### Onsite Septic System Site Evaluation And Replacement System Design

For:

David & Mitzi Spade (WPCLF)

6924 Nebraska Ave Toledo, OH 43615

Property Location:

6924 Nebraska Ave Toledo, OH 43615

Springfield Township, Lucas County

#### SYSTEM TYPE:

NPDES Norweco Singulair 960-500 GPD ATU W/ UV Disinfection & Reaeration (Telemetry Failsafe) BY: Nathan Wright (Soil Scientist)

Seth V. Layne (Designer)

Geophyta, Inc. 2685 C.R. 254 Vickery, OH 43464

419-547-8538

August 10th, 2024

## ♦ 6924 Nebraska Ave ♦



1. Disclaimer
2. Layout Map
3. Lucas County Utility Mapper
4. Soil Evaluation (2X Total)
5. 3D CAD Layout
G. Top CAD Layout
7. Elevation CAD Layout
8. Component Detail Prints (10X Total)
9. Bill of Materials
10. Operation & Maintenance (4X Total)

#### To The Homeowner:

A septic system is designed based on all the information you provide and Geophyta Inc collects at the site. It must be accurate. This information includes local soil limits and topography, plus existing and future locations of your home, number of bedrooms, out buildings, driveways, drinking water wells, ponds, septic systems, and property lines. Geophyta Inc. relies on this information to construct detailed design drawings that must meet local health department regulations before installation.

Any design changes required by the local health department to meet existing regulations are the responsibility of Geophyta Inc.

Any information changes made by you after the initial site inspection are your responsibility and will result in additional charges to you above the original quote for services. These charges may include additional site inspection work, system redesign, and resubmitted drawings.

#### To The Installer:

The registered installer of this septic system design is responsible for preparing an "asbuilt" record, as stated in the Ohio Administrative Code Chapter 3701-29-09, Par. F (p.32) of the "Sewage Treatment System Rules," Ohio Department of Health, January 1, 2015. Additionally, the installer is responsible for measuring and recording distal pressure head and float switch settings as baseline measures for future operation and maintenance of any pressure distribution system (3701-29-15, Appendix B, Par. VI(p.93) of above referenced rules.

If the installer requests "as-built" record creation from Geophyta Inc., additional charges will be billed to the installer by Geophyta Inc. and must be arranged prior to installation.

Geophyta Inc. must assume that any registered installer has the knowledge, equipment, ability, and experience to properly layout, install, and create as-built drawings for any septic system design approved by a local board of health. This includes the ability to read detailed design prints with an associated bill of materials. For this reason, any Geophyta Inc project supervision prior to or during installation will be billed to the installer.

Any product substitution made by the installer that is not specifically permitted in the design prints may result in Health Dept. disapproval and will result in additional redesign costs billed to the installer.

