COTTON CREEK SANITARY SEWER STUDY
ENGINEERS REPORT

February 20, 2007

AFRAM Corporation – MEMPHIS
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1. EXECUTIVE SUMMARY

The residents of the Cotton Creek area have experienced and reported various septic system operational problems through the years. In an effort to gain a better understanding of the severity and extent of the problems, Shelby County Government initiated Request For Proposal (RFP) #07-007-04, SEWER DESIGN SERVICE FOR THE COTTON CREEK AREA in July of 2006. The design team of AFRAM Corporation (prime consultant), Kimley-Horn and Associates (sub-consultant) and Utility Solutions (sub-consultant) was selected to provide the engineering services described in RFP #07-007-04.

This is a III Phase Project:

Phase I – Analyze and substantiate the extent and severity of the reported problems and assess alternatives based on targeting individual lots with known problems. Examples of these "individual solutions" include moving the tile fields or installation of Wisconsin Mounds.

Phase II – Determine and rank the various factors related to installation of either a local collection and treatment system (STEP/STEG recirculation sand filter) or collection via conventional gravity/pressure systems with conveyance to the Shelton Road Waste Water Treatment Plant in Collierville.

Phase III – Prepare design and construction documents related to the chosen alternative.

AFRAM Corporation entered into Contract No. CA074509, Cotton Creek Area Sewer Study with Shelby County on November 9, 2006. The contract covers Phases I and II. When an alternative is selected, Phase III is to be negotiated at that time.

The design team has determined that the problems reported by the homeowners are real, the problems are widespread throughout the study area and individual solutions are not feasible. The seasonal groundwater depth within the Cotton Creek area is basically at the ground surface. High groundwater and soils with slow percolation rates located within the study area makes the conditions unsuitable for sub-surface septic systems. Therefore, adding length to the existing tile fields or moving them to another location on a particular lot is not an option. Likewise, the Wisconsin Mound system is not an option for the areas labeled as unsuitable.

The Design Team recommends proceeding to Phase II to investigate alternatives related to either a local collection and treatment (STEP/STEG Recirculation Sand Filter) or conventional sewer systems.

2. INTRODUCTION

This project involves an analysis of an existing neighborhood in rural eastern Shelby County that is currently served by standard septic systems. The project area is known as The Cotton Creek area and is located in the southeast quadrant of the intersection of Collierville-Arlington and Raleigh-Lagrange Roads. The area is roughly bounded by Collierville-Arlington Road on the west, Raleigh-Lagrange Road on the north, the Shelby County/Fayette County boundary on the east and the TVA power lines on the south. The study area is comprised of the following developments plus individual lots along Collierville-Arlington Road: Kirkland Estates, Cotton Creek Subdivision and Fox Hollow Farms (1st and 2nd Phases). In total, there are ninety-one (91) residences included in the study area. The earliest of the homes was built in the late 1980's. A new home is currently being constructed along Cold Creek Cove. As of the date of this report, we have not received copies of the subsurface septic system plans for this address.

Through the years, residents have reported various problems with the operation of their septic systems. In response, Shelby County initiated a "fact-finding" questionnaire in early 2006 to the Cotton Creek area residents to determine the types of problems and whether the residents were willing to help pay for any recommended alternatives. Based on the responses received, Shelby County determined that further study was warranted.

The purpose of this project is to document the reported problems, determine the extent and severity of the problems, recommend to Shelby County possible alternatives to alleviate the reported problems and prepare design and construction documents based on the chosen alternative.

This project is to be performed in three phases:

Phase I Analyze extent and severity of reported problems and assess alternatives based on targeting the properties with known problems.

Phase II Determine and rank the various physical and political factors/issues related to installation of either a local collection and treatment system such as STEP/STEG Re-circulation Sand Filter or collection via conventional gravity/pressure systems with conveyance to the Shelton Road Waste Water Treatment Plant in Collierville.

Phase III Prepare design and construction documents related to the chosen alternative.

The remainder of this report summarizes the Design Team's project approach, data collection efforts and conclusions related to **Phase I**.

3. Project Approach

The design team approached Phase I in the following manner:

a. Analyze data collected in original questionnaire to the residents initiated by Shelby County in early 2006
b. Distribute a follow-up questionnaire (technical in nature)
c. Conduct site visits/interviews with the homeowners

d. Perform soils testing on approximately 1/3 of the properties in the study area
e. Analyze data obtained from b., c. and d. to determine suitability of individual solutions on individual lots such as moving the existing tile fields or constructing Wisconsin Mounds.

a. Shelby County Questionnaire Results

The initial questionnaire sent by Shelby County was very informative when addressing issues that the overall community was experiencing (see Appendix A for original questionnaire). Of the 91 mailed questionnaires, 59 responses were received. Of those received, no one has lived in the area longer than 20 years; most of the homes and septic systems are between 11 and 20 years old; 36 out of 59 are experiencing problems. Also, 92% believe that a public sewage collection system is needed for the area, 56% are willing to pay $65 to $130 per month for the system, and 76% are willing to pay a $3000 connection fee for the public system (See Appendix A for questionnaire results). Keep in mind the above mentioned results are only for the 59 respondents. There were 32 area residents that did not respond to the questionnaire; therefore, their opinion is not expressed.

Technical issues regarding specific types of septic problems, under what circumstances do those problems occur, etc. were not addressed in the original questionnaire. Also, respondents were not asked to provide their address; their responses were anonymous.

b. Follow up Questionnaire

Since addresses could not be linked to problems reported in the original questionnaire, the Design Team prepared a follow up questionnaire. Respondents were required to provide their address in order to pin point the problem areas. The follow up questionnaire was aimed toward identifying specific septic problems, the severity of those problems and to determine what circumstances caused those problems. Sixty-nine (69) responses were received out of the 91 that were sent (a 76% participation rate). Of the 69 responses, 49% reported some type of problem.

In order to determine the extent of the reported problems, a property map of the entire study area was created (see Appendix B-1). Each address with reported problems was highlighted on the map.

c. Individual Lot Analysis

The Tennessee Department of Environment and Conservation (TDEC) Division of Ground Water Protection Regulations to Govern Subsurface Sewage Disposal Systems (Septic Systems) Chapter 1200-1-6 gives the appropriate explanation, data and equations to calculate septic tank capacity, conventional septic absorption field lines, and Large Diameter Gravelless Pipe (LDGP) systems. Using the United States Department of Agriculture (USDA) Natural Resources Conservation Service Web Soil Survey website (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx), the soil type for each lot within the study area was determined. Subsurface sewage disposal plans were collected from the Shelby County Health Department (SCHD) to determine the existing type of system (conventional septic or LDGP), trench width, length of field lines, and septic tank capacity. Using the equations from TDEC regulations stated above, number of bedrooms, soil type and trench width, a spreadsheet (Appendix B-2) was created to determine appropriate length of field lines and required septic

tank capacity that should have been installed on the property. The existing septic system was compared with the calculated (TDEC) system. Out of the questionnaires received it was found that:

- 34 of 69 respondents (49%) have reported problems
- 22 of 69 respondents (32%) have insufficient field line length and/or septic tank capacity
- 12 of 34 respondents reporting problems (35%) have insufficient field line length and/or septic capacity
- 12 of 22 respondents (55%) with insufficient field line length and/or septic tank capacity have problems

The data revealed that insufficient septic tank capacity and/or absorption field line length are not the main cause for the problems being experienced by the residents. (See Appendix B-2 for worksheet and charts)

d. Soils Testing

Based on information received from the follow-up questionnaires, twenty (20) lots were chosen for soil testing. Some of the chosen lots were experiencing problems while others were not (See Appendix C-1 for soil testing addresses). The chosen lots were evenly distributed throughout the study area. Seven of the twenty lots were found to have differing soils than that which was stated on the web soil survey. However, the soils test results did not affect the statistics for insufficient line length. It was determined through the soils testing and the web soil survey that there are six dominant soil types in the area. These soil types are as follows:

- Calloway
- Collins
- Falaya
- Grenada
- Routon
- Waverly

Below is a table with the soil type, estimated absorption rate, the improvement practices required for a conventional system to work in that soil and the color code.

Soil Name / Depth in inches	Estimated Absorption Rate (minutes / in.)*	Improvement practices required	Color code
Collins 0-30 30-48	 45 >75	Interceptor or drawdown drains** - min. 42" depth	red / green
Falaya 30-48	>75	(Not applicable - unsuitable for conventional disposal systems.) Wetness; no suitable outlet for curtain drain.	red
Calloway 0-30 30-48	 >75	(Not applicable - unsuitable for conventional disposal systems.)	red
Grenada (pan 24-30"), 0-24 24-48	 75 >75	Interceptor drains** - min. 42" depth	red / yellow
Grenada (pan <24") 0-20 20-48	 >75 >75	(Not applicable - unsuitable for conventional disposal systems.)	red
Grenada overwash 0-30 30-48	 75 >75	Interceptor drains** - min. 42" depth	red / yellow
Routon 0-48	 >75	(Not applicable - unsuitable for conventional disposal systems.)	red
Routon overwash 0-24 24-48	 75 >75	Interceptor drains** - min. 42" depth	red / yellow
Waverly 0-48	45	(Not applicable - unsuitable for conventional disposal systems.)	red

*The estimated absorption rates given here apply only after the required improvement practices have been installed.

**A suitable outlet is required for all drainage practices. In many areas, a comprehensive drainage system will be required to provide ditches or other suitable outlets. In areas with slopes of more than 3 percent, the drain should be placed on the up-slope side of the absorption field. Areas with slopes of less 3 percent or less require drains which completely encircle the absorption field.

Slope is indicated by a numerical range which follows the soil name on the soil map. Slope is given in percentage (feet of fall or rise / 100 ft. lateral distance). Slopes are not shown for soils which have slopes of mostly less than three percent.

