ARAPAHOE COUNTY

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Variance Setback Consideration for 59508 E. Commanche Way

Arapahoe County Public Health

May 2025 Board of Health Meeting

Steven Chevalier, MS, REHS

ARAPAHOE COUNTY

Hearing Purpose

Variance request for reduction in 10-foot sewer line setback at 59508 E. Commanche Way.

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Property Overview

- Address: 59508 E. Commanche Way, Strasburg, CO
- Owners: Jeff and Tabitha Velasco (J&T Velasco Trust)
- Issue: Failed OWTS system requiring replacement

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Reason for Variance

- Existing concrete slab prevents 10-foot setback.
- Requested placement: 4–5 feet from eastern property line.

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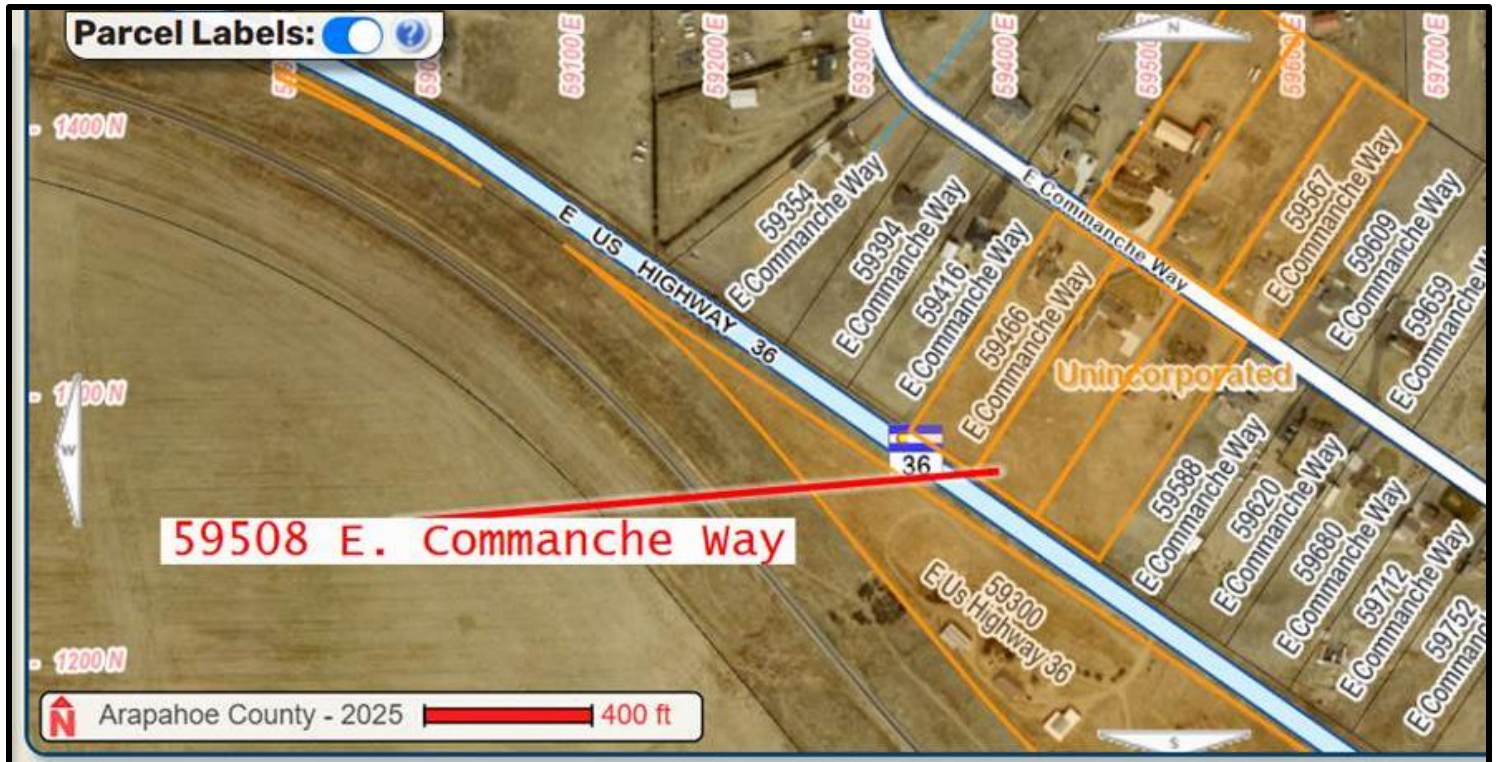
Notification Area

- Based on Sackett v. EPA (2023) interpretation of 'adjacent.'
- Includes adjoining and nearby properties across roads.



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Neighbor Acknowledgment

- Six nearby property owners were notified of public hearing for variance request. Notification letters were mailed on 4/22/2025.
  - As of May 7, 2025, no responses to the notification were received by ACPH
- 59548 E. Commanche Way: a “no objection letter” was provided as part of the variance materials.
- Phone confirmation was received by ACPH on April 18, 2025 from the property owners of 59548 E. Commanche Way.

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Engineering Review

- WW Enterprises supports variance.
- System will meet technical standards.
- Encasement required if neighboring well is <50 feet.

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Public Health Considerations

- Minimal public health risk.
- Well locations reduce exposure.
- System design meets environmental standards.

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Staff Recommendation

Approve with 4 conditions:

1. Property survey and line marking if property pins cannot be located
2. Maintain existing system
3. Submit detailed project timeline
4. Verify neighboring well location; encase if required

ARAPAHOE COUNTY

ON-SITE WASTEWATER REGULATIONS

PROMULGATED BY THE BOARD OF HEALTH OF ARAPAHOE COUNTY

Effective Date
December 24, 2022

Pursuant to Title 25-10-101, et seq. Colorado Revised Statutes and the Colorado Department of Public Health and Environment Water Quality Control Commission On-Site Wastewater Treatment System Regulation #43, 5 CCR-1002-43

This document describes the rules and regulations for the use and permitting of On-Site Wastewater Treatment Systems in Arapahoe County. This Regulation should be used by anyone seeking a permit, designing a system, installing a system, repairing a system, or using a system.

3.10 Variance Procedure

A. Request for Variance

An applicant for a permit to construct a new OWTS or to repair or expand an OWTS may request a variance from any provision of this Regulation, except as prohibited in Section 3.10.C.

B. Variance requests must be accompanied by:

1) Site-specific request identifying the specific criteria from which a variance is being requested;

2) Technical justification by a professional engineer or professional geologist, which indicates the specific conditions which exist and/or the measures which will be taken that support a finding that the variance will result in no greater risk than that associated with compliance with the requirements of the Regulation. Examples of conditions which exist, or measures which might be taken, include but are not limited to the following: evidence of a natural or manmade physical barrier to the movement of effluent to or toward the feature from which the variance is requested; placement of a manmade physical barrier to the movement of effluent to or toward the feature from which the variance is requested; soil replacement with sand filter media to reduce the infiltration rate of the effluent such that the travel time of the effluent from the soil treatment area to the physical feature is no less than the travel time through the native soils at the prescribed setback and Treatment Level (TL) 2;

3) A discussion of alternatives considered in lieu of the requested variance;

4) Technical documentation for selected alternative, which may include a testing program, which confirms that the variance does not increase the risk to public health and to the environment;

5) A statement of the hardship that creates the necessity for the variance; and

6) The Department has the authority to impose site-specific requirements and conditions on any variance granted.

C. Prohibitions on the Granting of Variance Requests

1) No variance shall be issued where the property can accommodate a conforming OWTS.

2) No variance shall be issued to mitigate an error in construction involving any element of property improvements.

3) No variance shall be allowed solely for economic gain.

4) No variance shall be issued, if it will result in a setback reduction to an offsite physical feature that does not conform to the minimum setbacks defined in Table 6 in Appendix A of this Regulation without the Board of Health considering any concerns of the owner of property containing said feature. Property lines are considered offsite features. The owner of the property containing said feature must be notified of the time and date of the hearing.

5) No variance shall be issued, if it reduces the separation to ground water or bedrock based on the level of treatment in Table 7 in Appendix A.

6) No variance from the horizontal setback from a well shall be issued unless it also meets the variance requirements of the Board of Examiners of Water Well Construction and Pump Installation Contractors.

D. Variances for Repair of Failing Systems

1) When a proposed variance for a system repair or upgrade would result in encroachment on minimum distances to physical features on neighboring properties required by the Department, the requirements in 3.10.B above must be followed.

2) For the repair of or upgrade to an existing system where the existing system does not meet the required separation distances and where conditions other than lot size precludes adherence to the required distances, a variance to the separation distances may be requested. The repairs or upgrade must be no closer to features requiring setbacks than the existing facilities. Variances requesting setbacks no closer than existing setbacks do not have to provide technical justification from a professional engineer or professional geologist.

E. Burden of Proof

The applicant has the burden of proof to demonstrate that the variance is justified and will pose no greater risk to public health and the environment than would a system meeting this Regulation.

F. Public Hearing

Upon receipt of the request for a variance and the required information in Section 3.10.B, the Department shall schedule a public hearing before the Board of Health. The Department will issue a Public Notice of the Hearing and send notice via certified mail, with a minimum 20-day reply time from the date of mailing, to all adjacent property owners. The applicant and his/her engineer may attend the hearing and present testimony regarding the request for a variance. Applicants may be represented by legal counsel at any public hearing or meeting.

G. Outcome of the Variance Proceeding

1) Following the Public Hearing, the Board of Health shall vote on the proposed variance. Approval of the variance shall require a majority vote of the Board of Health. The applicant will receive written notification of the decision regarding the request for a variance.

2) The Board of Health may impose requirements and conditions on any variance granted, and the notice of an approval of the variance will include any conditions of the approval. The notice of a denial of a variance shall include the basis for the denial.

3) Variances and any conditions thereof shall be recorded on the deed to the property and any expenses associated with that recording shall be the responsibility of the party obtaining the variance.

H. Findings on Appeal

1) A request for review must be made within 60 days after denial of an application by the Department.

2) The applicant must bear the burden of supplying the Board of Health with sufficient evidence to document that the denied system will be constructed and used in such a manner that will result in no greater risk than that associated with compliance with the requirements of Regulation 43, comply with the declaration and intent of this Regulation, and comply with all applicable state and local regulations and required terms and conditions in any permit.

