



Comal County

OFFICE OF COMAL COUNTY ENGINEER

License to Operate On-Site Sewage Treatment and Disposal Facility

Issued This Date: 05/01/2019 Permit Number: 108940

Location Description: 421 CIMARRON SPRING BRANCH, TX 78070
Subdivision: Lake of the Hills Estates
Unit:
Lot: 217
Block:
Acreage:

Type of System: Aerobic Surface Irrigation

Issued to: Sunny Circle, LLC

This license is authorization for the owner to operate and maintain a private facility at the location described in accordance to the rules and regulations for on-site sewerage facilities of Comal County, Texas, and the Texas Commission on Environmental Quality.

The license grants permission to operate the facility. It does not guarantee successful operation. It is the responsibility of the owner to maintain and operate the facility in a satisfactory manner.

Alterations to this permit including, but not limited to:

- Increase in the square feet of living area
- Increase in the number of bedrooms
- A change of use (i.e. residential to commercial)
- Relocation of system components (including the relocation of spray heads)
- Installation of landscaping
- Adding new structures to the system

may require a new permit. It is the responsibility of the owner to apply for a new permit, if applicable.

Inspection and licensing of a facility indicates only that the facility meets certain minimum requirements. It does not impede any governmental entity in taking the proper steps to prevent or control pollution, to abate nuisance, or to protect the public health.

This license to operate is valid for an indefinite period. The holder may transfer it to a succeeding owner, provided the facility has not been remodeled and is functioning properly.

Licensing Authority
Comal County Environmental Health

Michael Lopez OS8497
ENVIRONMENTAL HEALTH INSPECTOR

OS0007722
ENVIRONMENTAL HEALTH COORDINATOR

Comal County Environmental Health OSSF Inspection Sheet

Installer Name: Winters OSSF Installer #: 08 000 8924
 1st Inspection Date: 4.23.19 2nd Inspection Date: _____ 3rd Inspection Date: 5/1/19
 Inspector Name: Andrea B. Inspector Name: _____ Inspector Name: Mike T.
 Permit#: 108940 Address: 421 Cimarron

No.	Description	Answer	Citations	Notes	1st Insp.	2nd Insp.	3rd Insp.
1	SITE AND SOIL CONDITIONS & SETBACK DISTANCES Site and Soil Conditions Consistent with Submitted Planning Materials	/	285.31(a) 285.30(b)(1)(A)(iv) 285.30(b)(1)(A)(v) 285.30(b)(1)(A)(iii) 285.30(b)(1)(A)(ii) 285.30(b)(1)(A)(i)		/		<u>5/1/19</u>
2	SITE AND SOIL CONDITIONS & SETBACK DISTANCES Setback Distances Meet Minimum Standards	/	285.91(10) 285.30(b)(4) 285.31(d)		/		
3	SEWER PIPE Proper Type Pipe from Structure to Disposal System (Cast Iron, Ductile Iron, Sch. 40, SDR 26)	/	285.32(a)(1)		/		
4	SEWER PIPE Slope from the Sewer to the Tank at least 1/8 Inch Per Foot	/	285.32(a)(3)		/		
5	SEWER PIPE Two Way Sanitary - Type Cleanout Properly Installed (Add. C/O Every 100' &/or 90 degree bends)	/	285.32(a)(5)		/		
6	PRETREATMENT Installed (if required) TCEQ Approved List PRETREATMENT Septic Tank(s) Meet Minimum Requirements		285.32(b)(1)(G) 285.32(b)(1)(E)(iii) 285.32(b)(1)(E)(iv) 285.32(b)(1)(F) 285.32(b)(1)(B) 285.32(b)(1)(C)(i) 285.32(b)(1)(C)(ii) 285.32(b)(1)(D) 285.32(b)(1)(E) 285.32(b)(1)(A) 285.32(b)(1)(E)(ii)(II) 285.32(b)(1)(E)(i) 285.32(b)(1)(E)(ii)(I)				
7	PRETREATMENT Grease Interceptors if required for commercial		285.34(d)				

4-23-19

Tank level - set. up.
no leaks - cover tank
& lines

MT-5/1/19

covered & sod.