## HSTS Replacement Layout - 6924 Nebraska Ave





OWERED BY

#### Site and Soil Evaluation for Sewage Treatment and Dispersal

	County: Lucas			Land Use /	Vegetation:	Reside	ntal Turf	C	Control #: 24-	- LUC - 9A	- 254	$\square$
Township / Sec.: Springfield			Landform:	Glacial	Lake Pla	in				CPSS\		
Property .	Address: 6924 Ne	braska Aven	ue	Position of	n Landform:	Flat					<	
OR I	Location: Toledo,	OH 43615		Percent Slope: 0-1								VIEW
Applicar	nt Name: David &	. Mitzi Spade		Sha	pe of Slope:	Linear	-Linear				6	1
	Address: 6924 Ne	braska Aven	ue	Approximat	e Soil Type:	Granby	y S				Ce	Soil Scientist
	Toledo,	OH 43615								Certificat	ion #:	19395
	Phone #: <b>419-206</b>	-8836 (David)	)	-	Date:	25-Jul-	24					
	Lot #:			-	Evaluator:	Nathar	Wright					
Tes	t Hole #: A			-		Geophy	yta, Inc.			e C	h #	71.1
Latitude/Lo	ongitude: 83°42'24	.415''W 41°	38'49.565''N	-		2685 C	.R. 254			1	Jatha	Whight
	Method:	Pit Aug	er X Probe; 1 1	/4" dia.		Vicker	y, OH 434	464	Si	ignature:		J
					Phone#:	419-54	7-8538					
C. I		Б					<b>T</b> (1		D 1994			
Sol	il Profile	Es	timating Soil Sati				Estin	nating Soil	Permeability	y		
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	Depth	Matrix	Redoximorp	onic Features		exture			Structure			
Horizon	(inches)	Color	Concentrations	Depletions	Class	Approx. % Clay	Approx. % Fragments	Grade	Size	Type (shape)	Consistence	Other Soil Features
•	00150	10370 2/2			G		•	0				
A	0.0-15.0	10Y K 2/2	none	none	S	<5	0	<b>U-none</b>	-	sg	loose	
AB	0.0-15.0 15.0-25.0	10YR 2/2 10YR 3/3	none 15%7.5YR 3/4	none	S S	<5 <5	0	0-none	-	sg	loose	
AB C1	0.0-15.0 15.0-25.0 25.0-34.0	10YR 2/2 10YR 3/3 10YR 6/2	none 15%7.5YR 3/4 15%10YR 4/6	none none matrix	s s	<5 <5 <5	0	0-none 0-none	- - -	sg sg sg	loose loose	
AB           C1           C2	0.0-15.0 15.0-25.0 25.0-34.0 34.0-60.0	10YR 2/2 10YR 3/3 10YR 6/2 10YR 5/2	none 15%7.5YR 3/4 15%10YR 4/6 none	none none matrix matrix	S S S	<5 <5 <5 <5	0	0-none 0-none 0-none	-	sg sg sg sg	loose loose loose	
AB C1 C2	0.0-15.0 15.0-25.0 25.0-34.0 34.0-60.0	10YR 2/2 10YR 3/3 10YR 6/2 10YR 5/2	none 15%7.5YR 3/4 15%10YR 4/6 none	none none matrix matrix	8 8 8 8	<5 <5 <5 <5	0 0 0	0-none 0-none 0-none	-	sg sg sg	loose loose loose	
A           AB           C1           C2	0.0-15.0 15.0-25.0 25.0-34.0 34.0-60.0	10YR 2/2 10YR 3/3 10YR 6/2 10YR 5/2	none 15%7.5YR 3/4 15%10YR 4/6 none	none none matrix matrix	\$ \$ \$ \$	<5 <5 <5 <5	0	0-none 0-none 0-none	- - -	sg sg sg sg	loose loose loose	
A AB C1 C2	0.0-15.0 15.0-25.0 25.0-34.0 34.0-60.0	10YR 2/2 10YR 3/3 10YR 6/2 10YR 5/2	none 15%7.5YR 3/4 15%10YR 4/6 none	none none matrix matrix	S S S	<5 <5 <5 <5	0 0 0 0	0-none 0-none 0-none	- - -	sg sg sg sg	loose loose loose	
AB           C1           C2	0.0-15.0 15.0-25.0 25.0-34.0 34.0-60.0	10YR 2/2 10YR 3/3 10YR 6/2 10YR 5/2	none 15%7.5YR 3/4 15%10YR 4/6 none	none none matrix matrix	\$ \$ \$ \$	<5 <5 <5 <5	0	0-none 0-none 0-none	-	sg sg sg sg	loose loose loose	
AB           C1           C2	0.0-15.0 15.0-25.0 25.0-34.0 34.0-60.0	10YR 2/2 10YR 3/3 10YR 6/2 10YR 5/2	none 15%7.5YR 3/4 15%10YR 4/6 none	none none matrix matrix	<u>s</u> <u>s</u> <u>s</u>	<5 <5 <5 <5	0 0 0 0	0-none 0-none 0-none	-	sg sg sg sg	loose loose loose	
A AB C1 C2	0.0-15.0 15.0-25.0 25.0-34.0 34.0-60.0	10YR 2/2 10YR 3/3 10YR 6/2 10YR 5/2	none 15%7.5YR 3/4 15%10YR 4/6 none	none none matrix matrix	\$ \$ \$ \$	<5 <5 <5 	0 0 0	0-none 0-none 0-none	- - -	sg sg sg sg	loose loose loose	
A AB C1 C2 Limitin Perched Sease	0.0-15.0 15.0-25.0 25.0-34.0 34.0-60.0 ng Conditions onal Water Table	10YR 2/2 10YR 3/3 10YR 6/2 10YR 5/2 Depth to (	none 15%7.5YR 3/4 15%10YR 4/6 none in.)	none none matrix matrix Descriptive Notes	\$ \$ \$ \$	<5 <5 <5 	0 0 0	0-none 0-none 0-none tors: Values F 3. horizon ( )	- - - - - - - - - - - - - - - - - - -	sg sg sg sg und	loose loose loose	
AB C1 C2 Limitin Perched Sease Apparent Wal	0.0-15.0 15.0-25.0 25.0-34.0 34.0-60.0 ng Conditions onal Water Table ter Table	10YR 2/2 10YR 3/3 10YR 6/2 10YR 5/2 Depth to ( >60 25	none 15%7.5YR 3/4 15%10YR 4/6 none in.) Restricted b	none none matrix matrix Descriptive Notes	\$ \$ \$	<5 <5 <5 <b>Remarks</b> Tyler Ta ILR(>30	0 0 0 6 / Risk Fac ble: A-Al	0-none 0-none 0-none tors: Values F B horizon ( 0 0.8 gal/day		sg sg sg sg und ) ILR: S , HI	loose loose loose	
A AB C1 C2 Limitin Perched Sease Apparent Wal Highly Perme	0.0-15.0 15.0-25.0 25.0-34.0 34.0-60.0 ag Conditions onal Water Table ter Table cable Material	10YR 2/2 10YR 3/3 10YR 6/2 10YR 5/2 Depth to ( >60 25 >60	none 15%7.5YR 3/4 15%10YR 4/6 none in.) Restricted b	none none matrix matrix Descriptive Notes	\$ \$ \$ 	<5 <5 <5 Remarks Tyler Ta ILR(>30 HLLR =	0 0 0 0 8 / Risk Fac able: A-A 0mg/L) = 5 6.0 9a	0-none 0-none 0-none tors: Values F B horizon ( 0.8 gal/day I/day/ft		sg sg sg ) und ) ILR: S , HI )mg/L) = 1.6	loose loose loose	
AB C1 C2 Limitin Perched Sease Apparent War Highly Perme Bedrock	0.0-15.0 15.0-25.0 25.0-34.0 34.0-60.0 age Conditions onal Water Table ter Table eable Material	10YR 2/2 10YR 3/3 10YR 6/2 10YR 5/2 Depth to ( >60 25 >60 >60	none 15%7.5YR 3/4 15%10YR 4/6 none in.) Restricted b By Tile Pro	none none matrix matrix Descriptive Notes	S S S	<5 <5 <5 Remarks Tyler Ta ILR(>30 HLLR = 3 bedro	0 0 0 0 6 / <b>Risk Fac</b> ble: A-A 0mg/L) = 6.0 ga	0-none 0-none 0-none 0-none tors: Values F B horizon ( 0 0.8 gal/day l/day/ft equired absor	- - - - - - - - - - - - - - - - - - -	sg sg sg sg ) ILR: S , HI ) Mg/L) = 1.6 450 sq.ft.	loose loose loose	

Note : The evaluation shall include a complete site plan or site drawing including all requirements in paragraphs (B)(1) through (B)(4) of OAC 3701-29-08.

