LEWIS BAY EMBAYMENT AREA ONLY - ALL PARKING AND BUILDING ROOF AREAS WITHIN THE EMBAYMENT WILL BE DIRECTED TO SUBSURFACE INFILTATION SYSTEMS LOCATED OUTSIDE THE LIMITS OF THE LEWIS BAY EMBAYMENT AREA.

DRAFT

Water Resources Nitrogen Loading and Mitigation Worksheet

See Technical Bulletin 91-001 for further details: http://www.capecodcommission.org/regulatory/NitrogenLoadTechbulletin.pdf

Project Nitrogen Load	***Wastewater***	***Proposed development***			***Existing (if redevelopment)***		
					Calculate (A') through (P') as w/ (A) through (P):		
1.	Project Title-5 wastewater flows:	0.0	gpd	**(a)**	Title-5 wastewater flows:	0.0 gpd	
	Actual wastewater flows:	0.0 *		**(b)**	Actual wastewater flows:	0.0 *	
	Average wastewater flows:	0.0	gpd **(a)+(b) ÷2=**	**(A)**	Ave. wastewater flows:	0.0 gpd	**(A')**
	* Title-5 flows prescribed by TB91-001 for commercial uses						
	Place √ in applicable box:				Place √ in applicable box:		
	Yes **No**				**Yes** **No**		
	Yes ☐	Will the project be connected to sewer ?			☐ No	Is existing development on sewer ? (If 'Yes', then go to line 2.)	
	☐ √	Is project Title-5 wastewater flow 10,000 gpd or greater ? ***(If 'Yes', then the project must be reviewed for consistency with Additional Methods under Objective WR1)***					
	Place √ in applicable box and multiply unsewered wastewater flow by applicable conversion factor:						
	☐ Standard Title-5 System (35-ppm-N)	x 0.048359			☐ Standard Title-5 System		
	☐ DEP-approved I/A System (25-ppm-N)	x 0.034542			☐ DEP-approved I/A System (commercial)		
	☐ DEP-approved I/A System (19-ppm-N)	x 0.026252	} Type of system: _____		☐ DEP-approved I/A System (residential)		
	☐ Groundwater Discharge (10-ppm-N)	x 0.013817			☐ Wastewater Treatment Facility (GWDP)		
	Wastewater nitrogen load **(Title-5 flows)** =	0.00	kg-N/yr	**(B)**		0.00 kg-N/yr	**(B')**
	Wastewater nitrogen load **(Actual flows)** =	0.00	kg-N/yr	**(C)**		0.00 kg-N/yr wastewater offsets	**(C')**
	Stormwater Runoff						
	Town: _____	Recharge rate for town (inches; for natural areas from Technical Bulletin 91-001): :	18	**(RECH)**			
	Project site area:	1.472	acres	**(D)**	Project site area:	1.472 acres	**(D)**
	Project site wetland area:	0.000	acres	**(E)**	Project site wetland area:	0.000 acres	**(E)**
	Project site upland area:	1.472	acres	**(F)**	Project site upland area:	1.472 acres	**(F)**
	Pervious unpaved upland:	1.472	acres	**(G)**	Pervious unpaved upland:	1.472 acres	**(G')**
	13 % using LID Paved area:	0	s.f.	**(H)**	Paved area:	s.f.	**(H')**
	Factor may be adjusted for employment of LID →	x 1.3712E-04					
		= 0	kg-N/yr	**(I)**	Paving runoff offset:	kg-N/yr	**(I')**
	Roof area:	0	s.f.	**(J)**	Roof area:	s.f.	**(J')**
		x 7.0792E-05					
		= 0.0000	kg-N/yr	**(K)**	Roof runoff offset:	kg-N/yr	**(K')**
	Fertilizer						
	Managed turf:	0	s.f.		Managed turf:	0 s.f.	
		x 3.4019E-04					
		= 0.000	kg-N/yr	**(L)**	Fertilizer offset:	0.000 kg-N/yr	**(L')**
	Total Nitrogen Load						
	Total project nitrogen load **(Title-5 flows)**:	0.00	kg-N/yr	**(M)= (B)+(I)+(K)+(L)**	Existing nitrogen load (Title-5 flows):	kg-N/yr	**(M')**
	Total project nitrogen load **(Actual flows)**:	0.00	kg-N/yr	**(N)= (C)+(I)+(K)+(L)**	Existing nitrogen load (Actual flows):	kg-N/yr	**(N')**
	Nitrogen load per acre **(Average)**:	**0.00**	kg-N/yr/acre	**(O)= (M)+(N) ÷2 ÷(F)**	Nitrogen offset per acre:	kg-N/yr/acre	**(O')**
	Nitrogen Loading Concentration				Existing nitrogen loading concentrations:		
	Project nitrogen loading concentration (**Title-5 flows**):	**0.00**	ppm-N	**(P)= (M) / (a)÷723.76 + (G)x(RECH)÷9.7286 + (H)÷10,594 + (K)÷0.75**	Title-5 flows	ppm-N	**(P')**
	Project nitrogen loading concentration (**Actual flows**):	**0.00**	ppm-N	**(Q)= (N) / (b)÷723.76 + (G)x(RECH)÷9.7286 + (H)÷10,594 + (K)÷0.75**	Actual flows	ppm-N	**(Q')**
	Project nitrogen loading concentration (**Average**):	**0.00**	ppm-N	**(R)= (P)+(Q) ÷2**	Average	ppm-N	**(R')**

