H. Coragulac Locality Report

1h. Introduction

Coragulac is a rural locality located approximately 13km northwest of Colac, in close proximity to the Cororooke and Alvie localities within the Red Rock region. The landform features undulating agricultural land on the Western Volcanic Plains.

There are approximately 201 and 69 unsewered properties/parcels located within the Coragulac locality and town, respectively, with 38 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Coragulac locality are summarised as follows:

- 6 AWTS (3 subsurface irrigation and 3 drip irrigation);
- 1 sand filter (1 trench);
- 20 septic tanks (4 trenches and 16 unknown); and
- 11 unknown (2 trenches and 9 unknown).

No field investigations were conducted within the Coragulac locality as part of the 2014 field assessments.

2h. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- Red Rock Region Community Infrastructure Plan (September, 2013);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3h. Summary of Constraints to DWM

Characteristic	Description
Climate Zone	Zone 2.
Surface waterways & catchments	Minimal surface waterways, with only Lake Coragulac and Lake Purdiguluc along the north-western locality border. Not located within a DWSC.
Groundwater	Proximity to groundwater bores: distributed throughout the locality, similar to Cororooke.
Land subject to inundation	Minimal; small amount to the west.
Useable lot area **Town (Locality)**	High: 26 (41) Moderate: 16 (33) Low: 27 (125) Compliant: 0 (2)

Characteristic	Description
Minimum lot size compliance with Planning Scheme Zoning	The locality is predominantly zoned Farming Zone, with the town zoned Township Zone and Low Density Residential Zone. Compliancy is variable throughout the locality, with the rural properties/parcels surrounding the town generally non-compliant. Compliant: 60 (73) Non-compliant: 9 (128)
Slope **Town (Locality)**	High: 0 (1) Moderate: 0 (2) Low: 69 (198)
Geology	Underlain by the Newer Volcanic Group with unnamed phreatomagmatic (tuff ring) deposits in the west (including the town) and unnamed stony rises and hummocky lava flows in the east.
Soil suitability **Town (Locality)**	High: 0 (0) Moderate: 69 (201) Low: 0 (0) The locality consists of soil landscape units '123' and '114' which form on gently undulating plains and stony rises of the Volcanic Western Plains. Soil type changes significantly with landform, but generally consists of moderately to strongly structured, friable clay loam over strongly structured medium clay to less than 1.5m depth. Limitations include restricted drainage.
Sensitivity Overlay	Depth to Groundwater Compliance: all compliant. Landslip: Nil. Vegetation: locality borders Lake Coragulac to the northwest.
Sensitivity Analysis Rating **Town (Locality)**	Very High: 0 (0) High: 0 (0) Moderate: 42 (77) Low: 27 (124)

4h. Sensitivity Analysis (Maps)

