

Summary of Onsite Wastewater Treatment System (OWTS) Requirements

This document presents a summary of Key OWTS design parameters from the Local Area Management Plan (LAMP) and the County Code Chapter 7.38. It also includes some additional guidance for application of those requirements. Wherever there may be a conflict or lack of clarity, the provisions of Chapter 7.38 and the LAMP shall prevail.

This document includes information on:

- System Types and Allowable Uses
- Dispersal Area Application Rates, Design Flow and Dispersal Area Required
- Groundwater Separation
- Types of Enhanced Treatment Systems
- Design Flow for Non-Residential Uses

Table 3-1: Types of Systems, Requirements, and Building Allowances:

System Type	Conditions	Requirements	Building Allowed
New	Conventional: meets standards	Minimum Parcel size (7.38.045)	New residence; Possible ADU
	Enhanced Treatment for: reduced groundwater separation, fast or slow soil percolation	Minimum Parcel size Maintenance Contract Deed recordation	
Upgrade	Conventional, meets standards		ADU; Bedroom Addition; and/or >500 sf addition
	Enhanced Treatment for: <ul style="list-style-type: none"> • reduced groundwater or surface water separation, • fast or slow soil percolation • under pavement with traffic rated cover • reduced dispersal area • existing seepage pits 	<ul style="list-style-type: none"> • Maintenance Contract • Deed recordation 	
Repair: Replaces old or failing system	Conventional, meets standards as much as possible, improvement over old system and old system not causing impairment ; Low flow system may be approved.	<ul style="list-style-type: none"> • Meets conventional standards as much as possible • Must comply with Prohibitions (7.38.042) 	One-time addition less than 500 sf
	Enhanced Treatment for: <ul style="list-style-type: none"> • reduced groundwater or surface water separation, • fast or slow soil percolation • under pavement with traffic rated cover • reduced dispersal area <60% • existing seepage pits 	<ul style="list-style-type: none"> • Maintenance Contract • Deed recordation 	
	<ul style="list-style-type: none"> • Low Flow System • Nonconforming Interim (deferred enhanced treatment) 	<ul style="list-style-type: none"> • Water efficiency measures installed • Must comply with Prohibitions (7.38.042) • Must install enhanced treatment at time of property transfer • Deed Recordation • Annual Inspection 	No Addition
Existing System	<ul style="list-style-type: none"> • Meets standards for water separation • Not failing, good pumper report • Not seepage pit 	<ul style="list-style-type: none"> • Ongoing maintenance 	If dispersal size adequate: <ul style="list-style-type: none"> • Bedroom Addition, ADU • >500 sf addition
	<ul style="list-style-type: none"> • Does not fully meet standards • Not failing, good pumper report 	<ul style="list-style-type: none"> • Prestandard, before 1983 • Ongoing maintenance 	One-time addition less than 500 sf
	Failing: surfacing effluent	Repair required	Depends on Repair

Note: Standards for conventional systems are specified in County Code Section 7.38.095-180; Additional requirements for enhanced treatment systems and conventional non-standard systems are specified in Sections 7.38.182-186.

Table 3-2: Dispersal System Application Rates

Conventional Dispersal System and Enhanced Treatment System with Soil Texture Detail Application Rates (From USEPA, 2002, Table 4-3)

Percolation Rate MPI	Application gal/sf/day		Soil Texture	Soil Structure	
	BOD=150 mg/L Conventional	BOD=30 mg/L ET/Dosed		Shape	Grade
<1	--	1.6	--	--	--
1	0.8	1.6	Coarse sand, sand, loamy coarse sand, loamy sand	Single Grain	Structureless
5	0.8	1.6			
10	0.8	1.6			
15	0.6	1.0	Coarse sandy loam, sandy loam	Prismatic, blocky, granular	Moderate, strong
20	0.6	1.0			
25	0.4	0.8	Fine sandy loam, very fine sandy loam		
30	0.4	0.7	Loam, loamy fine sand		Weak
35	0.4	0.6	Silt Loam		
40	0.4	0.6	Sandy clay loam, clay loam, silty clay loam		Moderate, strong
45	0.4	0.6			
50	0.2	0.5	Loam	Massive	Structureless
55	0.2	0.3	Sandy Clay, Clay, silty clay	Prismatic, blocky, granular	Moderate, strong
60	0.2	0.3			
60-120	--	0.3	Clay		

Table 3-3: Design Flow per Bedroom

Number of Bedrooms	1	2	3	4	5	6	Per Additional Bedroom
Standard Design Flow (gpd)	250	300	375	450	525	600	75
Low Flow System (gpd) Repair Only, with Limitations)*	150	200	250	300	350	400	50

*Low Flow Systems require water conservation devices, flow monitoring, deed recordation, annual fee, periodic inspection, and limits on remodels.