Landforms
Upland*
Terrace
Flood Plain
Lake Pain
Beach Ridge
*Includes glacial till
plain and end moraine

Position on Landform	
Depression	
Flat	
Knoll	
Crest	
Hillslope	
Footslope	

Shape of Slope
Convex
Concave
Linear
Complex

				Horizon Nomenclature	
	Master Horizons			Horizon Suffixes	Horizon Modifiers
0	Predominantly organic matter (litter &		a	Highly decomposed organic matter	
	humus)		b	Buried genetic horizon	Numerical Prefixes: Used to denote
А	Mineral, organic matter (humus)	[	d	Densic layer (physically root restrictive)	lithologic discontinuities.
	accumulation, loss of Fe, Al, clay	[	e	Moderately decomposed organic matter	
Е	Mineral, loss of Si, Fe, Al, clay, organic	[	g	Strong gley	
	matter	- [	i	Slightly decomposed organic matter	Numerical Suffixes: Used to denote
В	Subsurface accumulation of clay, Fe, Al, Si,	- [	р	Plow layer or artificial disturbance	subdivisions within a master
	humus; sesquioxides; loss of CaCo <sub>3</sub> ;	- [	r	Weathered or soft bedrock	horizon.
	subsurface soil structure	[	t	Illuvial accumulation of silicate clay	
С		[	W	Weak color or structure within B	
	Little or no pedogenic alteration,	[	х	Fragipan characteristics	
	unconsoilidated earthy material, soft bedrock	•			
R	Hard bedrock				

Soil Texture				
Texture Class Abbreviati	ons		Textural Class Modifiers	
Course Sand	cos		Gravelly	GR
Sand	s		Fine Gravelly	FGR
Fine Sand	fs		Medium Gravelly	MGR
Very Fine Sand	vfs		Coarse Gravelly	CGR
Loamy Coarse Sand	lcos		Very Gravelly	VGR
Loamy Sand	ls		Extremely Gravelly	XGR
Loamy Fine Sand	lfs		Cobbly	CB
Loamy Very Fine Sand	lvfs		Very Cobbly	VCB
Coarse Sandy Loam	cosl		Extremely Cobbly	XCB
Sandy Loam	sl		Stony	ST
Fine Sandy Loam	fsl		Very Stony	VST
Very Fine Sandy Loam	vfsl		Extremely Stony	XST
Loam	1		Bouldery	BY
Silt Loam	sil		Very Bouldery	VBY
Silt	si		Extremely Bouldery	XBY
Sandy Clay Loam	scl		Channery	CN
Clay Loam	cl		Very Channery	VCN
Silty Clay Loam	sicl		Extremely Channery	XCN
Sandy Clay	sc		Flaggy	FL
Silty Clay	sic		Very Flaggy	VFL
Clay	с		Extremely Flaggy	XFL
*Estimate approximate c	lay perc	cer	tage within 5 percent	

		Soil St	ructur	e	
Grade Size Type (Shape)					
Structureless	0	Very Fine	vf	Granular	gr
Weak	1	Fine	f	Angular Blocky	abk
Moderate	2	Medium	m	Subangular Blocky	sbk
Strong	3	Coarse	со	Platy	pl
		Very Coarse	vc	Prismatic	pr
		Extr. Coarse	ec	Columnar	cpr
		Very Thin*	vn	Single Grain	sg
		Thin*	tn	Massive	m
		Thick*	tk	Cloddy	CDY
		Very Thick*	vk		

\* The sizes Very Thin, Thin, Thick, and Very Thick, are used when describing platy structure only. Substitute thin for fine, and thick for coarse when describing platy structure.

Moist Consiste	nce
Loose	1
Very Friable	vfr
Friable	fr
Firm	fi
Very Firm	vfi
Extremely Firm	efi

For a more detailed explanation on describing and sampling soils, please refer to the "Field Book for Describing and Sampling Soils" Schoeneberger, P.J., Wysocki, D.A., Benham, E.C., and Broderson, W.D. (editors) 2002. Field book for describing and sampling soils, version 2.0. Natural Resources Conservation Service, USDA, National Soil Survey Center, Lincoln, NE.





Sever Wain to Have Soggeted Fail or 1.25/141       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface         Sever Wain to Have Soggeted Fail or 1.25/100       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface         Elevation View - EAST To WEST       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface         Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface         Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface         Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface         Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface         Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface         Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface         Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface       Intrive Sall Surface         Intrive Sall Surface       Intr		
10.25' Groundshot NEBRASKAAVE 558' = Approx BOP Discharge Tap-in (21' Fall & 1% or 1.2'/10') S58' = Approx BOP Discharge Tap-in (21' Fall & 1% or 1.2'/10') Apprex BOT Tap-in to Sower Wain (Flowline Apprex 19' Below Boschmark) = 8.42' BOT Sower Wain Into Nonvece Software of Nonvece 960-50 WIN Bottom of Sample Box & BOP Start of Discharge "Includes 4" Tank F	Sewer Main to Have Suggested Fall or .125"/ft. Discharge MIN Fall 0.1% or 1.2"/100' <u>NOTES</u> ELEVAT	DESIGNER ION VIEW - EAST TO WEST
10.25' Groundshot & Existing Tank *Top of Tank is 12" Bolow, Assumed Julet 12" Bolow NEBRASKAAVE 5.58' = Approx BOT Discharge Tap-in (21" Fall & 1% or 1.2"/10') Approx. BOT Tap-in to Sewer Wain (Flowline Approx 19" Below Beechmark) = 8.42' BOT Sewer Wain Into Norweco Bottom of Norweco 960-50 WIN Bottom of Sample Box & BOT Start of Discharge *Includes 4" Tank F		*ALL ELEVATION VAL TO SURFACE ARE OF NA UNLESS OTHERWI
10.42 Groundshot 20 Existing Tark "Top of Tark 12 Below, Assumed Linet 12 Below 5.58' = Approx BOP Discharge Tap-in (21' Fall 20 1% or 1.2'/10') Approx. BOP Tap-in to Sewer Main (Flowline Approx 19' Below Benchmark) = 8.42' - BOP Sewer Main Into Norweeco Bottom of Norweeco 960-50 WIN Bottom of Sample Box & BOP Start of Discharge *Includes 4" Tank F		10.25' Groundshot D
5.58' = Approx BOP Discharge Tap-in (21" Fall & 1% or 1.2"/10') Approx. BOP Tap-in to Sewer Main (Flowline Approx 19" Below Beuchmark) = 8.42' — BOP Sewer Main Into Norweeo Bottom of Norweeo 960-50 MIN Bottom of Sample Box & BOP Start of Discharge *Includes 4" Tank F	NEBRASKAAVE	10.42 Groundshot a) Existing Tank *Top of Tank is 12 Below, Assumed Inlet 12 Below
	5.58' = Approx BOP Discharge Tap-in (21" Fall 2) 1% or 1.2"/10')	Approx. BOP Tap-in to Sewer Main (Flowline Approx 19" Below Benchmark) = 8.42' BOP Sewer Main Into Norweco 96 Bottom of Norweco 960-500/ MIN Bottom of Sample Box & BOP Start of Discharge *Includes 4" Tank Fall
ZERO ELEVATION REFERENCE   BENCHMARK = 10.00 FEET   TOP OF WATER SYSTEM GATE VALVE   SEE LAYOUT MAP SCALE 1:135		



