

Framework Masterplan Boundary

**Residential urban land** 

# **Commercial/industrial urban land**

Commercial/industrial

### **Public Open Space**

## **Community food growing**

Allotments & Community orchards

Additional Stormwater Wetlands

### **Soilscapes Drainage Type Boundary**

- 1. Existing land use in 37.4 ha of the total OPA site area will be unchanged, which includes Westenhanger Castle area and existing roads/buildings/ water bodies/ riparian buffers etc. Therefore such areas are fully excluded in this figure and associated nutrient budget calculations.
- 2. This figure only shows proposed land use for 44.29 ha within the FMP boundary outside the total OPA site boundary. The remaining area will be unchanged, or to be integrated in the form of the proposed strategic greenspace elements, which have the same nutrient export values.
- 3. Residential parcels also include approximately 15% of additional greenspace areas (including SuDS), which are not

Revision	Date	Status	Author	Checker	Approver
01	13/10/22	FINAL	EBP	ML	RG



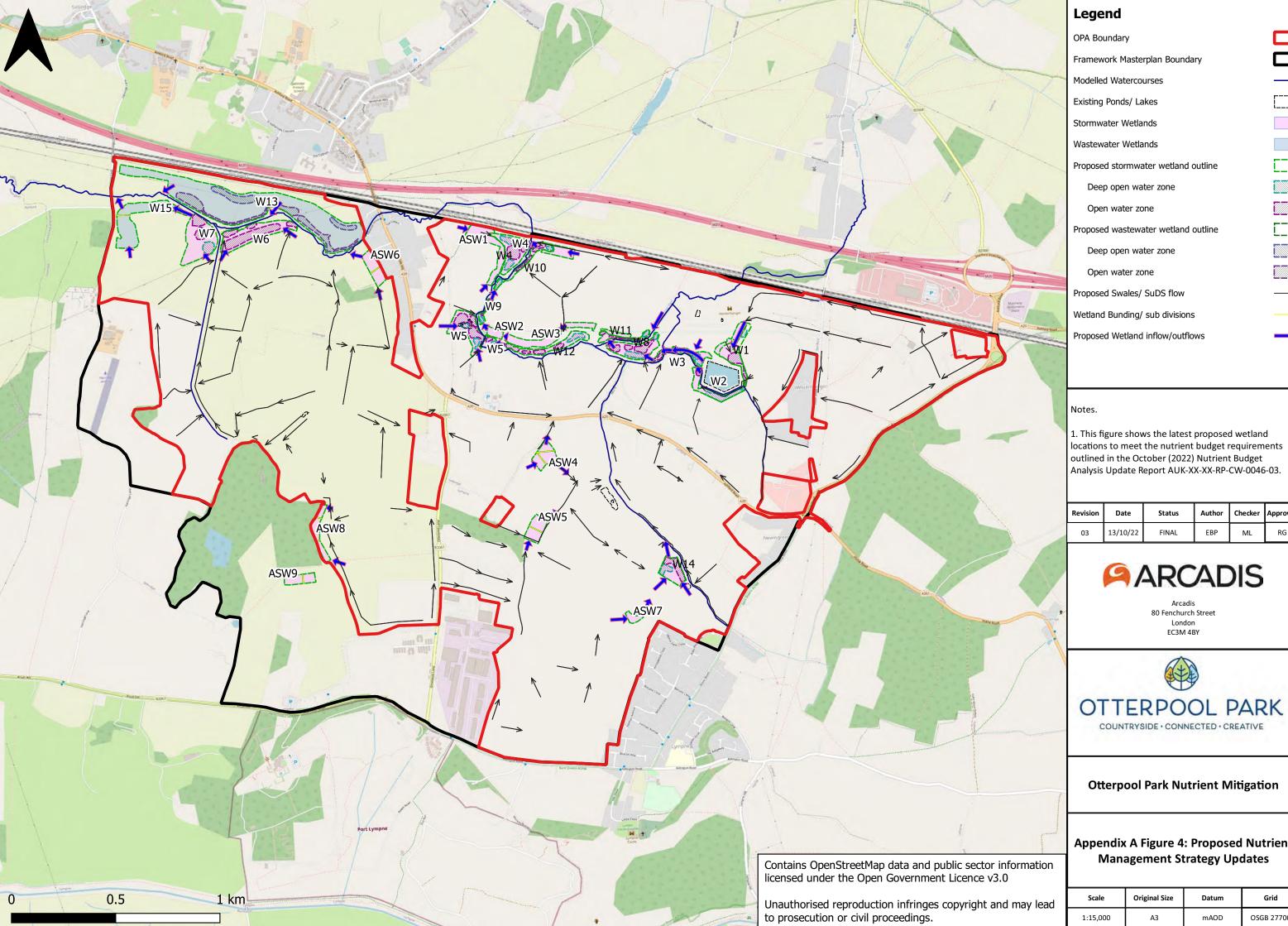
80 Fenchurch Street London EC3M 4BY



**Otterpool Park Nutrient Mitigation** 

### **Appendix A Figure 3: Revised Proposed Land Use Types**

ale	Original Size	Datum	Grid	
5,000	А3	mAOD	OSGB 27700	



Proposed stormwater wetland outline

Deep open water zone

Proposed wastewater wetland outline

Deep open water zone

outlined in the October (2022) Nutrient Budget Analysis Update Report AUK-XX-XX-RP-CW-0046-03.

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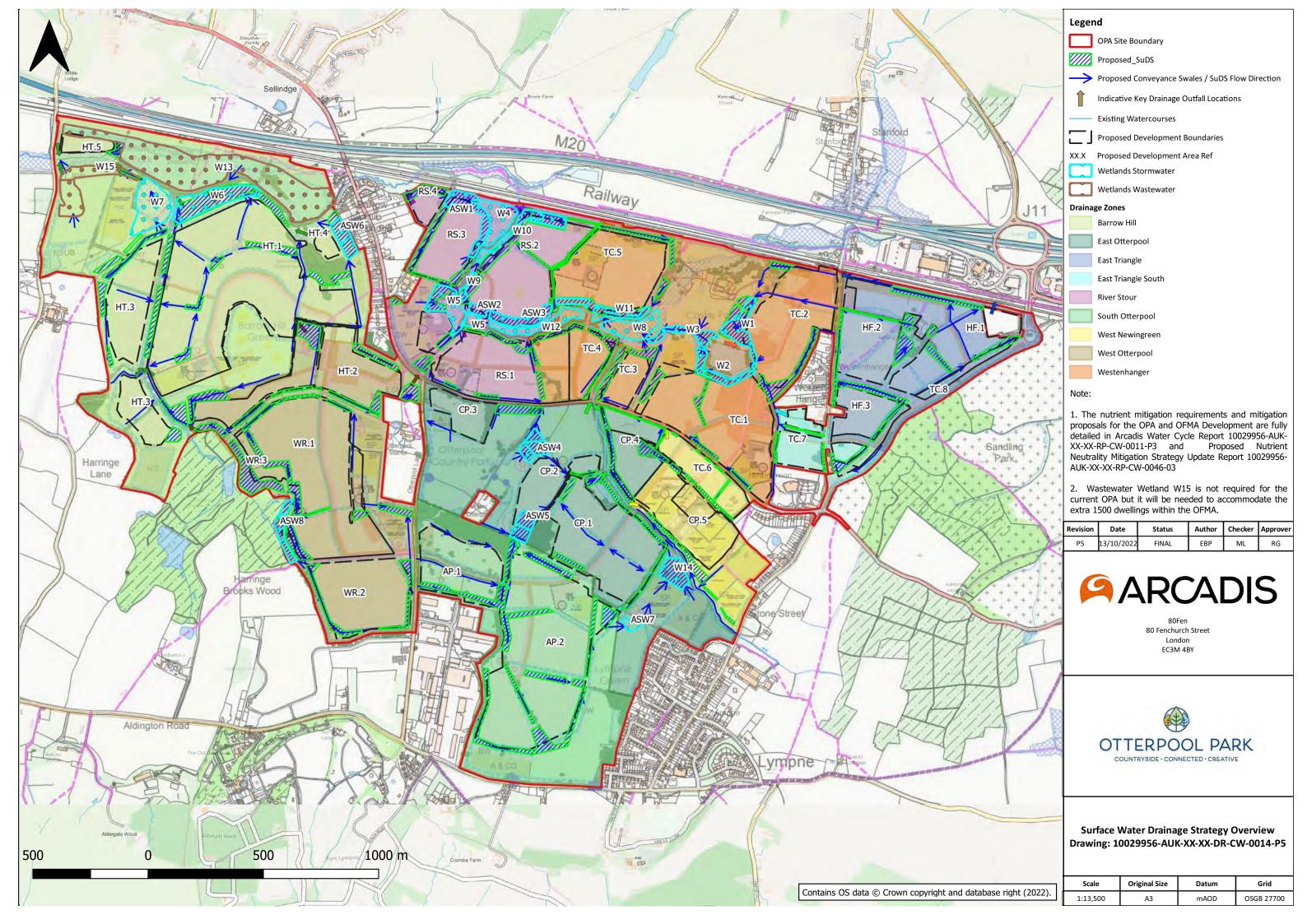
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**Otterpool Park Nutrient Mitigation** 