3) Such review must be conducted pursuant to the requirements of C.R.S. §24-4-105.

SECTION 10 MINIMUM HORIZONTAL DISTANCES

10.1 Required Minimum Horizontal Distances-Applicability

Horizontal distances from the various components of a system to pertinent terrain features, including streams, lakes, water courses, springs, wetlands, wells, subsurface drains, cisterns, water lines, suction lines, dry gulches, cut banks, dwellings, other occupied buildings and property lines, must be in accordance with Table 6 in Appendix A. The setback requirements are applicable for minimum system performance and treatment levels with specific modifications allowed for higher treatment levels as provided in Table 7 in Appendix A. All distance setback modifications must be analyzed and approved by the Board of Health or The Department and be in complete compliance with the variance procedures of this Regulation and those of the Board of Health. Acceptable methods of analyzing horizontal separation distances with higher treatment levels include but are not limited to:

A. Analyzing the intended uses of impacted surface and/or ground waters

B. Contacting adjacent property owners for potential conflicts with property line encroachments

C. Analyzing potential impacts that system locations may have on building foundations and other potentially affected features

20.5 Hearing and Review of Variance Requests

A. Upon receipt of the request for a variance and the required information in Section 3.10.B the Department will schedule a public hearing before the Board of Health. The Department will issue a Public Notice of the Hearing and send notice via certified mail, with a minimum 20 day reply time from the date of mailing, to all adjacent property owners. The applicant and his/her engineer may attend the hearing and present testimony regarding the request for a variance.

B. Following the public hearing, the Board of Health shall vote on the proposed variance. Approval of the variance shall require a majority vote of the Board of Health.

C. The applicant will receive written notification of the decision regarding the request for a variance.

D. The Board of Health may impose requirements and conditions on the variance granted and the notice of an approval of the variance will include any conditions of the approval. The notice of a denial or a variance shall include those reasons which form the basis for the denial.

E. The variance and any conditions thereof shall be recorded on the deed to the property and any expenses associated with that recording shall be the responsibility of the party obtaining the variance.

Table 6: Minimum Horizontal Distances in Feet Between OWTS Components Installed after November 15, 1973 and Water, Physical, and Health Impact Features

	Spring, Well,[1] Suction Line, Potable Water Supply Cistern[4]	Potable Water Supply Line[2],In-Ground Swimming Pool	Structure w/Basement, Crawl Space or Footing Drains	Structure Without Basement, Crawl Space or Footing Drains	Property Lines, Piped or Lined Irrigation Ditch, or Upslope Curtain Drain	Subsurface Drain, Intermittent Irrigation Lateral, Drywell, Stormwater Structure, or Stormwater Conveyance Channel	Lake, Water Course, Irrigation Ditch, Stream, Wetland	Dry Gulch, Cut Bank, Fill Area (from Crest)	Septic Tank, Higher Level Treatment Unit, Dosing Tank, Vault or Privy
Septic Tank, Higher Level Treatment Unit, Dosing Tank, Vault, or Vault Privy	50[2]	10[2]	5	5	10	10	50	10	--
Building Sewer or Effluent Lines	50[2]	5[6]	0	0	10[2]	10[2]	50[2]	10[2]	--
STA Trench, STA Bed, Unlined Sand Filter, Sub-surface Dispersal System, Seepage Pit	100[3]	25[2]	20	10	10	25	50[3]	25	5
Lined Sand Filter	60	10[2]	15	10	10	10	25	10	5
Lined Evapo-transpiration Field or Outside of Berm of Lined Wastewater Pond	60	10[2]	15	15	10	10	25	10	5
Unlined Sand Filter in Soil With a Percolation Rate Slower than 60 Minutes per Inch, Unlined or Partially Lined Evapo-transpiration System, Outside of Berm of Unlined Wastewater Pond, or System Not Relying on STA for Treatment Other than Aerosol	100	25[2]	15	15	10	25	25	15	10
Slit Trench Latrine, Pit Privy	100	50[2]	25	25	25	25	100	25	N/A
System Not Relying on STA for Dispersal	100[3]	10[2]	125	125[5]	10	0	25[3]	10	10

NOTE: The minimum distances shown above must be maintained between the OWTS components and the features described. Where soil, geological or other conditions warrant, greater distances may be required by the Board of Health or by the Water Quality Control Commission pursuant to Section 25-8-206, C.R.S. and applicable regulations. For repair or upgrading of existing OWTS where the size of lot precludes adherence to these distances, a repaired OWTS must not be closer to setback features than the existing OWTS, as reviewed and approved by the Department. Components that are not watertight should not extend into areas of the root system of nearby trees.

1. Includes potable wells, irrigation wells and monitoring wells set within a potable aquifer and infiltration galleries permitted as wells by the Division of Water Resources.
2. Crossings or encroachments may be permitted at the points as noted above provided that the water or wastewater conveyance pipe is encased for the minimum setback distance on each side of the crossing. A length of pipe with a minimum Schedule 40 rating of sufficient diameter to easily slide over and completely encase the conveyance must be used. Rigid end caps of at least Schedule 40 rating must be glued or secured in a watertight fashion to the ends of the encasement pipe. A hole of sufficient size to accommodate the pipe must be drilled in the lowest Section of the rigid cap so that the conveyance pipe rests on the bottom of the encasement pipe. The area in which the pipe passes through the end caps is to be sealed with an approved underground sealant compatible with the piping used. Other methods of encasement that provide equal protection are allowed. These methods must be reviewed and approved by the Department.
3. Add eight feet additional distance for each 100 gallons per day of design flows between 1,000 and 2,000 gallons per day, unless it can be demonstrated by a professional engineer or geologist by a hydrologic analysis or the use of a barrier, consisting of a minimum 30 mil PVC liner or equivalent, that contamination will be minimized. If effluent meets Treatment Level 3N and the Department has a maintenance oversight program in accordance with Section 14.D. of this Regulation, the distance addition is not required. Flows greater than 2,000 gallons per day must be hydrologically analyzed for flow, velocity, hydraulic head, and other pertinent characteristics as means of estimating distances required to minimize contamination as part of the Division site application and permitting process.
4. All horizontal setbacks to a well or potable water supply cistern must be met unless a variance by the Board of Examiners of Water Well Construction and Pump Installation Contractors is granted per Section 18.2 of the Water Well Construction Rules, 2 CCR 402-2. Setback requirements which may necessitate a variance are found within Section 10.2 or 11.4 of the Water Well Construction Rules, as applicable. The minimum horizontal setback that may be granted through a variance is to 25 feet.
5. If the structure is not used as a habitable unit, the isolation may be reduced by the local board of health to no less than 50 feet.
6. Building sewer installations shall meet the design requirements of the Colorado Plumbing Code

KENNEDY
PLUMBING & HEATING

kennedyplumbingdenver.com

303-710-1417

gtykennedy@aol.com

Arapahoe County Public Health
15400 E 14th Place
Aurora, Co 80011

Conner Gerken
Supervisor

4-14-25

Variance Request

1. I would like a variance for the sewer line at 59508 E. Commanche way, Strasburg, CO to be 6 feet from property line.
2. We would be using Sch 40 PVC if approved.
3. This request is to get around a cement poured basketball court.
4. The original septic system was put in the front yard that is irrigated.
5. Please find attached the permit that was applied for on 2-27-25.
6. New system was designed by WCW Enterprise.

KENNEDY
PLUMBING & HEATING

kennedyplumbingdenver.com

303-710-1417

gtykennedy@aol.com

7. Also find attached a letter from neighbors that border this request.
Rigel and Brooke Stephanson

8. I addition find a variance request letter from WW Enterprises.

Respectfully,

Greg Kennedy
PO Box 627
Bennett CO 80102

303-710-1417

Colorado Master Plumber MP 188016
Arapahoe County Septic system installer C10001687
Adams County Septic System installer C1000 1321
Elbert County Septic System installer #2025-155

ARAPAHOE COUNTY
PUBLIC HEALTH

Permit #_____

USE PERMIT APPLICATION FOR AN ON-SITE WASTEWATER TREATMENT SYSTEM (OWTS)

IMPORTANT NOTE: All items listed below MUST be completed and submitted at the same time:

- **Arapahoe County Public Health Use Permit Application form AND Application fee.**
- **Arapahoe County Public Health Inspection Report completed by a CERTIFIED inspector (an inspection report completed by an uncertified inspector will NOT be accepted). If multiple OWTS systems serve the property, then a separate inspection report and fee for each OWTS system must be submitted.**
- **Copy of the most recent septic tank pumper's receipt (if available).**
- **If the OWTS system needs to be repaired, then a Minor or Major Repair Permit Fee may be applicable.**

(PERMIT FEE IS NON-REFUNDABLE)

Submit electronically to water@arapahoegov.com

Completion of All Fields is Required **Application Date:**_____

PROPERTY FOR WHICH PERMIT IS REQUESTED

Address: 59508 E Comanche Way

City: Strasburg State: CO Zip: 80136

Parcel Number (APN):_____ Lot Size in Acres:_____

Current Property Owner Name: Jeff and Tabitha Velasco

Owner Phone: 303-717-9365 Owner Email: _____

County: Arapahoe

Name of Applicant: Kennedy Plumbing Inc

Address: PO Box 627

City: Bennett State: CO Zip: 80102

Applicant Phone: 303-710-7417 Email: CityKennedy@aol.com

Dwelling Type: ☒ Single Family ☐ Multi-Family ☐ Commercial ☐ Other _____

Number of Bedrooms (existing): 4

Water Supply: ☐ Public Community ☒ Private Well ☐ Public Non-Community ☐ Unknown ☐ Other

Is more than one building connected to the one OWTS system? ☐ Yes ☒ No

Are multiple OWTS serving the property? ☐ Yes ☒ No *(Complete a separate inspection form and fee for each OWTS)*

Reason for Use Permit **(Check One):** ☐ **Sale** ☐ **Bedrooms Added** (# Added _____)
☐ **Change in Use (Commercial or Business)** ☐ **Addition of Mobile Home**
☒ **Other (explain):** Current system is in front yard which they water