**Comal County Environmental Health
OSSF Inspection Sheet**

No.	Description	Answer	Citations	Notes	1st Insp.	2nd Insp.	3rd Insp.
8	SEPTIC TANK Tank(s) Clearly Marked SEPTIC TANK IF Single Tank, 2 Compartments Provided with Baffle SEPTIC TANK Inlet Flowline Greater than 3" and "T" Provided on Inlet and Outlet SEPTIC TANK Septic Tank(s) Meet Minimum Requirements		285.32(b)(1)(E) 285.91(2) 285.32(b)(1)(F) 285.32(b)(1)(E)(iii) 285.32(b)(1)(E)(ii)(II) 285.32(b)(1)(E)(ii)(I) 285.32(b)(1)(E)(i) 285.32(b)(1)(D) 285.32(b)(1)(C)(ii) 285.32(b)(1)(C)(i) 285.32(b)(1)(B) 285.32(b)(1)(A) 285.32(b)(1)(E)(iv)				
9	ALL TANKS Installed on 4" Sand Cushion/ Proper Backfill Used		285.32(b)(1)(F) 285.32(b)(1)(G) 285.34(b)				
10	SEPTIC TANK Inspection / Clean Out Port & Risers Provided on Tanks Buried Greater than 12" Sealed and Capped		285.38(d)				
11	SEPTIC TANK Secondary restraint system provided SEPTIC TANK Riser permanently fastened to lid or cast into tank SEPTIC TANK Riser cap protected against unauthorized intrusions		285.38(d) 285.38(e)				
12	SEPTIC TANK Tank Volume Installed						
13	PUMP TANK Volume Installed						
14	AEROBIC TREATMENT UNIT Size Installed	✓		500	✓		5/1/19
15	AEROBIC TREATMENT UNIT Manufacturer AEROBIC TREATMENT UNIT Model Number	✓		Aries	✓		✓
16	DISPOSAL SYSTEM Absorptive		285.33(a)(4) 285.33(a)(1) 285.33(a)(2) 285.33(a)(3)				
17	DISPOSAL SYSTEM Leaching Chamber		285.33(a)(1) 285.33(a)(3) 285.33(a)(4) 285.33(a)(2)				
18	DISPOSAL SYSTEM Evapo-transpirative		285.33(a)(3) 285.33(a)(4) 285.33(a)(1) 285.33(a)(2)				

**Comal County Environmental Health
OSSF Inspection Sheet**

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19	DISPOSAL SYSTEM Drip Irrigation	/	285.33(a)(1) 285.33(a)(3) 285.33(a)(4) 285.33(a)(2)		/		
20	DISPOSAL SYSTEM Soil Substitution		285.33(d)(4)				
21	DISPOSAL SYSTEM Pumped Effluent		285.33(a)(3) 285.33(a)(1) 285.33(a)(2)				
22	DISPOSAL SYSTEM Gravelless Pipe		285.33(a)(3) 285.33(a)(2) 285.33(a)(4) 285.33(a)(1)				
23	DISPOSAL SYSTEM Mound		285.33(a)(3) 285.33(a)(1) 285.33(a)(2) 285.33(a)(4)				
24	DISPOSAL SYSTEM Other (describe) (Approved Design)		285.33(d)(6) 285.33(c)(4)				
25	DRAINFIELD Absorptive Drainline 3" PVC or 4" PVC						
26	DRAINFIELD Area Installed	/			/		5/1/19
27	DRAINFIELD Level to within 1 inch per 25 feet and within 3 inches over entire excavation		285.33(b)(1)(A)(v)				
28	DRAINFIELD Excavation Width DRAINFIELD Excavation Depth DRAINFIELD Excavation Separation DRAINFIELD Depth of Porous Media DRAINFIELD Type of Porous Media						
29	DRAINFIELD Pipe and Gravel - Geotextile Fabric in Place		285.33(b)(1)(E)				
30	DRAINFIELD Leaching Chambers DRAINFIELD Chambers - Open End Plates w/Splash Plate, Inspection Port & Closed End Plates in Place (per manufacturers spec.)		285.33(c)(2)				
31	LOW PRESSURE DISPOSAL SYSTEM Adequate Trench Length & Width, and Adequate Separation Distance between Trenches		285.33(d)(1)(C)(i)				

