood Controls for Caravan Park Accommodation (2022)	C4 – Essential Services	<ul style="list-style-type: none"> <li>Insufficient detail provided to show that proposed onsite wastewater management system is suitably protected from flood damages up to the 1% AEP flood event.<sup>14</sup></li> </ul>
Tweed Shire Council (2004) Onsite Sewage Management Strategy	Background (Section 2), Objectives (Section 6), Risk Assessment Program (Section 12).	<ul style="list-style-type: none"> <li>Insufficient details of the onsite effluent irrigation system and wastewater management system are provided to show that objectives of the onsite sewage management strategy have been achieved. Notably, prevention of public health risk and protection of environmental health.<sup>15</sup></li> </ul>
Australian / New Zealand Standard 1547 (2012)	Entire Standard	<ul style="list-style-type: none"> <li>Insufficient detail is provided to fully assess the proposed onsite wastewater management and effluent irrigation systems against AS/NZS 1547 system design and performance requirements.<sup>16</sup></li> </ul>
NSW Department of Environment and Conservation (2004) <i>Use of Effluent by Irrigation</i> <sup>17</sup>	Sections 2 – 6 and Appendix 4	<ul style="list-style-type: none"> <li>Insufficient detail is given to demonstrate that the proposed onsite effluent irrigation area complies with NSW DEC (2004) guidelines in terms of: <ul style="list-style-type: none"> <li>Site and soil constraints.</li> <li>Effluent quality and sustainable soil loading rates for water, nutrients, BOD and salts.</li> <li>Pathogen transport.</li> <li>Minimum environmental buffers.</li> <li>System monitoring and testing programs for groundwater and surface water, public health and safety issues and minimum reporting requirements.</li> <li>Statutory considerations including licensing, environmental offences and consent requirements.</li> <li>Detailed effluent irrigation modelling of nutrient, salt and</li> </ul> </li> </ul>

<sup>13</sup> Tweed Shire Council (2020) Development Design Specification D7, c 7.07A.

<sup>14</sup> Tweed Shire Council (2022) Flood Controls for Caravan Park Accommodation, C2, p2.

<sup>15</sup> Tweed Shire Council (2004) On-Site Sewage Management Strategy, p 5, 11, 29-33.

<sup>16</sup> Australian / New Zealand Standard 1547 (2012) On-site domestic wastewater management.

<sup>17</sup> NSW Department of Environment and Conservation (2004) Use of Effluent by Irrigation.

Planning Instrument / Development Control	Relevant Clauses / Sections	Assessment
		water balances and overflows from proposed lagoons.
NSW Department of Local Government <i>et al.</i> (1998) <i>On-site Sewage Management for Single Households</i> <sup>18</sup>	Sections 4 - 6	<ul style="list-style-type: none"> <li>Insufficient details of the onsite effluent irrigation areas are provided to assess site and soils constraints, system design and performance parameters and recommended environmental buffers.</li> </ul>

## 2.5 Public Interest

The proposed onsite wastewater management system in its current form is not in the public interest, due to the high risk of detrimental environmental and social impacts arising from the operation of an onsite wastewater management system on a site which has significant constraints to sustainable onsite wastewater management.

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<sup>18</sup> NSW Department of Local Government *et al.* (1998) *On-site Sewage Management for Single Households*.

### 3 Summary

The EMP has not provided sufficient details to address likely risks and impacts arising from the proposed irrigation of effluent onto land which is unsuitable for that purpose. The applicant should address matters in Table 7.