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Use Permit Inspector

Name: _____ Phone: _____ Email: _____

National Association of Wastewater Technicians (NAWT) Certification Number:_____

ARAPAHOE COUNTY
PUBLIC HEALTH

PERMIT #_____

APPLICATION FOR AN ON-SITE WASTEWATER TREATMENT SYSTEM PERMIT

(PERMIT FEE IS NON-REFUNDABLE)

Submit electronically to water@arapahoegov.com

APPLICATION TO: ☒ **INSTALL (3010)** ☐ **EXPAND (3030)** ☐ **MAJOR REPAIR (3030)** ☐ **MINOR REPAIR (3035)**

Application Date: 2-27-25

ADDRESS OF PROPERTY SERVED BY PROPOSED SYSTEM

Street Number: 59508 Direction: E Street Name: Comanche Way

Street Type: (Ave, Dr, St) Way Gate Code: _____

City: Strasburg State: CO Zip: 80136

County: ☒ Arapahoe

Assessor's Office Parcel Number (APN): _____

Lot Size (in Acres): _____

Legal Description (if no street address):
1/4 Sec_____ 1/4 Sec_____ Section_____ Township_____ Range _____ Lot_____ Block _____

Subdivision Name: _____

Property Owner

Name: Jeff and Tabitha Velasco

Address: 59508 E Comanche Way

City: Strasburg

State: CO Zip: 80136

Phone1: 303-717-9365

Phone2: _____

E-mail: _____

Applicant ☐ Same as Property Owner

Name: Kennedy Plb Inc

Address: PO Box 627

City: Bennett

State: CO Zip: 80102

Phone1: 303-710-1417

Phone2: _____

E-mail: CityKennedy@aol.com

PROPOSED FACILITY

☒ Single Family ☐ Multi-Family ☐ Commercial ☐ Other _____

Number of Bedrooms: 4

Are Additional Bedrooms Planned in the future? ☐ Yes ☒ No

(Continued on back)

ARAPAHOE COUNTY
PUBLIC HEALTH

PERMIT #_____

WATER AND SEWER INFORMATION

Water Supply:

☐ Public Water System ☐ Other ☐ Unknown ☒ Private Well

Supplier Name (for Hauled or Public Water): _____

Is property within boundaries of a sewer district? ☐ Yes ☒ No

If yes, sewer district: _____

Is the property within 400 ft. of a sewer line? ☐ Yes ☒ No

If yes, has waiver been received from the sewer/sanitation district? ☐ Yes ☐ No

PROPERTY MARKED (Inspection Info Only)

Is lot marked? ☒ Yes ☐ No Soil profile test pits marked? ☒ Yes ☐ No

INSTALLER / ENGINEER INFORMATION

System Installer: Kennedy Plb INC

Soils Evaluation Technician WW Enterprises Job #: 24-4028

System Designer: WW Enterprises Job #: 24-4028

COMMERCIAL GENERAL INFORMATION (if applicable) ☐ Section Not Applicable

Type of Business: _____ Number of Employees: _____

Design Flow ≥ 2,000 Gallons/Day ☐ Yes ☐ No

Are floor drains existing or proposed? ☐ Yes ☐ No

EPA Shallow Injection Well Inventory Request form completed? ☐ Yes ☐ No

APPLICANT'S SIGNATURE

Applicant's Name (Print): _____

Applicant's Signature: Greg Kennedy Date: 2-27-25

For Arapahoe County Internal Use:

Permit Fee Paid by: ☐ Property Owner ☐ Applicant ☐ Other: _____

Date Paid: _____ Received By: _____

Payment Type: ☐ Cash ☐ Check (# _____) ☐ Charge

Amount Paid $_____

Aurora
15400 E. 14th Place, Suite 115
Aurora, CO 80011
303-363-3055

Greenwood Village
6162 S. Willow Drive, Suite 100
Greenwood Village, CO 80111
720-200-1670

ARAPAHOE COUNTY
PUBLIC HEALTH

Directions to Property

- Please provide CLEAR concise directions from the nearest Arapahoe County Public Health Department office to the site.
- Please note the condition of the road and ANY difficulties accessing the site (i.e., Gate codes. If a four-wheel drive vehicle is needed, arrangements to meet the inspector may be necessary).
- Our staff hours are 8 a.m.– 5 p.m. Monday–Friday.
- If the inspector cannot find the lot, the area of test pits or perc holes and/or cannot identify them due to improper marking, this will result in a second site visit and an additional charge.

By initialing the following you are confirming you understand the above statements:

GK The address or Lot # is CLEARLY marked
GK Test pits or perc holes flagged or staked and easily identifiable

Gate Code (if applicable) _____

ARAPAHOE COUNTY
PUBLIC HEALTH
Greenwood Village, CO 80111
303-795-4584

RECEIPT OF PAYMENT

☐ Greenwood Village ☒ Aurora

EH 0241

Date: 2.27.25

Account #: ARAP 4895 I

Invoice #: _____

Permit #: _____

Received from: Greg Kennedy

Received by: A. Higgins

Remarks: New Install

Amount Received: $ 1,120

☐ Cash ☐ Credit Card ☒ Check #: 2926

- ☐ Class Fees (*Explanation)
- ☐ Copies (*Explanation)
- ☐ Materials (*Explanation)
- ☐ Donation: Program _____
- ☐ Other (*Explanation)
- ☒ OWTS ☒ New ☐ Repair ☐ Use Permit
- ☐ Installers' & Cleaners' License
- ☐ Plan Review ☐ Food ☐ Pool
- ☐ Inspections ☐ OWTS ☐ COO
- ☐ Retail Food Establishment License

***Explanation:** New Install

Total Charges: $ 1,120.00

Balance Due: $ 0

ACPH A-2 Rev. 11/22 White—Client Canary — Cash Drawer

720 384 3669

RE: Acknowledgment of Septic System Work Near Property Line

To whom it may concern,

We are writing regarding the property owned by Jeff and Tabitha Velasco, located at 59508 E Commanche Way. As the owners of the adjacent property to the east, 59548 E Commanche Way, we would like to formally acknowledge that we have been made aware of the septic system issues they are experiencing.

We understand that due to these issues, they are unable to relocate the existing basketball court and must install underground piping closer to our property line. While the new piping will remain within their property boundaries, we recognize that it will be placed approximately 4–5 feet from our property line.

Please feel free to contact us if any additional information or clarification is needed.

Rigel & Brooke Stephenson

Rigel Stephenson

Brooke Stephenson

W.W. ENTERPRISES *Consulting Engineering*
2115 9th Street, P.O. Box 1242, Limon, Colorado 80828 (719) 775-9314

March 31, 2025
Project No. 24-4028

Mr. Greg Kennedy
Kennedy Plumbing, Inc.
PO Box 627
Bennett, CO 80112

RE: Request for Variance for the proposed replacement OWTS at 59508 E. Commanche Way, Strasburg, Arapahoe County, Colorado.

Dear Greg;

This letter is to follow-up our correspondence for the above referenced OWTS. The original OWTS is failing and needs to be replaced. The original OWTS is northeast of the house near the northeast property corner under a grass lawn. The replacement OWTS location is south of the house in the back yard. The existing septic tank located east of the house is to be abandoned. The new septic tank location is to be placed near the new OWTS in the back yard, so the effluent pipe from the house will drain to the new OWTS location. The proposed OWTS location is well below the existing septic tank elevation, so there is adequate drop for gravity flow from the house to the new OWTS location.

The new test pits for the replacement OWTS were observed on November 22, 2024. The test pit results and OWTS recommendations were discussed in our "Subsurface Investigation and Soils Report and Design for Onsite Wastewater Treatment System (OWTS)" report dated December 19, 2024. The piping for the new system was to be from the east end of the existing septic tank south to the new OWTS location in the back yard. The drain pipe is shown to be placed between the edge of the concrete slab and the southeast property line.

There is an existing concrete slab south and east of the house. The concrete slab extends almost to the southeast property line. The edge of the concrete slab is closer than 10' from the property line. Therefore, the drain pipe from the septic tank to the new the OWTS location can not be placed between the edge of the concrete slab and the property line while maintaining the minimum 10' side setback. To maintain the 10' side setback for the pipe construction, the existing concrete slab will need to be cut and removed. It is requested that a variance be given to allow the drain pipe to be inside the 10' side setback along the edge of the existing concrete slab. This will allow for the construction of the needed replacement OWTS without needing to cut and remove the east end of the concrete slab.

Per Table 6 "Minimum Horizontal Distances in Feet Between OWTS Components Installed after November 15, 1973 and Water, Physical, and Health Impact Features", a minimum 50' is required between the effluent line and any water well. If the pipe is within 50' of a well, it is to be encased per Note 2 of Table 6. The existing well on the property is located west of the southwest house corner, so it is more than 50' from the proposed pipe location. The location for the water well for the property to the southeast needs to be verified. If it is within the minimum 50' separation distance, the pipe will need to be encased per Note 2.

This variance is requested to allow the new OWTS to be installed without having to saw cut and remove the existing concrete slab in the back yard. The added cost for removal and replacement of the concrete slab would add to the cost of the replacement system. The variance for the needed 10' side setback requirement would allow for replacement OWTS construction without the added cost of concrete slab removal and replacement.

Please contact our office, if you have any questions concerning this information.

Respectfully;
WW Enterprises

Anthony J. Wernsman, P.E.

W.W. ENTERPRISES *Consulting Engineering*
2115 9th Street, P.O. Box 1242, Limon, Colorado 80828 (719) 775-9314

December 19, 2024
Project No: 24-4028

SUBSURFACE INVESTIGATION AND SOILS REPORT AND DESIGN FOR ONSITE WASTEWATER TREATMENT SYSTEM (OWTS)

DESCRIPTION: **59508 E. Commanche Way, Strasburg, Arapahoe County, Colorado**

Prepared for:
Kennedy Plumbing, Inc.
PO Box 627
Bennett, CO 80102
303-710-1417

SCOPE

This study was done to perform the Onsite Wastewater Treatment System (OWTS) test pit evaluation at the above referenced site. The system recommendations for the new OWTS were requested. The original OWTS and septic tank were sized for a 3 bedroom house. The house now has 5 bedrooms, so a larger tank and new OWTS are needed. The new pits for the proposed OWTS are south of the existing house and existing septic tank. The existing septic tank is too small for the new 5- bedroom system and will not be used with the new OWTS.

