



Memorandum

Date: April 23, 2015

To: SOUTHERN NEVADA DISTRICT BOARD OF HEALTH

From: Daniel LaRubio, Jr., P.E., *Environmental Health Engineer/Supervisor* *DPS*
Paul L. Klouse, REHS, *Environmental Health Manager* *PK*
Jacqueline L. Reszetar, M.S., REHS, *Director of Environmental Health* *JLR*
Joseph P. Iser, M.D., DrPH, MSc, *Chief Health Officer* *JPI*

Petitioner: Karen Fedelleck, Sole Owner

Subject: Variance Request to Permit an Existing Individual Sewage Disposal System (ISDS) on an Undersized Lot Served by an Off-Site Public Water Supply with a Deep Absorption Pit within Twenty (20) Feet of a structure and Ten (10) Feet of the Property Lines (APN 129-36-510-026)

BACKGROUND

Karen Fedelleck, sole owner, is requesting a variance to use an existing unpermitted individual sewage disposal system (ISDS) on an undersized lot served by municipal water. The lot is approximately 0.06 acre gross, which includes one-half ($\frac{1}{2}$) of the adjoining Aspen Avenue located in Mt. Charleston, Nevada where one quarter ($\frac{1}{4}$) or 0.25 acre gross is required for installation of an ISDS on a lot served by municipal water supply. The lot is located at 4550 Aspen Avenue legally description is Lot 11, Group 3, Plat Book 9999, Page 1 (Unrecorded), Charleston Park Resort, Portion of N $\frac{1}{2}$, NE $\frac{1}{4}$, Sec. 36, T19S, R56E, APN 129-36-510-026, Clark County, Nevada (see attached SNHD Public Notice signed by Jacqueline Reszetar on March 19, 2015 and Assessor's Map).

The owner of the property, Karen Fedelleck, obtained the property in April 2013 (see attached Clark County Assessor's Ownership History) and now wishes to have an unpermitted septic system permitted with an existing 1,500 gallon septic tank and leaching pit on her lot to be in compliance (See attached Karen Fedelleck letter dated December 2, 2014.). Ms. Fedelleck will be permitting an ISDS. (See attached Plot Plan and Detail A). Her letter further states, "The pit absorption field is existing no closer than five ft. from any structure or property line and the septic tank is no closer than 5 ft. from any structure or property line." (See attached Black Mountain Geotech Cone of Influence Letter dated November 14, 2014).

DISCUSSION

Section 5.1 of the *District Board of Health Regulations Governing Individual Sewage Disposal Systems and Liquid Waste Management* requires that a septic tank or soil absorption system not be located within ten (10) feet of any property line.

Section 11.20.2 of the *District Board of Health Regulations Governing Individual Sewage Disposal Systems and Liquid Waste Management* requires a minimum of one quarter (1/4) acre (10,900 sq. ft. including public streets or easements) for the installation of an ISDS on a lot served by municipal water supply.

Section 19.5 of the *District Board of Health Regulations Governing Individual Sewage Disposal Systems and Liquid Waste Management* requires the Board to consider the relative interests of first, the public; second, other property owners likely to be affected; third, the applicant; in that order. No variance shall be granted in the absence of showing that:

- (1) The variance would not endanger or tend to endanger human health or safety.
- (2) Compliance with regulations from which the variance is sought would produce serious hardship without equal or greater benefit to the public.

There is one existing well located upgradient and within six hundred (600) feet of the proposed deep absorption system which is in proximity to a high density of existing ISDS's. (See attached ISDS Density Map). The map also shows "185 Lots with a traceable permit for a septic system within a square mile of APN 129-36-510-026." The offsite water quality will not be affected by the proposed septic system. The closest neighboring building to the proposed ISDS is a distance of fifty (50) feet, thirty (30) feet more than the normal twenty (20) foot minimum required separation, but acceptable per attached Cone of Influence Letter dated November 14, 2014 by Steven E. McCullough, P.E. of Black Mountain Geotech Engineering. The closest property line is five (5) feet from the ISDS where ten (10) feet minimum separation is normally required by regulations.