#### KA AVE - HSTS\_ELEVATION



## **MODEL AT 1500**

#### **UV DISINFECTION SYSTEM**

### **INSTALLATION AND OPERATION MANUAL**

The Model AT 1500 UV disinfection system is listed with Underwriters Laboratories (UL) under Standard 979 as a residential treatment device. The installer should provide a power disconnect switch mounted to the exterior of the facility being serviced to de-energize power to the unit during maintenance. Electrical work must be performed in accordance with the latest edition of the National Electrical Code, as well as all applicable local codes. CAUTION: DO NOT LOOK DIRECTLY AT THE UV LAMP OR EXPOSE SKIN DURING OPERATION. PERMANENT EYE DAMAGE AND SKIN BURNS WILL OCCUR FROM UV RADIATION EXPOSURE. UV BLOCKING SAFETY GLASSES MUST BE WORN DURING INSTALLATION, SERVICE OR ANY TIME THE BULB MAY BE ILLUMINATED.

#### COMPONENTS

The Model AT 1500 UV disinfection system consists of the following components:

9)

- 1) Control enclosure
- 4" ABS riser pipe 2)
- 3) 4" ABS inlet coupling
- 4) Turbulence inducer
- 5) 4" ABS outlet coupling
- 6) Disinfection chamber
- 7) UV lamp (bulb)

These components should be supplied by the installer:

- 1) **Disconnect** switch
- 6) Isopropyl alcohol
- 7)
- 3) Hacksaw
- Glycerin (optional) 4) 5)
  - Clean, soft cloth



#### INSTALLATION INSTRUCTIONS

- 1. The excavation for the wastewater treatment system upstream of the UV disinfection device should include an additional 3 feet of length to allow for installation of the Model AT 1500.
- 2. Carefully unpack the Model AT 1500 system. Remove and properly discard all packaging materials from the system components. The UV lamp should remain in the protective shipping sleeve until it is installed.
- 3. Insert the turbulence inducer into the 4" inlet coupling. Solvent weld the inlet coupling to the disinfection chamber with the turbulence inducer towards the chamber. Solvent weld the 4" outlet coupling to the disinfection chamber.



4. Solvent weld the effluent line of the upstream treatment system to the 4" inlet coupling of the Model AT 1500. Next, solvent weld the 4" outlet coupling to the final effluent line. Cover the open top of the disinfection chamber and backfill up to the bottom of the plumbing.

10) Dielectric grease (5 g)

8) UV subassembly with

and Teflon sheath

anodized aluminum

frame, quartz sleeve

Subassembly handle

- 2) Solvent cement
- #14/2 AWG
- electrical cable
- Conduit and fittings 8)





## SERVICE PRO® CONTROL CENTER WITH MCD® TECHNOLOGY

#### **GENERAL SPECIFICATIONS**

The contractor shall furnish and install one complete Service Pro control center with MCD technology as described in the following specifications. Monitoring, Compliance and Diagnostic (MCD) functions for the domestic wastewater treatment system and auxiliary equipment shall be accomplished by combining solid state microprocessor technology with optional advanced telemetry and web-based data acquisition. The control center shall operate the Singulair wastewater treatment plant and monitor the entire system, including up to three auxiliary treatment components. Once commissioned, the telemetry system shall communicate with the Service Pro website and monitoring center to record all maintenance and alarm details. The website shall function as the user interface to manage all operational data with password protected access available to distributors, service providers, regulatory agencies and homeowners.



#### **OPERATING CONDITIONS**

The Service Pro control center with MCD technology shall be UL Listed and provide Monitoring, Compliance and Diagnostic functions for the Singulair wastewater treatment plant and auxiliary equipment using a microprocessor based platform. The microprocessor shall contain nonvolatile memory to prevent loss of programming in the event of a power failure. When used with the Singulair Model 960 system, the programmed run cycle shall not permit the aerator to be "off" for more than thirty minutes per hour. When used with the Singulair Model TNT system, the programmed run cycle for the aerator shall be sixty minutes "on" and sixty minutes "off." The control center shall be housed in a NEMA rated electrical enclosure designed specifically for outdoor use. Control centers that do not include integral telemetry equipment require multiple enclosures with interconnecting wiring and shall not be considered for this application.

# SERVICE PRO®

#### MONITORING FUNCTIONS

The Service Pro control center shall monitor the operation of the Singulair system and up to three auxiliary treatment components. The performance of the Singulair aerator shall be constantly monitored to detect any aerator over current, aerator under current or open motor condition. If any one of these conditions is detected, power to the aerator shall be interrupted, a diagnostic sequence shall begin and the visual alarm shall activate. After a factory programmed recovery interval, an automatic restart attempt shall be initiated. If normal aerator operation does not resume during 24 programmed recovery and restart cycles, the audible alarm shall activate and, if the telemetry system has been enabled, the control center shall report the specific condition to the Service Pro monitoring center. In the event that any of the auxiliary inputs detect an operational problem, the audible and visual alarms shall immediately activate and, if the telemetry system has been enabled, the control center shall report the specific alarm condition to the monitoring center. The distributor shall be automatically notified by the Service Pro monitoring center of the specific alarm condition using phone, fax or email.