The color coding system used in the preliminary soils map and described in the following discussion is the system described in the *Soils Handbook* and used by the Tenn. Dept. of Environment and Conservation, Division of Groundwater Protection for classifying soils for subsurface sewage disposal systems. Soils underlined in *red over green* have favorable properties and unfavorable properties that can be made favorable for conventional subsurface sewage disposal systems. Soils underlined in *red over yellow* have marginally favorable and some unfavorable properties for conventional subsurface sewage disposal systems. Soils underlined in *red* have unfavorable properties for conventional subsurface disposal systems. Of the 69 respondents:

SOILS TYPE	PROBLEMS REPORTED
▪ 6 (9%) were in Calloway soils	2
▪ 8 (12%) were in Collins soils	4
▪ 2 (3%) were in Routon soils	1
▪ 14 (20%) were in Grenada soils	3
▪ 16 (23%) were in Waverly soils	10
▪ 23 (33%) were in Falaya soils	14

According to TDEC regulations and the Design Team's soils scientist, 68% of the respondents are on soils unsuitable for subsurface disposal systems and the remaining 32% is suitable only with additional improvements (interceptor, drawdown or French drains). Falaya, Waverly, Routon and Calloway soils are unsuitable due to the high seasonal water table. Grenada and Collins soils are suitable only with additional drainage improvements that would allow the excess stormwater to drain from the absorption field lines. However, Grenada soils where the fragipan is less than 20 inches below the present surface are not suitable because the permeability is very slow in the fragipan layer and water accumulates above the fragipan in wet months. The only way to tell which type of Grenada (pan 24"-30" or <24" pan, etc) is to do a soil test. Therefore, since only 20 lots of the 69 respondents were tested, the others that had Grenada for a soil type on the web soil survey were assumed to be Grenada with a pan of 24"-30". In summary it was found that of the 69 respondents, 4 (6%) were considered suitable because there were additional improvements and they were in Collins or Grenada soils; 18 (26%) were unsuitable because they were in Collins or Grenada soils and did not have additional improvements; and 47 (68%) were not suitable because they were in Falaya, Waverly, Calloway or Routon soils (See Appendix C-2 for Soil Testing Data).

e. Interviews and Inspections

Door-to-door interviews were conducted in order to gain additional information concerning the lay of the land and to answer any questions or concerns the residents may have. Of the fifteen interviews conducted, three said they were experiencing no problems. During the interview process the team discovered that everyone's definition of a problem is different. For example, one resident reported no septic system problems but yet indicated he has his septic tank pumped twice a month during the rainy season. Sewage seeping to the ground surface appears to be considered a problem to some resident and not a problem to others. Some thought they did not have any problems, but meant they did not have any sewage backing up into the house, when their field lines were seeping sewage effluent to the ground. People reported sewage back-ups into the house, being unable to flush their toilets at times, gnats coming out of the drains, foul odors, and water ponding on their property. Some residents have adjusted their lifestyle to account for septic system issues. In other words, if rain is in the forecast, they plan showers, laundry and dishwashing accordingly. Reported repairs included adding more absorption field lines, pumping the septic tank, a terra lift system (see Appendix B-4 for definition) and, adding drainage improvements (French drain or interceptor drain). Most of the lots inspected had soggy yards and stormwater drainage issues, with water ponding in areas of their property and some on the absorption field lines. Sewage effluent was found seeping to the ground surface and in some cases was running into the stormwater drainage ditches. Each resident reporting septic system problems

indicated that the problems escalate during the rainy season. After reviewing the questionnaire responses, interviewing, and inspection of lots reporting no problems, one or more of the following applied:

- only 2 people live in the house,
- field lines are located in an area that does not pond stormwater,
- there is adequate drainage with no visible water on the lot,
- actually had sewage seepage or back-ups at one point in time but didn't feel it was an issue,
- had visible sewage effluent leaking onto the ground.

Pictures of the lots visited may be seen in Appendix B-3.

4. Conclusion/Recommendations

a. TDEC Regulations

If this were a new subdivision, many of the lots would not be approved with the TDEC regulations in force today since 68% are considered red lined or not suitable for septic systems. The lots that could be approved would require additional drainage improvements and a proper outlet. From observation, there appear to be stormwater drainage issues that are adding to the septic systems' poor performance. TDEC Regulations state "The water table shall be at least four feet below the bottom of the disposal field, except that a lesser depth may be permitted where soil conditions provide adequate protection for groundwater." With the soils found in the Cotton Creek area, it is evident that at the least, in the rainy season, the water table is well above four feet below the tile fields. In many cases it is probable that the field lines are actually lying submerged within the water table.

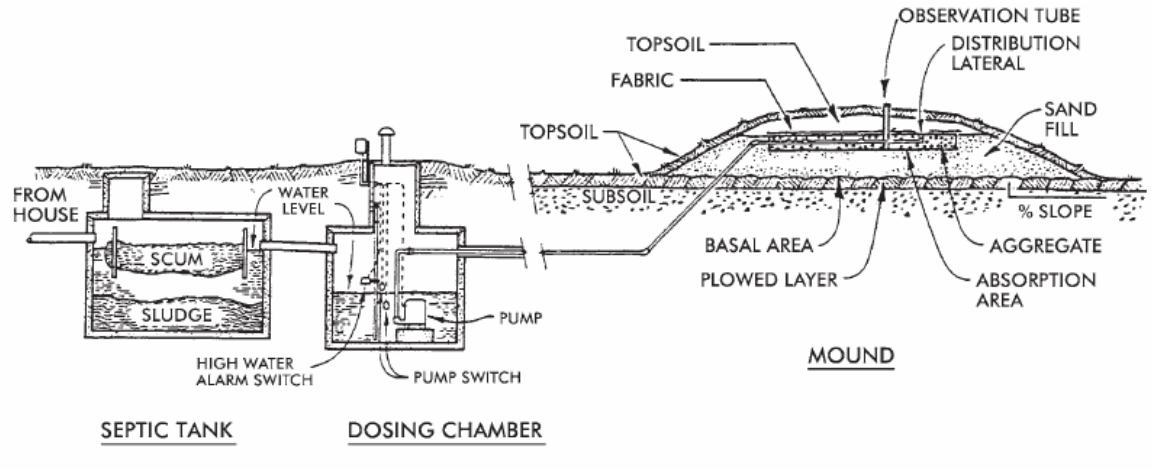
b. Possible Resolutions

Existing System Modifications

The questionnaire data, along with using the TDEC regulations to calculate appropriate septic tank capacities and field line lengths revealed that only 12 of the 22 respondents with insufficient septic tanks or field lines were experiencing problems. The soil testing and web soil survey revealed that 68% of the soil in the Cotton Creek area is considered "red lined", not suitable for a septic system. The issue is not one that can be fixed by repairing, moving or adding length to the existing field lines.

Wisconsin Mounds

Below is a cross sectional view of a typical Wisconsin Mound system (EPA Decentralize Systems Fact Sheet Mound Systems).



For a typical gravity septic system using field leach lines for disposing of wastewater, the ground must perk in the range of 10 min/inch to 75 min/inch to a minimum depth of 48" below the ground surface. Also, the water table level and any rock or hard, impenetrable clay layers must be a minimum of 48" below the bottom of the installed field lines. If any of these conditions cannot be met, the use of a mound system can be made to design around these constraints. However, if the virgin soils will not achieve perk rates which are acceptable for use with a standard leach field, then a mound system cannot be used either.

With a mound system, a minimum of 24" soil depth over any underlying restrictive layer and/or water must be available. A bed of sand can then be constructed in the area chosen for the disposal system to make up the difference between the restrictive layer or ground water elevations in order to meet the 48" minimum requirement. As an example, if the underlying restrictive is at the minimum 24" level, then the sand filter depth will have to be 24". If the restrictive layer is at 36", then the sand depth will have to be 12". The 12" depth is the minimum depth of sand allowed in any case.

The size of the mound is determined by the characteristics of the receiving soils, just as is a standard leach field. Multiple mounds can be constructed to achieve the required soil absorption area up to a total of ten mounds. However, a 100% reserve area must be set aside for future relocation of the system if the initial system fails.

The disadvantages of mound systems are:

1. They are typically 3-4 times the cost of a standard septic system with gravity field lines.
2. They are unsightly since they are above ground installations. It is possible to add landscaping to make the area more appealing.
3. If not properly designed, they can allow untreated water to seep from the sand at the ground level.

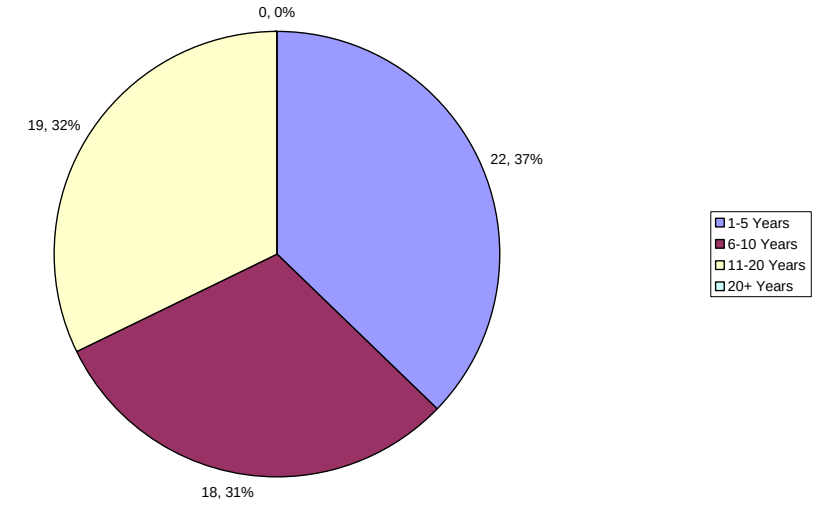
As stated previously, 68% of the study area has been determined to be unsuitable for sub-surface septic systems. Therefore, 68% of the study area is also eliminated as an option for Wisconsin Mound systems. Much additional field investigations would be necessary to determine locations that are candidates for Wisconsin Mounds. For

discussion purposes, assume the additional field investigations are approved. Also for discussion, now assume that 15 lots have been identified as Wisconsin Mound candidates. The problem for the other lots would still have to be addressed with either the STEG/STEG Re-circulating Sand Filter or conventional gravity/pressure systems.

