Permit: EH-15-014

• I. S. D. S. PERMIT •

TO INSTALL, CONSTRUCT, ALTER OR REPAIR **AN INDIVIDUAL SEWAGE DISPOSAL SYSTEM**

New: Y
Repair: N
Alteration: N
Addition: N

ROUTT COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH • P.O. BOX 770087 • STEAMBOAT SPRINGS, CO • 970-870-5588

This permit effective only on premises located at: **56010 HANNAHS WAY C**
Legal description of property: LOT 4 MURPHY-LARSEN RANCH SUBD 50.00A
Parcel Id.: 286800004 Lot No.: 004

Owner: BLACK DOG HOLDING, LLC
Address: A5 BAYSIDE VILLAS 1 PIK SHA ROAD
CLEAR WATER BAY KONLOON, HONG KONG
Phone:

Applicant: FAIR & SQUARE CONSTRUCTION
Address: ATTN: RON, P.O. BOX 817
CLARK CO 80428
Phone: 970-879-7725

As authorized and required by Chapter 25, Article 10 C.R.S., permission is hereby granted to the owner or a Routt County licensed ISDS installer to construct or repair an I.S.D.S. system at the property indicated above. All work must comply with the specifications on this permit and the Guidelines on Individual Sewage Disposal Systems - Revised 1988 - Colorado State Board of Health, 5 CCR 1003-6. This permit expires one year from date of issue.

SPECIFICATIONS

Y Residential N Commercial Other: **Number of bedrooms: 5**
Percolation Rate: 40 MPI
Minimum Septic Tank Capacity: 1500 gallon
Tank Material: Y Concrete N Polyethylene
Design: 1: Engineer shall certify that construction complies with permitted design.
Comments: SG 06/01/2015 THIS IS A 4 BEDROOM HOUSE WITH POSSIBLE 5TH BEDROOM ADDED AT LATER DATE. SYSTEM DESIGNED FOR 5 BEDROOMS.
Notice: All Sewage *HOLDING* Tanks must be Concrete. Inspections required (24 hour advanced notice required).

Environmental Health Specialist: [signature] **Date of Issue:** 6/1/15

The above individual sewage disposal system installed by ____________ has received a final inspection. The system is hereby approved for use.

Environmental Health Specialist: [signature] **Date** 12/15/17

Fee:	**State fee**	**$23.00**
	Percolation	**$0.00**
	Permit	**$277.00**
		$300.00

RECEIPT

RECEIPT NUMBER: R150000704

Routt County Environmental Health Department
P.O. Box 770087 Phone 970-870-5588
Steamboat Springs, CO 80477

APD #: EH-15-014 TYPE: EH-Ind. Sewage Disp Sys
SITE ADDRESS: 56010 HANNAHS WAY C
PARCEL: 286800004

May include fees collected within the jurisidiction.

TRANSACTION DATE: 06/01/2015

TOTAL PAYMENT:	300.00
TOTAL PAID FROM TRUST:	.00
TOTAL PAID FROM CURRENCY:	300.00

TRANSACTION LIST:

Type	Method	Description	Amount
Payment	Check	29008	300.00
		TOTAL:	300.00

ACCOUNT ITEM LIST:

Description	Account Code	Current Pmts
I.S.D.S. Permit Fee	01-20-22-000-568	277.00
State Surcharge for ISDS	01-20-22-000-546	23.00
	TOTAL:	300.00

RECEIPT ISSUED BY: SG INITIALS: SG
ENTERED DATE: 06/01/2015 TIME: 09:16 AM

OK to issue 5/29/15 - CJ

EH-15-

BUILDING PERMIT # CB-15-234
PERMIT PD 300.00
PERC PD

ck #2908 Fair + Square $300 5/29/15

APPLICATION FOR ON-SITE WASTEWATER SYSTEM PERMIT

NEW X REMODEL ___ REPAIR ___ EMERGENCY USE ___

Name of Owner Black Dog Holding, LLC Mailing Address Hong Kong Phone ___

Name of Applicant Fair & Square Const. Mailing Address PO Box 817 Clark, CO 80428 Phone 879-7725

LOCATION OF PROPOSED SYSTEM: Street Address 56010 Hannah's Way, Clark, CO 80428

Legal Description Lot 4, Murphy-Larsen Ranch (Lot# and Subdivision if applicable) Parcel ID# 2868000604 (this # can be found in the Assessor's Office)

Size of Lot 50 A (X)Residential ( )Commercial ( )Other (Describe) ~~2868000604~~

Number of: Bedrooms 4 designed for 5 Bedroom

Water Supply: ( ) Private Well
(X) Public (give name of supply) Subdivison has system

An appropriate plot plan must accompany this application showing required information. Percolation tests and an on-site inspection must be conducted by a Colorado Registered Professional Engineer, P.E. or the Routt County Department of Environmental Health after receipt of the application and plot plan. The permit, upon approval of this application may be obtained at the Routt County Department of Environmental Health with payment of the required fee.