Tables 3-3a, 3-3b, 3-3c: Dispersal Area size calculations based on percolation rate, flow, and treatment:

Required Conventional Infiltration Area (Square feet)								Enhanced Treatment (BOD <30 mg/L) Infiltration Area (Square Feet)							
Bedrooms:		1	2	3	4	5	Additional	Bedrooms:		1	2	3	4	5	Additional
	Flow gpd:	250	300	375	450	525	75		Flow gpd:	250	300	375	450	525	75
Perc MPI	App Rate							Perc MPI	App Rate						
<1	--	--	--	--	--	--	--	<1	1.6	156	188	234	281	328	47
1	--	--	--	--	--	--	--	1	1.6	156	188	234	281	328	47
5	0.8	313	375	469	563	656	94	5	1.6	156	188	234	281	328	47
10	0.8	313	375	469	563	656	94	10	1.6	156	188	234	281	328	47
15	0.6	417	500	625	750	875	125	15	1	250	300	375	450	525	75
20	0.6	417	500	625	750	875	125	20	1	250	300	375	450	525	75
25	0.4	625	750	938	1125	1313	188	25	0.8	313	375	469	563	656	94
30	0.4	625	750	938	1125	1313	188	30	0.7	357	429	536	643	750	107
35	0.4	625	750	938	1125	1313	188	35	0.6	417	500	625	750	875	125
40	0.4	625	750	938	1125	1313	188	40	0.6	417	500	625	750	875	125
45	0.4	625	750	938	1125	1313	188	45	0.6	417	500	625	750	875	125
50	0.2	1250	1500	1875	2250	2625	375	50	0.5	500	600	750	900	1050	150
55	0.2	1250	1500	1875	2250	2625	375	55	0.3	833	1000	1250	1500	1750	250
60	0.2	1250	1500	1875	2250	2625	375	60	0.3	833	1000	1250	1500	1750	250
60-120	--	--	--	--	--	--	--	60-120	0.3	833	1000	1250	1500	1750	250

Linear feet of Standard Trench by Number of Bedrooms (4 square feet of infiltration surface per linear foot)							
Bedrooms	1	2	3	4	5	Additional	
Flow g/d	250	300	375	450	525	75	
Perc	App Rate						
<1	--	--	--	--	--	--	--
1	0.8	78	94	117	141	164	23
5	0.8	78	94	117	141	164	23
10	0.6	104	125	156	188	219	31
15	0.6	104	125	156	188	219	31
20	0.4	156	188	234	281	328	47
25	0.4	156	188	234	281	328	47
30	0.4	156	188	234	281	328	47
35	0.4	156	188	234	281	328	47
40	0.4	156	188	234	281	328	47
45	0.2	313	375	469	563	656	94
50	0.2	313	375	469	563	656	94
55	0.2	313	375	469	563	656	94
60	0.3	208	250	313	375	438	63
60-120	--	--	--	--	--	--	--

Linear Feet of Standard Trench with Enhanced Treatment (BOD<30 mg/L) (4 square feet of infiltration surface per linear foot)							
Bedrooms	1	2	3	4	5	Additional	
Flow g/d	250	300	375	450	525	75	
Perc	App Rate						
<1	1.6	39	47	59	70	82	12
1	1.6	39	47	59	70	82	12
5	1.6	39	47	59	70	82	12
10	1.6	39	47	59	70	82	12
15	1	63	75	94	113	131	19
20	1	63	75	94	113	131	19
25	0.8	78	94	117	141	164	23
30	0.7	89	107	134	161	188	27
35	0.6	104	125	156	188	219	31
40	0.6	104	125	156	188	219	31
45	0.6	104	125	156	188	219	31
50	0.5	125	150	188	225	263	38
55	0.3	208	250	313	375	438	63
60	0.3	208	250	313	375	438	63
60-120	0.3	208	250	313	375	438	63

Low Flow System Infiltration Area (Square feet) Only for Repairs with water conservation and other limitations							
Bedrooms:		1	2	3	4	5	Additional
	Flow gpd:	150	200	250	300	350	50
Perc MPI	App Rate						
<1	--	--	--	--	--	--	--
1	--	--	--	--	--	--	--
5	0.8	188	250	313	375	438	63
10	0.8	188	250	313	375	438	63
15	0.6	250	333	417	500	583	83
20	0.6	250	333	417	500	583	83
25	0.4	375	500	625	750	875	125
30	0.4	375	500	625	750	875	125
35	0.4	375	500	625	750	875	125
40	0.4	375	500	625	750	875	125
45	0.4	375	500	625	750	875	125
50	0.2	750	1000	1250	1500	1750	250
55	0.2	750	1000	1250	1500	1750	250
60	0.2	750	1000	1250	1500	1750	250
60-120	--	--	--	--	--	--	--