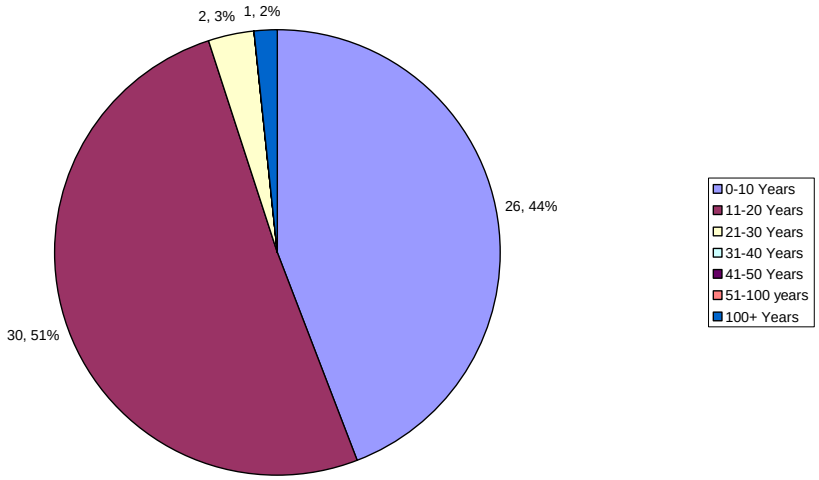
For this reason, the Design Team recommends proceeding to Phase II of the project to investigate alternatives that would serve the entire study area such as STEP/STEG Re-circulating sand filters or conventional gravity/pressure systems conveying to the Shelton Road Waste Water Treatment Plant.

APPENDIX A

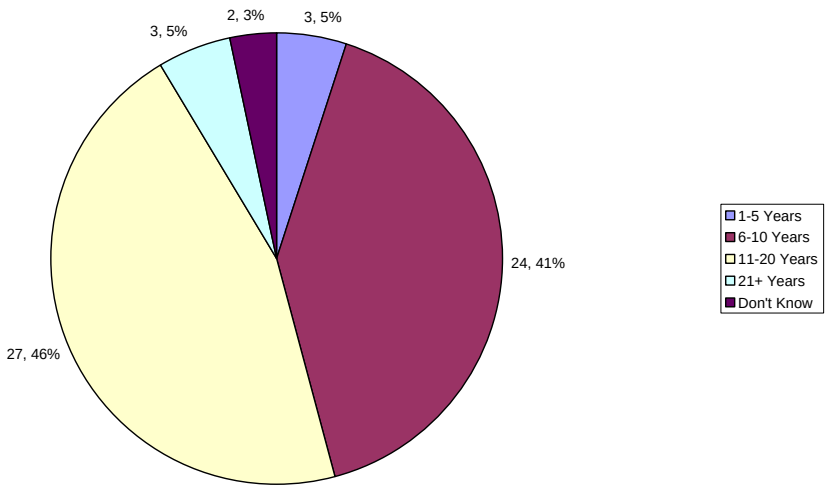
Years at Address



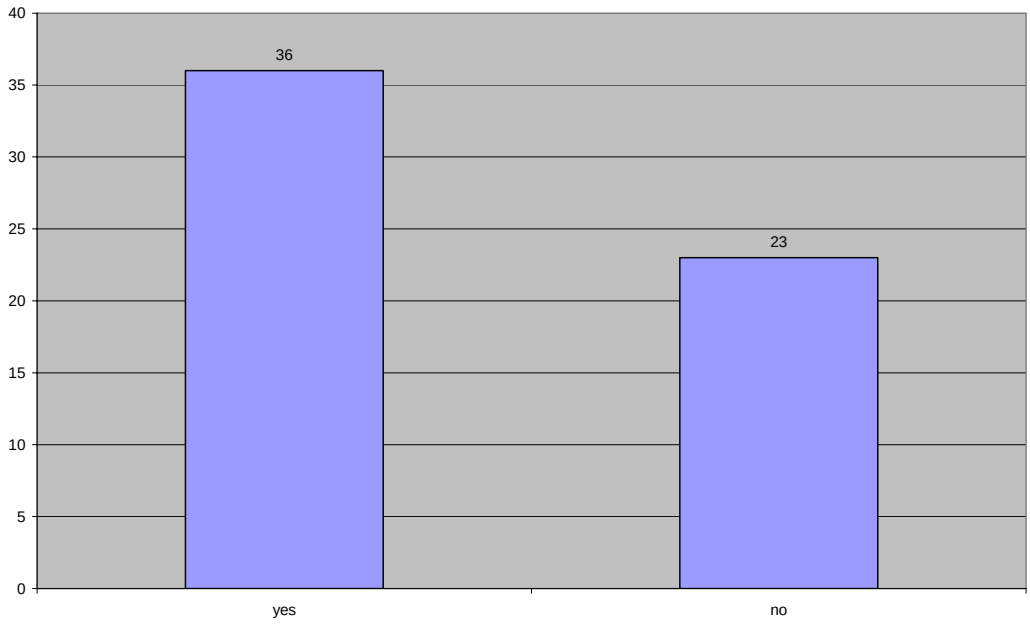
Age of Home



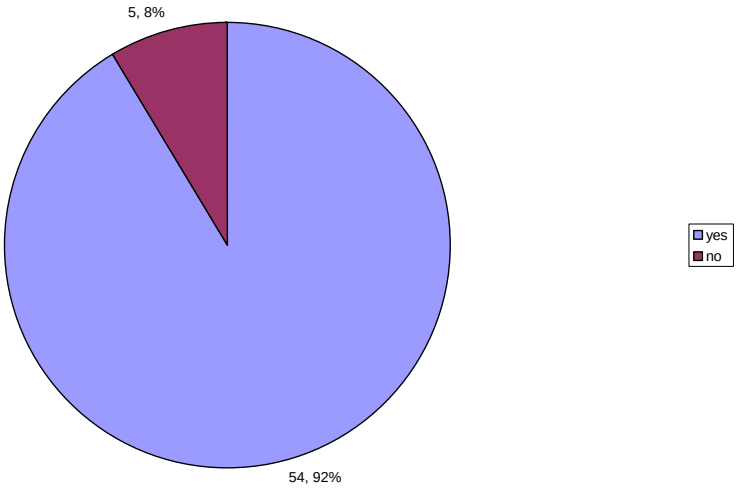
Age of Septic Tank



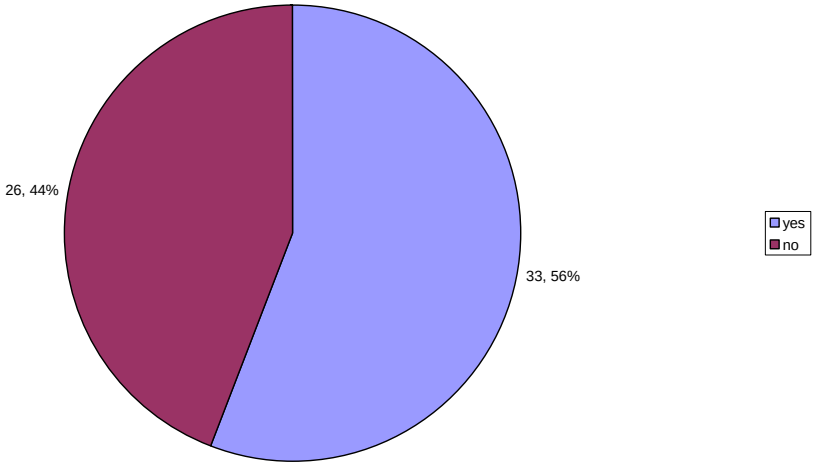
Problems with Septic System?

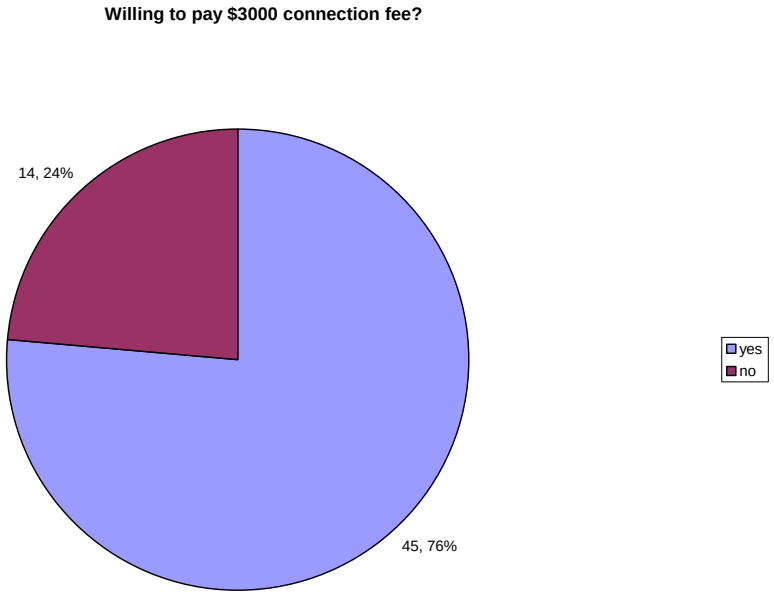


Is a public sewage collection system needed in your area?