### **Appendix A Figure 4: Proposed Nutrient Management Strategy Updates**

le	Original Size	Datum	Grid	
000	А3	mAOD	OSGB 27700	



# Appendix B

Nutrient Neutrality Assessment – For Onsite WwTW

# **Existing and Proposed Development Splits**

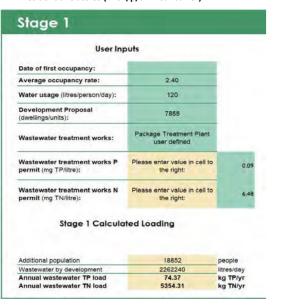
Existing Land Use					
	Soilso	Soilscapes classification			
	Freely draining	Slowly permeable (Impeded Drainage)	Naturally Wet		
Otterpool OPA Land	d Use				
Open urban land	7.62	0.00	18.09		
Greenspace	61.10	0.80	18.51		
Lowland	60.76	17.64	40.4		
Shrub	1.69	0.00	0.36		
Woodland	0.04	0.00	0.92		
Cereals	157.36	34.61	131.7		
	288.57	53.05	209.98		

	Proposed Land Use				
		Soilscapes cl	assification		
			Slowly		
			permeable		
			(Impeded	Naturally	
		Freely draining	Drainage)	Wet	
	Otterpool OPA Lan	d Use			
nt	Residential urban land	145.21	13.16	98.25	
Development Parcels	Commercial/industrial urban land	14.50	1.50		
relopmo Parcels	Greenspace	25.63	2.32	17.34	
eve Pa	community food growing	0.00	0.00	0.22	
ă					
	Open urban land	5.27	2.57	6.26	
Open	Greenspace	95.07	27.98	60.79	
olic Op Space	community food growing	2.69	0.00	4.07	
	Water - stormwater wetlands	0.23			
	Water - wastewater wetlands	0.00	3.51	8.08	
		288.60	53.04	209.97	<b>6</b> 7

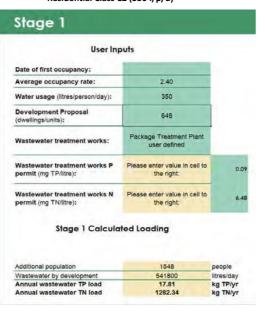
### Stage 1 Outputs

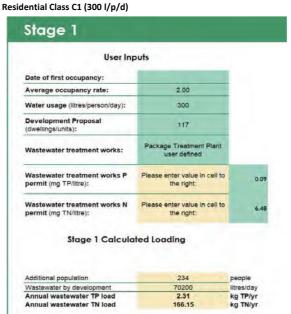
Scenario 1				
Stage 1 Results - Breakdown				
Total Annual Wastewater TP and TN Load				
Scenario 1				
	TP (kgN/yr)	TN (kgP/yr)		
Stage 1 - Residential Class C3 (110 l/p/d + 10% buffer)	74.4	5354.3		
Stage 1 - Residential Class C2 (350 l/p/d)	17.8	1282.3		
Stage 1 - Residential Class C1 (300 l/p/d)	2.3	166.2		
Final Stage 1 Output	94.5	6802.8		

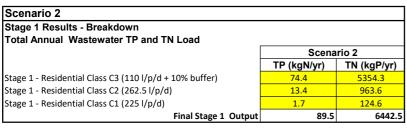
### Residential Class C3 (110 l/p/d + 10% buffer)



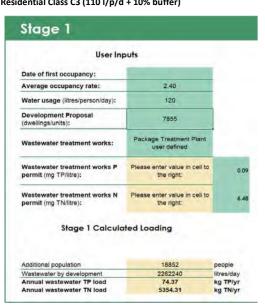
#### Residential Class C2 (350 l/p/d)







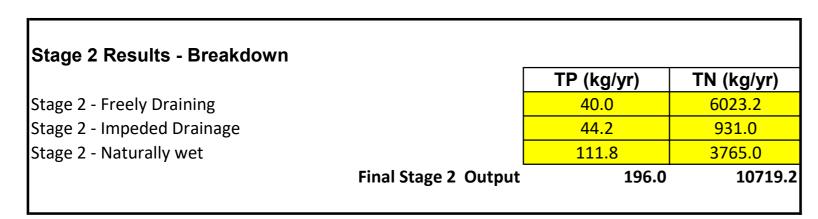
Residential Class C3 (110 l/p/d + 10% buffer)