RECOMMENDATIONS

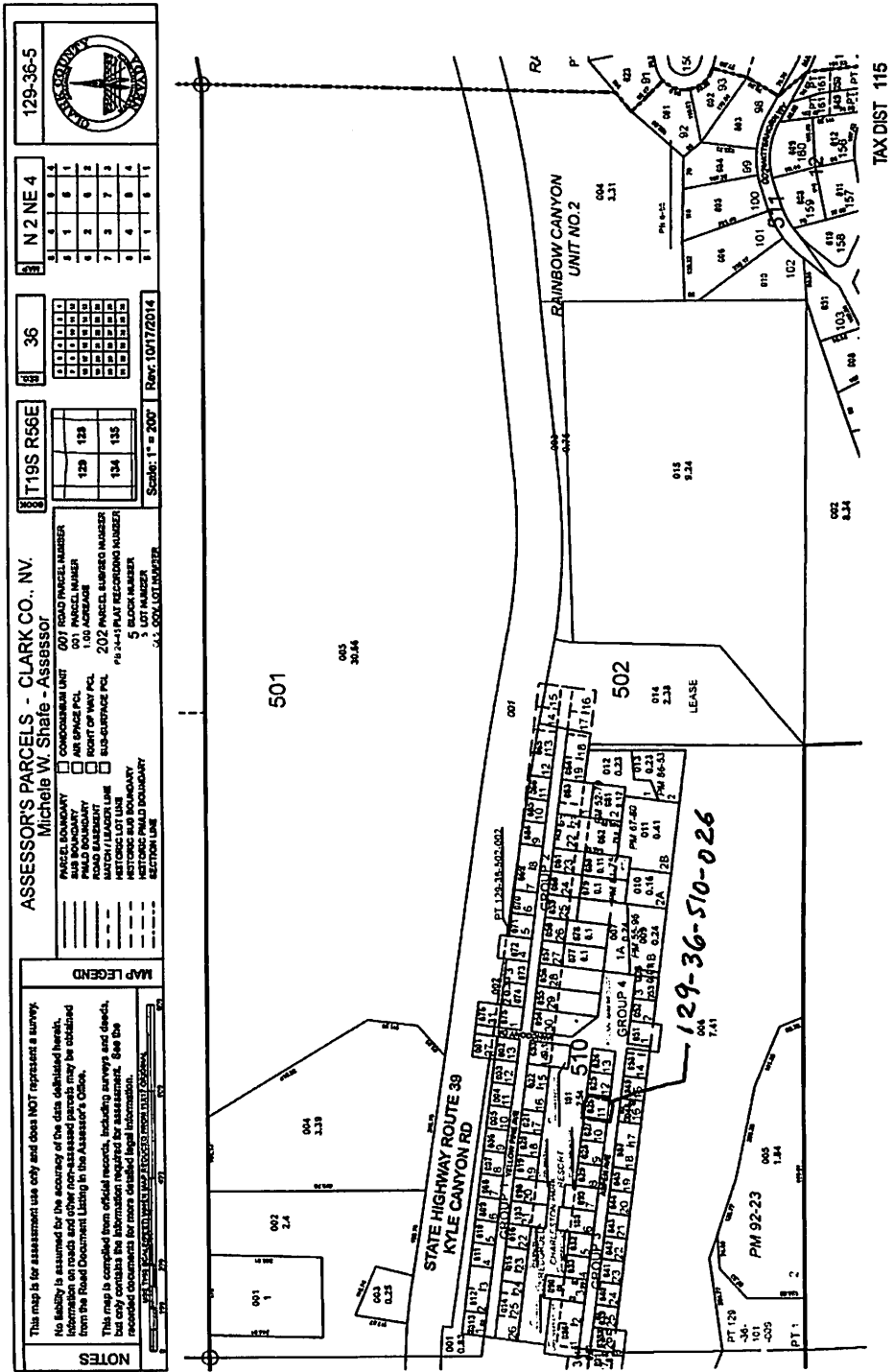
Therefore, staff recommends denial for the following reasons:

1. The existing Leach Pit does not have the capacity for a minimum 1,000 gallon septic tank with a minimum of 3 minutes per inch percolation rate.
2. The ISDS capacity as calculated by Ronald G. Mariano, a Nevada Registered Mechanical Engineer, does not comply with the requirements of the *District Board of Health Regulations Governing Individual Sewage Disposal Systems and Liquid Waste Management*.
3. Assumptions made in Mr. Mariano's calculations are not consistent with the SNHD *Regulations Governing Individual Sewage Disposal Systems and Liquid Waste Management Revised February 26, 2009*.

Attachments:

- A. SNHD Public Notice
- B. Assessor's Map
- C. Clark County Assessor's Ownership History
- D. Karen Fedelleck letter dated December 2, 2014.
- E. Black Mountain Geotech Cone of Influence Letter
- F. ISDS Density Map
- G. Plot Plan
- H. Circular Leach Pit (Detail A)
- I. Existing Leach Pit Capacity Calculation based on the *Regulations Governing Individual Sewage Disposal Systems and Liquid Waste Management Revised February 26, 2009*
- J. Evaluation of the Size of the Seepage Pit at 4550 Aspen Ave. Mt. Charleston by Ronald G. Mariano, P.E.
- K. Evaluation of Mr. Murano's Calculations by SNHD ISDS Staff

Attachment B: Assessor's Map



Attachment C: Clark County Assessor's Ownership History

Michele W. Shafe, Assessor

PARCEL OWNERSHIP HISTORY

Assessor Map Aerial View Comment Codes Current Ownership New Search

ASSESSOR DESCRIPTION
CHARLESTON PARK RESORT (UNREC) PLAT BOOK 9999 PAGE 1 LOT 11 GROUP 3

CURRENT PARCEL NO.	CURRENT OWNER	%	RECORDED DOCUMENT NO.	RECORDED DATE	VESTING	TAX DIST	EST SIZE	COMMENTS
129-36-510-026	FEDELLECK KAREN		20130401:02121	4/1/2013	NS	115	.06 AC	