Application for an individual wastewater system is hereby submitted. The on-site wastewater system will be constructed, installed and operated in accordance with the regulations governing individual sewage disposal systems within Routt County and will comply with applicable State Regulations adopted pursuant to Article 10 of Title 25, C.R.S. 1973, as amended. The undersigned acknowledges that the above information is true and that false information will invalidate the application or subsequent permit. The owner assumes all responsibility in case of failure or inadequacy of this sewage disposal system. (*Hot tubs and Jacuzzis shall not be connected to on-site sewage disposal systems.)

Signature of Applicant F&S Date 5/29/15

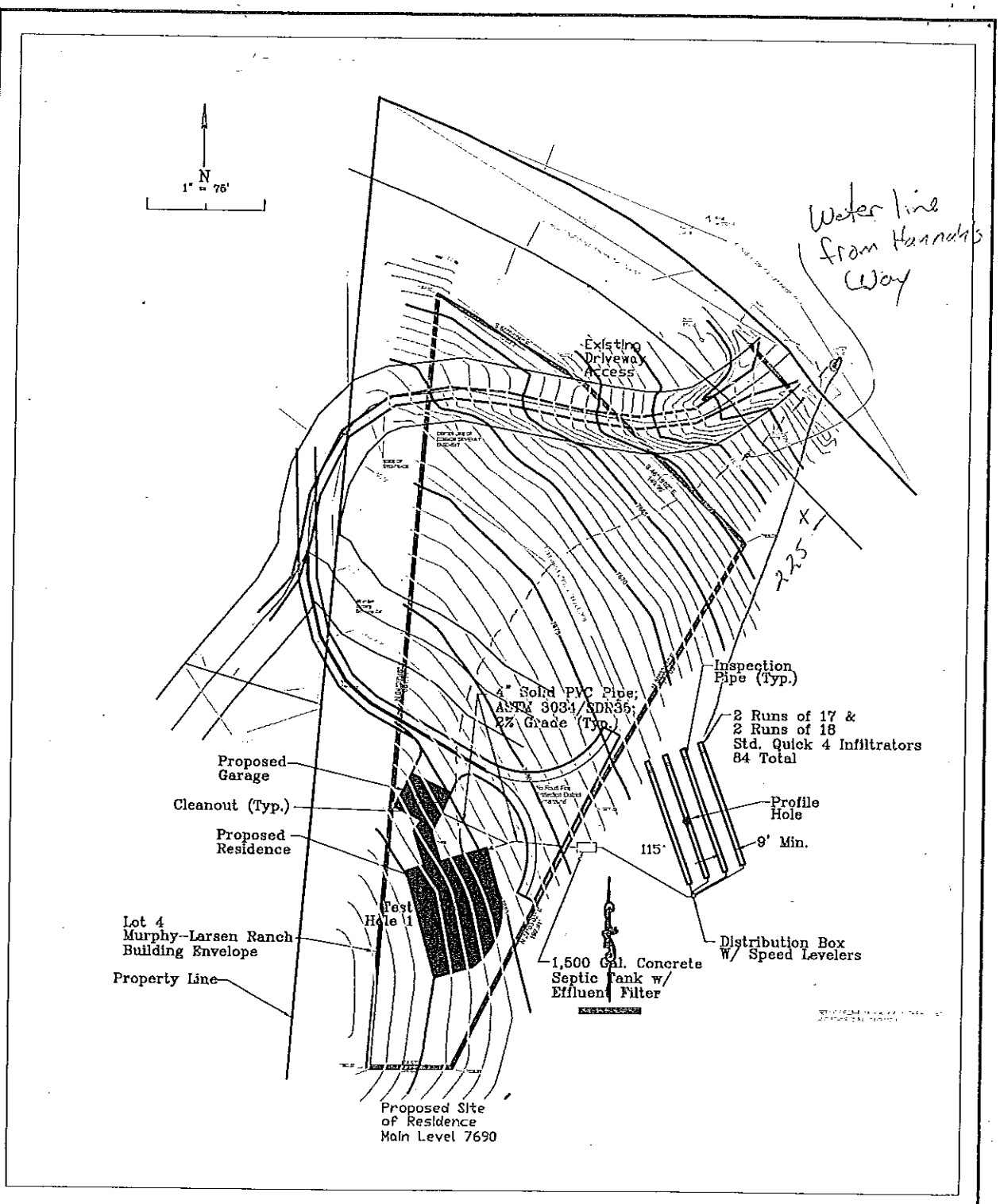
SUBI

PLOT

Name

Locati

PLOT PLAN



OWTS SITE PLAN

Project Name: Ostragnai Residence	SOILOGIC Steamboat Springs Hayden•Greeley	
Location: Lot 4, Murphy-Larsen Ranch, Routt County	Project No.: 14-4004	Drawn/Checked:HS/HS
	Date: 10/23/14	Figure No.: 2