**Comal County Environmental Health
OSSF Inspection Sheet**

No.	Description	Answer	Citations	Notes	1st Insp.	2nd Insp.	3rd Insp.
32	<p>EFFLUENT DISPOSAL SYSTEM Utilized Only by Single Family Dwelling</p> <p>EFFLUENT DISPOSAL SYSTEM Topographic Slopes < 2.0%</p> <p>EFFLUENT DISPOSAL SYSTEM Adequate Length of Drain Field (1000 Linear ft. for 2 bedrooms or Less & an additional 400 ft. for each additional bedroom)</p> <p>EFFLUENT DISPOSAL SYSTEM Lateral Depth of 18 inches to 3 ft. & Vertical Separation of 1ft on bottom and 2 ft. to restrictive horizon and ground water respectfully</p> <p>EFFLUENT DISPOSAL SYSTEM Lateral Drain Pipe (1.25 - 1.5" dia.) & Pipe Holes (3/16 - 1/4" dia. Hole Size) 5 ft. Apart</p>		<p>285.33(b)(3)(A)</p> <p>285.33(b)(3)(A)</p> <p>285.33(b)(3)(B)</p> <p>285.91(13)</p> <p>285.33(b)(3)(D)</p> <p>285.33(b)(3)(F)</p>				
33	<p>AEROBIC TREATMENT UNIT Is Aerobic Unit Installed According to Approved Guidelines.</p>		285.32(c)(1)				5/1/19
34	<p>AEROBIC TREATMENT UNIT Inspection/Clean Out Port & Risers Provided</p> <p>AEROBIC TREATMENT UNIT Secondary restraint system provided</p> <p>AEROBIC TREATMENT UNIT Riser permanently fastened to lid or cast into tank</p> <p>AEROBIC TREATMENT UNIT Riser cap protected against unauthorized intrusions</p>						
35	<p>AEROBIC TREATMENT UNIT Chlorinator Properly Installed with Chlorine Tablets in Place.</p>						
36	<p>PUMP TANK Is the Pump Tank an approved concrete tank or other acceptable materials & construction</p> <p>PUMP TANK Sampling Port Provided in the Treated Effluent Line</p> <p>PUMP TANK Check Valve and/or Anti- Siphon Device Present When Required</p> <p>PUMP TANK Audible and Visual High Water Alarm Installed on Separate Circuit From Pump</p>						
37	<p>PUMP TANK Inspection/Clean Out Port & Risers Provided</p> <p>PUMP TANK Secondary restraint system provided</p> <p>PUMP TANK Riser permanently fastened to lid or cast into tank</p> <p>PUMP TANK Riser cap protected against unauthorized intrusions</p>						
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OSSF Inspection Sheet**

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41	APPLICATION AREA Low Angle Nozzles Used / Pressure is as required APPLICATION AREA Acceptable Area, nothing within 10 ft of sprinkler heads? APPLICATION AREA The Landscape Plan is as Designed	✓	285.33(d)(2)(G)(i) 285.33(d)(2)(A) 285.33(d)(2)(F)				
42	APPLICATION AREA Area Installed	✓					
43	PUMP TANK Meets Minimum Reserve Capacity Requirements						
44	PUMP TANK Material Type & Manufacturer						
45	PUMP TANK Type/Size of Pump Installed						

Comal County Environmental Health OSSF Inspection Sheet

Installer Name: Winters OSSF Installer #: 08 000 8924

1st Inspection Date: 4.23.19 2nd Inspection Date: _____ 3rd Inspection Date: _____