PARCEL NO.	PRIOR OWNER(S)	%	RECORDED DOCUMENT NO.	RECORDED DATE	VESTING	TAX DIST	EST SIZE	COMMENTS
129-36-510-026	SOUTHERN NEVADA ACQUISITIONS L L C		20130213:02711	02/13/2013	NS	115	SUBDIVIDED LOT	
129-36-510-026	CHU REAL ESTATE INVESTMENT L L C		20120412:01728	04/12/2012	NS	115	SUBDIVIDED LOT	
129-36-510-026	CHU ANDY J		20120117:02328	01/17/2012	NS	115	SUBDIVIDED LOT	
129-36-510-026	FEDERAL NATIONAL MORTGAGE ASSN		20110607:02698	06/07/2011	NS	115	SUBDIVIDED LOT	
129-36-510-026	LITVINOFF MICHAEL B		20050926:01624	09/26/2005	NS	115	SUBDIVIDED LOT	L-20050909:4384
129-36-510-026	LITVINOFF MICHAEL B & REBECCA		19930813:01429	08/13/1993	JT	115	SUBDIVIDED LOT	
460-583-003	CARTER JANNE L		19900530:00040	05/30/1990	NS	115	SUBDIVIDED LOT	
460-583-003	ANDERSON BETH		19900405:00718	04/05/1990	NS	115	SUBDIVIDED LOT	
460-583-003	ANDERSON JEFF T		19860910:00432	09/10/1986	NS	115	SUBDIVIDED LOT	
460-583-003	ELLIS ROBERT C		2076:2035533	03/12/1985	NS	115	SUBDIVIDED LOT	
460-583-003	LISNER GREGG P		1932:1891485	06/07/1984	NS	115	SUBDIVIDED LOT	
460-583-003	ELLIS ROBERT C		1501:1460812	12/21/1981	NS	115	SUBDIVIDED LOT	
460-583-003	ELLIS ROBERT C & FRANCES M		0973:0780927	08/25/1969		115	SUBDIVIDED LOT	
460-583-003	ELLIS ROBERT C & FRANCES M		0973:0780927	08/25/1969		110	SUBDIVIDED LOT	
460-583-003	ELLIS ROBERT C & FRANCES M					110	SUBDIVIDED LOT	INITIAL

Note: Only documents from September 15, 1999 through present are available for viewing.

NOTE: THIS RECORD IS FOR ASSESSMENT USE ONLY. NO LIABILITY IS ASSUMED AS TO THE ACCURACY OF THE DATA DELINEATED HEREON.

Attachment D: Justification Letter from Owner

**To: Southern Nevada Health District
330 S. Valley View Blvd.
Las Vegas, NV 89107**

**From: Karen Fedelleck
409 Arnold St.
Las Vegas, NV 89106**

Re: Parcel # 129-36-510-026

Date: December 2, 2014

To whom this may concern:

I hereby make application and petition the Southern Nevada District Board of Health for a variance to the Regulations Governing Individual Sewage Disposal and Liquid Waste Management Sections 11.20.2, requiring a minimum of one fourth (1/4) acre (10,900 sq. ft.) for the pre-existing individual sewage disposal system (ISDS) on a lot served by an off-site water supply; and Section 5.2, requiring that no septic tank be within 8' of a building or a deep absorption field be located within 20' of a building; and section 5.1, requiring that no septic tank or leach field be within 10' of a property line.

This variance request is made for an existing septic system already installed on the 0.06 acre property (with cabin) that I bought as a retirement home "As Is". The existing septic system was exposed and found to include a Seep Pit 6' wide by 7' deep deemed worthy of the property use. Steven E. McCullough, P.E. of Black Mountain Geotech performed a Percolation Test and wrote a Cone of Influence Letter both passing regulations and submitted for your approval among other required documents. The ISDS is located 10' from a proposed structure and no closer than 5' from the nearest property line.

The legal description of said property is APN # 129-36-510-026, further described as Lot Eleven (11) in Group Three (3) of the unrecorded Plat of Charleston Park Resort (Old Town) and is generally known as 4550 Aspen Ave. Mt. Charleston, 89124.

I have owned the property since February 2013. Plans have been drawn for an addition that will extend the existing cabin from 557 sq. ft. to a proposed total of 1210 sq. ft. which the existing septic can handle per dual Perc. Tests and a proposed Total Fixture Units of ten (10). Having the ISDS permitted will allow the Clark County Building Dept. to approve the building plans, add value to my property, and in turn, add value to the surrounding properties.

Thank-you for your consideration,
Sincerely,



Karen Fedelleck

Attachment E: Cone of Influence Letter



Ms. Karen Fedelleck
409 Arnold Street
Las Vegas, Nevada 89106

November 14, 2014

Subject: Evaluation of the Impact of the Location and Depth
Of the Leach Filed on the Foundation of the Structure
At 4550 Aspen Ave., MT. Charleston, Nevada

Dear Ms. Fedelleck:

This letter is written to evaluate the influence from an existing deep leaching field on a proposed addition to the existing house; and the influence of the proposed addition on the existing adjacent deep leach field.

To evaluate the site conditions we reviewed a sketch provided by the owner that showed the leach field to be 5 feet from the new addition (the sketch is attached to this report). We also advanced 2 borings in the vicinity of the deep infiltration pit between the new proposed addition and the existing deep infiltration pit.

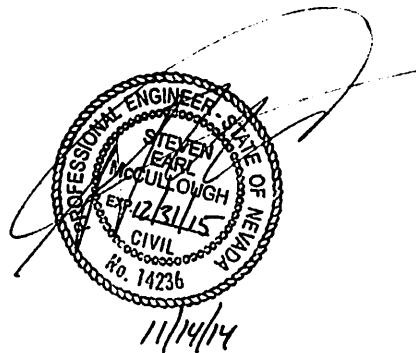
Based on what we found in the boring explorations, we have concluded that there will be no stress influence from the proposed new addition onto the deep infiltration pit (leach field) since it is far enough from the addition to not be within the stress distribution zone from the bottom of the proposed foundations. We also concluded that since the soil conditions encountered immediately adjacent to the foundation are cohesionless (GP-GM) and not moisture sensitive, any increase in the moisture conditions beneath the foundation will not compromise the stability of the proposed addition or the addition on the deep infiltration pit. If there were swelling clays (CH or CL) or hydrocollapseable soils then we would be concerned about the stability of the proposed addition, but these conditions do not exist and therefore any increase in moisture beneath the proposed addition's foundation will not compromise its stability.