October 28, 2014

Black Dog Holding, LLC
C/o Rob Hawkins Architects
P.O. Box 771743
Steamboat Springs, CO 80477

Attn: Mr. Rob Hawkins

Re: On-Site Wastewater Treatment System Design Report
Proposed Ostragnai Residence
Lot 4, Murphy Larsen Ranch Subdivision
Routt County, Colorado
Soilogic Project # 14-4004

Dear Rob,

Soilogic, Inc. (Soilogic) has completed the On-site Wastewater Treatment System (OWTS) design you requested for the proposed Ostragnai residence to be constructed within Lot 4 of the Murphy Larsen Ranch in Routt County, Colorado. The results of our site and soil evaluations, design calculations, system design drawings and other pertinent information are included with this report.

PROPOSED CONSTRUCTION

Based on the site plan provided and our discussions with the client, Soilogic understands the proposed single family residence will be constructed with four bedrooms, initially, with the potential for one additional bedroom placed over the garage structure. Therefore, this design is based on a total of five (5) bedrooms. No other future building additions or bedrooms generating wastewater are anticipated.

SITE CONDITIONS

The project site consists of approximately 50 acres of rural, agricultural land located at the along Hannah's Way and west of County Road 62 in Routt County, Colorado. At the time of Soilogic's site exploration, the property was generally vacant and undisturbed. Site vegetation consists of natural grasses, weeds, deciduous brush and scattered aspen trees.

The proposed OWTS absorption field site consists of vacant and undisturbed land located approximately 100 feet northeast of the building site. Site topography was fairly consistent and generally sloped moderately down to the northeast at approximately 8 to 10 percent.

Existing wells, springs, ponds streams or other water features were not present in the vicinity of the site. Property boundaries and existing and proposed site features are shown on Figure 1.

SOIL EVAULATION

A soil evaluation program consisting of the drilling of two (2) exploratory test holes was conducted at the project site to provide subsurface information at the proposed building site and absorption field locations. The approximate test hole locations are shown on Figure 2 and graphic test hole logs, legend and notes are shown on Figure 3.

The subsurface conditions encountered in the profile hole were variable and generally consisted of a layer of vegetation overlying natural silty, sandy loam and sandy lean clay to the maximum depth explored, 7½ feet.

The vegetation layer was approximately 6 inches in thickness and was underlain silty, sandy loam. Natural sandy lean clay/clayey sand was encountered beneath the silty, sandy loam at a depth of approximately 30 inches and extended to the maximum depth explored, 9 feet. The lean clay/clayey sand was low to moderately plastic, very stiff to hard, moist to wet and reddish brown to gray in color.

Groundwater was not encountered in the profile hole at the time of grilling or when checked 24 hours after drilling. Evidence of a higher seasonal groundwater level was not observed. Groundwater levels will vary seasonally and over time based on weather conditions, site development, irrigation practices and other hydrologic conditions.

Percolation Testing: Percolation testing was conducted at the proposed absorption field site/Soil Treatment Area (STA) by Soilogic personnel on September 16, 2014 to evaluate the soil types for Long Term Acceptance Rates (LTARs). Three percolation test holes

were advanced in the upper 29 inches of silty, sandy loam. Two additional percolation test holes were advanced to depths of 36 and 40 inches to evaluate the LTAR of the potentially restrictive layer of sandy lean clay/clayey sand. Percolation test results (indicated in minutes per inch - mpi) and associated Treatment Level 1 (TL-1) LTARs are summarized below in Table A.

TABLE A

Soil Type	Depth (in)	Avg. Perc Rate (mpi)	LTAR (gpd/ft^2)
Silty, Sandy Loam - (Type 2)	6-30	40	0.50
Sandy Lean Clay – (Type 3)	30 +	120	0.15

OWTS DESIGN ANALYSIS AND RECOMMENDATIONS

The site and soil evaluations indicate suitable conditions for wastewater disposal at depths between 12 and 18 inches below existing grades. Based on proposed construction and Soilogic's experience with similar sites and conditions in this area of Routt County, we recommend the OWTS consist of a gravity fed, septic tank and absorption field sized assuming TL-1 treatment levels. The recommended absorption field design consists of infiltration chambers (Standard Quick 4 Infiltrators®) installed in a trench configuration.

Based on anticipated lateral shallow groundwater (effluent) flow direction (similar to site topography), Soilogic believes the underlying sandy lean clay/clayey sand does not represent a restrictive layer to efficient wastewater treatment and no future effluent surfacing will occur based on topography. Therefore, an LTAR of 0.50 gpd/ft^2 was used in system sizing. Pertinent system components are summarized below and associated design calculations are provided in Appendix A. Regulatory, inspection and system component specifications are provided in Appendix B.

Septic Tank: 1,500 gallon, concrete with effluent filter.
Transmission Piping: 4-inch solid PVC, gravity discharge, 2% min. grade.