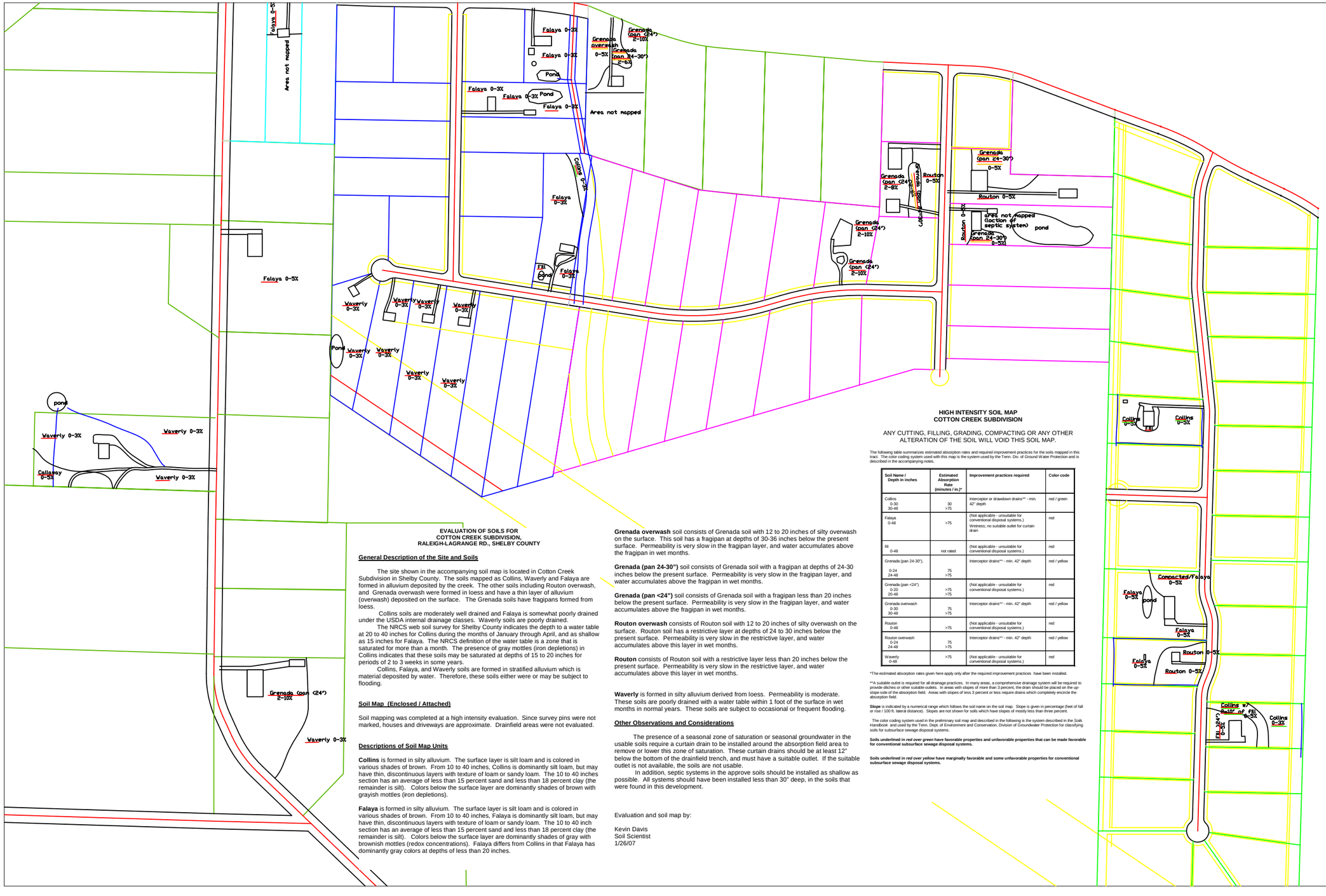


Willing to pay $65 to $130 per month?




Willing to pay $3000 connection fee?
14, 24%
45, 76%
yes
no

APPENDIX B



HIGH INTENSITY SOIL MAP
COTTON CREEK SUBDIVISION

ANY CUTTING, FILLING, GRADING, COMPACTING OR ANY OTHER ALTERATION OF THE SOIL WILL VOID THIS SOIL MAP.

The following table summarizes estimated absorption rates and required improvement practices for the soils mapped in this tract. The color coding system used with this map is the system used by the Tenn. Div. of Ground Water Protection and is described in the accompanying notes.

Soil Name / Depth in inches	Estimated Absorption Rate (minutes / in.)*	Improvement practices required	Color code
Collins 0-30 30-48	 30 >75	Interceptor or drawdown drains** - min. 42" depth	red / green
Falaya 0-48	>75	(Not applicable - unsuitable for conventional disposal systems.) Wetness; no suitable outlet for curtain drain	red
fill 0-48	not rated	(Not applicable - unsuitable for conventional disposal systems.)	red
Grenada (pan 24-30"), 0-24 24-48	 75 >75	Interceptor drains** - min. 42" depth	red / yellow
Grenada (pan <24") 0-20 20-48	 >75 >75	(Not applicable - unsuitable for conventional disposal systems.)	red
Grenada overwash 0-30 30-48	 75 >75	Interceptor drains** - min. 42" depth	red / yellow
Routon 0-48	>75	(Not applicable - unsuitable for conventional disposal systems.)	red
Routon overwash 0-24 24-48	 75 >75	Interceptor drains** - min. 42" depth	red / yellow
Waverly 0-48	>75	(Not applicable - unsuitable for conventional disposal systems.)	red

*The estimated absorption rates given here apply only after the required improvement practices have been installed.

**A suitable outlet is required for all drainage practices. In many areas, a comprehensive drainage system will be required to provide ditches or other suitable outlets. In areas with slopes of more than 3 percent, the drain should be placed on the up-slope side of the absorption field. Areas with slopes of less 3 percent or less require drains which completely encircle the absorption field.

Slope is indicated by a numerical range which follows the soil name on the soil map. Slope is given in percentage (feet of fall or rise / 100 ft. lateral distance). Slopes are not shown for soils which have slopes of mostly less than three percent.

The color coding system used in the preliminary soil map and described in the following is the system described in the *Soils Handbook* and used by the Tenn. Dept. of Environment and Conservation, Division of Groundwater Protection for classifying soils for subsurface sewage disposal systems.

Soils underlined in *red over green* have favorable properties and unfavorable properties that can be made favorable for conventional subsurface sewage disposal systems.

Soils underlined in *red over yellow* have marginally favorable and some unfavorable properties for conventional subsurface sewage disposal systems.

EVALUATION OF SOILS FOR
COTTON CREEK SUBDIVISION,
RALEIGH-LAGRANGE RD., SHELBY COUNTY

General Description of the Site and Soils

The site shown in the accompanying soil map is located in Cotton Creek Subdivision in Shelby County. The soils mapped as Collins, Waverly and Falaya are formed in alluvium deposited by the creek. The other soils including Routon overwash, and Grenada overwash were formed in loess and have a thin layer of alluvium (overwash) deposited on the surface. The Grenada soils have fragipans formed from loess.

Collins soils are moderately well drained and Falaya is somewhat poorly drained under the USDA internal drainage classes. Waverly soils are poorly drained.

The NRCS web soil survey for Shelby County indicates the depth to a water table at 20 to 40 inches for Collins during the months of January through April, and as shallow as 15 inches for Falaya. The NRCS definition of the water table is a zone that is saturated for more than a month. The presence of gray mottles (iron depletions) in Collins indicates that these soils may be saturated at depths of 15 to 20 inches for periods of 2 to 3 weeks in some years.

Collins, Falaya, and Waverly soils are formed in stratified alluvium which is material deposited by water. Therefore, these soils either were or may be subject to flooding.

Soil Map (Enclosed / Attached)

Soil mapping was completed at a high intensity evaluation. Since survey pins were not marked, houses and driveways are approximate. Drainfield areas were not evaluated.

Descriptions of Soil Map Units

Collins is formed in silty alluvium. The surface layer is silt loam and is colored in various shades of brown. From 10 to 40 inches, Collins is dominantly silt loam, but may have thin, discontinuous layers with texture of loam or sandy loam. The 10 to 40 inches section has an average of less than 15 percent sand and less than 18 percent clay (the remainder is silt). Colors below the surface layer are dominantly shades of brown with grayish mottles (iron depletions).

Falaya is formed in silty alluvium. The surface layer is silt loam and is colored in various shades of brown. From 10 to 40 inches, Falaya is dominantly silt loam, but may have thin, discontinuous layers with texture of loam or sandy loam. The 10 to 40 inch section has an average of less than 15 percent sand and less than 18 percent clay (the remainder is silt). Colors below the surface layer are dominantly shades of gray with brownish mottles (redox concentrations). Falaya differs from Collins in that Falaya has dominantly gray colors at depths of less than 20 inches.

Grenada overwash soil consists of Grenada soil with 12 to 20 inches of silty overwash on the surface. This soil has a fragipan at depths of 30-36 inches below the present surface. Permeability is very slow in the fragipan layer, and water accumulates above the fragipan in wet months.

Grenada (pan 24-30") soil consists of Grenada soil with a fragipan at depths of 24-30 inches below the present surface. Permeability is very slow in the fragipan layer, and water accumulates above the fragipan in wet months.

Grenada (pan <24") soil consists of Grenada soil with a fragipan less than 20 inches below the present surface. Permeability is very slow in the fragipan layer, and water accumulates above the fragipan in wet months.

Routon overwash consists of Routon soil with 12 to 20 inches of silty overwash on the surface. Routon soil has a restrictive layer at depths of 24 to 30 inches below the present surface. Permeability is very slow in the restrictive layer, and water accumulates above this layer in wet months.

Routon consists of Routon soil with a restrictive layer less than 20 inches below the present surface. Permeability is very slow in the restrictive layer, and water accumulates above this layer in wet months.

Waverly is formed in silty alluvium derived from loess. Permeability is moderate. These soils are poorly drained with a water table within 1 foot of the surface in wet months in normal years. These soils are subject to occasional or frequent flooding.

Other Observations and Considerations

The presence of a seasonal zone of saturation or seasonal groundwater in the usable soils require a curtain drain to be installed around the absorption field area to remove or lower this zone of saturation. These curtain drains should be at least 12" below the bottom of the drainfield trench, and must have a suitable outlet. If the suitable outlet is not available, the soils are not usable.

In addition, septic systems in the approve soils should be installed as shallow as possible. All systems should have been installed less than 30" deep, in the soils that were found in this development.