The site is located in Arapahoe County, Colorado, east of the Town of Strasburg. Groundcover consists of a grass lawn north of the existing house and native grasses in the area of the proposed OWTS. The area of the new OWTS is southwest of the existing house and septic tank near the southwest end of the property. The property slopes approximately 8 % to the southeast in the area of the proposed OWTS and test pits. The new OWTS is to be located at least 100' from the water well at the northeast corner of the existing red shed southwest of the existing house.

SOILS INVESTIGATION FOR THE ON-SITE WASTEWATER TREATMENT SYSTEM (OWTS)

SITE AND SOIL EVALUATION

PRELIMINARY INVESTIGATION

A. Property Information
   1) The site address will be 59508 E. Commanche Way, Colorado.
   2) The site legal description is Lot 8, Block 1, Schmitt Subdivision in part of the N ½ of Section 2, T. 4 S., R. 62 W., Arapahoe County, Colorado.
   3) There is an existing house and detached garage on the site. The existing septic tank is located approximately east of the house. The existing failing OWTS bed is north and slightly down slope from the existing septic tank. The existing septic tank will be replaced with a new septic tank south of the house, near the new OWTS location. The new septic tank location will be south and down slope from the existing septic tank. The new OWTS trenches are to be placed south of the house and new septic tank in the backyard closer to the south end of the property.
   4) The water well for the property is located just north of the northeast corner of the red shed southwest of the house. This existing well location will provide the minimum 100' separation between the well and the proposed OWTS.

B. Department Records

   Property lines were taken from the Schmitt Subdivision Plat and were used for developing the Location Maps in the report. The contour line information was taken from the Strasburg Quad Map and site observations at the time of test pit evaluation.

C. Published Site Information

1) Topography

The Strasburg Quad Map was reviewed and indicates southeasterly slopes consistent with the observed site topography. The contour lines and slopes on the site are shown on the Location Maps in the report.

2) Soil Data

The "Soil Survey of Arapahoe County, Colorado" from the NRCS was reviewed. Terry-Olney-Thedalund sandy loams, 5 to 20 % (TeE) is on the entire property. The TeE is mostly rangeland. Because the soils are steep and are severely susceptible to erosion, they are not suited to cultivated crops. The few areas that were cultivated have been severely eroded and, in places, the subsoil has been exposed. Numerous gullies have formed. In most places, however, the formerly cultivated areas have been reseeded to grass. Good range management, including regulation of grazing, is essential in controlling erosion. Capability unit VIe-3; Sandy Plains range site; tree planting suitability group 4.

D. Location of Physical Features

The existing house location is near the northeast end of the property. The failing OWTS location is north and east of the house. The proposed OWTS location is south of the house closer to the southwest end of the property behind the house. The slope at the site is approximately 8 % to the southeast across the proposed OWTS location. There is an approximate 6' drop from the rear of the house to the new OWTS location. Refer to the Location Maps in the report for additional details.

E. Preliminary Soil Treatment

From previous experience with the soils in the area and the slope at the site, it is anticipated that a gravity flow OWTS can be used from the existing outlet pipe from the house to the new septic tank and OWTS location.

F. Other Information Requested

Currently, no additional information has been requested.

G. Additional Information

1) Survey

Front and rear property markers were located at the time of site observation. Therefore, it appears that the property has been surveyed.

2) Easements

An 8' utility easement is on the front property line along E. Commanche Way.

3) Floodplain Maps

Little Comanche Creek is approximately 1.5 miles west of the property. Spring Gulch starts approximately ¼ mile north of the property. The proposed OWTS area is at least 20' above the flowline of the creeks. Therefore, it appears that the site is not in the flood plain of the creeks.

4) Geology and Basin Maps and Descriptions

The 1979 Ogden Tweto "Geologic Map of Colorado" was reviewed. The map indicates that Tkdl – Denver Formation and Lower part of the Dawson Arkose is at the site. These include Arkosic sandstone, shale, mudstone, conglomerate, and local coal beds.

5) Aerial Photographs

Satellite maps of the area were reviewed to see if any items of note were apparent. The constructed houses, vegetation, topography, and creeks near the property were noted.

6) Climate Information

From the USDA 25-YEAR 24 HOUR PRECIPITATION annual isopluvials for Colorado, the site is in an area of approximately 32" of evaporation per year.

7) Delineated Wetlands Maps

The property has an existing house, detached garage, and water well. It is covered with native grasses and a lawn in front of the house. The up and down slope areas of this area of the property appear to have the same native vegetation throughout. Therefore, it appears that the moisture content across the site is consistent, and no wetlands are present in the area of the proposed OWTS.

RECONNAISSANCE VISIT

A. Landscape Position

The lot is an approximate rectangle with the long dimension southwest to northeast. The existing house is near the north end of the property. The existing septic tank is east of the existing house. The failing OWTS is north of the existing septic tank in the front yard of the house near the northeast property corner. The proposed septic tank and OWTS are south of the existing house and backyard near the south end of the property.

B. Topography

The proposed OWTS is to be located south of the existing house and backyard. The new septic tank is to be located south of the existing backyard just north of the proposed OWTS location near the south end of the property. With the elevation difference from the backyard to the trench location, gravity flow should be available.

C. Vegetation

The native vegetation in the area of the proposed OWTS is mostly native grasses. They appear consistent across the proposed OWTS area on the property.

D. Natural and Cultural Features

The natural features on the property are the slopes and vegetation. No cultural features were observed.

E. Current and History Land Use

Historically, the area has been used with native grass pastures for livestock and wildlife. The site and the surrounding properties now have houses and OWTSs. It is anticipated that the undeveloped portions of the properties in the area will remain with native grass.

DETAILED SOIL INVESTIGATION

A. Soil Investigation

Method Used: Visual and tactile evaluation from two or more soil profile test pit excavations. The soils investigation, evaluation, and sampling for the test pits was performed on November 22, 2024. The soil was evaluated in the field and laboratory. The test pits are located northeast of the existing failing OWTS bed east of the existing house. The Location Maps and Log of Test Pits provide the information for the site and soil encountered.

B. Percolation Test

A percolation test was not performed.

C. Visual and Tactile Evaluation

The soils were observed and tested in the field and laboratory by Joe Wernsman under the supervision of Anthony J. Wernsman, P.E., who has been working as a field (soil drilling, sampling, testing and percolation tests) and laboratory (sieve analysis, Atterberg Limits, etc.) technician since 1989.

SOIL DESCRIPTIONS FOR DETERMINATION OF A LIMITING CONDITION

A. Soil Horizon Depth

The test pit site observations were used to generate the Log of Pits included with this report.

B. Depth to Bedrock

Bedrock was not encountered in the test pits.

C. Depth to Periodically Saturated Soil

1) Redoximorphic features

No redoximorphic features were encountered.

2) Standing Water

No groundwater or standing water were observed.

D. Any Other Soil Characteristics

The soils at the site are relatively consistent in the test pits. Topsoil with roots overlies the site. Reddish-brown, damp, silty sand was encountered beneath the topsoil to the 8' bottom of test pit depth in TP1 and to an approximate 7' depth in TP2. Gray with white, damp, silt/clay with sand was encountered beneath the silty sand to the 8' bottom of test pit depth in TP2.

The soils were observed, sampled, tested, and compared to the soils indicated in Table 10 "Soil Treatment Area Long-term Acceptance Rates by Soil Texture, Soil Structure, Percolation Rate and Treatment Level". The silty sand is Soil Type 2A sandy loam with blocky (bk) soil structure and moderate (2) to weak (1) soil grade. The lower silt/clay with sand is Soil Type 3 sandy clay loam with blocky (bk) soil structure and moderate (2) soil grade. The silty sand was not cemented. The Soil Type 3 sandy clay loam is the most limiting soils encountered.

The 1979 Ogden Tweto "Geologic Map of Colorado" indicates that Tkdl – Denver Formation or Lower Part of the Dawson Arkose is at the site. This includes arkosic sandstone, shale, mudstone, conglomerate, and local coal beds. Using the National Soil Survey Center Natural Resources Conservation Service (NRCS) "Field Book for Describing and Sampling Soils" (NRCS Field Book), a cementation class for the silty sand is non-cemented (NC) to weakly cemented (W). Therefore, the silty sand and silt/clay with sand are not limiting layers. The silty sand soil tests as a Soil Type 2A sandy loam. The silt/clay with sand soil test as a Soil Type 3 sandy clay loam. Since the silty sand and silty/clay with sand soils are in the area of the lower part of the Dawson Arkose, it is recommended that the OWTS be designed as a Soil Type 3A sandy clay loam soil with a with an LTAR of 0.30 gpd/sf.

CONSTRUCTION, LAND USE, AND DIFFICULTIES

The slopes at the site typically require that the trenches be oriented parallel to the contour lines (perpendicular to the slope). The undeveloped portions of the properties in the area will continue to be in native grasses. With the slopes on the site, gravity flow should be available from the existing house outlet pipe to the proposed septic tank location and from the new septic tank to the new OWTS trenches.

HOLE AND PIT MARKING

The test pits at the site were backfilled the same day after they were evaluated. Their location can be determined from the ground scar from filled test pits and the locations shown on the Location Maps.

TEST PIT RESULTS

On November 22, 2024, a subsurface investigation was conducted at this site by WW Enterprises. Two (2) test pits had been excavated in the area of the OWTS location. The soils at the site are relatively consistent in the test pits. Topsoil with roots overlies the site. Reddish-brown, damp, silty sand was encountered beneath the topsoil to the 8' bottom of test pit depth in TP1 and to an approximate 7' depth in TP2. Gray with white, damp, silt/clay with sand was encountered beneath the silty sand to the 8' bottom of test pit depth in TP2.

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SIZE AND DESIGN-BASIS

The following items were used to determine the size of the required Onsite Wastewater Treatment System (OWTS) for the proposed site.

* Existing house with 5 bedrooms.
* Soil Type 3A sandy clay loam soils for design.
* LTAR of 0.30 gpd/sf used for designing the system.
* Chamber trench system.
* No flow from water softener, spas, or pools

ENGINEERED SYSTEMS

With the Soil Type 3A sandy clay loam soil designation to be used at the site, an engineered system is required for this system. A gravity flow trench system is to be used for the site. The effluent is to be lifted to the distribution box with a pump from the existing septic tank south of the house. Groundwater and restrictive layers were not encountered, the ground slope is less than 20 degrees, and pressure distribution is not to be used.