Distribution Box: Min. 4 outlet with Speed Levelers®.

Infiltration Chambers: 70 - Infiltrator® Standard Quick 4 chambers.

Infiltrative Surface: Establish at 12-18 inches below existing ground surface.

*Chamber Protective Wrapping: ¼-inch galvanized steel mesh.

Topsoil Cover: Provide all absorption field areas with minimum 18 inches topsoil cover.

Marking and Protection: Septic tank and distribution box locations marked with metal T posts. Absorption field fenced off to prevent machinery, livestock and wildlife damage.

*Please note that infiltration chambers must be protected from rodent excavating and backfilling activity by the placement of ¼-inch galvanized steel mesh that completely covers the open base area of the chamber. Mesh must be secured to chamber base using an approved method and frequency. Schematic OWTS site plan and typical absorption field cross section are shown on Figure 3 and 4, respectively.

OWTS OPERATION AND MAINENANCE

Proper OWTS operation and maintenance is crucial for satisfactory long-term system performance. Soilogic recommends the following operation and maintenance criteria be observed by the owner/operator.

1. Regular inspection and pumping of the septic tank and effluent filter located at the tank outlet should be conducted by a qualified service provider. A recommended frequency of 3 to 5 years is typical for normal usage. More frequent pumping may be required based on higher usage.
2. Inspection of absorption field area for signs of surfacing effluent should be conducted on a yearly basis.
3. The installation of water conserving plumbing fixtures, judicious use of water and minimization of solid waste directed to the OWTS is strongly recommended to extend system life.
4. Leaking plumbing fixtures should be repaired immediately. The additional hydraulic loading can permanently damage the absorption field.

5. Discharge from spas, pools and water treatment systems should not be directed to the OWTS. The chemical and hydraulic loading from these features can permanently damage the absorption field.
6. The OWTS treatment is based on naturally occurring biological processes. Discharge of various harsh chemicals, solvents, excessive oil and grease and non-organic wastes to the system can damage or limit biological treatment processes, reducing system performance and life. These materials should not be directed to the OWTS.

LIMITATIONS

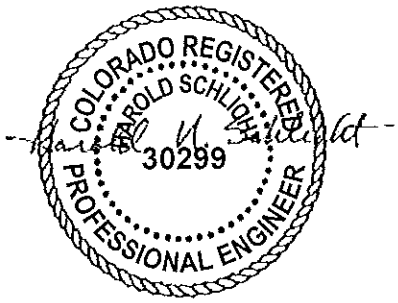
Site and soil evaluations and design report were conducted and prepared by Harold Schlicht (Colorado P.E. No. 30299) and reviewed by Wolf von Carlowitz (Colorado P.E. No. 36746). This report and design are based on the evaluations and were completed in accordance with the Routt County On-Site Wastewater Treatment System Regulations (2014) and using currently accepted OWTS design procedures and standard of care for the profession at the time of service.

This report has been prepared for the exclusive use of Soilogic's client for the specific application indicated. No warranties express or implied, are made. Changes to the stated proposed construction and usage or addition of wastewater generating features may require changes to the OWTS.

Please be advised that construction or alteration of an OWTS requires a valid permit from the Routt County Department of Environmental Health ((970)-879-0185).

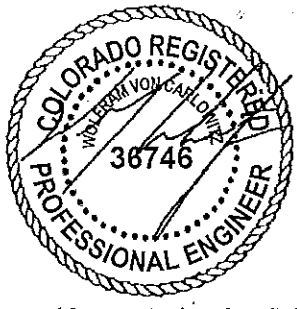
Soilogic appreciates the opportunity to be of service to you on this project. If you have any questions concerning the enclosed information or if we can be of further service to you in any way, please do not hesitate to contact us.

Very Truly Yours,
Soilogic, Inc.



Harold Schlicht, P.E.
Senior Project Engineer

Reviewed by:

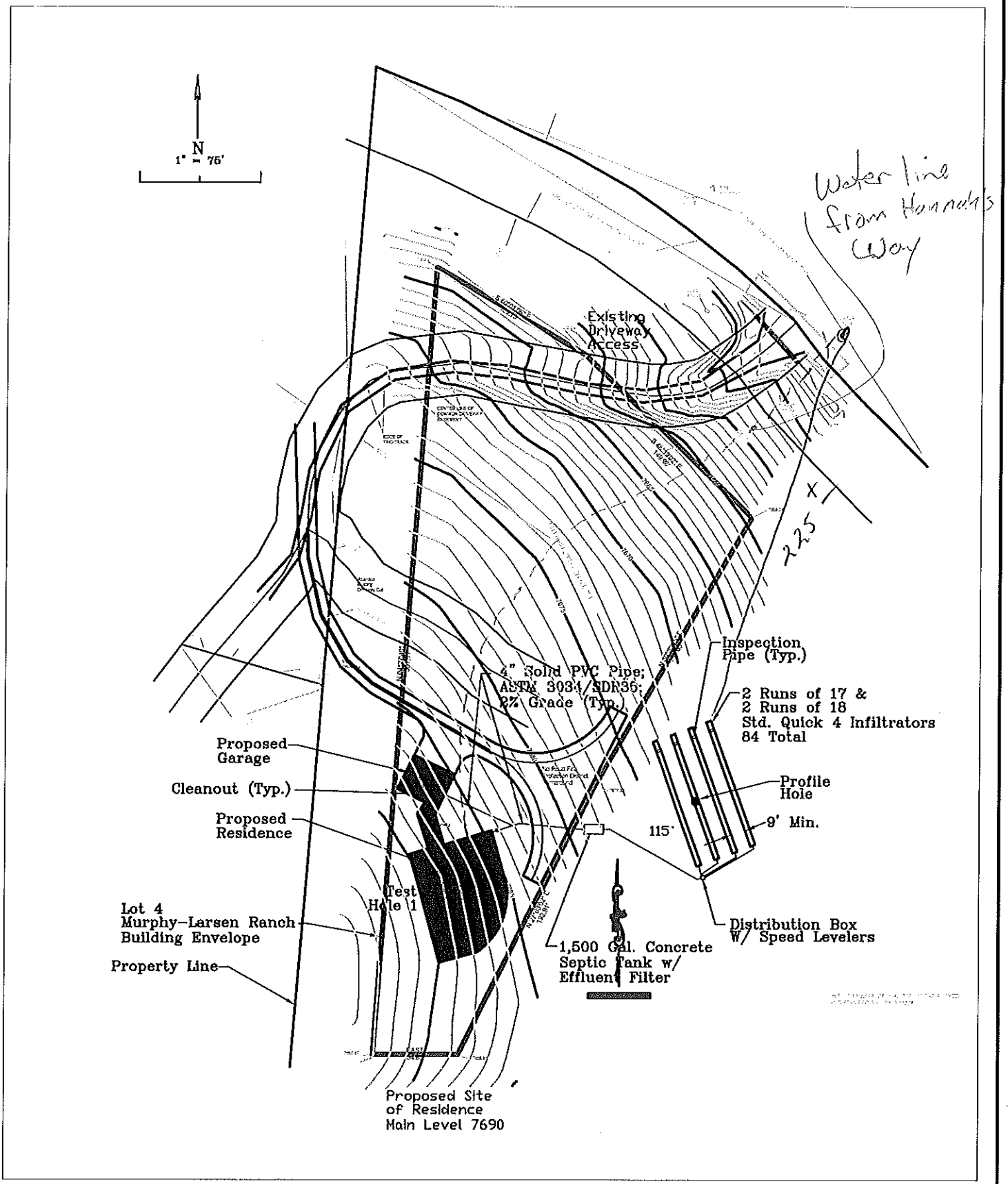


Wolf von Carlowitz, P.E.
Principal Engineer

N
(NOT TO SCALE)