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Resource/ Impact Based Criteria

Marine Water Recharge Areas

	Yes	No	
2.	Yes		Is the project in Marine Water Recharge Area (MWRA) with a nitrogen-loading limit OR in a MWRA that discharges to coastal waters with documented impaired water quality** ? *(If 'No', then go to line 3.)*

Name of Marine Water Recharge Area sub-embayment
(*from RPP Data Viewer*):

Nitrogen-loading limit** : **0.000** kg-N/year/acre **(S)**

		Does project's nitrogen load **(O)** exceed the existing load **(O')** AND the critical nitrogen load **(S)** ? *(If 'No', then go to line 3.)*

Excess project nitrogen load to be mitigated: 0.00 kg-N/yr **(T)=** LESSER OF **(O)-(S) x(F)** AND **(O)-(O') x(F)**
x $8,290 /kg/yr
= $ **0** **(U)**

	Place √ in box if applicant intends to make this payment **(S)** ***(If not checked, then the project must provide an alternative strategy for meeting its nitrogen load requirement pursuant to Objective WR3)***

*** When a nitrogen-loading limit has been determined through either a Total Maximum Daily Load (TMDL), a Massachusetts Estuaries Project-accepted technical report, or specified by a Commission-approved comprehensive wastewater management plan pursuant to Objective WR3, or if impaired water quality has been documented for the receiving coastal waters, the nitrogen loading limit shall be 0 kg-N/yr per acre pursuant to Objective WR3.*

Groundwater Quality

	Yes	No	
3.		No	Does the project's nitrogen loading concentration in groundwater **(R)** exceed the greater of **5 ppm** *or* the existing concentration **(R')** ? ***(If 'Yes' and the project is not located in an Impaired Area, the project will need to provide an alternative strategy for meeting Objective WR1)***

Potential Public Water Supply Areas

	Yes	No	
4.		No	Is project in a Potential Public Water Supply Area (PPWSA) ? *(If 'No', then go to line 5.)*
			Does the project's nitrogen loading concentration **(R)** exceed the greater of **1 ppm** *or* the existing concentration **(R')** ? ***(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)***
			Does the project use, treat, generate, store or dispose of hazardous materials in excess of the greater of a) household quantities or b) existing quantities ? ***(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)***

Wellhead ProtectionAreas

	Yes	No	
5.	Yes		Is project in a Wellhead Protection Area (WHPA) ? *(If 'No', then go to line 6.)*
		no	Does the project's nitrogen loading concentration **(R)** exceed the greater of **5 ppm** *or* the existing concentration **(R')** ? ***(If 'Yes' and the project is not located in an Impaired Area, the project must provide an alternative strategy for meeting Objective WR1)***
		no	Does the project use, treat, generate, store or dispose of hazardous materials in excess of the greater of a) household quantities or b) existing quantities ? ***(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)***

Fresh Water Recharge Areas

	Yes	No	
6.		No	Is project wastewater disposed of within 300 feet of a stream or fresh surface water body? *(If 'No', then go to line 7.)*
			Is the project located in a freshwater recharge area (FWRA) hydraulically upgradient of a stream or fresh surface water body? ***(If 'Yes', the project must provide an alternative strategy for meeting Objective WR2)***

Other Potential Impacts

	Yes	No	
7.		no	Will the project withdraw more than 20,000 gallons of water per day ? ***(If 'Yes', then the project must provide documentation demonstrating that there will not be significant impacts to water levels, surface waters and wetlands)***

8. ***The project must demonstrate compliance with Objective WR4, including use of Low Impact Development to mitigate impacts of stormwater runoff and O & M plans for maintaining stormwater infrastructure and landscaping.***