Evaluation and soil map by:

Kevin Davis
Soil Scientist
1/26/07

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NO.	DESCRIPTION	DATE

FILE NAME:

DATE:

DRAWN: CHECKED:

SHEET TITLE:

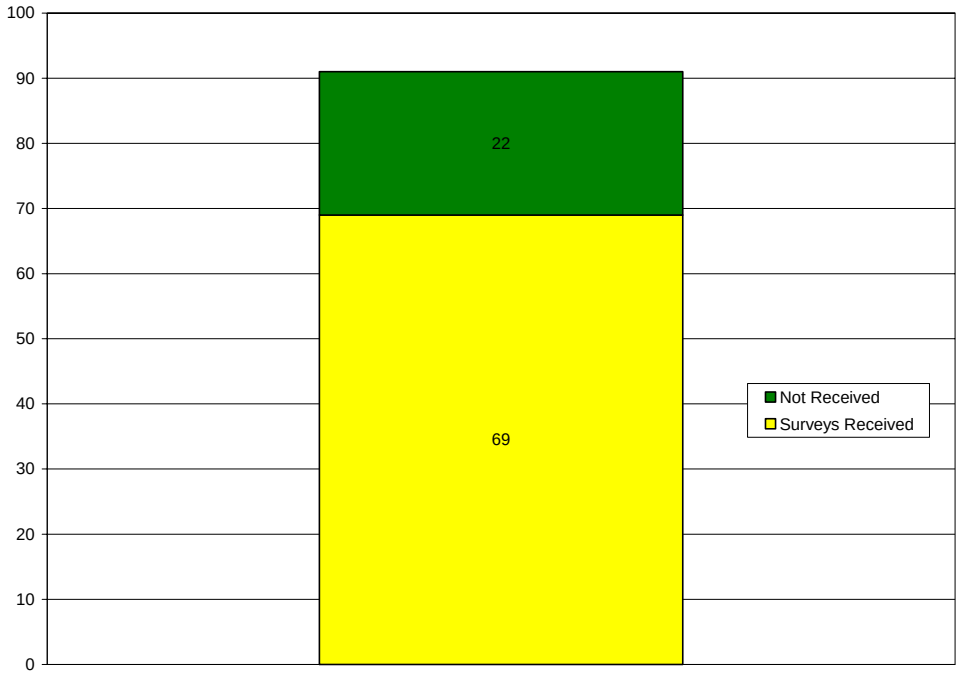
SCALE:

SHEET NO.:

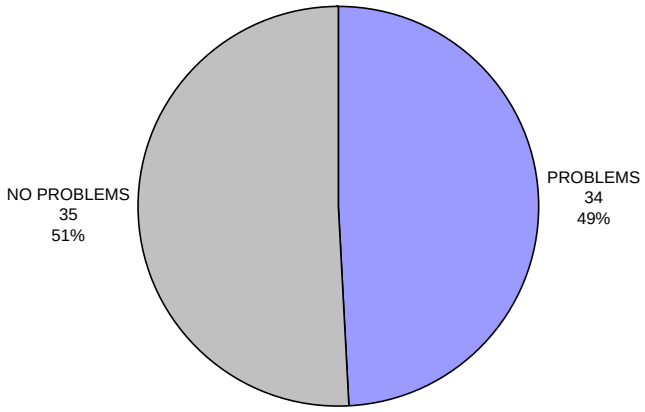
OF

Follow up Questionnaire Results

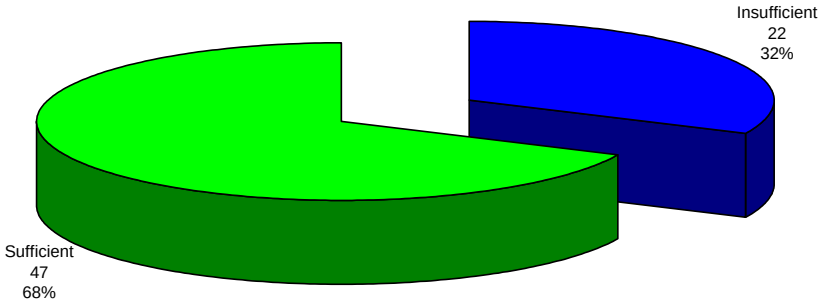
Cotton Creek Sewer Study



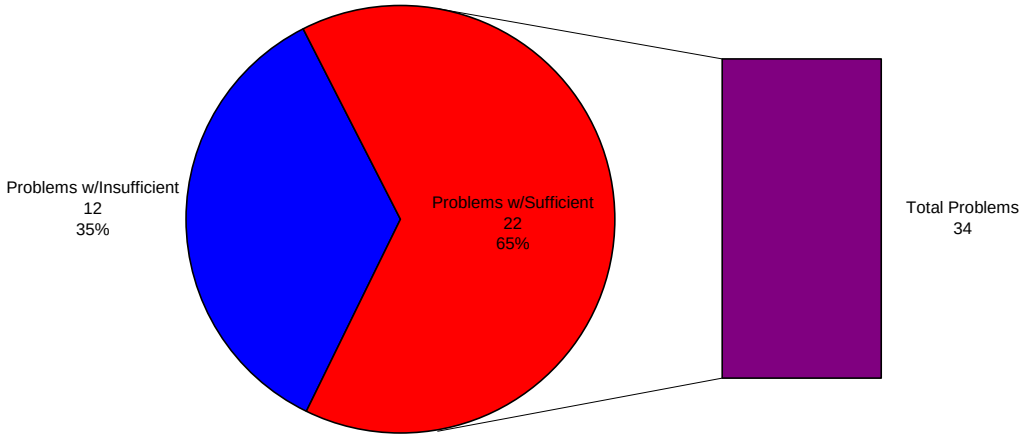
Cotton Creek Sewer Study
Problems Reported by Surveys Received



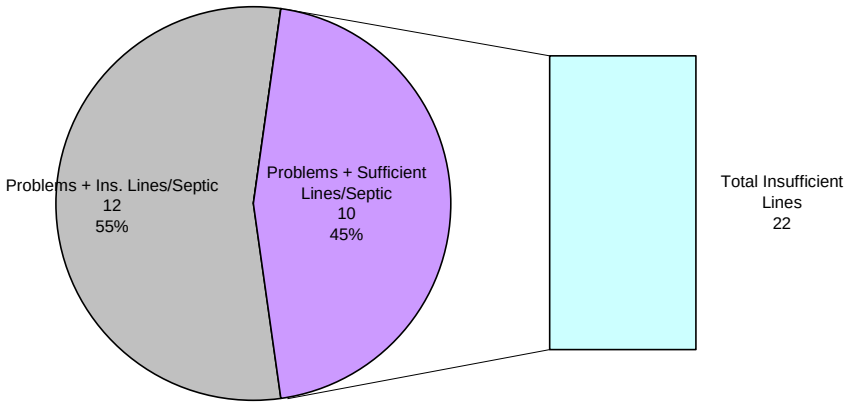
Cotton Creek Sewer Study
Out of Surveys Received Insufficient Lines and/or Septic



Cotton Creek Sewer Study
Problems Reported with Insufficient Lines and/or Septic System



Cotton Creek Sewer Study
Insufficient Lines and or Septic




Cotton Creek-West side ditch looking North


12161 Raliegh LaGrange Rd -Field Lines


12401 Fox Lair-sewage seeping to ground


12401 Fox Lair-Backyard looking Southeast


12401 Fox Lair-Backyard looking South


12401 Fox Lair-Backyard looking North


12401 Fox Lair-Back fence line looking East


12265 Fox Lair-Front yard looking South


12265 Fox Lair-Front yard looking East


12245 Fox Lair-west side of house


12245 Fox Lair-green grass where sewage has leaked


12245 Fox Lair-Field lines


12245 Fox Lair-drain pipe that excess sewage come…


12245 Fox Lair-Backyard looking South (tree line)


12245 Fox Lair-Backyard Looking South


12245 Fox Lair


12215 Fox Lair-Under TVA lines


12215 Fox Lair- SW Backyard ditch


12215 Fox Lair- NW Backyard


12215 Fox Lair


801 Cold Creek- South sinkhole on West end of pr…


801 Cold Creek- South Look at Fied lines


801 Cold Creek- SE backyard (1)


801 Cold Creek- SE backyard


755 Cold Creek-Backyard looking West


755 Cold Creek-Backyard looking South


755 Cold Creek-Backyard looking North


755 Cold Creek-Backyard looking East


12401 Fox Lair-Sewage seeping to ground 2


650 Cotton Creek slope south side of house


650 Cotton Creek- Septic Tank cap


650 Cotton Creek-Full back yard


650 Cotton Creek-North front yard


650 Cotton Creek-Slope South side of house


650 Cotton Creek-South front yard


670 Cotton Creek looking North (slope on North side)


670 Cotton Creek-North side front yard


675 Cotton Creek-South side front yard (where field line…


745 S Collierville-Arlington Rd-Backyard looking East


745 S Collierville-Arlington Rd-Field lines


745 S Collierville-Arlington Rd-Previous sewage seepi…


745 S Collierville-Arlington Rd-Septic Tank pipe


750 Cotton Creek-Culvert installed under driveway


750 Cotton Creek-Ditch running by South side of h…


750 Cotton Creek-Field lines 2


750 Cotton Creek-Field lines


750 Cotton Creek-S side field lines


750 Cotton Creek-S side of house (sewage in water b…


750 Cotton Creek-South side water back up (sewage in it)


815 Cold Creek-Field Lines looking east backyard


815 Cold Creek-gray water pumped from field lines wh…


815 Cold Creek-Pump on E side of Field lines


815 Cold Creek-Septic Cap


881 Cold Creek-Ditch on back of property


881 Cold Creek-Field lines in Front yard (NE corner of lot)


881 Cold Creek-N side ditch looking E


881 Cold Creek-Pond drains to back ditch


881 Cold Creek-Pond


881 Cold Creek-S side ditch front yard

Terra Lift Information

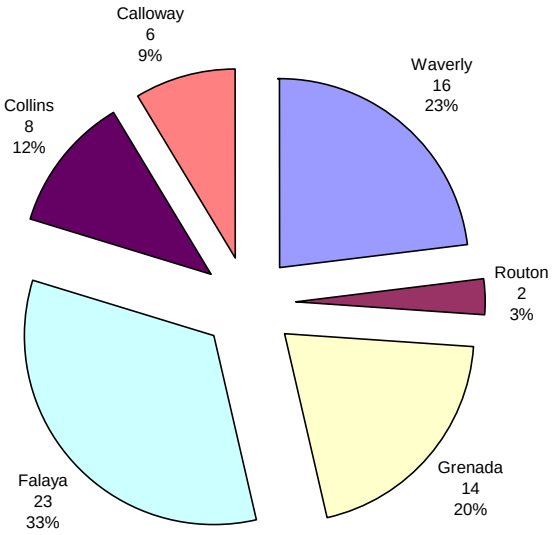
If Your System Fails
In quite a few cases, a tune-up can fix your failing septic system and you can avoid the high costs of replacing the system. This tuneup includes properly pumping the tank, cleaning (jetting) the drainfield lines, and installing washing machine and effluent filters. If these measures are not sufficient, some failed systems can be rejuvenated by fracturing the soil. This process (Terra Lift) utilizes a hollow tube inserted into the soil, then a 300 pound blast or air is injected into the soil creating thousands of tiny fissures. These fissures allow the drainfield to drain, creating an oxygen atmosphere and the aerobic bacterial colonies to repopulate. Aerobic bacteria, which require oxygen, typically live in the top 26 inches of the drainfield and process waste much more quickly than anaerobic bacteria. This process can be performed in a matter of hours with no digging or damage to the yard. One company which performs this service is Terra lift International (http://www.terraliftinternational.com). Please note that the Terra lift method is not legal in all states, and, while it has worked for many people in the past, there is no guarantee that it will work in your specific situation.