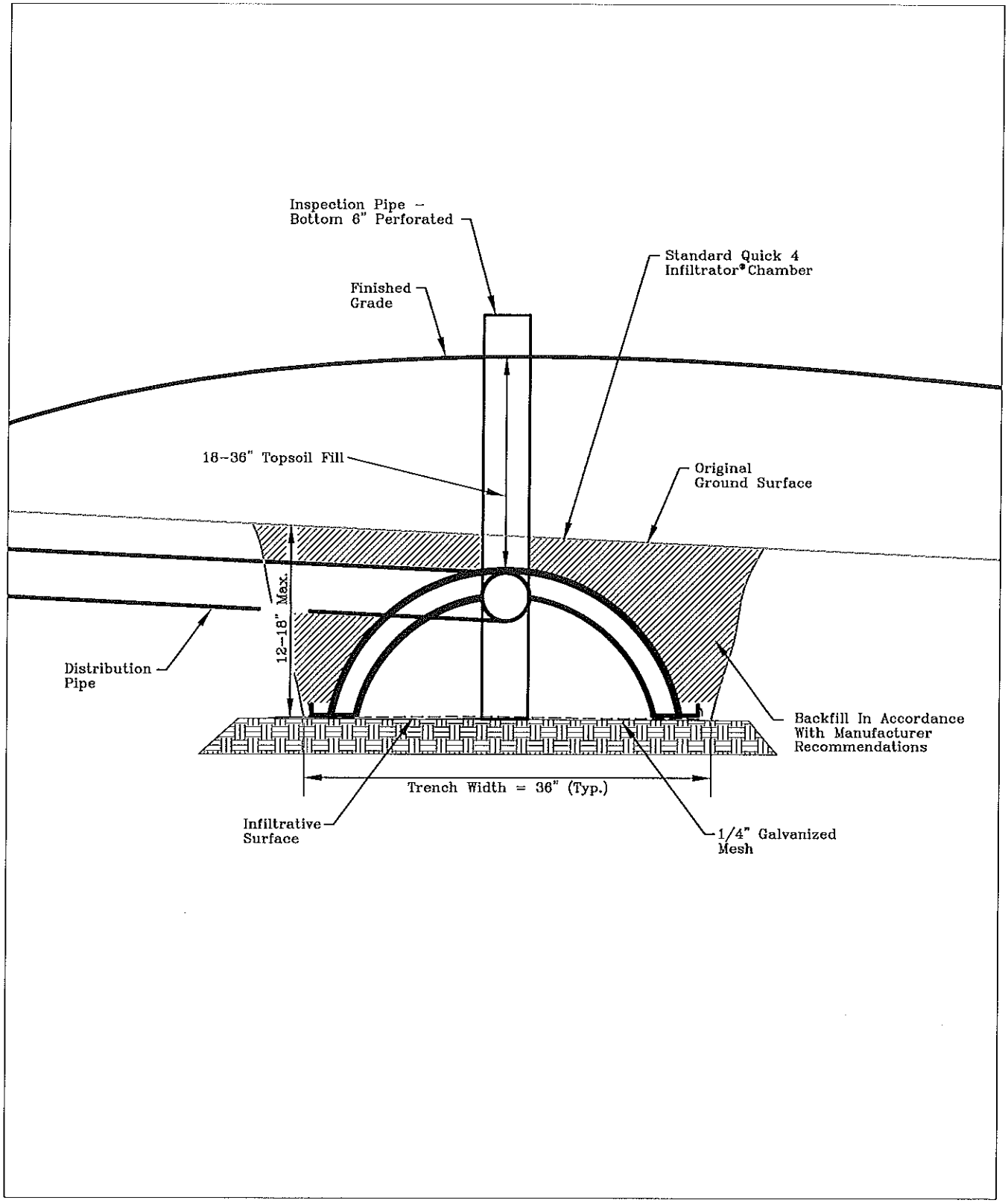
OWTS VICINITY MAP

Project Name: Ostragnai Residence	SOILOGIC Steamboat Springs Hayden•Greeley	
Location: Lot 4, Murphy Larsen Ranch, Routt County, CO	Project No.: 14-4004	Drawn/Checked:HS/HS
	Date: 10/23/14	Figure No.: 1



OWTS SITE PLAN

Project Name: Ostragnai Residence	SOILOGIC Steamboat Springs Hayden•Greeley	
Location: Lot 4, Murphy-Larsen Ranch, Routt County	Project No.: 14-4004	Drawn/Checked:HS/HS
	Date: 10/23/14	Figure No.: 2



INFILTRATION CHAMBER SYSTEM – TYPICAL CROSS SECTION

Project Name: Ostragnai Residence	SOILOGIC Steamboat Springs Hayden•Greeley	
Location: Lot 4, Murphy Larsen Ranch, Routt County, CO	Project No.: 14–4004	Drawn/Checked:HS/HS
	Date: 10/24/14	Figure No.: 3

APPENDIX A

DESIGN CALCULATIONS & SETBACK REQUIREMENTS

A. Sewage Volume Calculations

1. Residence – 5 Bedrooms: 600 gpd (per Table 6-1[1])
2. Design Flow: Q = 600 gpd

B. . System Sizing

1. Treatment Level: TL-1
2. Soil Treatment Area (STA) Sizing
    a. Percolation Rate = 40 mpi
3. LTAR: 0.50 gpd/ft^2 (per Table 10-1[1])
4. STA = Q/LTAR = 600/0.50 = 1,200 ft^2
    a. Adjustment Factor – Chambers = 0.70
    b. Adjustment Factor – Gravity Flow - Trench = 1.0
    c. STA (Adjusted) = 1,200 ft^2 x 0.70 x 1.0 = 840 ft^2
    d. Number of Chambers = 840 ft^2 /12.0 ft^2/chamber = 70 chambers
    e. Septic Tank (5 Bedroom Residence): 1,500 gallon minimum, concrete
    f. Effluent Filter: Yes
5. STA Setback Requirements
    a. Property Line: 10 ft.
    b. Spring or Well: 100 ft.
    c. Potable Water Supply Line: 25 ft.
    d. Dry Gulch: 25 ft.
    e. Lake, Water Course, Stream, Ditch or Wetland: 50 ft.

[1] Routt County On-Site Wastewater Treatment System Regulations (2014)

APPENDIX B

SPECIFICATIONS

A. Installer and owner must comply with all requirements contained in the Routt County On-Site Wastewater Treatment System Regulations (2014). Plumbing shall meet current plumbing codes.

B. OWTS components shall be installed at the approximate locations, depths and grades as indicated on the plans. Variations from the plans may be required due to variations in topography, building site location and elevation. If variations are necessary, Soilogic must be contacted for approval. A preconstruction meeting is strongly recommended to discuss system layout, construction and inspection requirements and to reduce potential changes to OWTS plans.