Should you have any questions regarding this letter-report please do not hesitate to call

Sincerely,
Black Mountain Geotech

Steven E. McCullough, P.E.
Principal Engineer

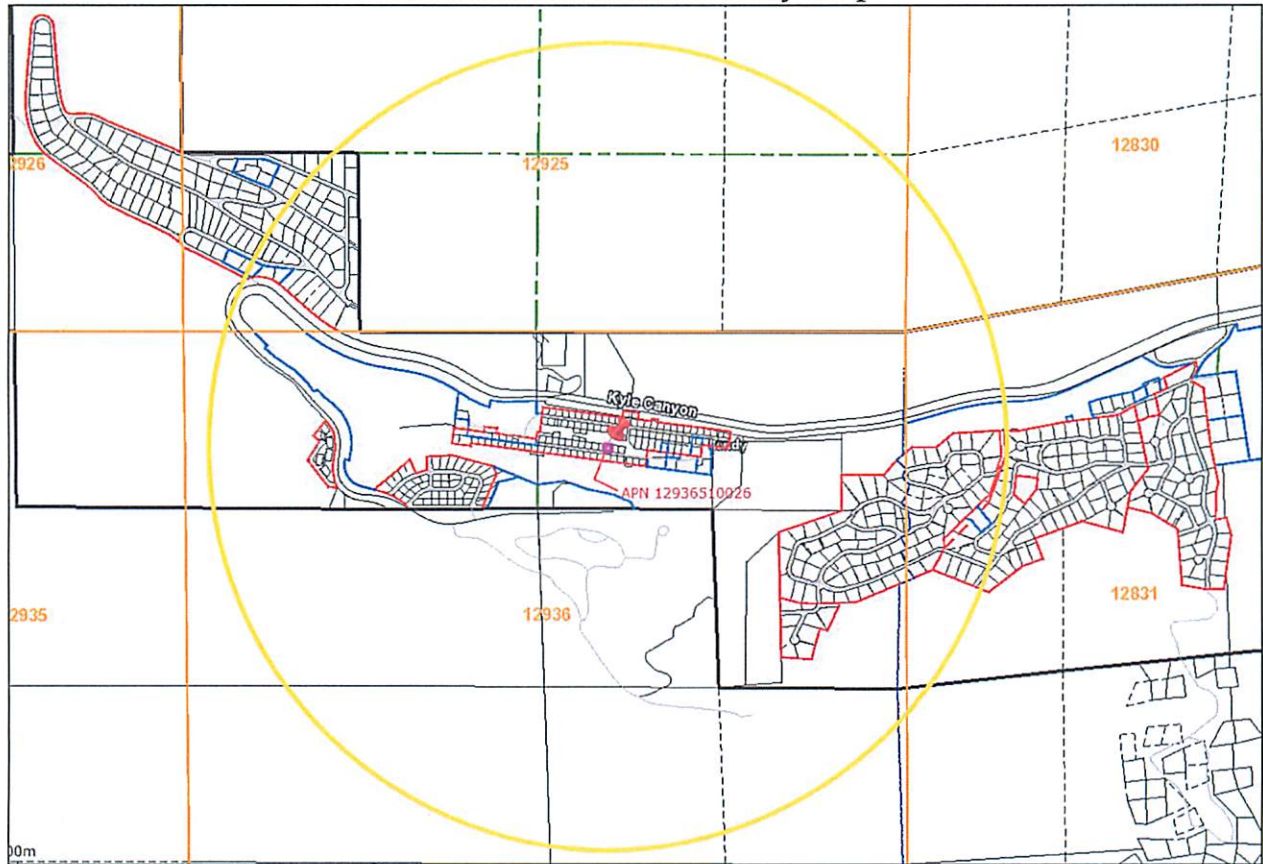
Attachments: Site Plan



383 Suzanne Peak Ct.
Henderson, Nevada 89012

Phone: 702-378-1685
Fax: 702-988-8772
BlackMountainGeotech@gmail.com

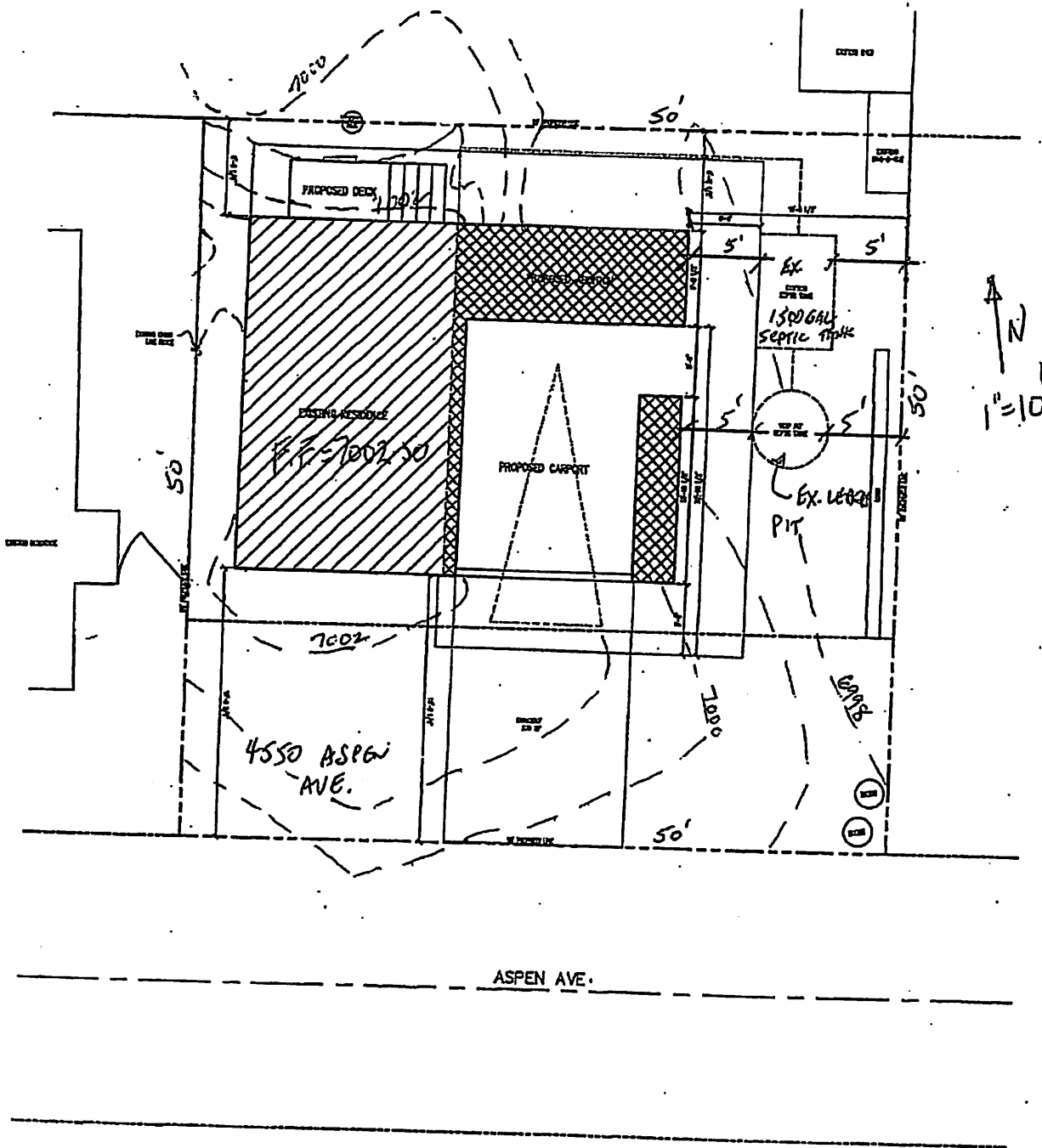