Source: http://www.laundry-alternative.com/terra_lift.htm

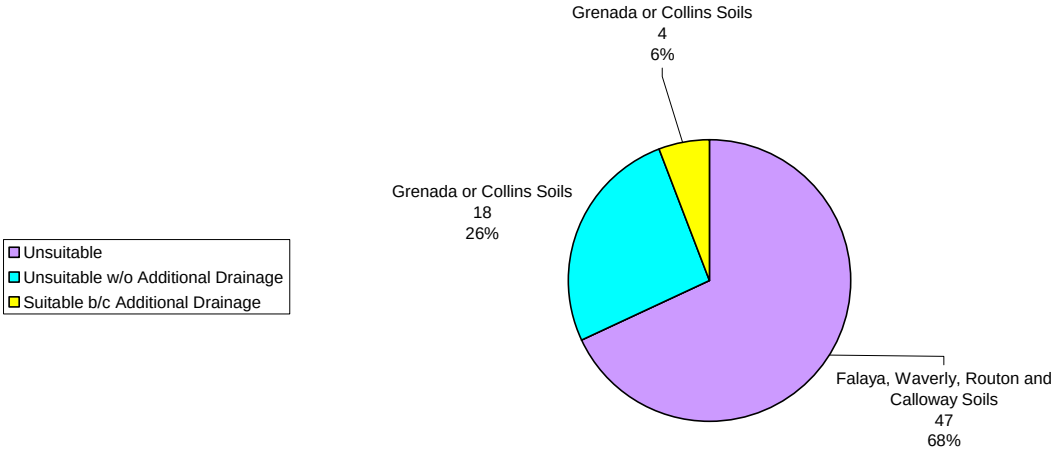
Appendix C

Property Address		Owner
801	Cold Creek Cove	Carolyn Jackson
881	Cold Creek Cove	Daniel & Beverly Sobolewski
905	Cold Creek Cove	George & Mary Cathey
956	Cold Creek Cove	Mauro & Lisa Gozzo
710 S	Collierville-Arlington Road	Robert & Donna Buckner
745 S	Collierville-Arlington Road	Bill & Joan Cowan
890 S	Collierville-Arlington Road	Clark & Beth Smeltzer
670	Cotton Creek Drive	Thomas & Renee Toth
675	Cotton Creek Drive	Michael & Elissa Mars
690	Cotton Creek Drive	Mike & Kim Scott
12209	Fox Lair Drive	Ann Mann
12215	Fox Lair Drive	Randolph & Janice Kruger
12235	Fox Lair Drive	Christopher & Susan Earl
12245	Fox Lair Drive	Terry & Rebecca Austin
12290	Fox Lair Drive	Kit & Anders Hanssen
12420	Fox Lair Drive	Joseph Mann
640	Green Level Road	Michael Billings
12285	Raleigh-LaGrange Road	Claudia Stinson-Turner & Glen Turner
12303	Raleigh-LaGrange Road	Jason & Jessica Sholtz

Soil Types
(Out of the 69 Responses)



Soil Suitablity
(Out of the 69 Responses)



Conventional Septic Field Lines

Soil Absorbtion Rates (Min/In)*		
Ca	Calloway	>75
Co	Collins	30
Fm	Falaya	45
Ga	Grenada	75
Ro	Routon	>75
Wv	Waverly	45

Abs. Rate Min/In	Absorbtion Area (SF/Bedroom)*
10	165
15	190
30	250
45	300
60	330
75	370

-No data on Existing system
-Tested Soils
-Unsuitable for Septic System
-Unsuitable without INTERCEPTOR Drain

Septic Tank Capacity*	
# of Bedrooms	*Capacity in Gallons*
2 or less	750
3	900
4[a]	1000

**Per TDEC Regulations To Govern Subsurface Sewage Disposal Systems (Septic Systems) Chapter 1200-1-*

[1] Type of Soil obtained from maps given off of USDA Natural Resources Conservation Service (National Cooperative Soil Survey) (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx)

[a] For each additional bedroom, add two hundred and fifty (250) gallons.