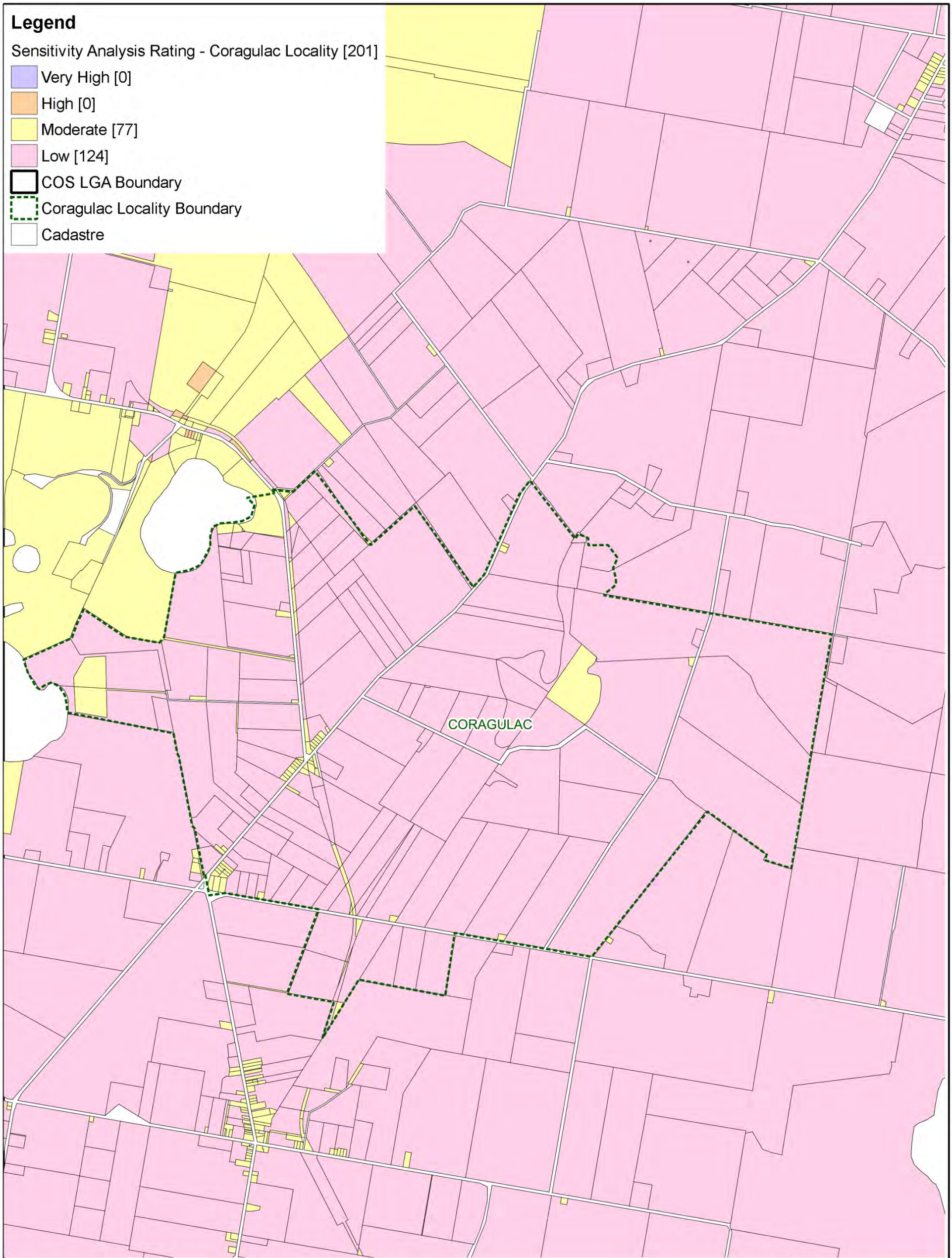

Figure h1: Sensitivity Analysis - Coragulac Locality

Colac Otway Shire DWMP Review

Whitehead & Associates Environmental Consultants

0 500 1000 1500 2000 2500 m

(Approx Scale)