Legacy System Infiltration Area (Square Feet) Only used for calamity rebuilds (7.38.080(C)(3))							
Bedrooms:		1	2	3	4	5	Additional
	Flow gpd:	215	270	325	375	430	55
Perc MPI	App Rate						
<1	0.43	500	625	750	875	1000	125
1	0.43	500	625	750	875	1000	125
5	0.43	500	625	750	875	1000	125
10	0.36	600	750	900	1050	1200	150
15	0.36	600	750	900	1050	1200	150
20	0.36	600	750	900	1050	1200	150
25	0.36	600	750	900	1050	1200	150
30	0.36	600	750	900	1050	1200	150
35	0.24	900	1125	1350	1575	1800	225
40	0.24	900	1125	1350	1575	1800	225
45	0.24	900	1125	1350	1575	1800	225
50	0.24	900	1125	1350	1575	1800	225
55	0.24	900	1125	1350	1575	1800	225
60	0.24	900	1125	1350	1575	1800	225
60-120	0.1	2150	2700	3250	3750	4300	550

Table 3-4: Minimum Groundwater Separation based on Soil Percolation and Water Feature Setback

GROUNDWATER SEPARATION	25-50 FEET To stream or ocean	50 - 100 FEET To stream or ocean	100- 250 FEET To stream, well or wellsite*	> 250 FEET To stream, well, or wellsite*
<u>Standard Conventional System - New</u>	Not Permitted	Not Permitted	Not Permitted: <5 MPI and >60 MPI 8': 5-29.9 MPI 5': 30-60 MPI	Not Permitted: <5 MPI and >60 MPI 8': 5-29.9 MPI 5': 30-60 MPI
<u>Standard conventional system – Replacement/Upgrade</u>	Not Permitted	Not Permitted	Not Permitted <5 MPI and >60 MPI 8': 5-29.9 MPI 5': 30-60 MPI	Not Permitted <5 MPI and >60 MPI 8': 5-29.9 MPI 5': 30-60 MPI
<u>Standard Conventional System - Repair of Failure</u>	Not Permitted	Not Permitted <5 MPI and >60 MPI 8': 5-60 MPI	Not Permitted <5 MPI and >60 MPI 8': 5-29.9 MPI 5': 30-60 MPI	Not Permitted <5 MPI and >60 MPI 8': 5-29.9 MPI 5': 30-60 MPI
<u>Enhanced Treatment**</u> BOD, TSS <30 mg/L Nitrogen Reduction for percolation rates <5 MPI and pits Pathogen Reduction as specified	<= 3 FEET Repair Only, with nitrogen and pathogen reduction	<= 3 FEET Repair/Upgrade Only with nitrogen and pathogen reduction	< 8-feet with nitrogen reduction <= 3 feet with nitrogen and pathogen reduction	< 8-feet with nitrogen reduction <= 3 feet with nitrogen and pathogen reduction
<u>Lot with Existing Seepage Pit-Repair/Upgrade Only</u>	Not Permitted	Not Permitted	10 feet, with Enhanced treatment**	10 feet, with Enhanced treatment**
<u>Greywater Sump</u>	Not Permitted <6 MPI and >60 MPI 5': 6-60 MPI	Not Permitted <6 MPI and >60 MPI 5': 6-60 MPI	Not Permitted <6 MPI and >60 MPI 5': 6-60 MPI	Not Permitted <6 MPI and >60 MPI 5': 6-60 MPI

*Well site would include any potential well location on an adjacent property that is 50 feet from the property line.

** See Enhanced Treatment Table 3-5 Appendix D for specifications on type of treatment required.

Table 3-5: Types of Enhanced Treatment Systems and Approved Applications

Level of Treatment and Treatment Technology	Reduced Dispersal Application Area	Minimum Groundwater Separation (ft)	Minimum Waterbody setback (ft)	Fast Perc <5 MPI	Slow Perc >60 MPI	Seepage Pits
<p><u>BOD and TSS Reduction</u> Reduce BOD and TSS to <30 mg/L</p> <p>Intermittent Sand Filter</p> <p>Proprietary Systems That Meet NSF/ANSI 40^a Certification</p> <p>Proprietary Systems include: OSI Advantex Biomicrobics FAST AquaKlear Bord Na Mona Multi-Flo Aerobic Trmt MicroSepTec HOOT Acqualogic</p>	Yes, per Table 7.38.150. B.3	See Table 3-4 Groundwater Separation based on Soil Percolation and Water Feature Setback	See Table 3-4 Groundwater Separation based on Soil Percolation and Water Feature Setback OR >50 -feet for Repairs and Upgrades only	Not Permitted See next row for BOD and TSS Reduction with Nitrogen Reduction	Repairs and Upgrades Only	Not Permitted See next row for BOD and TSS Reduction with Nitrogen Reduction
<p><u>BOD and TSS Reduction with Nitrogen Reduction</u> Reduce Total Nitrogen by 50%</p> <p>Recirculating Sand Filter Trickling Filter</p> <p>Proprietary Systems That Meet NSF/ANSI 245a Certification, including: OSI Advantex Multi-Flo Aerobic Trmt MicroSepTec</p>	Yes, per Table 7.38.150. B.3	See Table 3-4 Groundwater Separation based on Soil Percolation and Water Feature Setback	See Table 3-4 Groundwater Separation based on Soil Percolation and Water Feature Setback	Required	NA	Required with min. 10-ft Separation to Groundwater
<p><u>Pathogen Reduction</u> Reduce Pathogens by 99%</p> <p>Recirculating Sand filter Ultraviolet Light Chlorine disinfection</p>	NA	Required with groundwater separation of 2-3 feet. See Table 3-4 of the Santa Cruz LAMP	25-50 feet for Repairs Only	Required	NA	Required with minimum Separation to Groundwater of 5-10 ft.