CALCULATION OF INFILTRATIVE SURFACE OF SOIL TREATMENT AREA

A. The bottom area of trenches is the only infiltrative surface. No sidewall credit is allowed or taken.
B. The long-term acceptance rate (LTAR) for the Soil Type 3A sandy clay loam soil to be used at the site is 0.30 gallons per day per square foot (gal/day/sf), per Table 10, and is to be used for designing this system.
C. The site evaluation included visual tactile evaluation and laboratory testing of the soils at the property. The lesser LTAR was used to determine the size of the soil treatment area.

D. The factors for adjusting the size of the soil treatment area were taken from Tables 12 and 13. The size adjustment factors for methods of application for a bed is 1.2 for gravity method of effluent application from treatment unit preceding soil treatment area. The size adjustment factor for types of distribution media is 1.0 for beds when rock and pipe are used.

E. The required area for a soil treatment area is determined by the following formula:

$$\text{Soil Treatment Area (STA) (in square feet)} = \frac{\text{Design Flow (gal/day)}}{\text{LTAR (gal/day/sf)}}$$

1) Adjusted Soil Treatment Area = Required Soil Treatment Area x Size Adjustment Factor(s).
2) Size adjustment factors for methods of application are in Table 12.
3) Size adjustment factors for types of storage/distribution media are in Table 13.
4) The required soil treatment area is receiving TL1 effluent and may be multiplied by one size adjustment factor from Tables 12 and 13, or both.
5) The soil treatment area is receiving TL1 effluent, so it is not required to be pressure dosed.

ALLOWABLE SOIL TREATMENT AREA REDUCTIONS AND INCREASES

A. The soil treatment area size is determined by dividing the design flow rate by the long-term acceptance rate may be adjusted by factors for method treatment, soil treatment area design, and type of distribution media.

B. For the purpose of Tables 12 and 13, a "baseline system" (adjustment factor of 1.00) is considered to be TL1 applied by gravity to a gravel-filled trench.

C. The maximum reduction from all combined reductions including higher level treatment shall be not greater than 50 percent (50%) of the baseline system required for a soil treatment area.

D. The higher-level treatment categories listed in Table 4 do not apply for this system.

DESIGN OF DISTRIBUTION SYSTEMS

The design of the distribution system was done per "On-Site Wastewater Regulations" for the Arapahoe County Health Department.

A. General
1) The infiltrative surface and distribution lines must be level.
2) The infiltrative surface must be no deeper than four feet (4'). The depth will be measured from the downslope side of the trench.
3) Trenches must follow the ground surface contours so variations in infiltrative surface depth are minimized.
4) Pipe for gravity distribution must be no less than three-inch (3") diameter.
5) A final cover of soil suitable for vegetation at least ten inches (10") deep must be placed from the top of the geotextile or similar pervious material in a rock and pipe system, chamber, or manufactured media up to the final surface grade of the soil treatment area.

6) Following construction, the ground surface must be graded to divert storm water runoff or other outside water from the soil treatment area. The area must be protected against erosion. Subsurface drains upslope of the soil treatment area may be installed to divert subsurface flow around the area.

7) Backfilling and compaction of soil treatment areas shall be accomplished in a manner that does not impair the intended function and performance of the storage/distribution median and soil and distribution laterals, allows for the establishment of vegetative cover, minimizes settlement, and maintains proper drainage.

B. Distribution Lines

1) Distribution lines in a soil treatment area must be as even as possible. Uneven settling of portions of the distribution system following construction must be addressed by provisions in the design to adjust flows between lines.

2) Distribution lines shall be a maximum 150' long. These will not be used in this system.

3) Distribution lines longer than 100' shall be pressure dosed. This does not apply for this site, as pressure dosing will not be used.

4) The end of a distribution pipe or chambers must be capped, unless it is in a bed or trenches in a level soil treatment area, where the ends of the lines may be looped.

C. Inspection Ports

1) The bottom of the inspection port tube must extend to the infiltrative surface and not be connected to the end of the distribution pipe.

2) Additional inspection ports connected to distribution pipes may be installed.

3) The top of the inspection ports may be below the final grade of the surface if each has a cover at the surface such as a valve box for a lawn irrigation system.

D. Trenches

1) Trenches must be three feet (3') wide or less.

2) The separating distance between trenches must be a minimum of four feet (4'), sidewall-to-sidewall.

3) Chambers used in a trench must be as close to the center of the trench as possible.

E. Beds

Beds will not be used for this system.

F. Serial and Sequential Distribution

1) A serial or sequential distribution system may be used where the ground slope does not allow for suitable installation of a single, level soil treatment area unless a distribution box or dosing chamber is used. For the slopes on the site, it is not anticipated that this will be needed.

2) The horizontal distance from the side of the absorption system to the surface of the ground on a slope must be adequate to prevent lateral flow and surfacing.

3) Adjacent trenches or beds must be connected with a stepdown/relief line or a drop box arrangement such that each trench fills with effluent to the top of the gravel or chamber outlet before flowing to succeeding treatment area.

G. Storage/Distribution Media

1) Rock and Pipe
Rock and Pipe will not be used for this system.

2) Tire Chips
Tire chips will not be used for this system.

3) Chambers
Infiltrator Quick 4 Chambers will be used for this system.

4) Manufactured Media
Manufactured media will not be used for this system.

H. Pressure Distribution
Pressure distribution will not be used for this system.

I. Driplines
Driplines will not be used for this system.

SOIL REPLACEMENT
Soil replacement will not be used for this system.

SEPTIC TANK
Per Table 9, the minimum septic tank size is based on the number is bedrooms is a 1500-gallon tank capacity for 5 bedrooms. The existing septic tank is to be replaced. The septic tank is to be designed for a maximum 48" buried depth.

DISTRIBUTION BOX
A variable rate distribution box is to also be used for the new beds to evenly distribute the effluent between the trenches. This will also allow for future adjustment of effluent to each trench, if needed.

DESIGN OF SOIL TREATMENT AREA (STA)
Per Table 2 Single-Family Residential Design Flows, the proposed 5-bedroom house for the property is to have a design flow of 675 gallons per day.

Soil Treatment Area (STA) = Design Flow (gallons per day) / LTAR (gal/day/sf)
= 675 gallons per day / 0.30 gal/day/sf
= 2250 square feet (sf).

Adjusted Soil Treatment Area = Required STA x Size Adjustment Factor(s)
Trench Area = 2250 sf x 1.0(for trench) x 0.7(for chambers)
= 1575 sf

Trench Calculations

1575 sf / 3' wide chambers = 525' length of trenches.
525' / 6 trenches = 88' long trenches. Each trench will have 88' / 4' per chamber = 22 chambers. The total number of chambers needed is 22 chambers per trench x 6 trenches = 132 chambers.

Use 6 trenches 88' long.

RECOMMENDATIONS

Recommended are a septic tank of the required size followed by a standard absorption trench system with chamber construction. The chamber trench system is to be constructed with a bottom area of 1575 square feet (6 trenches with 88' length). The trench system is to be constructed in accordance with the design criteria discussed in "On-Site Wastewater Regulations" for the Arapahoe County Health Department. Refer to the attached "OWTS Design" drawings (page 1 through 5) for the layout of the systems.

INSPECTION

W.W. Enterprises and the Arapahoe County Health Department will conduct a final inspection of this Onsite Wastewater Disposal System. The contractor is to contact us no sooner than 24-hours prior to the final inspection. All components will be visible to the inspector. As-built drawings will be provided to the Owner after the final inspection.

MAINTENANCE

The Maintenance of your Onsite Wastewater Disposal System is very important.

1. Direct surface water away from the trenches. Lawn irrigation equipment should not be placed above or near the trenches.
2. Seed the soil above the trench with native grasses. Sun light is an important part of the dispersion of the wastewater.
3. The septic tanks should be cleaned out by a licensed contractor every two years or as required.
4. The use of a water softener will increase the amount of wastewater entering the system and is not recommended. If a water softener is used, a separate leaching system should be constructed. Contact Arapahoe County Health Department for further details on water softeners.
5. Refer to Appendix I - "General Maintenance Recommendations for Onsite Wastewater Treatment Systems (OWTS)" for additional recommendations.