Attachment F: ISDS Density Map



Aerial View of Parcel (APN 129-36-510-026)

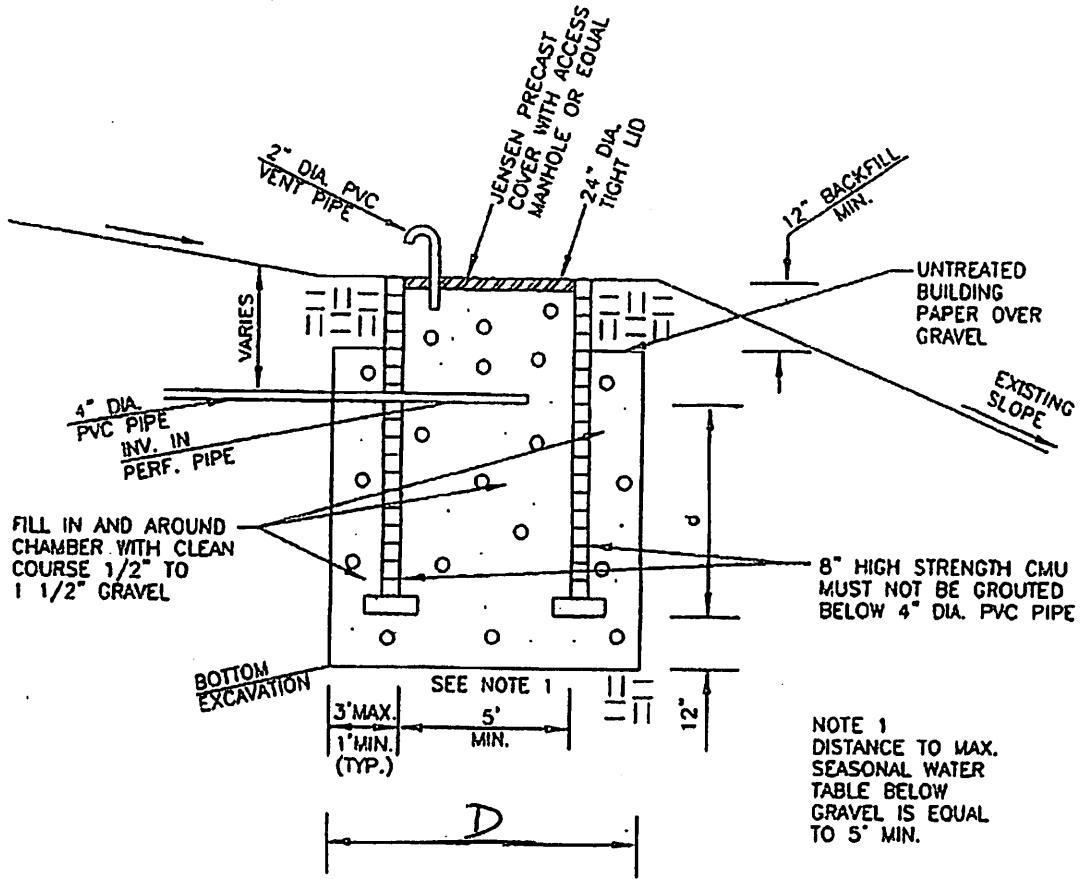
185 Parcels permitted for a septic system within 1 circular square mile of the parcel.
1 well within 600' of the parcel 129-36-510-026

Attachment G: Plot Plan



PLOT PLAN

Attachment H: Leach Pit Detail



d = Distance Below 4" PVC PIPE
 D = DIAMETER OF LEACH PIT
 ABSORPTION AREA = $\pi D d$