C. Engineer (Soilogic) must be contacted at least 24 hours in advance for necessary inspections/observations of installed OWTS components including:
   1. Building sewer, tank discharge and distribution piping;
   2. Septic tank, inlet and outlet Ts and effluent filter;
   3. Distribution piping, chambers and/or washed rock;
   4. Pressurized piping shall be pressure tested as directed by engineer;
   5. Approved mound fill – classification, depth and dimensions (when applicable);
   6. Approved pumping components and testing (when applicable);
   7. Approved mechanical filter units, automatic distribution valves and other mechanical components (when applicable);
   8. Contractor shall assist engineer in compiling as-constructed system information including product information and 2-point ties to permanent site features.

D. All system gravity piping shall consist of 4-inch solid or perforated PVC meeting or exceeding ASTM 3034/SDR35 requirements. Joints shall be watertight, cemented/bonded or gasketed.
   1. All piping shall be bedded and shaded with fine grained on-site or imported material. Bedding and shading will be installed such that it shall provide uniform support and protection to piping.
   2. Trenching and component backfill shall be uniformly compacted to at least 95% of the standard Proctor density near optimum moisture content, unless otherwise noted.
   3. Provide minimum 24 inches soil cover over all piping and components, unless otherwise noted. Provide cleanouts at min. 100' intervals.

E. Infiltration chambers shall consist of Infiltrator® Quick 4 or other approved product. Manufacturer's recommendations for installation and backfill shall be observed for all components. Inspection pipes shall be provided one per trench located near end of trench.

F. Septic tank inlet and outlet piping shall be supported by compacted (Min. 80% Relative density (ASTM D4253/4254)) screened or washed rock fill where piping enters and leaves the tank excavation limits. Risers and securable access ports shall be watertight and extend to or be exposed at final grades.

G. Absorption areas shall be fenced off from construction or other activity that contributes to disturbance or soil compaction. Absorption field construction shall not be commenced during periods of high soil moisture content to minimize disturbance and smearing of infiltrative surfaces.

H. Finished grading shall be sloped to provide positive drainage away from all absorption field surfaces. Surface and subsurface runoff, foundation drains and other sources of water located upslope of the absorption field shall be directed away from absorption field areas by grading, ditching, piping or use of subsurface drainage collection and discharge systems.

I. All pressurized piping shall be Sch40 PVC or higher rating or other material approved for wastewater applications. All joints shall be cemented, mechanically or chemically bonded to provide an airtight fit. Pressure testing shall be conducted as directed by the engineer.

J. Pumping, mechanical systems and electrical systems and controls shall be installed by qualified installers and shall meet all applicable local plumbing and electrical code requirements.

K. Imported fill materials used for seepage beds and trenches, mound fill or other seepage and distribution related components shall be approved by Soilogic prior to transportation to the site.

L. It is the responsibility of the installer and owner to comply with and maintain all setback requirements throughout the life of the system.

February 23, 2017

Black Dog Holding, LLC
c/o Rob Hawkins Architects
PO Box 771743
Steamboat Springs, Colorado 80477

Re: OWTS Observations
Black Dog Residence
Lot 4, Murphy Larson Ranch Subdivision
Routt County, Colorado
Soilogic Project # 14-4004

Dear Rob,

This report summarizes Soilogic, Inc.'s (Soilogic) observations of the On-site Wastewater Treatment System (OWTS) conducted for the above referenced project. Soilogic conducted two site visits for observation of the OWTS on August 10 and 18, 2016.

Site Observations: At the time of Soilogic's site visit on August 10, 2016, we observed the building sewer piping from the main house had been installed. The building sewer originating from the garage area was buried and could not be observed. Portions observed, and information supplied by the installer concerning the buried piping indicated the piping met minimum material and grade requirements.

At the time of our August 18, 2016 site visit, we observed the absorption system had been installed at the approximate plan location. Our observations indicated 70 Standard Quick 4 Infiltrators® were installed in a configuration consisting of 2 runs of 17 and 2 runs of 18 chambers.

A distribution box with Speed Levelers® and distribution piping was also installed and met minimum material and grade requirements. We observed all distribution piping and distribution box had been adequately supported and bedded using imported sand and washed rock fill.

We also observed a 1,500 gallon concrete septic tank (Front Range Precast) had been installed at the approximate plan location. Sanitary tees were installed on tank inlet and

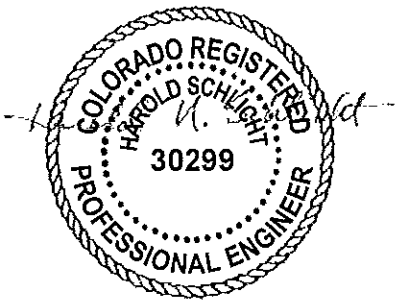
outlet piping, and an effluent filter was also installed. Tank inlet and outlet piping was bedded with washed rock fill with per the specifications.

