

Loudoun County Onsite System Maintenance
2017 Annual Report

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Background and Summary

In Loudoun County Virginia, two primary local ordinances govern the onsite treatment and dispersal of sewage. The Loudoun County Board of Supervisors enacted Chapter 1067 of the Codified Ordinance in November of 2008, establishing a local program for the operation and maintenance of alternative onsite sewage systems; it was substantially amended on April 7, 2013. Loudoun County Ordinance Chapter 1066, which established county requirements for onsite sewage disposal systems, was re-enacted in its entirety in 1994 and most recently underwent major revision in January 2017. The Loudoun County Health Department (LCHD) also administers Virginia Department of Health (VDH) Sewage Handling and Disposal Regulations (12 VAC 5-610-10 et seq.). Alternative Discharging Sewage Treatment Regulations for Individual Single Family Dwellings (12VAC5-640-5 et seq.) and Regulations for Alternative Onsite Sewage Systems (12 VAC 5-613-10 et seq.).

The number of known alternative systems in the county continues to increase (Table I). In 2017, 49% of installed new and replacement on-site systems were alternative systems. In 2017, 75 new alternative and 78 new conventional systems were installed. Currently approximately 12% of known existing systems in Loudoun County are alternative.

Owners of alternative systems are notified by postcard of the need for their annual inspection in early April of each year. Overdue letters are sent in mid-July with notices of violation for the inspection requirement of Chapter 1067 in mid-August. If a report has not been received, ticketing occurs at least 30 days after receipt of the notices of violation. Repeat tickets may be issued as often as every 10 days but are typically issued every 14 days. Owners may also be ticketed for not completing system repairs; these tickets are typically preceded by a notification letter two weeks after the report, a reminder letter six weeks after the report, and a notice of violation 10 weeks after the report. The notice of violation must be received at least 30 days prior to initiation of ticketing.

Systems with sewage on the ground that are not immediately corrected by the operator are quickly visited. Owners are issued a notice of violation and placed on emergency pump and haul until corrections are made.

Notwithstanding the considerable efforts to ensure their proper operation, LCHD continues to see the importance of maintaining vigilance about how these systems are working. For example, in 2017 approximately 31% of inspected systems were experiencing deficiencies although many of these did not meet the definition of failure. Most of these deficiencies could be readily addressed (e.g., tank pump-out, insecure lids, malfunctioning alarm/panel, infiltration/inflow, air filter cleaning or replacement, etc.) but if not dealt with could eventually lead to ground water contamination, safety issues or system failure. Also, approximately 1.3% (22) of the alternative systems inspected in 2017 had failed as defined by sewage on the ground or backing into the house plumbing at the time of inspection (Table II). The majority of the systems reported as failing, as in previous years, were drip dispersal (10 of 305 drip systems, 3.3%), which failed at almost five times the average for other alternative systems, followed by low pressure (5 of 387 low pressure systems, 1.3%) systems.

2009-2017 Findings

The number of alternative systems in the LCHD database continued to increase. Although a few systems continue to be identified, most of the 2017 increase results from new systems.

Table I: Number of alternative systems identified in Loudoun County

Year	Number	Annual Increase	Annual Increase %
2009	1096	-----	-----
2010	1221	125	11.4%
2011	1297	76	6.2%
2012	1436	139	10.7%
2013	1506	70	4.9%
2014	1558	52	3.4%
2015	1670	112	7.2%
2016	1723	52	3.1%

2017	1798	75	4.4%
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Table II: Results of 2017 Onsite System Maintenance (As of Dec 31, 2017)

Total known conventional systems	12889
Total known alternative systems	1783
Total known alternative discharging systems (<1000 GPD residential)	26
Total permitted pump and haul (temporary and permanent)	76
Total alternative systems required to be inspected (20 systems installed after inspection season cutoff, 39 inspections deferred to following year, 4 removed from database)	1735(97%)
Total alternative systems (required to be inspected) with operator site visits	1719 (99%)
Properties receiving at least 1 ticket	32 (1.8%)
Total tickets issued for non-inspection	62
Total valid tickets	51
Total tickets rescinded	16
Total tickets for not completing repairs	5 (2 rescinded)
Total deficient systems (not functioning as designed but not failing)	530 (31%)
Number of deficient systems repaired by year end	498 (94%)
Total alternative systems with sewage on ground (SOG)	22 (1.3%)
Total systems with sewage on ground not repaired by year end	1
Total alternative system reports with tank pump out required	161 (9.4%)
Total alternative systems pumped out	380 (22.0%)
Total minor repairs requiring permits (alt. & conv.)	230 (1.6%)
Total system replacement repairs of all systems (alt. & conv.)	34 (.023%)
Pump outs reported for all systems including P&H	3240
Verification inspections of alternative system reports	168 (9.8%)

Number of conventional systems > 5 years old reported as being pumped in last 5 years	9186 (71 %)
Number of conventional systems (>5 years since installation) with no record of pump-out in last five years	3703 (29%)
Number of conventional systems pumped out	1867
Number of conventional systems installed	78
Number of alternative systems installed	75

In calendar year 2017, the 22 alternative systems reported as failing (SOG) malfunctioned due to a variety of factors (see Table III). Most of these failures were easily repaired and none resulted in absorption area replacement.