CIRCULAR LEACH PIT (DETAIL A)
 NTS

**Attachment I: Existing Leach Pit Capacity Calculation based on the SNHD Regulations
Governing Sewage Disposal Systems and Liquid Waste Management**

Required Absorptive Area Calculation

Variables:

t = Average Percolation Rate ($t_{\min} = 3$ minutes/inch)

Q = Average Application Factor

C = Loading Factor

$$Q = \frac{5}{\sqrt{t}} = \frac{5}{\sqrt{3}} = 2.89 \frac{\text{Gallons per day}}{\text{square foot (SF)}}$$

$$C = \frac{100}{Q}$$

$$C = 100 / 2.89 \text{ GPD/SF}$$

$$C = 34.60 \text{ SF/100 gallons of septic tank size}$$

For a minimum 1,000 gallon septic tank

$$C = (34.60 / 100 \text{ gal of septic tank size}) \times 1000 \text{ gallon septic tank size}$$

$$C = 346 \text{ SF of absorption area minimum}$$

Per Section 9.9, Table V (shown on page 2), the minimum absorption area for a 1,000 gallon septic tank with a 3 min/in percolation rate.

$$C_{\min} = 350 \text{ sf}$$

Attachment I: Existing Leach Pit Capacity Calculation based on the SNHD Regulations Governing Sewage Disposal Systems and Liquid Waste Management

TABLE V

Minimum Liquid Capacity of Septic Tank (in Gallons)	Required Absorption Bottom Area for Seepage Beds (Pipe and Gravel Leach Field) or Sidewall Area for Seepage Pits and Trenches (in Square Feet)							
	1000	350	400	450	635	775	1100	1345
1200	420	480	540	760	935	1315	1610	1860
1500	520	600	710	950	1165	1645	2015	2325
2000	700	800	900	1272	1550	2200	2690	3100
2250	788	900	1013	1429	1744	2475	3075	3488
2500	875	1000	1125	1588	1940	2750	3363	3875
2750	963	1100	1238	1747	2132	3025	3699	4263
3000	1050	1200	1350	1905	2325	3300	4035	4650
3250	1138	1300	1463	2064	2519	3575	4371	5038
3500	1225	1400	1575	2223	2713	3850	4708	5425
Percolation Rate Time in Minutes for Water to Fall One Inch (1")	3 (c)	4	5	10	15	30 (a)	45 (a)	60 (a) & (b)
<p>NOTE: Reduce absorption field area by thirty percent (30%) when using leaching chambers</p> <p>a) Unsuitable for seepage pits if over thirty (30)</p> <p>b) Soils with a percolation rate over sixty (60) minutes per inch shall not be used for absorption systems</p> <p>c) A minimum percolation rate of three (3) minutes per inch shall be used to calculate absorption area requirements.</p>								

Capacity of Existing Cylindrical Leach Pit in Absorptive Area

Variables:

$d = \text{Depth below inlet pipe (Assume best case } d = 6')$

$D = \text{Diameter of the Pit}$

$C_a = \text{Absorptive Capacity of the Leach Pit}$

$\pi = 3.141592654$

$$C_a = d * \pi * D$$

$$C_a = 6' * \pi * 6'$$

$$C_a = 114 \text{ sf (Absorptive Capacity of Existing Pit System)}$$

$$C_{\min} = 350 \text{ sf - Minimum Absorptive Capacity according to regulations}$$

Therefore; the existing leach pit does not have enough capacity for a minimum 1,000 gallon septic tank

Attachment J: Evaluation of the Size of the Seepage Pit at 4550 Aspen Ave. Mt. Charleston by
Ronald G. Mariano, P.E. (Page 1 of 4)



January 28, 2015

Ms. Karen Fedelleck
409 Arnold Street
Las Vegas, Nevada 89106

Re: Evaluation of the Size of the Seepage Pit at 4550 Aspen Ave. Mt. Charleston, NV

Dear Ms. Fedelleck,

As requested by your general contractor Reliabil Construction Co., an evaluation was made on the size of the existing seepage pit for compliance with the current Codes. I also have reviewed the impact evaluation report from Black Mountain Geotech and used the percolation test data to verify and validate the size of seepage pit.

Sizing Evaluation

The calculation I have used is based on formulas derived by the American Society of Plumbing Engineers and information from the 2012 Uniform Plumbing Code. Please keep in mind that I am only validating the size of the seepage pit only and that its construction shall comply with local ordinances per the Southern Nevada Health District Board of Health.

The calculation is based on the following variables:

$Df =$ Design flow (gal/day)

$SAR =$ Soil Absorption Rate (gal/sq. ft./day) Volume of water that will soak into the soil each day in 1 sq. ft. of sidewall of the seepage pit.

$P =$ Percolation Rate (min/in)

To calculate the required dimensions, the required Absorptive Area (sq ft.) must first be determined. The absorptive area is the total effective area of the seepage pit walls. From Table 25.11 (see attachment) and the measured percolation rates provided by Black Mountain Geotech ranging from 0.52 to 1.63 (min/in), the SAR is 3.5. Since the residence has 2 bedrooms, per Table 25-9, Quantities of Sewage Flows (see attachment) for one person is 75 gal/day. For four persons the total sewage flow is 300 gal/day.