The approximate location of OWTS components is shown on the attached Figure 1.

Based on Soilogic's observations, system components observed appeared to have been installed in general accordance with the approved OWTS design. A copy of this report will be forwarded to the Routt County Department of environmental Health for their review and records.

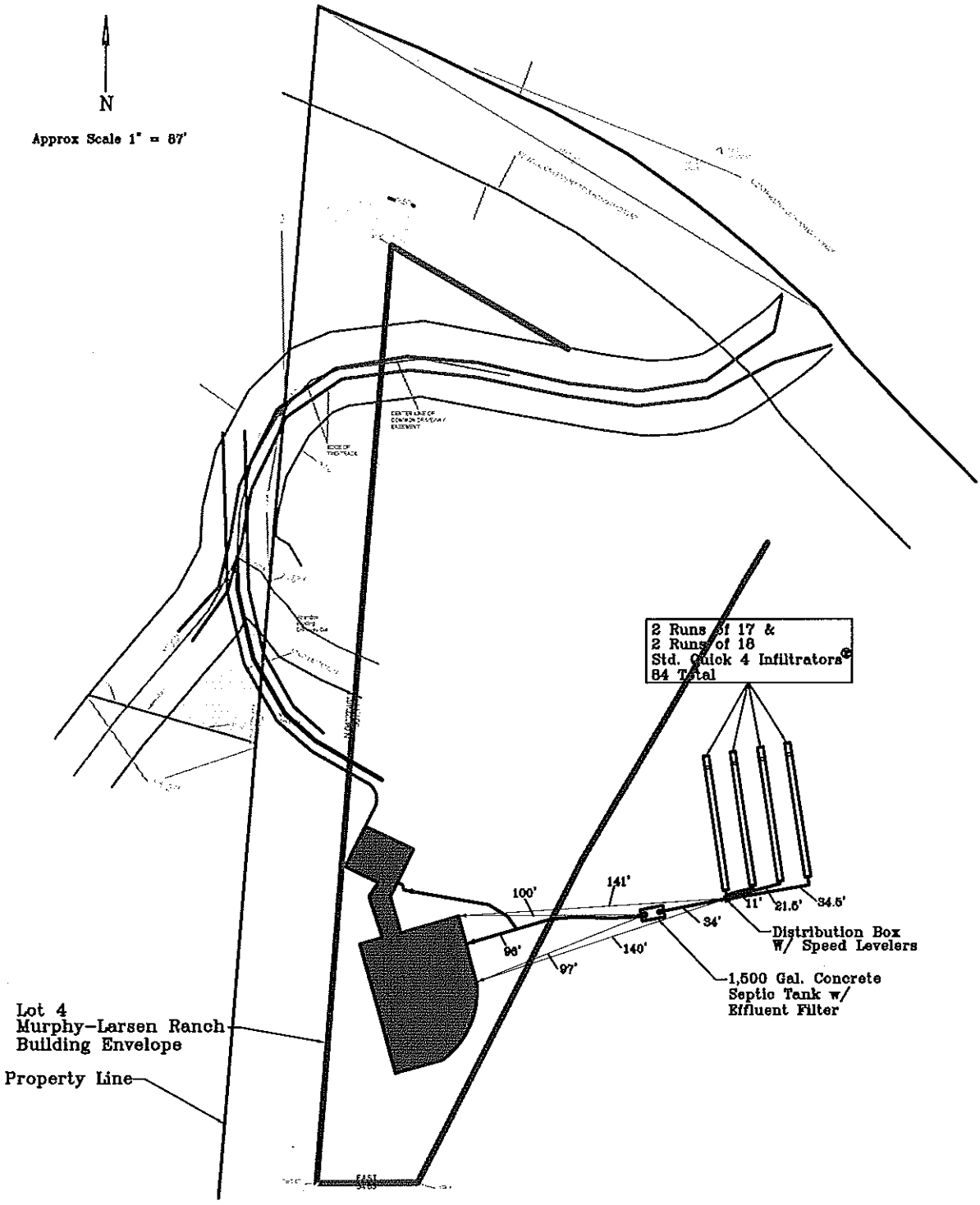
Soilogic appreciates the opportunity to be of service to you on this project. If you have any questions concerning this report or if we can be of further service to you in any way, please do not hesitate to contact us.

Very Truly Yours,
Soilogic, Inc.



Hal Schlicht, P.E.
Senior Geotechnical Engineer

Cc: Routt County Department of Environmental Health
Ron Davies – Fair & Square Construction



OWTS AS-CONSTRUCTED PLAN

Project Name: Ostragnai Residence	SOILOGIC Steamboat Springs Hayden•Greeley	
Location: Lot 4, Murphy-Larsen Ranch, Routt County	Project No.: 14-4004	Drawn/Checked:HS/HS
	Date: 2/19/17	Figure No.: 1