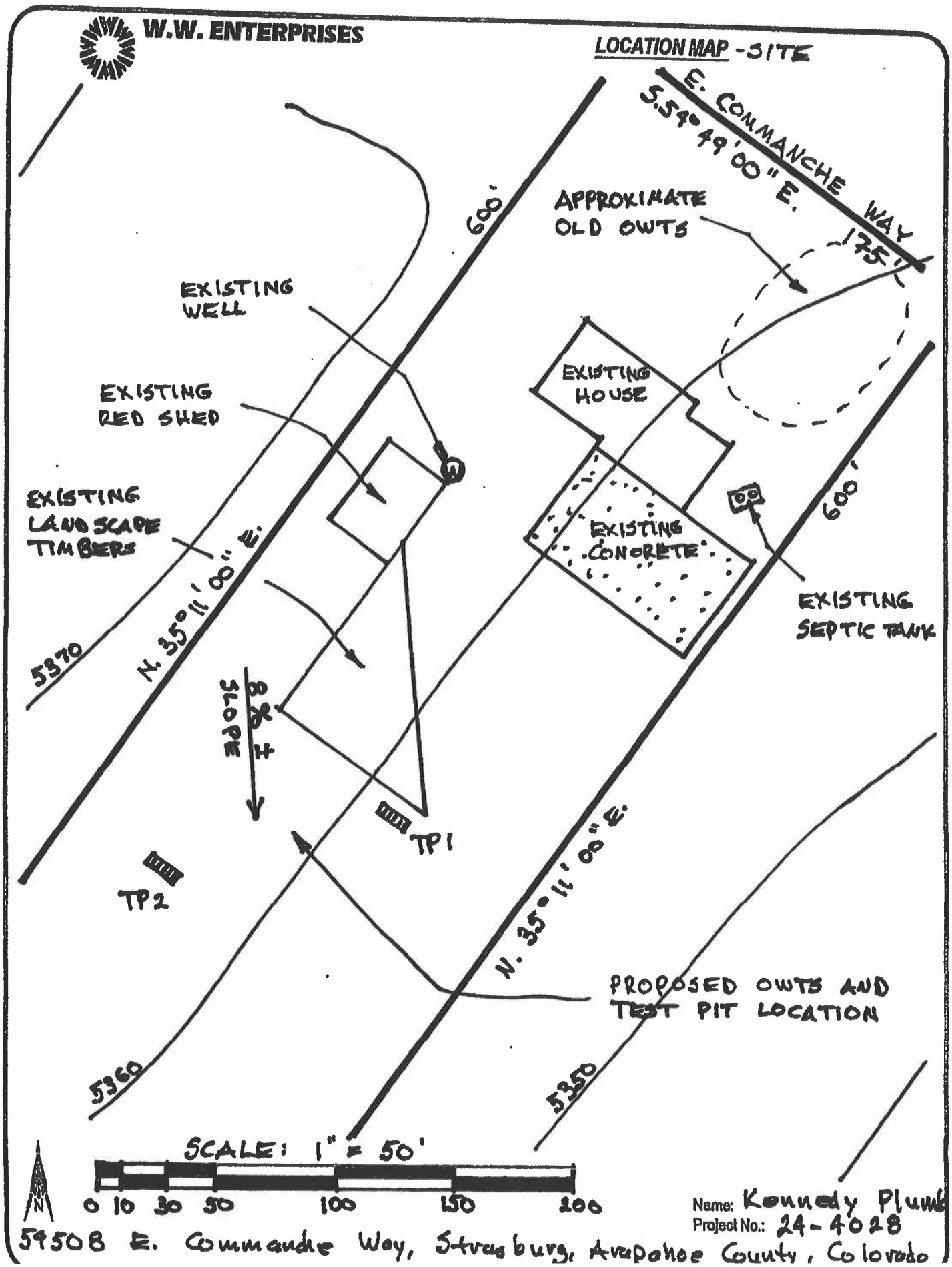
GENERAL

The findings and recommendations of this report have been obtained in accordance with accepted engineering practices in the field of Geotechnical Engineering. There is no other warranty, either expressed or implied.

All future owners should be directed to those items under "General Maintenance Recommendations for Onsite Wastewater Treatment Systems (OWTS)" in Appendix I, included in this report.

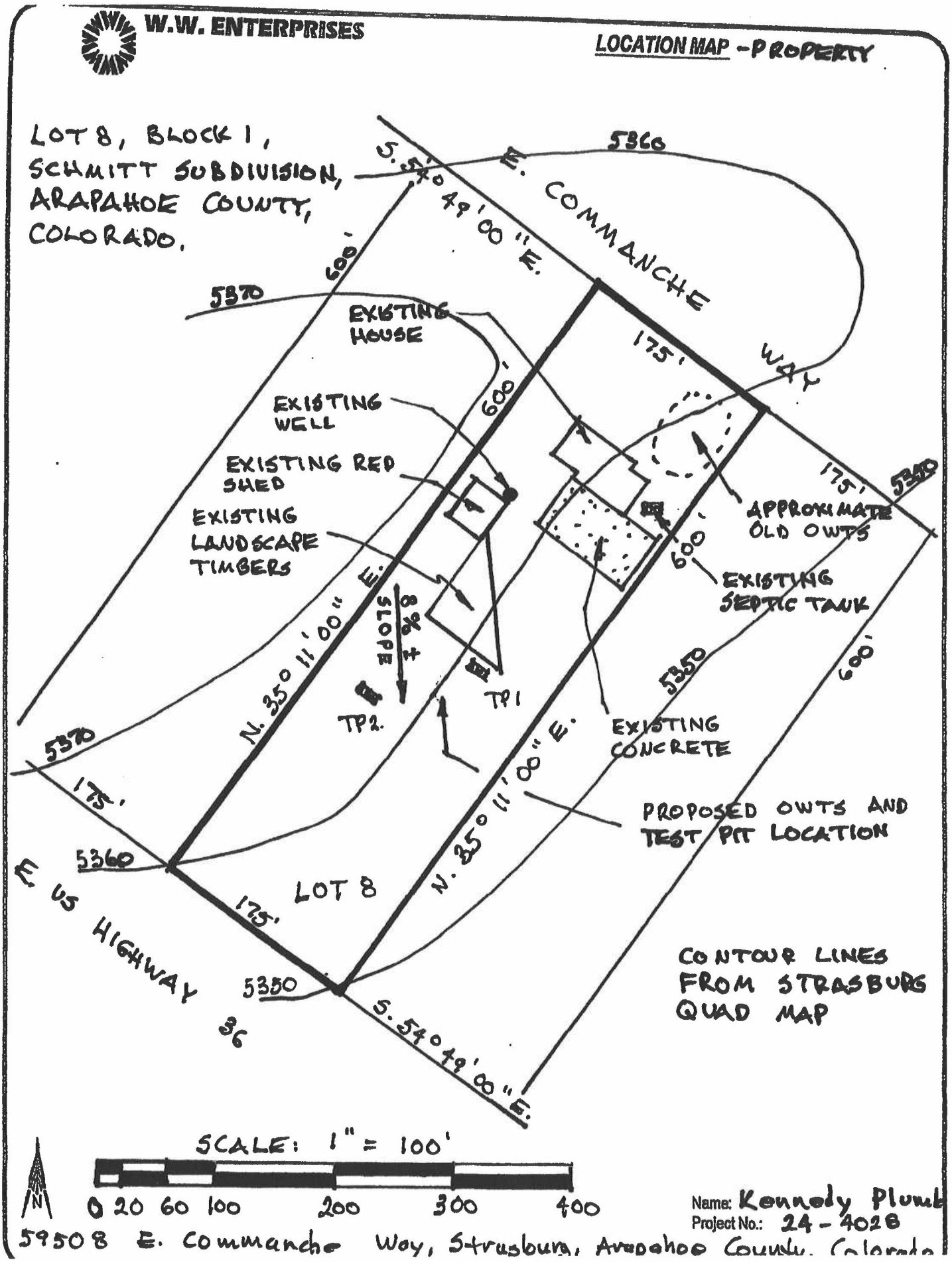
If there are any questions concerning information in this report, please contact our office.

If the consistency or color of the soil is different than in the soils report, contact this office immediately.



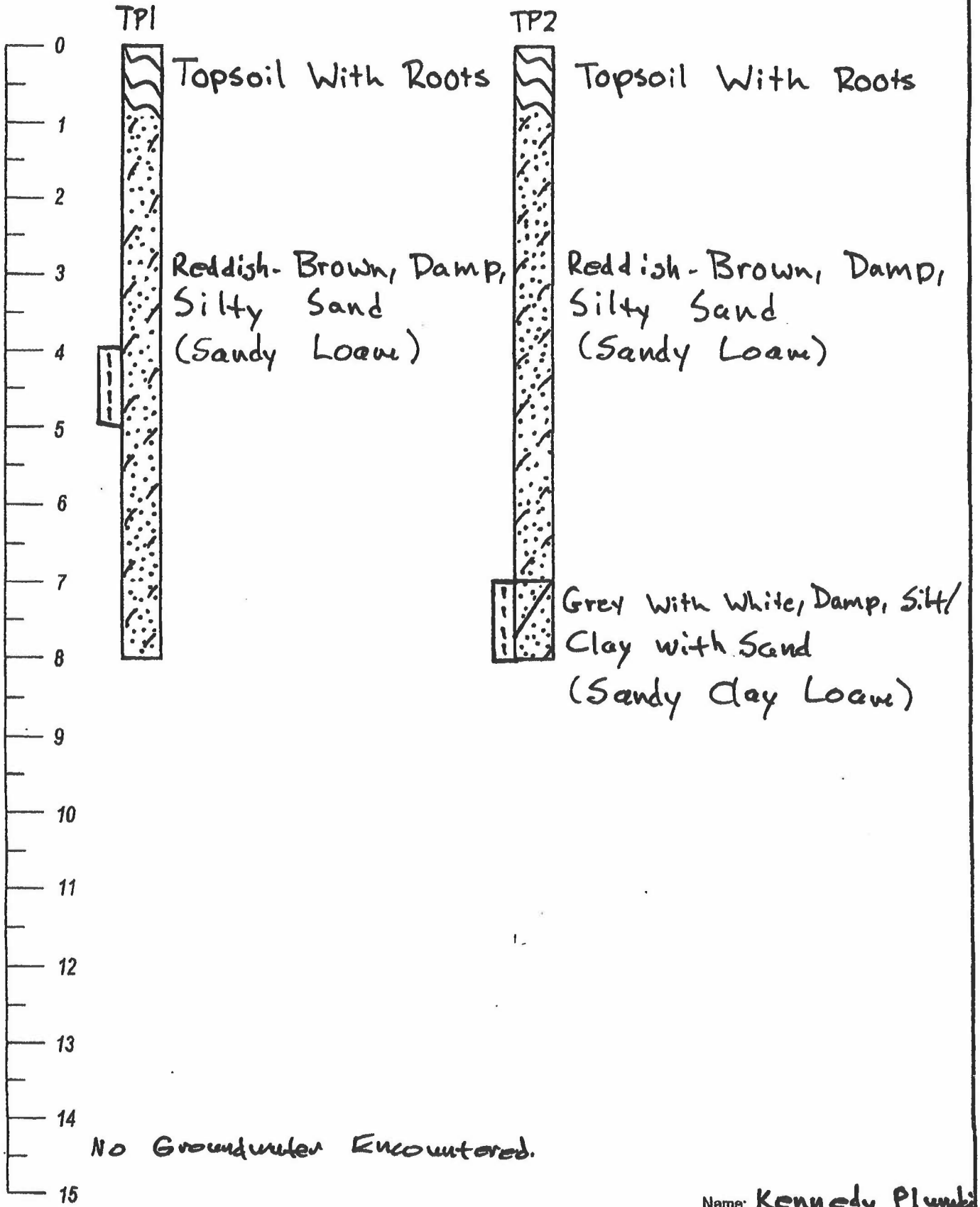
Name: Kennedy Plumb
Project No.: 24-4028