The Absorptive Area is:

85.71 sq. ft. = 300 gal/day / 3.5 gal/ sq.ft/day

Attachment J: Evaluation of the Size of the Seepage Pit at 4550 Aspen Ave. Mt. Charleston by
Ronald G. Mariano, P.E. (Page 2 of 4)

Page 2

The existing seepage pit has a diameter of 6 ft with a minimum depth of 6 ft. Therefore to verify if the depth is adequate:

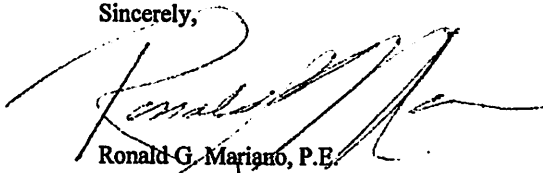
$$28.26 \text{ sq. ft.} = 3^2 \times 3.14 \text{ (area of a circle)}$$

$$3 \text{ ft.} = 85.71 \text{ sq. ft.} / 28.26 \text{ sq. ft. (minimum depth required of the seepage pit)}$$

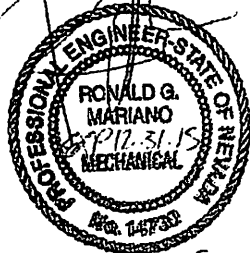
This is the minimum depth and diameter required for the given sewage flow and soil percolation rate. In conclusion, the existing seepage pit will handle the sewage flow rate from the residence.

If you have any questions, please don't hesitate to call me at 361-0020.

Sincerely,



Ronald G. Mariano, P.E.



1.20.15

Attachment J: Evaluation of the Size of the Seepage Pit at 4550 Aspen Ave. Mt. Charleston by
 Ronald G. Mariano, P.E. (Page 3 of 4)

25-20

ASPE Data Book

Table 25-10 Estimated Distribution of Sewage Flows

Type of Waste	Volume, gpd/person (L/d/person)				
	30 (115)	40 (150)	50 (180)	75 (285)	100 (380)
Total Flow					
Kitchen wastes	0 ^a	7 (26)	10 (40)	10 (40)	15 (60)
Toilet wastes	15 (60)	15 (60)	20 (80)	25 (95)	30 (115)
Showers, washbasins, etc.	15 (60)	18 (70)	20 (80)	25 (95)	35 (135)
Laundry wastes	0 ^a	0 ^a	0 ^a	15 (60)	20 (80)

^aNo waste from these uses.

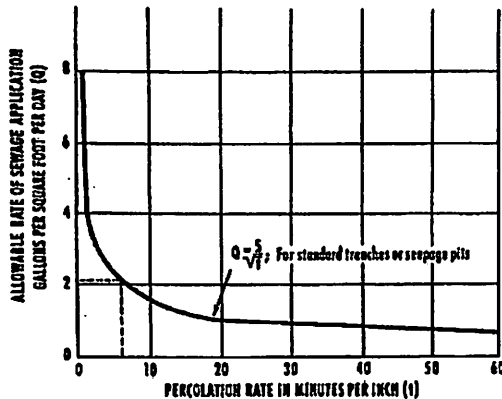


Figure 25-4 Graph Showing Relation Between Percolation Rate and Allowable Rate at Sewage Application

"Where all pertinent factors are suitable for conventional soil absorption systems, Figure 25-4 and Table 25-10 may be used for sizing systems where the percolation test is selected. However, where local experience, soil analysis results and other data are available, such data should be taken into consideration in the final design."

Table 25-11 and Figure 25-4 do not allow for waste from garbage grinders and automatic washing machines. Discharges from these appliances to an institutional waste disposal system calls for special design considerations.

Generally, garbage disposal units are not recommended for institutional occupancies that have central kitchens. It is usually more efficient and economical to handle garbage through conventional garbage cans and disposal methods. However, where it is decided to use garbage disposal units in central kitchens or food processing plants, the system designer should especially design the grease interceptor or a separate garbage separation tank on the basis of anticipated quantities of garbage to be produced between normal tank cleanings. Then, special provisions should be made for removal and disposal of garbage and grease at sufficiently frequent intervals based upon actual periodic inspection of such receptacles.

The amount of additional flow of wastewater from garbage grinding can be estimated by determining the nature of the operation. Interpolating from data in the *Manual*, an average design flow of about 1 gal (4.54 L) per meal per day is estimated when garbage grinders are used.

Table 25-11 Allowable Rate of Sewage Application to a Soil Absorption System

Percolation Rate (time in min for water to fall 1 in. [25.4 mm])	Maximum Rate of Sewage Application for Absorption Trenches, ^a Seepage Beds, and Seepage Pits ^b , g/ft ² /d (L/m ² /d) ^c	Percolation Rate (time in min for water to fall 1 in. [25.4 mm])	Maximum Rate of Sewage Application for Absorption Trenches, ^a Seepage Beds, and Seepage Pits ^b , g/ft ² /d (L/m ² /d) ^c
1 or less	5.0 (244.3)	10	1.6 (78.2)
2	3.5 (171.0)	15	1.3 (63.5)
3	2.9 (141.7)	30 ^d	0.9 (44.0)
4	2.5 (122.2)	45 ^d	0.8 (39.1)
5	2.2 (107.5)	60 ^e	0.6 (29.3)

^aAbsorption area is figured as trench bottom area and includes a statistical allowance for vertical sidewall area.

^bAbsorption area for seepage pits is effective sidewall area.

^cNot including effluents from septic tanks that receive wastes from garbage grinders and automatic washing machines.

^dMore than 30 is unsuitable for seepage pits.

^eMore than 60 is unsuitable for absorption systems.