	Property Address		Owner	(Enter number and Hide Colum) Type of Soil	Type of Soil[1]	Soil Absorbtion* (Min/In)	Absorbtion Area* (SF/Bedroom)	Number of Bedrooms	Absorbtion Area* (SF)	Trench Width (FT)	Trench Factor*	Existing Field Lines (LF)	Calculated Field Lines* (LF)	Field Lines That Are Not Sufficient	Existing Septic Tank Capacity (GAL)	Calculated Septic Tank Capacity* (GAL)	Septic Tanks Not Sufficient	Problems (Y/N)	Repairs (Y/N)	Additional Drainage Improvements (Y/N)	Additional Drainage Improvements (Type)
1	971	Cold Creek Cove	Stephen & Leigh Sawicki	1	Ca	75	370	5	1850	6	1.5	600	463		1000	1250	X	N	N	Y	CURTIAN DRAIN
2	826 S	Collierville-Arlington Road	Red Sea L.L.C.	1	Ca	75	370	4	1480	3	1	502	493		1000	1000		N	N	N	
3	853 S	Collierville-Arlington Road	Mark & Chris Norris	1	Ca	75	370	3	1110	3	1		370		1000	900		N	N		
4	854 S	Collierville-Arlington Road	John & Virginia Livingston	1	Ca	75	370	3	1110	3	1		370		1000	900		N	N	N	
5	720	Cotton Creek Drive	Rodney & Elizabeth Jones	1	Ca	75	370	4	1480	3	1	600	493		1000	1000		Y	N	N	
6	730	Cotton Creek Drive	Michael & Charlene Davenport	1	Ca	75	370	4	1480	3	1	910	493		1000	1000		Y	Y	N	
7	750	Cold Creek Cove	James & Kelly Studstill	2	Co	30	250	4	1000	3	1	750	333		1000	1000		Y	N	N	
8	801	Cold Creek Cove	Carolyn Jackson	2	Co	30	250	5	1250	3	1	900	417		1000	1250	X	Y	Y	N	
9	810	Cold Creek Cove	Allen & Hollee Lott	2	Co	30	250	4	1000	3	1	765	333		1000	1000		Y	N	Y	CURTIAN DRAIN
10	830	Cold Creek Cove	Ricky & Rachel Wherry	2	Co	30	250	5	1250	3	1	600	417		1000	1250	X	Y	N	N	
11	916	Cold Creek Cove	Mark & Charee Metts	2	Co	30	250	4	1000	3	1	900	333		1000	1000		N	N	N	
12	936	Cold Creek Cove	Jay & Amberlee Snell	2	Co	30	250	4	1000	6	1.5	270	250		1000	1000		N	N	Y	CURTIAN DRAIN
13	956	Cold Creek Cove	Mauro & Lisa Gozzo	2	Co	30	250	4	1000	3	1	600	333		1000	1000		N	N	N	
14	12215	Raleigh-LaGrange Road	Richard & Sandra Rodgers	2	Co	30	250	5	1250	3	1	600	417		1000	1250	X	N	N	N	
15	755	Cold Creek Cove	Thomas & Rebecca Perusi	3	Fm	45	300	4	1200	3	1	600	400		1000	1000		Y	N	Y	INTERCEPTOR
16	770	Cold Creek Cove	Gary & Sheila Rapp	3	Fm	45	300	4	1200	3	1	600	400		1000	1000		Y	N	N	
17	790	Cold Creek Cove	Herschel & Birdie Stokes	3	Fm	45	300	5	1500	3	1	600	500		1000	1250	X	N	N	N	
18	815	Cold Creek Cove	Brian & Cheryl Gardner	3	Fm	45	300	5	1500	3	1	900	500		1000	1250	X	Y	Y	Y	CURTIAN DRAIN
19	881	Cold Creek Cove	Daniel & Beverly Sobolewski	3	Fm	45	300	4	1200	3	1	600	400		1000	1000		N	N	Y	CURTIAN DRAIN
20	890	Cold Creek Cove	John & Shelia Collins	3	Fm	45	300	5	1500	3	1	600	500		1000	1250	X	N	N	N	
21	993	Cold Creek Cove	Bradley & Melanie Bell	3	Fm	45	300	4	1200	3	1	600	400		1000	1000		N	N	Y	CURTIAN DRAIN
22	710 S	Collierville-Arlington Road	Robert & Donna Buckner	3	Fm	45	300	4	1200	3	1	600	400		1000	1000		N	N	N	
23	715	Cotton Creek Drive	Paul & Cynthia Vaughn	3	Fm	45	300	4	1200	6	1.5	425	300		1000	1000		N	N	N	
24	747	Cotton Creek Drive	Wesley & Katrina Scott	3	Fm	45	300	3	900	3	1		300		1000	900		N	N	N	
25	750	Cotton Creek Drive	William & Leah Clarke	3	Fm	45	300	5	1500	6	1.5	750	375		1000	1250	X	Y	N	N	
26	12275	Fox Lair Drive	Leonard & Linda Pitman	3	Fm	45	300	4	1200	3	1	600	400		1000	1000		Y	N	N	
27	12290	Fox Lair Drive	Kit & Anders Hanssen	3	Fm	45	300	5	1500	3	1	600	500		1000	1250	X	Y	N	N	
28	12295	Fox Lair Drive	Richard & Beverly Luck	3	Fm	45	300	4	1200	3	1	300	400	X	1035	1000		Y	Y	N	
29	12330	Fox Lair Drive	David & Dina Rylander	3	Fm	45	300	5	1500	3	1	1300	500		1000	1250	X	Y	Y	Y	
30	12331	Fox Lair Drive	Frank & Anne Abbadessa	3	Fm	45	300	3	900	3	1	870	300		1000	900		Y	Y	N	
31	12340	Fox Lair Drive	Joe & Pamela Opie	3	Fm	45	300	3	900	3	1	600	300		1000	900		Y	N	N	
32	12341	Fox Lair Drive	Larry & Betty Robertson	3	Fm	45	300	3	900	3	1	600	300		1000	900		N	N	N	
33	12360	Fox Lair Drive	Elaine & Robert Covin	3	Fm	45	300	4	1200	3	1	600	400		1000	1000		Y	N	N	
34	12380	Fox Lair Drive	Jeffrey & Deborah Bennett	3	Fm	45	300	4	1200	3	1	600	400		1000	1000		N	?	N	
35	640	Green Level Road	Michael Billings	3	Fm	45	300	4	1200	3	1	600	400		1000	1000		Y	Y		
36	660	Green Level Road	Rickey & Pamela Davis	3	Fm	45	300	3	900	3	1	600	300		1000	900		Y	Y		
37	12285	Raleigh-LaGrange Road	Claudia Stinson-Turner & Glen Turner	3	Fm	45	300	3	900	3	1	600	300		1000	900		Y	N		
38	685	Cold Creek Cove	Ed & Donna Mottern	4	Ga	75	370	5	1850	6	1.5	310	463	X	1000	1250	X	N	N	N	
39	707	Cold Creek Cove	Steve & Joyce Harrison	4	Ga	75	370	4	1480	6	1.5	330	370	X	1000	1000		N	N	N	
40	708	Cold Creek Cove	Garry & Patricia Greer	4	Ga	75	370	5	1850	3	1	600	617	X	1000	1250	X	Y	N	N	
41	731	Cold Creek Cove	Norman & Betty Wilson	4	Ga	75	370	5	1850	3	1	600	617	X	1000	1250	X	Y	N	Y	INTERCEPTOR
42	670 S	Collierville-Arlington Road	Carolyn Billings	4	Ga	75	370	3	1110	3	1	600	370		1000	900		N	N	N	
43	890 S	Collierville-Arlington Road	Clark & Beth Smeltzer	4	Ga	75	370	6	2220	3	1	600	740	X	1000	1500	X	N	N	N	
44	650	Cotton Creek Drive	John & Michelle Leatherwood	4	Ga	75	370	5	1850	3	1	600	617	X	1000	1250	X	Y	Y	N	
45	655	Cotton Creek Drive	McClinton & Alexandrina Jagers	4	Ga	75	370	4	1480	3	1	550	493		1000	1000		N	N	N	
46	670	Cotton Creek Drive	Thomas & Renee Toth	4	Ga	75	370	4	1480	3	1	600	493		1000	1000		N	Y	N	
47	675	Cotton Creek Drive	Michael & Elissa Mars	4	Ga	75	370	4	1480	3	1	600	493		1000	1000		N	N	N	
48	12400	Fox Lair Drive	Laverne Lamphere	4	Ga	75	370	3	1110	3	1	520	370		1000	900		N	N	N	
49	12420	Fox Lair Drive	Joseph Mann	4	Ga	75	370	5	1850	3	1	600	617	X	1000	1250	X	N	N	N	
50	12303	Raleigh-LaGrange Road	Jason & Jessica Sholtz	4	Ga	75	370	3	1110	3	1		370		1000	900		N	N	N	
51	12337	Raleigh-LaGrange Road	David & Regina Scott	4	Ga	75	370	4	1480	3	1	500	493		1000	1000		N	N	Y	French Drain ?
52	745 S	Collierville-Arlington Road	Bill & Joan Cowan	6	Wv	45	300	3	900	3	1	1185	300		1000	900		Y	Y	N	
53	12209	Fox Lair Drive	Ann Mann	6	Wv	45	300	4	1200	3	1		400		1000	1000		Y	N	N	
54	12215	Fox Lair Drive	Randolph & Janice Kruger	6	Wv	45	300	4	1200	6	1.5	380	300		1000	1000		Y	N	N	
55	12235	Fox Lair Drive	Christopher & Susan Earl	6	Wv	45	300	4	1200	3	1	900	400		1000	1000		Y	Y	N	
56	12245	Fox Lair Drive	Terry & Rebecca Austin	6	Wv	45	300	4	1200	3	1		400		1000	1000		Y	Y	N	
57	12265	Fox Lair Drive	Cecil & Carla Roberts	6	Wv	45	300	4	1200	3	1	730	400		1000	1000		Y	N	N	
58	12381	Fox Lair Drive	Michael & Marcia Whitehorn	6	Wv	45	300	5	1500	3	1	800	500		1000	1250	X	N	N	N	
59	12401	Fox Lair Drive	Chris & Shadi Johnson	6	Wv	45	300	4	1200	3	1	600	400		1000	1000		Y	N	N	
60	645	Green Level Road	Phillip & Delores Jobe	6	Wv	45	300	3	900	3	1	500	300		1000	900		N	N	N	
61	655	Green Level Road	Timothy & Julie Kelly	6	Wv	45	300	4	1200	3	1	730	400		1000	1000		N	N	N	
62	675	Green Level Road	Darryle Carter	6	Wv	45	300	4	1200	3	1		400		1000	1000		N	Y	N	
63	701	Green Level Road	Paul & Pamela Hyde	6	Wv	45	300	6	1800	3	1	600	600		1000	1500	X	N	Y		
64	710	Green Level Road	Robert & Sherry Vowell	6	Wv	45	300	3	900	3	1	500	300		1000	900		Y	Y	N	
65	12151	Raleigh-LaGrange Road	Mark & Ethylynne Wagner	6	Wv	45	300	4	1200	3	1	800	400		1000	1000		N	N	N	
66	12161	Raleigh-LaGrange Road	Richard & Charlene Franks	6	Wv	45	300	5	1500	3	1	400	500	X	1000	1250	X	Y	Y	Y	CURTIAN DRAIN
67	12171	Raleigh-LaGrange Road	Randy Martin	6	Wv	45	300	3	900	3	1		300		1000	900		Y	N	N	
68	905	Cold Creek Cove	George & Mary Cathey	7	Ro	75	370	4	1480	6	1.5	330	370	X	1000	1000		Y	N	Y	CURTIAN DRAIN
69	690	Cotton Creek Drive	Mike & Kim Scott	7	Ro	75	370	3	1110	3	1	600	370		1000	900		N	N	N	

Conventional Septic Field Lines

	Soil Absorbtion Rates (Min/In)[1]		
1	Ca	Calloway	>75
2	Co	Collins	30
3	Fm	Falaya	45
4	Ga	Grenada	75
5	He	Henry	30
6	Wv	Waverly	45
7	Ro	Routon	>75

Abs. Rate Min/In	Absorbtion Area (SF/Bedroom)*
10	165
15	190
30	250
45	300
60	330
75	370

-No data on Existing systerr
-Ca and Ro soils (only used 75 min/in absorbtion rate and it could be greater.)
-Tested Soils

Septic Tank Capacity*	
# of Bedrooms	*Capacity in Gallons*
2 or less	750
3	900
4[a]	1000

Large Diameter Graveless Septic Systems

	Property Address	Owner	Pipe Size (inches)	Trench Length* (LF/Bedroom)	Calculated Field Lines* (LF)	Calculated Septic Tank Capacity* (GAL)
1	12209	Fox Lair Drive	Ann Mann	8	150	600	900
2	12245	Fox Lair Drive	Terry & Rebecca Austin	8	150	600	1250
3	12171	Raleigh-LaGrange Roac	Randy Martin	8	125	375	#REF!

*Per TDEC Regulations To Govern Subsurface Sewage Disposal Systems (Septic Systems) Chapter 1200-1-
[1] Type of Soil obtained from maps given off of USDA Natural Resources Conservation Service (National Cooperative Soil Survey) (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx)
[a] For each additional bedroom, add two hundred and fifty (250) gallons.