5950B E. Commanche Way, Strasburg, Arapahoe County, Colorado


W.W. ENTERPRISES
LOCATION MAP - PROPERTY
LOT 8, BLOCK 1,
SCHMITT SUBDIVISION,
ARAPAHOE COUNTY,
COLORADO.
S. 54° 49' 00" E.
5360
E. COMMANCHE
600'
5370
EXISTING HOUSE
175'
WAY
EXISTING WELL
600'
EXISTING RED SHED
EXISTING LANDSCAPE TIMBERS
175'
5340
APPROXIMATE OLD OWTS
600'
EXISTING SEPTIC TANK
N. 35° 11' 00" E.
8% + SLOPE
TP2.
TP1
5350
600'
5370
EXISTING CONCRETE
N. 35° 11' 00" E.
175'
PROPOSED OWTS AND TEST PIT LOCATION
5360
LOT 8
E US HIGHWAY 36
175'
5350
S. 54° 49' 00" E.
CONTOUR LINES FROM STRASBURG QUAD MAP
SCALE: 1" = 100'
N
0 20 60 100 200 300 400
Name: Kennedy Plumb
Project No.: 24-4028
59508 E. Commanche Way, Strasburg, Arapahoe County, Colorado

W.W. ENTERPRISES

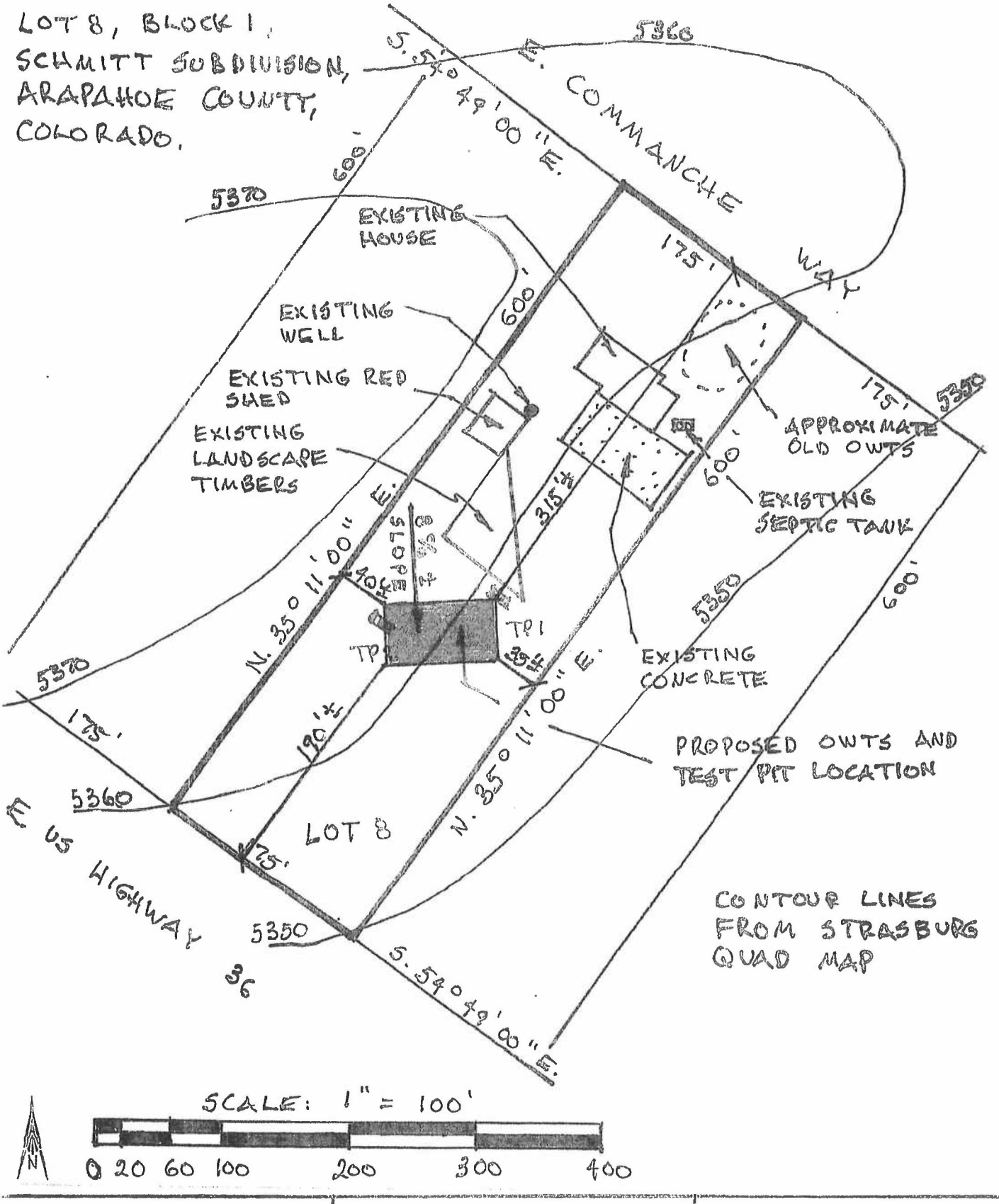
LOG OF TEST HOLES



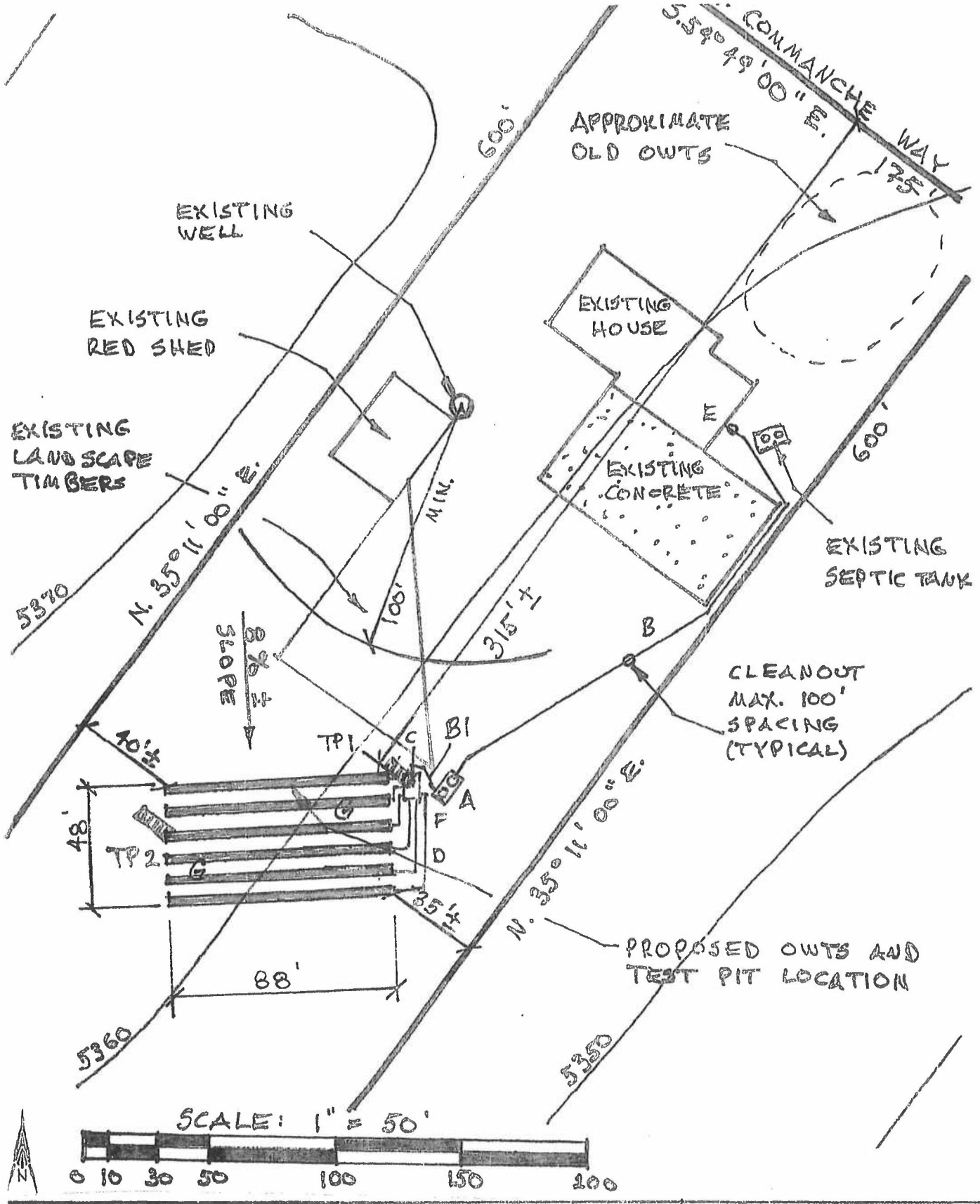
No Groundwater Encountered.

Name: Kennedy Plumbi
Project No.: 18-A210

LOT 8, BLOCK 1,
SCHMITT SUBDIVISION,
ARAPAHOE COUNTY,
COLORADO.