Attachment J: Evaluation of the Size of the Seepage Pit at 4550 Aspen Ave. Mt. Charleston by
 Ronald G. Mariano, P.E. (Page 4 of 4)

Table 25-9 Quantities of Sewage Flows

Type of Establishment	GPD/Person (L/D/Person) ^a
Airports (per passenger)	5 (20)
Apartments—multifamily (per resident)	60 (225)
Bathhouses and swimming pools	10 (40)
Camps	
Campground with central comfort stations	35 (130)
With flush toilets, no showers	25 (95)
Construction camps (semipermanent)	50 (190)
Day camps (no meals served)	15 (60)
Resort camps (night and day) with limited plumbing	50 (190)
Luxury camps	100 (380)
Cottages and small dwellings with seasonal occupancy	50 (190)
Country clubs (per resident member)	100 (380)
Country clubs (per nonresident member present)	25 (95)
Dwellings	
Boarding houses	50 (190)
additional for nonresident boarders	10 (40)
Luxury residences and estates	150 (570)
Multifamily dwellings (apartments)	60 (225)
Rooming houses	40 (150)
Single-family dwellings	75 (285)
Factories (gal [L] per person, per shift, exclusive of industrial wastes)	35 (130)
Hospitals (per bed space)	250 (945) ^b
Hotels with private baths (2 persons per room)	60 (225)
Hotels without private baths	50 (190)
Institutions other than hospitals (per bed space)	125 (475)
Laundries, self-service (gal [L] per wash, i.e., per customer)	50 (190)
Mobile home parks (per space)	250 (945)
Motels with bath, toilet, and kitchen wastes (per bed space)	50 (190)
Motels (per bed space)	40 (150)
Picnic parks (toilet wastes only) (per picnicker)	5 (20)
Picnic parks with bathhouses, showers, and flush toilets	10 (40)
Restaurants (toilet and kitchen wastes per patron)	10 (40)
Restaurants (kitchen wastes per meal served)	3 (10)
Restaurants, additional for bars and cocktail lounges	2 (8)
Schools	
Boarding	100 (380)
Day, without gyms, cafeterias, or showers	15 (60)
Day, with gyms, cafeteria, and showers	25 (95)
Day, with cafeteria, but without gyms or showers	20 (80)
Service stations (per vehicle served)	10 (40)
Swimming pools and bathhouses	10 (40)
Theaters	
Movie (per auditorium seat)	5 (20)
Drive-in (per car space)	5 (20)
Travel trailer parks without individual water and sewer hookups (per space)	50 (190)
Travel trailer parks with individual water and sewer hookups (per space)	100 (380)
Workers	
Construction (at semipermanent camps)	50 (190)
Day, at schools and offices (per shift)	15 (60)

^aUnless otherwise noted.
^bIncludes cafeteria.

Attachment K: Evaluation of Mr. Murano’s Calculations by SNHD ISDS Staff

Assumptions:

1. The percolation rate used equals 2 minutes/inch.
2. The capacity calculation is based on 75 gallons/day/person using 4 people as the maximum number of people that the septic system would have to service.
3. Using 300 gallons/day as the maximum sewage flow.
4. Absorptive area equals 85.71 sf.

Corrections:

1. The minimum percolation rate allowed by SNHD ISDS Regulations is 3 minutes /inch per Section 9.9 Table V (refer to table below).
2. The minimum capacity of a septic system is 1,000 gallons per SNHD ISDS Regulations Section 9.9 Table V (refer to table below).
3. The existing leach pit capacity is based on use is less than required based on fixture count; Therefore, the calculation is not conservative. The empirical data provided by ASPE doesn’t account for garbage disposal and any automatic washing appliances (dish washer / clothes washer / etc) while regulations requirements take into account these appliances as well as sludge storage.
4. SNHD ISDS Regulations requires that the maximum sewage flow be equal to the size of the septic tank required. For 14 fixture units, a minimum 1,000 gallons septic tank is required per Section 6.10 Table IV (refer to table below) of the SNHD ISDS Regulations.

Section 9.9 Table V

Maximum Liquid Capacity of Septic Tank (in Gallons)	Required Absorption Bottom Area for Seepage Beds (Pipe and Gravel Leach Field) or Sidewall Area for Seepage Pits and Trenches (in Square Feet)							
	350	400	450	635	775	1100	1345	1550
1000	350	400	450	635	775	1100	1345	1550
1200	420	480	540	760	935	1315	1610	1860
1500	520	600	710	950	1165	1645	2015	2325
2000	700	800	900	1272	1550	2200	2690	3100
2250	788	900	1013	1429	1744	2475	3075	3488
2500	875	1000	1125	1588	1940	2750	3363	3875
2750	963	1100	1238	1747	2132	3025	3699	4263
3000	1050	1200	1350	1905	2325	3300	4035	4650
3250	1138	1300	1463	2064	2519	3575	4371	5038
3500	1225	1400	1575	2223	2713	3850	4708	5425
Percolation Rate Time in Minutes for Water to Fall One Inch (1")	3 (c)	4	5	10	15	30 (a)	45 (a)	60 (a) & (b)

NOTE: Reduce absorption field area by thirty percent (30%) when using leaching chambers:

- a) Unsuitable for seepage pits if over thirty (30)
- b) Soils with a percolation rate over sixty (60) minutes per inch shall not be used for absorption systems
- c) A minimum percolation rate of three (3) minutes per inch shall be used to calculate absorption area requirements.

Section 6.10 Table IV

Maximum Fixture Units Served	Minimum Septic Tank Capacity in Gallons
20	1000
25	1200
35	1500
45	2000
55	2250
60	2500
70	2750
80	3000
90	3250
100	3500

Fixture units over 100 – 25 gallons per fixture unit.

NOTE: Septic tank sizes in this table include sludge storage capacity and the connection of domestic food waste disposal units and dishwashers without further volume increase.