^a NSF/ANSI 40 is a standard for residential wastewater treatment systems with rated capacities between 400 and 1,500 gallons (1,514 and 5,678 liters) per day. Class I systems must achieve a 30-day average effluent quality of 25 mg/L CBOD5 and 30 mg/L TSS or less, and pH 6.0-9.0 spanning six months of testing.

Table 3-6: Design Flows for Non-Residential Uses

OWTS serving non-residential uses are subject to the same design and installation requirements. Design flows shall be determined by the designer based on historic or proposed water usage, according to the following table. *Source: U.S. Environmental Protection Agency. Onsite Wastewater Treatment Systems Manual Revised 2002, Chapter 3: Establishing Treatment System Performance Requirements*

Type of Business or Facility	Design Flow (gallons per day)
Assisted Living/Residential Care Home <ul style="list-style-type: none"> - Per resident bed space, ambulatory residents - Per resident bed space, non-ambulatory residents - Live-in caregiver - Per employee (day use) 	<p style="text-align: center;">100 125 75 15</p>
Camps (per person) <ul style="list-style-type: none"> - Day use - Overnight use, with flush toilets, no showers - Overnight use, with flush toilets and showers 	<p style="text-align: center;">10 25 35</p>
Churches and assembly halls (per seat) <ul style="list-style-type: none"> - Without kitchen - With kitchen 	<p style="text-align: center;">5 15</p>
Country clubs <ul style="list-style-type: none"> - Per resident member or caretaker - Per guest - Per employee 	<p style="text-align: center;">75 25 15</p>
Day care (per patron, employee)	<p style="text-align: center;">15</p>
Detention center <ul style="list-style-type: none"> - Per resident bed space - Per employee 	<p style="text-align: center;">100 15</p>
Factories and industrial buildings (toilet waste only) <ul style="list-style-type: none"> - Without showers (per employee) - With showers (per employee) 	<p style="text-align: center;">15 35</p>
Hotels or motels <ul style="list-style-type: none"> - Per guest - Per employee - Additional for restaurant, spa or other facilities 	<p style="text-align: center;">50 15 Case-by-case</p>
Laundromat, with self-service washing machines <ul style="list-style-type: none"> - Per machine, or - Per customer 	<p style="text-align: center;">500 50</p>
Mobile home parks (per space)	<p style="text-align: center;">250</p>
Multiunit residential housing <ul style="list-style-type: none"> - Apartments, per bedroom - Boarding house and farm labor housing, per bed 	<p style="text-align: center;">150 50</p>
Office and stores (per employee)	<p style="text-align: center;">15</p>
Parks with picnic areas (per person) <ul style="list-style-type: none"> - With flush toilets - With flush toilets and showers 	<p style="text-align: center;">5 10</p>
Recreational vehicle parks <ul style="list-style-type: none"> - Without individual sewer hook-ups (per space) - With individual sewer hook ups (per space) 	<p style="text-align: center;">50 100</p>
Restaurants and Food Service <ul style="list-style-type: none"> - Toilet and kitchen wastes (per patron) - Kitchen wastes only (per meal served) - Addition for bars (per patron) - Per employee 	<p style="text-align: center;">10 5 2 15</p>

Type of Business or Facility	Design Flow (gallons per day)
Service Station - per vehicle served - per employee	10 15
Schools, boarding - student and live-in staff (per person) - daily staff (per person)	75 15
Schools, day - without cafeteria or showers (per student) - with cafeteria (per student) - with cafeteria and showers (per student) - staff (per person)	15 20 25 15
Swimming pools - per patron - per employee	10 15
Theaters - per seat - per employee	5 15
Wineries (sanitary waste only) - tasting room, per visitor - per employee - special events	2.5 15 Case-by-case