W.W. ENTERPRISES P.O. Box 1242 Limon, CO 80828	OWTS LOCATION/ SETBACK PLAN	PROJECT NO. 24-4028 PAGE 1 OF 5



W.W. ENTERPRISES
P.O. Box 1242
Limon, CO 80828

OWTS SYSTEM LAYOUT PLAN
- TRENCH -

PROJECT NO.
24-4028
PAGE 2 OF 5

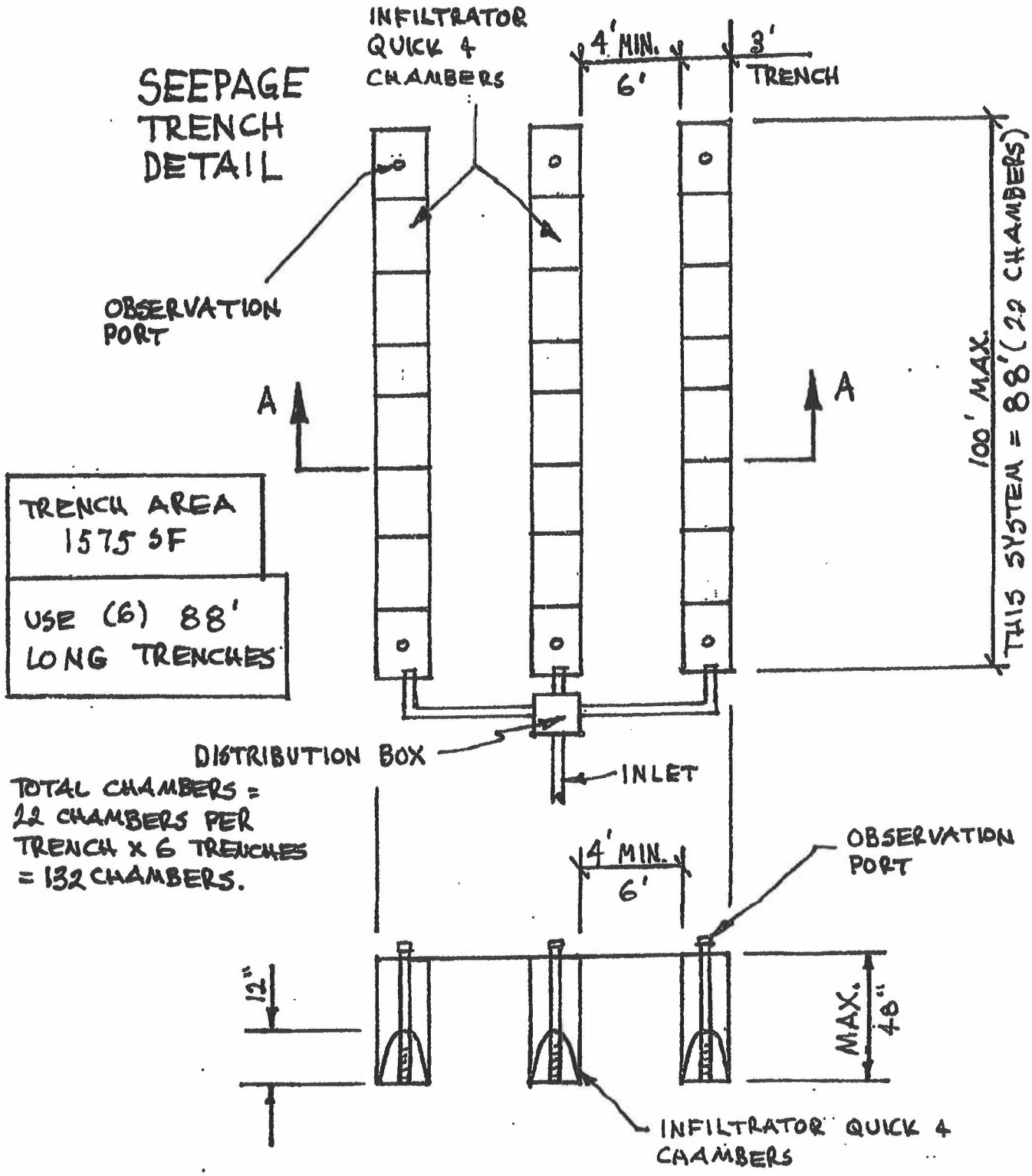
KEY		
A	1500 GAL. 2 COMP. SEPTIC TANK	
B	4" SCHED. 40 PVC PIPE: 170 ± LF	B1 4" SCH. 40 PVC PIPE: 15 ± LF
C	DISTRIBUTION BOX ELEV. = 5362.4 ±	
D	4" SCHED. 40 PVC DISCHARGE PIPES	
E	OUTLET PIPE FLOWLINE = 5366.0±. BASEMENT SLAB = 5360.0 ±	VERIFY (EXISTING) VERIFY (EXISTING)
F	SEPTIC TANK OUTLET ELEV. = 5362.6 ±.	
G	TRENCHES - BOTTOM MAX. 4' BELOW GRADE = 5361.9 TO 5358.1 ±.	

W.W. ENTERPRISES
P.O. Box 1242,
Limon, CO 80828

OWTS SYSTEM LAYOUT PLAN - TRENCH -

PROJECT NO. 24-4028

SEEPAGE TRENCH DETAIL



SECTION A-A

W.W. ENTERPRISES P.O. Box 1242, Limon, CO 80828	OWTS STANDARD ABSORPTION TRENCH DESIGN	PROJECT NO. 24-4028 PAGE 4 OF 5

1. Bottom of surface of bed should be roughened before construction of bed and trenches to avoid having a penetration resistant interface between natural soil and fill.

2. Distribution pipes should be laid level. The pipes should be interconnected for beds.

3. A layer of straw or paper shall be used between the gravel and backfill. Four inches (4") of "pea" gravel may be substituted for the straw or paper. NA for chambers.

4. Backfill shall consist of natural on-site material. Heavy clays should not be used as back-fill. The upper four inches (4") shall be suitable soil for supporting vegetation.

5. Top of bed shall be side-sloped about two percent (2%) and promote positive drainage away from the bed. The maximum slope for any septic system is thirty percent (30%).

6. Surface of bed not usable under traffic areas, either animal or machinery. Vegetation over bed should be durable and tolerate both wet and dry periods.

7. Surface of bed and trenches should receive sunlight. Shade trees near system not recommended.

8. This system to meet all applicable Arap County Health Department Rules and Regulations set forth in the Individual Sewage Disposal System Regulations.

9. A representative of W. W. Enterprises and the Arap. County Health Department should be contacted for Inspection prior to placement of backfill. Inspections by the Engineer are an additional charge.

APPENDIX I

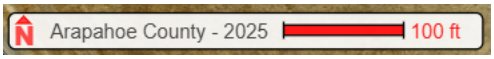
GENERAL MAINTENACE RECOMMENDATIONS FOR

ONSITE WASTEWATER TREATMENT SYSTEMS (OWTS)

The following recommendations, if followed, should help increase the lifetime of the system:

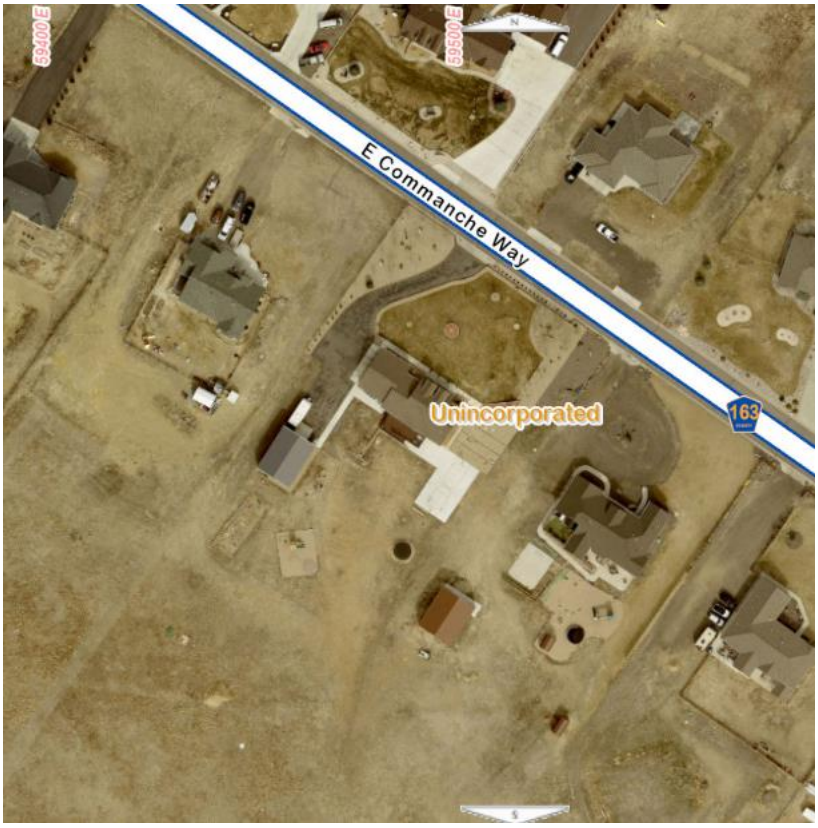
1. Septic tanks should be pumped a minimum once every four (4) years.
2. Septic tanks and distribution boxes should be checked at least once a year for sludge accumulation which may clog the leach area if overflow occurs.
3. The leach area should not be used for grazing, sports activities, traffic, or other activity which may compact the soils.
4. Schedule 40 pipe should be used if lines are to be placed under driveways.
5. Trees should not be planted near the leach area so as to prevent roots from clogging the system.
6. If trees are to be planted nearby, they should be located so that the leach area is not shaded.
7. Overuse of strong chemicals, which may kill the bacteria in the system and inhibit decomposition of the sewage, should be avoided.
8. Positive drainage should be maintained over and around the absorption field area to prevent pooling of water.
9. Lines to the tank or leach area should have sufficient ground cover to prevent freezing.

Map Legend for Arapamap source maps



Map 1a and 1b. Aerial Photo 2024 59508 E Commanche Way Source: Arapamap

Map 1b.



Map 2. Aerial Photo 2022 59508 E Commanche Way Source: Arapamap

Map 3: Aerial Photo 2024 with Contours 59508 E Commanche Way Source: Arapamap

Map 4. 2025 Aerial Photo 59508 E Commanche Way Source: Google Maps

59508 E Commanche Wy

6 foot distance between edge of concrete basketball court and property line per homeowner

6 foot distance between edge of concrete basketball court and property line per homeowner

View of east side of house looking uphill

View of test pit excavation areas

View of test pit excavation area

View of south west side of property

View of front of house from street

View of front yard from the driveway

View of front yard facing the house from the driveway

View of front yard facing the street from the driveway/front porch area

View of front yard facing the street from the driveway/front porch area

View of the ground in the front yard

View of inspection port per the homeowner

View of front yard

View of front yard near inspection port

View of front yard facing the house

View of edge of landscaping next to the street facing the house

View of ground in front yard and SE side of house facing SW towards cleanout and basketball court

View of SE side of house, landscaping, existing septic tank lid and basketball court facing SW

View of SE side of house, landscaping, existing septic tank lids and basketball court facing SW

View of SE side of house, landscaping, existing septic tank lid and basketball court facing SW

View of SE side of house, landscaping, existing septic tank lid and basketball court facing W

View of SE side of house, landscaping, existing septic tank lids, cleanout, and basketball court facing NW

View of SE side of house, landscaping, existing septic tank lids facing NW

View of SE side of house, landscaping, existing septic tank lids, and cleanout facing NW

View of front yard facing the street from SE side of house

View of front yard facing the street from porch