Table III: Primary Cause of Failure 2017 (22 Total)

Sewer line, force main, header or lateral break	6
Bad wiring/floats	3
Cut or broken drip lines	3
Broken air relief valves	3
Leaking components	2
Pretreatment unit overflowing	1
Unbalanced LPD	1
Control box issues	1
Missing end cap	1
Undetermined	1

Operators reported a variety of deficiencies that did not result in system failure. Systems may have multiple deficiencies. The largest number of deficiencies reported were ATU’s and tanks needing to be pumped, lids and hatches not secure, and dispersal area abused or not maintained. Corrections of these deficiencies are tracked to completion by LCHD staff in cooperation with owners and operators.

Table IV: Types of Category 2/3 System Deficiencies*

ATU pumping required	78
Septic tank pumping required	73

Pump tank pumping required	68
Excessive sludge in ATU	57
Lids and access hatches not secure	51
Dispersal area abused or not maintained	45
Effluent pump not pumping at proper rate	36
Infiltration and inflow	33
Peat filter media not in good condition	32
Panel/alarm malfunctioning	28
Components not accessible for service	26
Level sensor not operating correctly	24
Air filter needs cleaning or replacement	24
Effluent level within septic tank not within operational limits	20
Drip dosing does not meet design requirements	17
Power to control panel off	15
Tank not structurally sound	14
Blower not operating properly	14
Air release valves not functioning properly	13
Drip zones not functioning properly	12
Alarm not functioning	12
Encroachment by structures or surfaces	11
Distribution box in disrepair	9
Settling around components	9
Distributing valve not dosing as intended	8
Low pressure lines need cleaning or testing	7
Blower vent not clear of obstructions or operating	7
Media dosing not equalized	6
Vigorous boiling not occurring	6
Vegetation not managed	5
Drip system auto flush not working	5
Check valves not functioning properly	4
Air release valves not accessible	4
Control panel not set properly	3
Effluent not visually clear	3
Trash tank needs pumped	2
Baffles missing	2

Peat modules not level	2
Sand filter requires raking	2
Advantex® unit not vented properly	2
Spray irrigation not working as intended	2
UV light not working	2
ATU clogging	1

*More than 1 deficiency may have been identified per deficient system

Table V: Number of major alternative system components in Loudoun

Pretreatment

Aerobic treatment units	876
Peat media filters	533
Textile filters	84
Sand filters	25

Dispersal

Conventional trenches	1024
Low pressure	393
Drip	305
Mound	56
Spray	5

* Alternative systems may have multiple components

Disinfection (includes alternative discharging systems)

Chlorine	64
UV	13
Ozone	1

Table VI: Verification Visits

Year	Number of visits	Visits % of total inspections	# of systems with deficiencies not reported by operator	% visits with HD reports not matching operator report
2017	168	9.9%	11	6.5%

Table VII: Total tank pump-outs reported by year (includes pump and haul systems)

2010	30
2011	124
2012	1411
2013	2089
2014	2618
2015	3254
2016	3924
2017	3240

Table VII: Conventional systems > 5 years old, tank pump-outs reported by year

2010	15
2011	94
2012	648
2013	1123
2014	1571
2015	2004
2016	2621
2017	1867

Some tanks may have been pumped more than once in last 5 years

2017 program strengths

High number of operator visits

Of the existing eligible alternative systems in Loudoun County, 99% had operator site visits reported in 2017. Thirty-two owners in Loudoun County received at least

one ticket for lack of an operator inspection. 1.9 % of alternative system owners who were required to have an operator visit were ticketed by the LCHD.

Improved reporting

Staff continues to instruct operators to report deficiencies as they were observed upon arrival at the site. Deficiency rates for operators visiting more than 30 systems were 4%, 8%, 9%, 11%, 16% 20%, 26%, 27%, 33%, 34%, 38%, 41%, and 47%. The Health Department observed deficiency rate was 15%. These widely divergent numbers indicate that operators do not report deficiencies in a uniform manner.

Deficient System Repairs

Of 530 systems reported by the operator as having a deficiency, which included the 227 with SOG, 498 were corrected by year end, a 94 % correction rate. Correction of remaining deficient systems is an ongoing process. The credit for this excellent percentage is shared by owners who are committed to maintaining their systems, committed operators, and diligent Health Department staff. Only five tickets for not completing repairs were issued with two of those being rescinded.

Tank pump outs/number of conventional systems

The number of tank pump outs declined in 2017 from the previous year. Presumably this is due to a large number of tank pump-outs in the previous years with all owners of un-pumped tanks having been previously notified before 2017. Unlicensed pumpers were again discovered to be operating in Loudoun. Enforcement action occurred against pumpers who do not consistently report and also unlicensed pumpers. The pump-out program has had the effect of greatly improving the conventional system database by identifying abandoned systems, systems that have been connected to public sewer and locating previously unknown systems. This has resulted in a substantial net decrease of active conventional systems in the database.