Inspector Name: Arntsen B. Inspector Name: _____ Inspector Name: _____

Permit#: 108940 Address: 421 Dimarron

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44	PUMP TANK Material Type & Manufacturer						
45	PUMP TANK Type/Size of Pump Installed						



Comal County

OFFICE OF COMAL COUNTY ENGINEER

Permit of Authorization to Construct an On-Site Sewage Facility Permit Valid For One Year From Date Issued

Permit Number: 108940
Issued This Date: 04/04/2019
This permit is hereby given to: Sunny Circle, LLC

To start construction of a private, on-site sewage facility located at:

421 CIMARRON
SPRING BRANCH, TX 78070

Subdivision: Lake of the Hills Estates
Unit:
Lot: 217
Block:
Acreage:

APPROVED MINIMUM SIZES AS PER ATTACHED DESIGN

Type of System: Aerobic
Surface Irrigation

This permit gives permission for the construction of the above referenced on-site facility to commence. Installation must be completed by an installer holding a valid registration card from the Texas Commission on Environmental Quality (TCEQ). Installation and inspection must comply with current TCEQ and Comal County requirements.

Call (830) 608-2090 to schedule inspections.

* * * **COMAL COUNTY OFFICE OF ENVIRONMENTAL HEALTH** * * *
APPLICATION FOR PERMIT FOR AUTHORIZATION TO CONSTRUCT AN
ON-SITE SEWAGE FACILITY AND LICENSE TO OPERATE

Date 03/25/19 Permit # 108940
Sunny Circle, LLC, a Texas Limited
Owner Name Liability Company Agent Name John J. Haag, P.E.
Mailing Address 156 Canyon Bend Agent Address 15831 Secret Trail
City, State, Zip Canyon Lake, Texas 78133 City, State, Zip San Antonio, Tx. 78247
Phone # 830-776-0248 Phone # 210-705-4268
Email lolasunnycircle@gmail.com Email jhaag@satx.rr.com

All correspondence should be sent to: Owner Agent Both Method: Mail Email

Subdivision Name Lake of the Hills Estates Unit _____ Lot 217 Block 22
Acreage/Legal 0.2296
Street Name/Address 421 Cimarron City Spring Branch Zip 78070

Type of Development:

Single Family Residential
Type of Construction (House, Mobile, RV, Etc.) House
Number of Bedrooms 3
Indicate Sq Ft of Living Area 1154

Commercial or Institutional Facility

(Planning materials must show adequate land area for doubling the required land needed for treatment units and disposal area)

Type of Facility _____
Offices, Factories, Churches, Schools, Parks, Etc. - Indicate Number Of Occupants _____
Restaurants, Lounges, Theaters - Indicate Number of Seats _____
Hotel, Motel, Hospital, Nursing Home - Indicate Number of Beds _____
Travel Trailer/RV Parks - Indicate Number of Spaces _____
Miscellaneous _____

Estimated Cost of Construction: \$ 135,000 (Structure Only)

Is any portion of the proposed OSSF located in the United States Army Corps of Engineers (USACE) flowage easement?

Yes No (If yes, owner must provide approval from USACE for proposed OSSF improvements within the USACE flowage easement)

Source of Water Public Private Well

Are Water Saving Devices Being Utilized Within the Residence? Yes No

By signing this application, I certify that:

- The completed application and all additional information submitted does not contain any false information and does not conceal any material facts.
- Authorization is hereby given to the permitting authority and designated agents to enter upon the above described property for the purpose of site/soil evaluation and inspection of private sewage facilities..
- I understand that a permit of authorization to construct will not be issued until the Floodplain Administrator has performed the reviews required by the Comal County Flood Damage Prevention Order.
- I affirmatively consent to the online posting/public release of my e-mail address associated with this permit application, as applicable.