#### **COMPLIANCE FUNCTIONS**



SERVICE PRO CONTROL CENTER MODEL 960 SYSTEM

The Service Pro control center shall insure compliance with regulatory requirements by confirming normal system operation, providing remote system monitoring and automatically recording operating data and service visits. Distributors shall have the ability to grant regulatory agencies access to reports about installations in their jurisdiction that have been recorded on the Service Pro website. The optional integrated telemetry system shall enable the Service Pro control center to communicate with the monitoring center via standard residential telephone or Internet service. By use of the alarm reset button, the monitoring center shall be notified of the beginning and end of any service visit. The monitoring center shall provide a time and date stamped record of each service visit and post the data to the Service Pro website. If telemetry is enabled, the control panel shall automatically contact the monitoring center shall provide notification to the service provider indicating the system has not confirmed proper operation and a site visit is required. Control centers and/or telemetry systems without the heartbeat feature do not provide proactive confirmation of system compliance and shall not be considered for this application.

#### **DIAGNOSTIC FUNCTIONS**

The diagnostic functions of the Service Pro panel shall insure automatic identification of any alarm condition from the Singulair system or accessory equipment. Excessive load on the aerator from any cause, including effluent pump failure, a Bio-Kinetic system requiring service or system high water, shall result in the control center visual alarm indicating an aerator over current condition. An open electrical circuit anywhere in the control center or aerator, a broken service wire between the control center and the aerator, open motor windings within the aerator or an aerator that has been left unplugged shall activate the visual alarm indicating an aerator under current condition. Any aerator alarm condition shall activate the diagnostic sequence during which the control center shall allow for a temporary condition to correct itself before a call is made to the remote monitoring center. The diagnostic sequence shall include up to 24 automatic restart attempts within a two hour period. During this diagnostic period when the control center is attempting to automatically restart the Singulair aerator, pushing the reset button shall result in a manual restart attempt. Any successful restart attempt shall return the system to normal operation and the visual alarm shall deactivate. If the condition has not been corrected after 24 manual or automatic restart attempts, the control center shall activate the audible alarm and, if the telemetry system has been enabled, notify the monitoring center of the specific alarm code. Any auxiliary equipment malfunction shall immediately activate the control center audible and visual alarms. If enabled, the telemetry system shall then call the monitoring center to identify the specific auxiliary alarm.

#### **CONTROL CENTER COMPONENTS**

The Service Pro control center shall use a microprocessor based platform to control and monitor the wastewater treatment system. Nonvolatile memory built into the solid state circuit board shall prevent programming loss in the event of a power failure to the facility being served. The pre-wired controls shall be mounted in a lockable NEMA rated enclosure designed specifically for outdoor use. The corrosion resistant enclosure shall have knockouts molded into the bottom surface to facilitate installation of electrical conduit and the system phone or network line. Each control center shall be a UL Listed assembly and shall include a time clock, main alarm light, reset button, power switch, power light, phone/network light, aerator alarm light and three auxiliary alarm lights. The power switch shall control power for all Service Pro control center and aerator functions. The green power light shall be lit when the controls are energized and is the only light that will be illuminated during normal system operation. The yellow phone/ network light shall be illuminated when the telemetry system is communicating. The red aerator alarm light shall be illuminated when normal operation of the aerator has been interrupted. The



#### BOTTOM OF ENCLOSURE WITH KNOCKOUTS

red auxiliary input lights shall illuminate only when the respective optional device requires service. The main alarm circuit of the Service Pro control center shall contain both visual and audible alarms and a reset button. Both the audible and visual alarms shall comply with the requirements of NSF/ANSI Standard 40 and Standard 245 regarding visual and audible signaling equipment. The main alarm light shall be visible through the closed door of the enclosure via a red weatherproof lens. When activated by either an aerator or auxiliary alarm, the main alarm light shall flash a programmed pattern to indicate the specific alarm condition. The reset button shall be centrally located on the control center and accessible from outside the enclosure via a weatherproof boot. Pressing the reset button shall cause a manual restart attempt of the aerator and re-initiate the programmed run cycle. If the audible alarm has been activated, pressing the reset button shall silence the alarm. The visual alarm shall remain active during the time the audible alarm is silenced. If the alarm condition has not been corrected after 48 hours, the audible alarm will reactivate. If telemetry is enabled, the control panel shall automatically call the Service Pro monitoring center. Data transmitted by the control center shall be received by the monitoring center and recorded in the database maintained via the Service Pro website. The monitoring center shall automatically notify the distributor or service provider when a Service Pro panel reports an alarm condition or fails to initiate a monthly heartbeat call.



MODEL TNT CONTROL CENTER WITH AUXILIARY ALARM LABELS

#### **MODEL 960 SYSTEM OPERATION**

When a Service Pro control center is used with the Model 960 Singulair system, the aerator run cycle shall be controlled by an adjustable, pre-wired time clock. The minimum setting shall not permit the aerator to be "off" for more than 30 minutes per hour. The time clock shall be adjustable in 5 minute increments and designed so that any adjustment results in additional run time up to "continuous" operation (60 minutes per hour). Use of a time clock can seriously affect system performance and operating cost. Systems that have not been performance certified at the minimum time clock setting by an independent testing laboratory shall not be considered for this application.

#### MODEL TNT SYSTEM OPERATION

The Service Pro control center supplied with the Model TNT Singulair system shall be equipped with a factory programmed timer that controls aerator operation. The non-adjustable timer shall create a 60 minute aeration cycle followed by a 60 minute anoxic cycle during which the aerator shall be "off". A total of twelve hours of aerator operation per day shall be provided.