User Ing	outs	
Date of first occupancy:		
Average occupancy rate:	2.40	
Water usage (litres/person/day):	263	
Development Proposal (dwellings/units):	645	
Wastewater treatment works:	Package Treatment Plant user defined	
Wastewater treatment works P permit (mg TP/litre):	Please enter value in cell to the right:	0.09
Wastewater treatment works N permit (mg TN/litre):	Please enter value in cell to the right:	6.48
Stage 1 Calcula	ted Loading	
	1548	e con
Additional population	1548	people

Stage 1		
User Inp	outs	
Date of first occupancy:		
Average occupancy rate:	2.00	
Water usage (litres/person/day):	225	
Development Proposal (dwellings/units):	117	
Wastewater treatment works:	Package Treatment Plant user defined	
Wastewater treatment works P permit (mg TP/litre):	Please enter value in cell to the right:	0.09
Wastewater treatment works N permit (mg TN/litre):	Please enter value in cell to the right:	6.48
Stage 1 Calcula	ted Loading	
Additional population	234	people
Wastewater by development	52650	litres/day
Annual wastewater TP load	1.73 124.61	kg TP/yr kg TN/yr

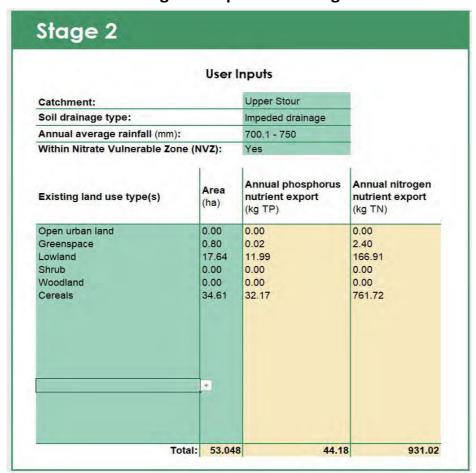
# **Stage 2 Outputs**



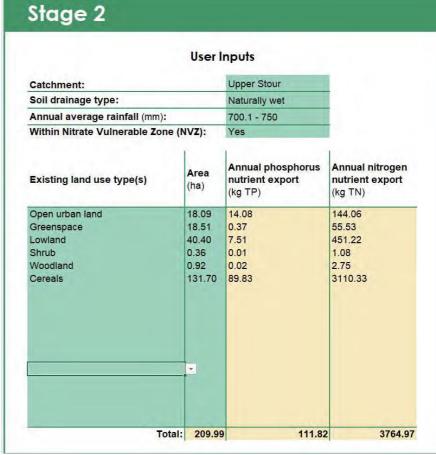
**Stage 2 - Freely Draining** 

Stage 2 **User Inputs** Upper Stour Catchment: Soil drainage type: Freely draining Annual average rainfall (mm): 700.1 - 750 Within Nitrate Vulnerable Zone (NVZ): Annual nitrogen Annual phosphorus Area Existing land use type(s) nutrient export nutrient export (ha) Open urban land 7.62 5.93 60.69 61.10 1.22 183.30 Greenspace 60.76 6.82 867.44 Lowland Shrub 1.69 0.03 5.07 0.04 0.00 Woodland 0.11 157.36 26.00 4906.60 Total: 288.57 40.00 6023.21

Stage 2 - Impeded Drainage



**Stage 2 - Naturally Wet** 



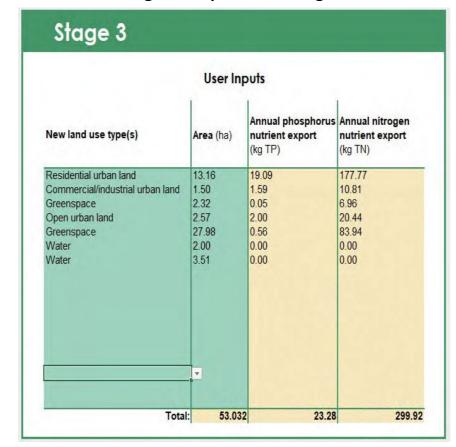
# **Stage 3 Outputs**

Stage 3 Results - Breakdown Total Annual Phosphorous and Nitrogen Nutrient Export						
	TP (kgN/yr)	TN (kgP/yr)				
Stage 3 - Freely Draining	233.7	2517.4				
Stage 3 - Impeded Drainage	23.3	299.9				
Stage 3 - Naturally wet	150.8	1686.9				
Final Stage 3 Output	407.8	4504.2				