N

Revision	3
Drawn	JK
Approved	MS

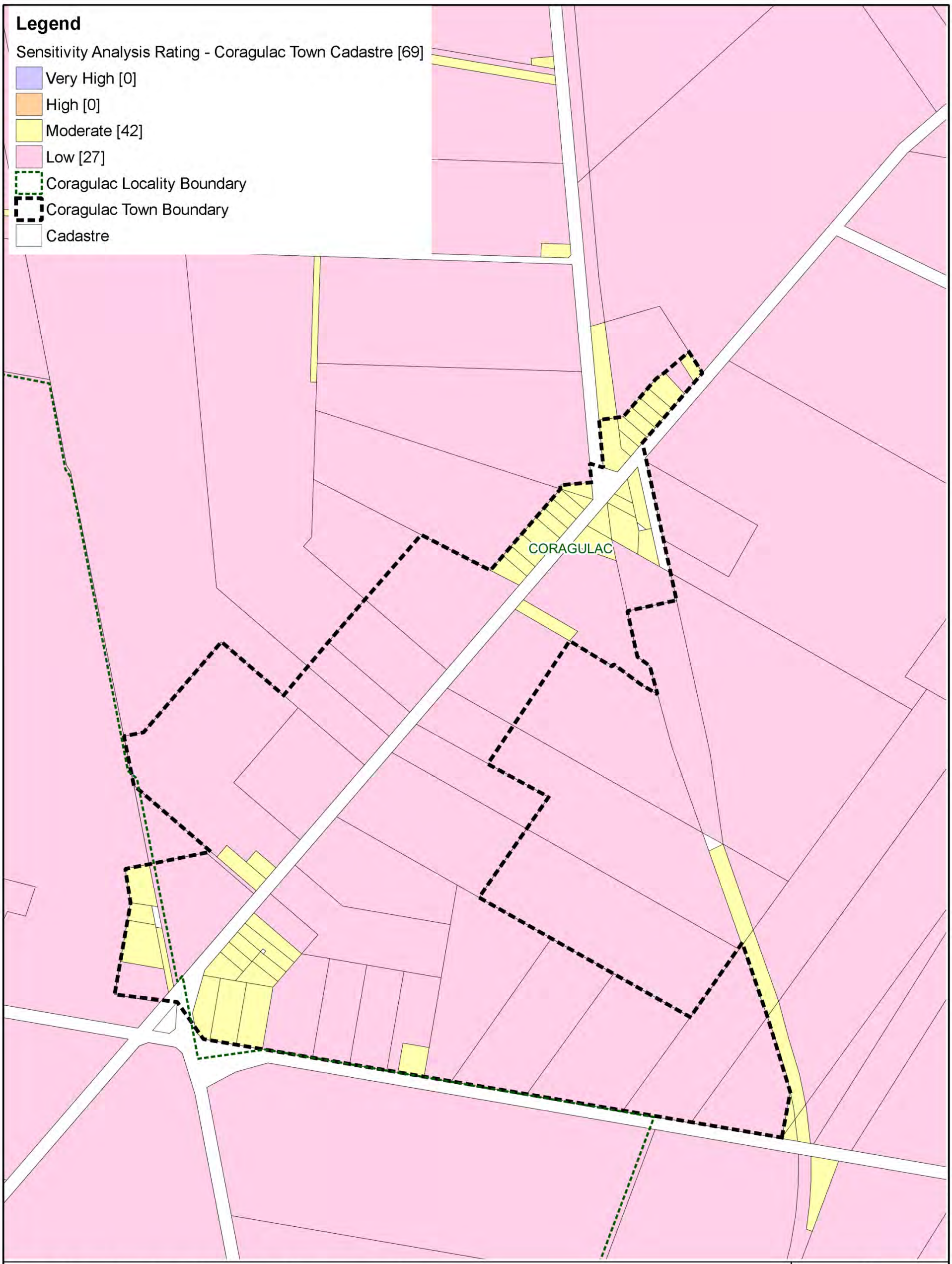

Figure h2: Sensitivity Analysis - Coragulac Town

Colac Otway Shire DWMP Review

Whitehead & Associates Environmental Consultants

0 150 300 450 600 750 m

(Approx Scale)

N

Revision	3
Drawn	JK
Approved	MS

5h. System Selection

Due to the dominance of heavy-textured soils in the Coragulac locality, conventional absorption trenches and beds are not likely to be feasible and are discouraged. Appendix A of the EPA Code of Practice (2013) prohibits LPED systems on Category 5 and 6 soils (medium to heavy clays). The System Sizing Tables (below) indicate which systems are likely to be the most appropriate for the locality.

6h. System Sizing Tables

Sizing Tables for each system type were created using conservative monthly water balances, following methods described in the MAV Model LCA, 2014. The water balances used monthly 70^{th} percentile rainfall and average evapotranspiration data for a single geographic point between Coragulac and Cororooke, due to their proximity. The climate data was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained properties/parcels.

Sizing Tables for the Coragulac locality are provided below.

7h. General Conclusion

The properties/parcels within Coragulac have been assigned a Moderate or Low Sensitivity Rating to sustainable DWM. Both Standard and Council LCAs will be required, with the use of System Sizing Tables deemed appropriate. The constraints within Coragulac are quite low in comparison to other localities, with particular attention directed towards ensuring that the quality of the groundwater resources is maintained and the correct decommissioning of groundwater bores occurs where necessary.