Signature of Owner _____

Date _____

Page 1 of 2

RECEIVED

APR 01 2019

COUNTY ENGINEER

***** COMAL COUNTY OFFICE OF ENVIRONMENTAL HEALTH *****
APPLICATION FOR PERMIT FOR AUTHORIZATION TO CONSTRUCT AN
ON-SITE SEWAGE FACILITY AND LICENSE TO OPERATE

Planning Materials & Site Evaluation as Required Completed By John J. Haag, P.E.

System Description Proprietary aerobic treatment with drip system disposal

Size of Septic System Required Based on Planning Materials & Soil Evaluation

Tank Size(s) (Gallons) Aeris D-500-M (500 gpd) Absorption/Application Area (Sq Ft) 1200 min.

Gallons Per Day (As Per TCEQ Table III) 240 gpd

(Sites generating more than 5000 gallons per day are required to obtain a permit through TCEQ.)

RECEIVED

APR 01 2019

COUNTY ENGINEER

Is the property located over the Edwards Recharge Zone? Yes No

(If yes, the planning materials must be completed by a Registered Sanitarian (R.S.) or Professional Engineer (P.E.))

Is there an existing TCEQ approved WPAP for the property? Yes No

(If yes, the R.S. or P.E. shall certify that the OSSF design complies with all provisions of the existing WPAP.)

If there is no existing WPAP, does the proposed development activity require a TCEQ approved WPAP? Yes No

(If yes, the R.S. or P.E. shall certify that the OSSF design will comply with all provisions of the proposed WPAP. A Permit to Construct will not be issued for the proposed OSSF until the proposed WPAP has been approved by the appropriate regional office.)

Is the property located over the Edwards Contributing Zone? Yes No

Is there an existing TCEQ approval CZP for the property? Yes No

(If yes, the P.E. or R.S. shall certify that the OSSF design complies with all provisions of the existing CZP.)

If there is no existing CZP, does the proposed development activity require a TCEQ approved CZP? Yes No

(If yes, the R.S. or P.E. shall certify that the OSSF design will comply with all provisions of the proposed CZP. A Permit to Construct will not be issued for the proposed OSSF until the CZP has been approved by the appropriate regional office.)

Is this property within an incorporated city? Yes No

If yes, indicate the city: _____

By signing this application, I certify that:

- The information provided above is true and correct to the best of my knowledge.

- I affirmatively consent to the online posting/public release of my e-mail address associated with this permit application, as applicable.

John J. Haag, P.E.
Signature of Designer

04/01/19
Date

Yes

THE COUNTY OF COMAL



201906010095 03/27/2019 11:20:49 AM RECEIVED

STATE OF TEXAS

APR 01 2019

CERTIFICATION OF OSSF REQUIRING MAINTENANCE

COUNTY ENGINEER

According to Texas Commission on Environmental Quality (TCEQ) Rules for On- Site Sewage Facilities, this document is filed in the Deed Records of Comal County, Texas.

I

The Texas Health and Safety Code, Chapter 366 authorizes the TCEQ to regulate on-site sewage facilities (OSSFs). Additionally, the Texas Water Code (TWC), § 5.012 and § 5.013, gives the TCEQ primary responsibility for implementing the laws of the State of Texas relating to water and adopting rules necessary to carry out its powers and duties under the TWC. The TCEQ, under the authority of the TWC and the Texas Health and Safety Code, requires owner's to provide notice to the public that certain types of OSSFs are located on specific pieces of property. To achieve this notice, the TCEQ requires a recorded affidavit. Additionally, the owner must provide proof of the recording to the OSSF permitting authority. This recorded affidavit is not a representation or warranty by the TCEQ of the suitability of this OSSF, nor does it constitute any guarantee by the TCEQ that the appropriate OSSF was installed.