Stage 3 - Freely Draining

Stage 3 **User Inputs** Annual Annual nitrogen phosphorus nutrient export New land use type(s) Area (ha) nutrient export Residential urban land 145.21 210.62 1961.59 Commercial/industrial urban land 14.50 15.39 104.47 25.63 5.27 95.07 2.69 0.23 0.51 76.89 Greenspace Open urban land 4.10 41.97 Greenspace 1.90 285.21 1.19 47.27 Community food growing 0.00 0.00 Total: 288.59894 233.72 2517.40

Stage 3 - Impeded Drainage



Stage 3 - Naturally Wet

	U	lser Inp	outs	
New land use type(s)	Are	a (ha)	Annual phosphorus nutrient export (kg TP)	Annual nitrogen nutrient export (kg TN)
Residential urban land Community food growing Greenspace Open urban land Greenspace Community food growing Water Water	98.2 0.22 17.3 6.26 60.7 4.07 14.9 8.08	2 34 3 79 7	142.51 0.10 0.35 4.87 1.22 1.80 0.00	1327.23 3.84 52.02 49.85 182.38 71.54 0.00 0.00
		Please area in hectar	n	

# **Stage 4 Outputs and Sensitivity Tests**

Stage 4 -	Calculated	Outputs
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	Scenario 1		Scenario 2	
Total Annual Phosphorous and Nitrogen Load to				TN
Mitigate	TP (kgN/yr)	TN (kgP/yr)	TP (kgN/yr)	(kgP/yr)
Step 1: Nutrient Budget*	306.3	587.8	301.3	227.5
Step 2: Nutrient Budget* X 1.2	367.6	705.3	361.6	273.0
Stage 4 Final Nutrient Load	367.60	705.3	361.58	273.0

# Stage 4 - Calculated Outputs (Sensitivity Test - Land Use Nutrients Only)

Total Annual Phosphorous and Nitrogen Load to Mitigate

Step 1: Nutrient Budget\*

Step 2: Nutrient Budget\* X 1.2

Stage 4 Final Nutrient Load

Scenario 1	Scenario 2

TP (kgN/yr)	TN (kgP/yr)	TP (kgN/yr)	TN (kgP/yr)
211.84	-6215.02	211.84	-6215.02
254.21	-7458.02	254.21	-7458.02
254.21	-7458.02	254.21	-7458.02

<sup>\*</sup> Nutrient Budget = Final Stage 1 Output + (Final Stage 3 Output -Final Stage 2 Output)

# Stage 4 - Calculated Outputs (Sensitivity Test - WwTW Nutrients Only)

Total Annual Phosphorous and Nitrogen Load to Mitigate

Step 1: Nutrient Budget\*

Step 2: Nutrient Budget\* X 1.2

Stage 4 Final Nutrient Load

Scenario 1		Scenario 2		
TP (kgN/yr)	TN (kgP/yr)	TP (kgN/yr)	TN (kgP/yr)	
94.49	6802.80	89.48	6442.51	
113.39	8163.36	107.38	7731.01	
113.39	8163.36	107.38	7731.01	

<sup>\*</sup> Nutrient Budget = Final Stage 1 Output + (Final Stage 3 Output -Final Stage 2 Output)

<sup>\*</sup> Nutrient Budget = Final Stage 1 Output + (Final Stage 3 Output -Final Stage 2 Output)

Nutrient Mitigation - Wetland Area Requirement Summary	Scenario 1		Scenario 2	
	TP Wetland Area (ha)	TN Wetland Area (ha)	TP Wetland Area (ha)	TN Wetland Area (ha)
Final nutrient load/ Assumed Wetland TP/TN removal rate	30.63	0.76	30.13	0.29
Assumed Wetland TN removal rate Assumed Wetland TP removal rate	93 g/m2/yr 1.2 g/m2/yr			

Nutrient Mitigation - Wetland Area Requirement Summary (Sensitivity Test - Land Use Nutrients Only)	Scenario 1		Scenario 2	
	TP Wetland Area (ha)	TN Wetland Area (ha)	TP Wetland Area (ha)	TN Wetland Area (ha)
Final nutrient load/ Assumed Wetland TP/TN removal rate	21.18	-8.02	21.18	-8.02
Assumed Wetland TN removal rate Assumed Wetland TP removal rate	93 g/m2/yr 1.2 g/m2/yr			

Nutrient Mitigation - Wetland Area Requirement Summary (Sensitivity Test - WwTW Nutrients Only)	Scenario 1		Scenario 2	
	TP Wetland Area (ha)	TN Wetland Area (ha)	TP Wetland Area (ha)	TN Wetland Area (ha)
Final nutrient load/ Assumed Wetland TP/TN removal rate	9.45	8.78	8.95	8.31
Assumed Wetland TN removal rate Assumed Wetland TP removal rate	93 g/m2/yr 1.2 g/m2/yr			