Coragulac

Drip and Spray Irrigation Systems* - Secondary Treated Effluent only

	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3)	Clay Loams (4)	Light Clays (5)	Medium to Heavy Clays (6)		
	DIR (mm)	5	5	4	3.5	3	2		
Development Type	Daily (L/day)	Total min. irrigation area required for zero wet weather effluent storage (m^2) not including spacing & setbacks							
5 + bedroom residence	1,080	287		390	476	610	1,397		
4 bedroom residence	900	239		325	396	508	1,164		
1-3 bedroom residence	720	191		260	317	407	932		

Note: * irrigation system sizes are based on the assumption that the land application area is less than 10% slope. Reductions in DIR apply for slopes above 10% according to Table M2 of AS1547:2012

Conventional Absorption Trenches and Beds - Primary or Secondary Treated Effluent

	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3)	Weak Loams & High/Mod Clay Loams (3 & 4)	Weak Clay Loams (4)	Massive Clay Loams (4)	Light Clays (5)	Medium to Heavy Clays (6)
	DLR (mm)	Not supported (Alternative Land Application System Required)							
Development Type	Daily (L/day)								
5 + bedroom residence	1,080								
4 bedroom residence	900								
1-3 bedroom residence	720								

Evapotranspiration-Absorption Trenches and Beds - Primary or Secondary Treated Effluent (Category 1 to 5) and Secondary Treated Effluent only (Category 6)

	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3a)	Weak/Massive Loams (3b)	High/Mod Clay Loams (4a)	Weak Clay Loams (4b) & Strong Light Clays (5a)	Massive Clay Loams (4c) and Mod & Weak Light Clays (5b, 5c)	Medium to Heavy Clays (6) - Secondary Effluent Only
	DLR (mm)	20*	20*	15	10	12	8	5	5
Development Type	Daily (L/day)	Total min. basal or 'wetted' area required for zero wet weather effluent storage (m^2) not including spacing & setbacks							
5 + bedroom residence	1,080	59	80	127	103	165	305		
4 bedroom residence	900	49	67	106	86	138	254		
1-3 bedroom residence	720	39	54	85	69	110	203		

Note: * Gravels, Sands and sandy loams are unsuitable for conventional absorption trenches and beds if there is a high watertable, including seasonal and perched watertables. Value based on average of conservative rate and maximum rate for Category 2b and 3a soils in AS1547:2012

LPED Irrigation Systems - Primary or Secondary Treated Effluent

	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3)	Clay Loams (4)	Light Clays (5)	Medium to Heavy Clays (6)		
	DIR (mm)	N/A (Alternative Land Application System Required)	4	3.5	3	2.5	N/A (Alternative Land Application System Required)		
Development Type	Daily (L/day)		Total min. basal or 'wetted' area for zero wet weather storage (m^2)†						
5 + bedroom residence	1,080		424	527	697	1,029			
4 bedroom residence	900		353	440	581	858			
1-3 bedroom residence	720		283	352	465	686			

† not including spacing & setbacks

Wick Trenches and Beds - Secondary Treated Effluent Only

	Soil Category	Gravels & Sands (1)	Sandy Loams (2) Loams (3) & High/Mod Clay Loams (4a,b)	Weak Clay Loams (4)	Massive Clay Loams (4)	Strong Light Clays (5a)	Moderate Light Clays (5b)	Weak Light Clays (5c)	Medium to Heavy Clays (6)
	DLR (mm)	25	30	20	10	12	8	8	5
Development Type	Daily (L/day)	Total min. basal or 'wetted' area required for zero wet weather effluent storage (m^2) not including spacing & setbacks							
5 + bedroom residence	1,080	46	38	59	127	103	165		305
4 bedroom residence	900	39	32	49	106	86	138		254
1-3 bedroom residence	720	31	26	39	85	69	110		203