# MCD<sup>®</sup> TECHNOLOGY

#### AUXILIARY ALARMS

The Service Pro control center shall contain three auxiliary alarm inputs to monitor accessory components. Each auxiliary input shall allow connection to a voltage signal, normally open relay contacts or normally closed relay contacts, using the appropriate input terminals and jumpers. The voltage input connections are located along the left edge of the circuit board and shall automatically adjust to accept any input voltage from 5 to 120 VAC/DC without programming or jumper adjustment. The relay input connections are located along the top edge of the circuit board and shall be configured for normally open (O) or normally closed (C) relay contacts by placing jumpers over the appropriate pins (labeled JP7, JP8 and JP9). Any auxiliary alarm signal shall activate that specific auxiliary alarm light and the main alarm light, sound the audible alarm and call the remote monitoring center if the telemetry function is enabled. Once connected to the remote monitoring center, the control center shall identify which auxiliary alarm has been activated. Each auxiliary input shall be labeled in the space provided on the control center insert using the



**AUXILIARY ALARM INPUTS** 

factory-supplied preprinted labels. The auxiliary inputs shall be used to monitor wastewater treatment equipment only. Connection of household appliances, security systems or other unauthorized equipment is prohibited and shall void the limited warranty.

#### **TELEMETRY FUNCTIONS (Optional)**

Optional integrated telemetry shall permit interactive communication between the monitoring center and the Singulair system, including all auxiliary equipment. The panel shall be factory programmed to contact the Service Pro monitoring center where the database of specific system information and a call record is maintained. The control center shall be shipped from the factory with the telemetry function disabled. Following panel installation and execution of the remote monitoring agreement, a commissioning process shall activate the telemetry function and establish communications with the Service Pro monitoring center shall initiate a communication to the monitoring center at monthly intervals. The panel shall also contact the monitoring center to report alarm



WIRING DIAGRAM

conditions. During each communication, the control center shall identify the individual installation and deliver the operational status or specific alarm code. The panel shall confirm receipt of the message before ending the communication. If not confirmed, the panel shall repeat until successful. The telemetry system shall have the ability to share a phone line or Internet connection with the facility being served. A dedicated telephone line or Internet connection shall not be required. If a telephone line is utilized, the panel shall automatically check phone line availability before initiating a call. If the phone line is not available, the system shall check every five minutes until the line becomes clear. When a clear line is available, the panel shall connect with the monitoring center. If the telemetry system is in the process of communicating and the telephone is picked up, the telemetry system shall immediately disconnect. The telephone shall be available for use after the person attempting to initiate a call momentarily hangs up to clear the phone line. The panel shall continue to monitor use of the telephone line. When the control center detects the telephone line is available for use, the telemetry system shall repeat the interrupted communication to the remote monitoring center.

# SPECIFICATIONS

#### SERVICE PRO® MONITORING CENTER

The Service Pro monitoring center shall include a 128 bit encrypted, password protected website for interface with the database of wastewater treatment system information. Access to the secure website shall be obtained through a unique user name and password that gives users tiered access to data from the wastewater treatment systems being monitored. Access levels shall include distributors, service providers, local regulatory agencies, state regulatory agencies and individual system owners. Distributors and service providers shall be able to create accounts, maintain service records and grant regulatory agencies access to the website. Individual system owners shall be able to view information regarding their own systems, as well as download instructional information. The monitoring center database shall contain the following information for each system registered: owner's name and system address, aerator serial number, control center serial number, system model number(s), auxiliary alarm information, accessory equipment information, permit information, service contract information, account status, service history and complete alarm history. Access to all wastewater treatment system owners. Integrity of stored data shall be maintained through the use of multiple servers operating in geographically isolated locations.

#### **COMMISSIONING PROCESS**

The Service Pro control center shall be programmed to initiate communications with the website and remote monitoring center via the commissioning process. Commissioning shall typically be initiated at Singulair system start-up and shall require no special tools or electronic equipment. The colored indicator lights on the face of the control center insert shall be used to confirm each step through the commissioning process. The Service Pro telemetry system shall send a communication to the monitoring center identifying the control panel and indicating that telemetry features have been enabled. If the control center has been correctly commissioned, the red alarm light in the center of the Service Pro panel shall flash five times and then turn off. If commissioning is not performed, the telemetry features shall remain disabled, but all Singulair wastewater treatment system operating controls and diagnostic features shall be fully functional.

#### SERVICE MANAGEMENT MODULE





All routine and emergency service shall be managed by the Service Pro monitoring center and shall be accessible through the password protected website. Systems where the telemetry functions are not activated shall be managed by manual entries into the website. When a Singulair installation is registered, the service frequency for the system shall be entered into the database. An online report shall constantly notify distributors and service providers of the systems that are due for service in the next 90 days, including both warranty and extended service contract inspections. All systems with service contracts expiring within the next 90 days in a given geographic area also shall be posted to an online report. Any system in the area that is currently experiencing an alarm condition shall be posted and viewable by the distributor and service provider. Distributors shall have the ability to grant regulatory officials access to system reports. These reports shall improve maintenance efficiency by allowing all service visits and installation inspections to be scheduled by date and grouped by physical proximity.

When service to the Singulair wastewater treatment system is performed, the date and time of the service visit as reported by the Service Pro telemetry system shall be posted on the website. If the telemetry system has not been commissioned, the website shall have the ability to receive manually entered service reports and post them with all inspection and compliance information. Manually completed service reports shall be automatically incorporated into the Service Pro website for electronic tracking. The service reports shall specify the inspection date, service performed and the condition of all equipment, including the Singulair aerator, Bio-Kinetic system, control center, optional disinfection system and effluent disposal system.

#### **CERTIFICATION AND TESTING**

The Service Pro control center shall be certified by internationally accredited, independent testing laboratories to verify product safety and performance. The control center shall meet the requirements of Underwriter's Laboratory (UL) Standard 508 and the Canadian Standards Association (CSA) Standard CAN/CSA-C22.2 No. 68-92 (R2004). The telemetry equipment shall be licensed by the Federal Communications Commission (FCC) under Standard 68. The circuit board shall be tested by an independent agency for certification and approval to ANSI C62-41 for 320 joules of intermittent electrical surge protection. The Service Pro control center shall be tested by an independent third party laboratory for electromagnetic compatibility per European Standard EN61000-6-1, including radiated and conducted radio frequency testing, electrostatic discharge testing and fast burst transient testing. To prevent corrosion from humidity or potentially harmful gasses associated with the treatment of domestic wastewater, the completed circuit board shall be conformal coated with a UL Recognized acrylic resin meeting military specification MIL-46058C.