**Table 7:** Outstanding matters.

Issue	Information Required
Insufficient soil investigations	Supplementary boreholes in effluent disposal area and supportive laboratory analyses of representative soil samples.
Insufficient groundwater investigations	Baseline groundwater data to characterise local groundwater environment. Groundwater risk assessment and risk mitigation measures.
Insufficient surface water investigations	Baseline surface water data to characterise local surface water environment. Surface water risk assessment and risk mitigation measures.
Wet weather storage	Detailed monthly water balance model in accordance with NSW DEC (2004) guidelines required to assess frequency of overflows from effluent storage lagoons.
Long term nutrient, BOD and salt load on site soils.	Detailed nutrient, BOD and salt balance modelling demonstrating long term capacity of site soils to assimilate irrigated effluent.
Flooding risks	Detailed flood risk impact and mitigation assessment, including flood frequency analyses to determine frequency of unavailability of effluent irrigation due to flooding. Details of soils monitoring, reporting and irrigation resumption following flooding to be provided. Detailed measures for managing effluent storage and disposal during prolonged periods of flooding and wet weather required.
Onsite Wastewater Management System Freeboard	Details of design surface and floor levels for the proposed STP, STP compound and wastewater management systems demonstrating freeboard compliance to the 1% AEP flood and peak stormwater storage levels.
Sewerage system concept design	Detailed design of proposed sewerage system to determine compliance with Council engineering design specifications.
Site contamination	Site contamination assessment to include detailed investigation of proposed effluent irrigation areas.
Acid sulfate soils risk	EMP should refer to a detailed ASS management plan for construction of effluent irrigation system.
Odour impacts	Detailed odour impact assessment of STP and effluent storage lagoons.
Noise impacts	Detailed noise impact assessment of STP and associated infrastructure.
Public safety risk	Details of risk assessment and mitigation measures to prevent unauthorised access to STP and effluent storage lagoons.
Traffic impacts	Updated traffic assessment considering impacts of additional pump out tankers on local roads during periods of flood / extended wet weather when onsite effluent irrigation is not possible.
Environmental impact assessment	Detailed environmental impact and risk assessment and details of risk mitigation for surface runoff from effluent irrigation areas, system overflows and groundwater impacts.

## 4 References

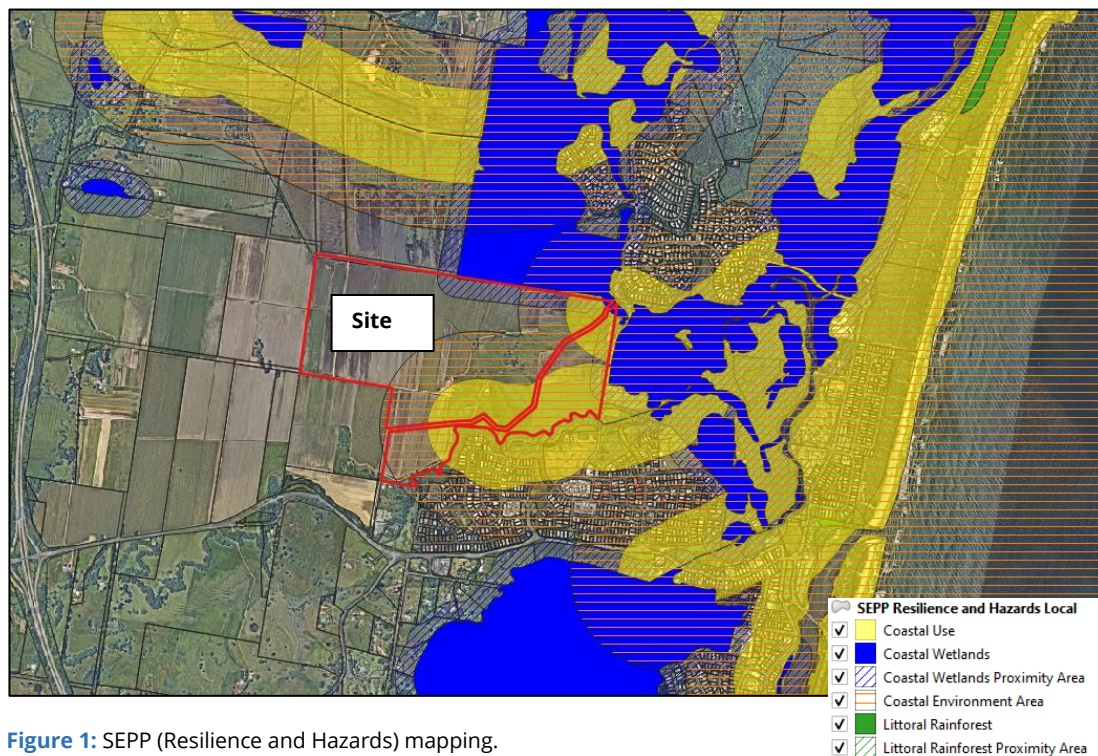
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- ADW Johnson (May 2024) *Pottsville Caravan Park – Engineering Plans*.
- ADW Johnson (May 2024) *Stormwater Management Plan – Proposed Caravan Park*.
- Australian / New Zealand Standard 1547 (2012) *On-site domestic wastewater management*.
- Biodiversity Australia (April 2024) *Mosquito Management Plan*.
- Bitzios Consulting (April 2024) *Traffic Impact Assessment*.
- BMT (April 2024) *Flood Impact Assessment – 1183 Cudgera Creek Road, Cudgera (NSW)*.
- Environmental Planning and Assessment Act 1979 (NSW)*.
- NSW Department of Environment and Conservation (2004) *Use of Effluent by Irrigation*.
- NSW Department of Local Government *et al.* (1998) *On-site Sewage Management for Single Households*.
- Planit Consulting (July 2024) *Statement of Environmental Effects – Provision of a Caravan Park and Road, 1183 Cudgera Creek Road, Cudgera Creek*.
- Qaltest (April 2024) *Preliminary & Detailed Site Investigation*.
- Qaltest (April 2024) *Proposed Development Preliminary Geotechnical Assessment*.
- State Environmental Planning Policy (Resilience and Hazards) 2021 (NSW)*.
- True Water (June 2024) *Effluent Management Plan*.
- Tweed Shire Council (2008) *Development Control Plan*.
- Tweed Shire Council (2020) *Development Design Specification D7 – Stormwater Quality*.
- Tweed Shire Council (2022) *Flood Controls for Caravan Park Accommodation*.
- Tweed Shire Council (2014) *Local Environment Plan*.
- Tweed Shire Council (2004) *Onsite Sewage Management Strategy*.