	Property Address		Owner	Type of Soil[1]	Soil Absorbtion* (Min/In)	Absorbtion Area* (SF/Bedroom)	Number of Bedrooms	Absorbtion Area* (SF)	Trench Width (FT)	Trench Factor*	Existing Field Lines (LF)	Calculated Field Lines* (LF)	Field Lines That Are Not Sufficient	Existing Septic Tank Capacity (GAL)	Calculated Septic Tank Capacity* (GAL)	Septic Tanks Not Sufficient	Problems (Y/N)	Repairs (Y/N)	Additional Drainage Improvements (Y/N)	Additional Drainage Improvements (Type)
1	685	Cold Creek Cove	Ed & Donna Mottern	Ga	75	370	5	1850	6	1.5	310	463	X	1000	1250	X	N	N	N	
2	707	Cold Creek Cove	Steve & Joyce Harrison	Ga	75	370	4	1480	6	1.5	330	370	X	1000	1000		N	N	N	
3	708	Cold Creek Cove	Garry & Patricia Greer	Ga	75	370	5	1850	3	1	600	617	X	1000	1250	X	Y	N	N	
4	731	Cold Creek Cove	Norman & Betty Wilson	Ga	75	370	5	1850	3	1	600	617	X	1000	1250	X	Y	N	Y	INTERCEPTOR
5	750	Cold Creek Cove	James & Kelly Studstill	Co	30	250	4	1000	3	1	750	333		1000	1000		Y	N	N	
6	755	Cold Creek Cove	Thomas & Rebecca Perusi	Fm	45	300	4	1200	3	1	600	400		1000	1000		Y	N	Y	INTERCEPTOR
7	770	Cold Creek Cove	Gary & Sheila Rapp	Fm	45	300	4	1200	3	1	600	400		1000	1000		Y	N	N	
8	790	Cold Creek Cove	Herschel & Birdie Stokes	Fm	45	300	5	1500	3	1	600	500		1000	1250	X	N	N	N	
9	801	Cold Creek Cove	Carolyn Jackson	Co	30	250	5	1250	3	1	900	417		1000	1250	X	Y	Y	N	
10	810	Cold Creek Cove	Allen & Hollee Lott	Co	30	250	4	1000	3	1	765	333		1000	1000		Y	N	Y	CURTIAN DRAIN
11	815	Cold Creek Cove	Brian & Cheryl Gardner	Fm	45	300	5	1500	3	1	900	500		1000	1250	X	Y	Y	Y	CURTIAN DRAIN
12	830	Cold Creek Cove	Ricky & Rachel Wherry	Co	30	250	5	1250	3	1	600	417		1000	1250	X	Y	N	N	
13	981	Cold Creek Cove	Daniel & Beverly Sobolewski	Fm	45	300	4	1200	3	1	600	400		1000	1000		N	N	Y	CURTIAN DRAIN
14	890	Cold Creek Cove	John & Shelia Collins	Fm	45	300	5	1500	3	1	600	500		1000	1250	X	N	N	N	
15	905	Cold Creek Cove	George & Mary Cathey	Ro	75	370	4	1480	6	1.5	330	370	X	1000	1000		Y	N	Y	CURTIAN DRAIN
16	916	Cold Creek Cove	Mark & Charee Metts	Co	30	250	4	1000	3	1	900	333		1000	1000		N	N	N	
17	936	Cold Creek Cove	Jay & Amberlee Snell	Co	30	250	4	1000	6	1.5	270	250		1000	1000		N	N	Y	CURTIAN DRAIN
18	956	Cold Creek Cove	Mauro & Lisa Gozzo	Co	30	250	4	1000	3	1	600	333		1000	1000		N	N	N	
19	971	Cold Creek Cove	Stephen & Leigh Sawicki	Ca	75	370	5	1850	6	1.5	600	463		1000	1250	X	N	N	Y	CURTIAN DRAIN
20	993	Cold Creek Cove	Bradley & Melanie Bell	Fm	45	300	4	1200	3	1	600	400		1000	1000		N	N	Y	CURTIAN DRAIN
21	670 S	Collierville-Arlington Road	Carolyn Billings	Ga	75	370	3	1110	3	1	600	370		1000	900		N	N	N	
22	710 S	Collierville-Arlington Road	Robert & Donna Buckner	Fm	45	300	4	1200	3	1	600	400		1000	1000		N	N	N	
23	745 S	Collierville-Arlington Road	Bill & Joan Cowan	Wv	45	300	3	900	3	1	1185	300		1000	900		Y	Y	N	
24	926 S	Collierville-Arlington Road	Red Sea L.L.C.	Ca	75	370	4	1480	3	1	502	493		1000	1000		N	N	N	
25	953 S	Collierville-Arlington Road	Mark & Chris Norris	Ca	75	370	3	1110	3	1		370		1000	900		N	N		
26	954 S	Collierville-Arlington Road	John & Virginia Livingston	Ca	75	370	3	1110	3	1		370		1000	900		N	N	N	
27	990 S	Collierville-Arlington Road	Clark & Beth Smeltzer	Ga	75	370	6	2220	3	1	600	740	X	1000	1500	X	N	N	N	
28	650	Cotton Creek Drive	John & Michelle Leatherwood	Ga	75	370	5	1850	3	1	600	617	X	1000	1250	X	Y	Y	N	
29	655	Cotton Creek Drive	McClinton & Alexandrina Jagers	Ga	75	370	4	1480	3	1	550	493		1000	1000		N	N	N	
30	670	Cotton Creek Drive	Thomas & Renee Toth	Ga	75	370	4	1480	3	1	600	493		1000	1000		N	Y	N	
31	675	Cotton Creek Drive	Michael & Elissa Mars	Ga	75	370	4	1480	3	1	600	493		1000	1000		N	N	N	
32	690	Cotton Creek Drive	Mike & Kim Scott	Ro	75	370	3	1110	3	1	600	370		1000	900		N	N	N	
33	715	Cotton Creek Drive	Paul & Cynthia Vaughn	Fm	45	300	4	1200	6	1.5	425	300		1000	1000		N	N	N	
34	720	Cotton Creek Drive	Rodney & Elizabeth Jones	Ca	75	370	4	1480	3	1	600	493		1000	1000		Y	N	N	
35	730	Cotton Creek Drive	Michael & Charlene Davenport	Ca	75	370	4	1480	3	1	910	493		1000	1000		Y	Y	N	
36	747	Cotton Creek Drive	Wesley & Katrina Scott	Fm	45	300	3	900	3	1		300		1000	900		N	N	N	
37	750	Cotton Creek Drive	William & Leah Clarke	Fm	45	300	5	1500	6	1.5	750	375		1000	1250	X	Y	N	N	
38	12209	Fox Lair Drive	Ann Mann				4		3	1				1000	1000		Y	N	N	
39	12215	Fox Lair Drive	Randolph & Janice Kruger	Wv	45	300	4	1200	6	1.5	380	300		1000	1000		Y	N	N	
40	12235	Fox Lair Drive	Christopher & Susan Earl	Wv	45	300	4	1200	3	1	900	400		1000	1000		Y	Y	N	
41	12245	Fox Lair Drive	Terry & Rebecca Austin				4		3	1				1000	1000		Y	Y	N	
42	12265	Fox Lair Drive	Cecil & Carla Roberts	Wv	45	300	4	1200	3	1	730	400		1000	1000		Y	N	N	
43	12275	Fox Lair Drive	Leonard & Linda Pitman	Fm	45	300	4	1200	3	1	600	400		1000	1000		Y	N	N	
44	12290	Fox Lair Drive	Kit & Anders Hanssen	Fm	45	300	5	1500	3	1	600	500		1000	1250	X	Y	N	N	
45	12295	Fox Lair Drive	Richard & Beverly Luck	Fm	45	300	4	1200	3	1	300	400	X	1035	1000		Y	Y	N	
46	12330	Fox Lair Drive	David & Dina Rylander	Fm	45	300	5	1500	3	1	1300	500		1000	1250	X	Y	Y	Y	
47	12331	Fox Lair Drive	Frank & Anne Abbadessa	Fm	45	300	3	900	3	1	870	300		1000	900		Y	Y	N	
48	12340	Fox Lair Drive	Joe & Pamela Opie	Fm	45	300	3	900	3	1	600	300		1000	900		Y	N	N	
49	12341	Fox Lair Drive	Larry & Betty Robertson	Fm	45	300	3	900	3	1	600	300		1000	900		N	N	N	
50	12360	Fox Lair Drive	Elaine & Robert Covin	Fm	45	300	4	1200	3	1	600	400		1000	1000		Y	N	N	
51	12380	Fox Lair Drive	Jeffrey & Deborah Bennett	Fm	45	300	4	1200	3	1	600	400		1000	1000		N	?	N	
52	12381	Fox Lair Drive	Michael & Marcia Whitehorn	Wv	45	300	5	1500	3	1	800	500		1000	1250	X	N	N	N	
53	12400	Fox Lair Drive	Laverne Lamphere	Ga	75	370	3	1110	3	1	520	370		1000	900		N	N	N	
54	12401	Fox Lair Drive	Chris & Shadi Johnson	Wv	45	300	4	1200	3	1	600	400		1000	1000		Y	N	N	
55	12420	Fox Lair Drive	Joseph Mann	Ga	75	370	5	1850	3	1	600	617	X	1000	1250	X	N	N	N	
56	640	Green Level Road	Michael Billings	Fm	45	300	4	1200	3	1	600	400		1000	1000		Y	Y		
57	645	Green Level Road	Phillip & Delores Jobe	Wv	45	300	3	900	3	1	500	300		1000	900		N	N	N	
58	655	Green Level Road	Timothy & Julie Kelly	Wv	45	300	4	1200	3	1	730	400		1000	1000		N	N	N	
59	660	Green Level Road	Rickey & Pamela Davis	Fm	45	300	3	900	3	1	600	300		1000	900		Y	Y		
60	675	Green Level Road	Darryle Carter	Wv	45	300	4	1200	3	1		400		1000	1000		N	Y	N	
61	701	Green Level Road	Paul & Pamela Hyde	Wv	45	300	6	1800	3	1	600	600		1000	1500	X	N	Y		
62	710	Green Level Road	Robert & Sherry Vowell	Wv	45	300	3	900	3	1	500	300		1000	900		Y	Y	N	
63	12151	Raleigh-LaGrange Road	Mark & Ethylynne Wagner	Wv	45	300	4	1200	3	1	800	400		1000	1000		N	N	N	
64	12161	Raleigh-LaGrange Road	Richard & Charlene Franks	Wv	45	300	5	1500	3	1	400	500	X	1000	1250	X	Y	Y	Y	CURTIAN DRAIN
65	12171	Raleigh-LaGrange Road	Randy Martin				3		3	1				1000	900		Y	N	N	
66	12215	Raleigh-LaGrange Road	Richard & Sandra Rodgers	Co	30	250	5	1250	3	1	600	417		1000	1250	X	N	N	N	
67	12285	Raleigh-LaGrange Road	Claudia Stinson-Turner & Glen Turner	Fm	45	300	3	900	3	1	600	300		1000	900		Y	N		
68	12303	Raleigh-LaGrange Road	Jason & Jessica Sholtz	Ga	75	370	3	1110	3	1		370		1000	900		N	N	N	
69	12337	Raleigh-LaGrange Road	David & Regina Scott	Ga	75	370	4	1480	3	1	500	493		1000	1000		N	N	Y	French Drain ?