The Service Pro control center shall be listed by NSF International and CSA for compliance with all applicable standards. The enclosure for the control center shall be certified as complying with NEMA standards for outdoor rated electrical enclosures. The current sensing circuit of the control center shall be tested to maintain accuracy to within 5% of the design parameters when operated in ambient temperatures from -20° to 160° Fahrenheit. The control center shall meet the requirements of NSF/ANSI Standard 40 and Standard 245 for use with Singulair wastewater treatment systems, including performance testing of the audible and visual alarms. Control centers not complying with applicable standards, certifications and testing have not been proven suitable for long term use and shall not be considered for this application.

#### WARRANTY PROGRAM

The manufacturer shall provide a three year limited warranty against defects in material and workmanship under normal use and service for each Service Pro control center with MCD technology. The warranty shall also cover any other Singulair components purchased from the manufacturer. The Singulair distributor shall provide warranty program details to the regulatory agency, contractor and customer as required.

#### EQUIPMENT MANUFACTURER

The equipment specified herein shall be the product of a manufacturer having a minimum of seven years experience in the construction of prefabricated wastewater treatment equipment and systems. Bids shall be prepared on the basis of the equipment and material specified herein for purposes of determining the low bid. This is not done, however, to eliminate other products or equipment of equal quality and efficiency. If equipment is to be substituted, approval of such substitution must be made prior to execution of any order. It is assumed that substitution will result in a reduction of cost to the contractor and that if accepted, these savings will be passed along by a reduction in the base bid.

### **PROGRESS THROUGH SERVICE SINCE 1906**



Engineering the future of water and wastewater treatment

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Geophyta, Inc.

Bill	f Matanials - 6924 Nahnaska Ava USTS Daplacement - NPD	ES Norwasa Singulain 960-500 GPD	ATU M// UV Disinf
DIII 0	Materials - 0924 Nedraska Ave, 11313 Replacement - NPD	ES Norweco Singulair 900-500 GPD 7	
Quantity	Part Name	Section	
3	SCH40 PVC Ø4 inch Coupler	Sewer Main Replaced to PVC or Existing	
4	SCH40 PVC Ø4 inch pipe 10 ft. Long	Cleanout Total Length of Pipe = ~40 Max'	
1	ATU Tank	ATU Tank	Norweco Singulai
1	Model AT 1500 UV Disinfection	LIV Disinfection & Decention	Model A
2	SCH40 PVC Ø4 inch pipe 1 ft. Long	UV DISINTECTION & Rederation	
1	Free-Falling Sample Box	Sampling Requirement	PolyLok
1	Control Panel		S
~50 ft.	2 conductor w/ground, 14 gauge UG wire	ATU, UV & Reaeration Monitoring	A
~50 ft.	2 conductor w/ground, 14 gauge UG wire	*Telemetry Failsafe Setup*	Alarm Circ
~50 ft.	Plastic conduit, to contain 6-14ga		
~	SDR35 PVC or Equiv. Ø3-4 inch Fittings	NPDES Discharge to Existing 36" Dia. Storm Drain	
~	SDR35 PVC or Equiv. Ø3-4 inch pipe 175 ft. Long	MUST BE SDR35 PVC or Equiv.	
		Additional Notes	
	Pu	mp, Crush & Backfill Old Tank. 🧹	
	Line is to be	Directionally Bored Under Nebraska	Ave.
	Contractor Please Consult With Lucas County	y Engineer's Office Regarding Require	ements For Storm
-	Grass Seed	2 lbs./1000 ft.² K. Bluegrass	
-	Straw Mulch For Grass Establishment	Homeowner's Choice	*Required by
-	Grass Establishment Fertilizer	10 lbs. 20-10-10/1000 ft. <sup>2</sup>	
		***Call OUPS before you dig.***	
	Installer substitution of materials not specified in this Bill Of Materials may v	oid Health Dept. approval of this design and will	result in a re-design fee

Design Prints Take Precedence Over This Bill of Materials. This is a best estimate of materials required and is provided as a convenience to installers. This BOM is not required for design approval.

ection & Reaeration (Telemetry Failsafe)
Comment
See Design
r 960-500 GPD ATU or Equiv. W/ 18" Risers
T 1500 UV Disinfection & Reaeration
12" D-Box or Equiv. With 18" Riser
ervice Pro MCD Control Center
TU Circuit; Standalone Breaker
cuit, Added To House Lighting Breaker
ATU & Alarm Circuit Conduit
Length May Vary Slightly
Drain Tap Permit.
Over Tankage & Piping
Homeowner Due to Continued Settling of
Backfill*
and is the sole responsibility of the installer.

#### **Operation and Maintenance Procedures**

#### Home Septic Treatment Systems With Processing Through An Aeration Treatment Unit, Disinfection, And Effluent Discharge

Home septic treatment systems are biologically based systems. They rely on both anaerobic and aerobic microorganisms to process human waste. These systems may utilize processing, storage, and pumping tanks. Also, the processed effluent may be disinfected before discharge to a storm drain, ditch, or stream. In some cases, a soil absorption component, the leachfield, also processes, treats, and disperses septic effluent. Any abuse of this biological treatment system will result in less efficient sewage treatment and early failure of your new system.

## Improper operation and/or maintenance of your home septic treatment system will result in its failure.

Geophyta, Inc. strongly recommends that a homeowner hire a professional service provider to inspect and maintain your system. Your county health department has a list of registered service providers. Make sure that your service provider has septic tank and leachfield maintenance experience.