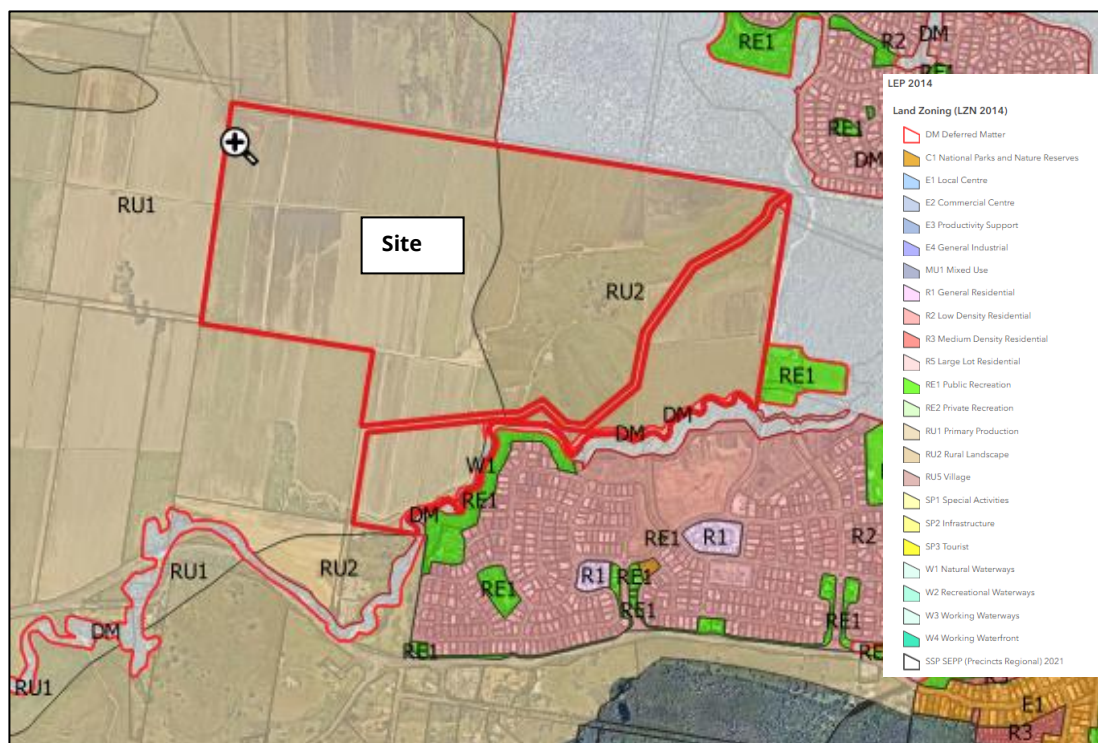
## Appendix A – Figures

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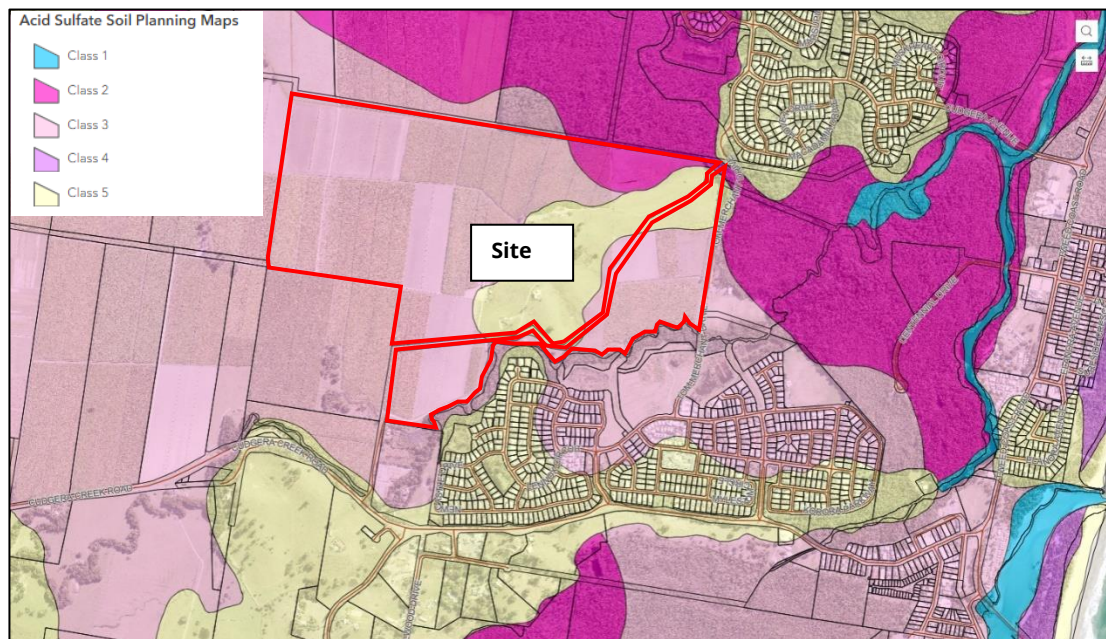


**Figure 1:** SEPP (Resilience and Hazards) mapping.

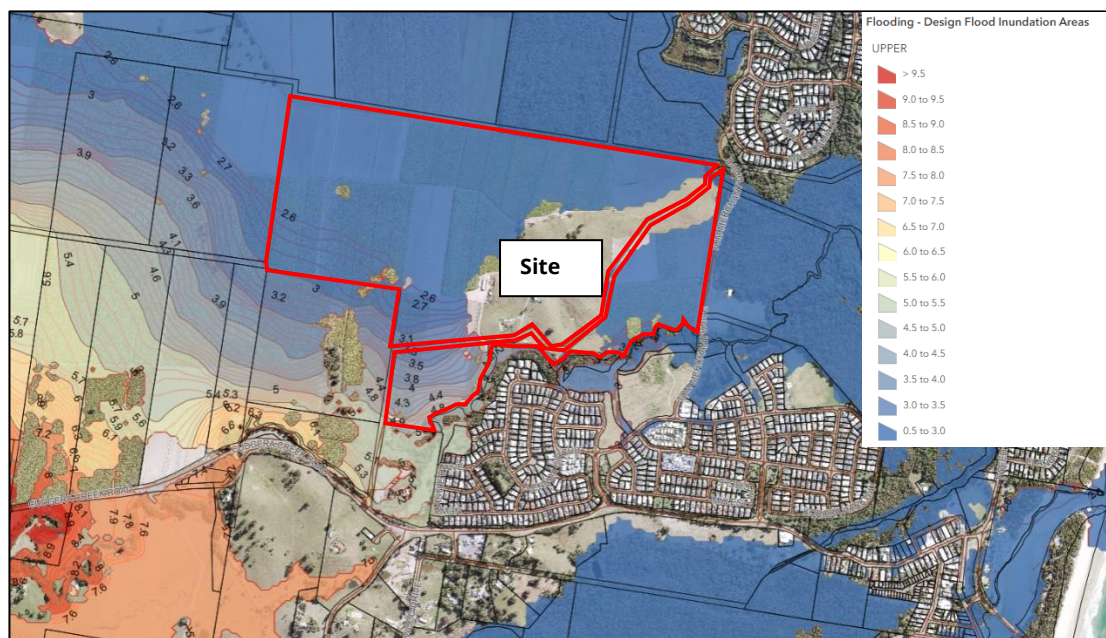


**Figure 2:** Tweed Local Environment Plan - zoning.





**Figure 3:** Tweed Local Environment Plan – Acid Sulphate Soils Mapping.



**Figure 4:** Tweed Local Environment Plan – Flood Mapping (1% AEP peak depth).