#### 1) Homeowner Responsibility:

- a) The system owner is responsible for the continuous operation and maintenance of this home septic treatment system
- b) Your county health department may require third-party inspection and maintenance of your home septic treatment system.
- c) Home Interior Design & Appliance Selection:
  - i) Install water conserving fixtures such as low flow shower heads, low flow toilets, and front loading washers.
  - ii) Space out water use throughout the day and week. Avoid doing all laundry in one day.
  - iii) Repair all water leaking fixtures.
  - iv) Eliminate garbage disposals, or limit their use. Collect food scraps with sink strainers for disposal as trash or for composting; this includes coffee grounds.
  - v) DO NOT pipe sump pump output into your sewer line.
- d) Home Landscaping Limitations:
  - i) Do not pipe roof downspouts or any other rainwater drainage into the septic or dose tanks.
  - ii) Divert all downspouts or other rainwater drainage away from your entire septic system.
  - iii) Divert all downspouts or other rainwater drainage away from the leachfield area.

- iv) Do not drive or park cars, boats, heavy equipment, or other vehicles on or near septic system tanks and leachfield areas.
- v) Do not add additional soil fill on or near the leachfield. This will limit air movement into the soil needed for effluent treatment and may cause system failure.
- vi) Limit lawnmower traffic on the leachfield when soil is excessively wet.
- vii) Do not plant any deep rooted plants on top of or near your leachfield soil absorption area.
- e) Home Resident Responsibilities:
  - i) Only flush or drain bio-degradable human waste, toilet paper, laundry and dish and personal care soaps, and water into your home septic treatment system.
  - ii) Severely limit disposal of food fats, oils, and greases. These will clog your system.
  - iii) Do not flush or drain undiluted bleach, cleansers, or drain cleaners.
  - iv) Do not flush any non-biodegradable items. For example, plastic items.
  - v) Do not flush or drain motor oils, greases, anti-freezes, cleaners, etc.
  - vi) Do not flush cat litter.
  - vii) Do not flush paper towels, facial tissue, cigarette butts, disposable diapers, sanitary napkins, tampons, or condoms.
  - viii) Do not flush prescription or over-the-counter drugs. Antibiotics and cancer treatment drugs are very harmful to your home septic treatment system.
  - ix) Do not dump solvents like dry cleaning fluid, pesticides, photographic chemicals, paint thinner down the drain.
  - x) Don't use septic tank additives, unless health department approved.
  - xi) Don't drain a hot tub or large amounts of water into your septic system.
- f) Home Improvement/Expansion:
  - i) Contact your county sanitarian before adding new driveways, decks, patios, pools, and outbuildings not identified on your original layout plan to make sure all setback distances from your septic system tanks and mound are met.
  - ii) Contact your county sanitarian before adding bedrooms and/or increasing your home occupancy. This may overload your septic system. Septic system expansion may be required to prevent failure.
- g) Homeowner Cautions:
  - i) **DO NOT ENTER TANKS WITHOUT PROPER SAFETY EQUIPMENT.** Septic and dose tanks contain noxious and deadly gases.
  - ii) Pump or dose tanks and control boxes contain electrical components. **ELECTRICAL SHOCK HAZARD CAN EXIST WITH IMPROPERLY WIRED OR FAILING COMPONENTS.**
  - iii) Always keep tank fall guards in place, except for the time needed to replace components when safety equipment is present.
  - iv) Always replace and secure septic and dose tank lids after completing any inspection.
  - v) Any disconnection or removal of filters, screens, floats, alarms, and/or control panels will result in system failure.
  - vi) Contact your county sanitarian for allowed homeowner maintenance and repair of your septic system.

#### 2) Inspection & Maintenance Requirements:

- a) Perform inspection & maintenance every six months.
- b) Review Baseline Operation and Maintenance Data:
  - i) The installer of your system set and recorded all float/liquid level heights, pump down times, cycles per day, and distal head pressures required in the design specifications.
  - ii) Review all previous six month inspection data.
- c) Identify any house additions, patios, pools, ponds, driveways, outbuildings, etc. added since the last inspection that may impact the home septic treatment system. Draw a sketch of these differences.
- d) Inspect the house sewer main two-way cleanout tee bottom:
  - i) Check for clogging.
  - ii) Check for continuous clear water flows from the home.
- e) Evaluate Aeration Treatment Tank & Pump Tank:
  - i) Measure sludge and scum depths; pump tank when cumulative thickness is 1/3 of the tank depth.
  - ii) Look for signs of clogging and tank damage.
  - iii) Look for signs of tank and riser leakage.
  - iv) Clean & inspect any tank outlet filter.
  - v) Make sure lids are securely attached to risers.
- f) Evaluate Pump/Dose Tank & Pumping Equipment:
  - i) Measure sludge and scum depths; pump tank when septic tank is pumped.
  - ii) Look for signs of clogging and tank damage.
  - iii) Look for signs of tank and riser leakage.
  - iv) Inspect and assure proper functioning of floats or other liquid level controls.
  - v) Clean and inspect dose pump outlet filter. May not be present in some designs.
  - vi) Inspect and assure proper condition and functioning of the effluent pump.
  - vii) Make sure lids are securely attached to risers.
- g) Evaluate Drain Fields:
  - i) Inspect all leachfield soil inspection tubes for surface condition, surface color, and depth of ponded effluent, if present.
  - ii) Look for surfacing effluent.
  - iii) Look for excessively moist soil around leachfield area.
  - iv) Identify appropriate vegetative cover.
  - v) Look for surface disturbances, compaction, abnormal settling, and erosion.
  - vi) Identify any deep rooted vegetation recently planted near the leachfield area.
- h) Switch leachfield resting trench in D-box:
  - i) Determine a rotation sequence for closing off flow to the resting trench/trenches.
  - ii) Open the previously rested leach trench.
  - iii) Close the next trench in sequence for resting.
- i) Measure Pump Run Time and/or Drawdown:
  - i) For demand dosed systems, verify original design effluent drawdown depth.

- ii) For time dosed systems, verify original design pump run time.
- iii) For systems with a cycle counter or run time meter, record the current values.
- j) Test Alarms:
  - i) Evaluate proper function of low liquid level alarm.
  - ii) Evaluate proper function of high liquid level alarm and warning light.

#### 3) Findings & Repairs:

- a) All findings during inspection and maintenance must be recorded.
- b) Any system adjustments must be recorded.
- c) Any system deficiencies, worn out components, and/or damage must be repaired to return your septic system to a properly functioning state.
- d) All repairs must be recorded.