II

An OSSF requiring a maintenance contract, according to 30 Texas Administrative Code §285.91(12) will be installed on the property described as (insert legal description):

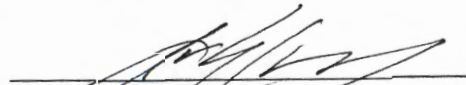
Legal Description: Lot 217, Block 22, Lake of the Hills Estates

This property is owned by: Sunny Circle, LLC

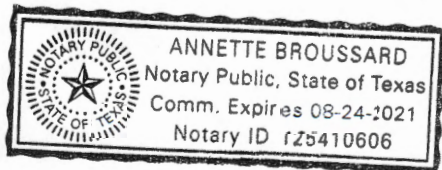
This OSSF must be covered by a continuous maintenance contract for the first two years. After the initial two year service policy, the owner of an aerobic system for a single family residence shall either obtain a maintenance contract within 30 days or maintain the system personally.

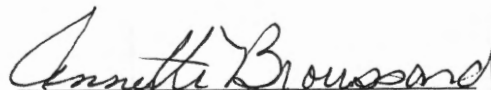
The owner will, upon any sale or transfer of the above-described property, request a transfer of the permit for the OSSF to the buyer or new owner. A copy of the planning materials for the OSSF can be obtained from Comal County.

WITNESS BY HAND(S) ON THIS 27th DAY OF March, 2019.


Owner Signature
Lester Collinsworth, dba Sunny Circle, LLC

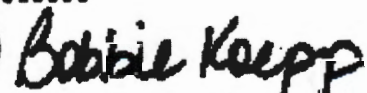
SWORN TO AND SUBSCRIBED BEFORE ME ON THIS 27th DAY OF March, 2019.




Notary Public, State of Texas

Filed and Recorded
Official Public Records
Bobbie Koepf, County Clerk
Comal County, Texas
03/27/2019 11:20:49 AM
TERRI 1 Page(s)
201906010095





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DAVID WINTERS SEPTICS, LLC
PO BOX 195
SPRING BRANCH, TX 78070
830-935-2477 OFFICE
830-935-2477 FAX
winters3@gvtc.com

COUNTY ENGINEER

Routine Maintenance and Inspection Agreement

This Work-for-Hire Agreement (hereafter referred to as this "Agreement") is entered into, by, and between Sunny Circle, LLC (referred to as "Client") and David Winters Septic's, LLC, Inc. (hereafter referred to as "Contractor") located at Lot 217, Blk. 22 Lake of the Hills Estates Date beginning on LTO and contract ending

By this agreement the Contractor agrees to render professional service, as described herein, and the Client agrees to fulfill the terms of this Agreement as described herein.

This agreement will provide for all required inspections, testing, and service for your Aerobic Treatment System. The policy will include the following:

1. Three (3) inspections per year/service calls (at least one every four months), for a total of six (6) over the two-year period, including inspection, adjustment, and servicing of the mechanical, electrical and other applicable component parts to ensure proper function. This includes inspecting control panel, air pumps, air filters, diffuser operation, and replacing or repairing any component not found to be functioning correctly. Any alarm situations affecting the proper function of the Aerobic process will be addressed within a 48-hour time frame. After the initial agreement expires, repair work on warranty parts does not include labor prices. Repair work on non-warranty parts will include prices for labor and parts. The prices will be quoted before work is performed.
2. An effluent quality inspection consisting of a visual check of color, turbidity, scum overflow and examination for odors. A test for chlorine residual and pH will be taken and reported as necessary.
3. If any improper operation is observed, which cannot be corrected at the time of the service visit, you will be notified immediately in writing of the conditions and estimated date of correction.
4. The Client is responsible for the chlorine tablets; they must be filled before or during the service visit.
5. Any additional visits, inspections or sample collection required by specific Municipalities, Water/River Authorities, and County Agencies the TCEQ or any other authorized regulatory agency in your jurisdiction will be covered by this policy.

At the conclusion of the initial service policy, our company will make available, for purchase on an annual basis, a continuing service policy cover NORMAL inspection, maintenance and repair.

The Homeowners Manual must be strictly followed or warranties are subject invalidation. Pumping of sludge build up is not covered by this policy and will result in additional charges.

This agreement does not cover any labor or parts for items which must be replaced due to acts of God, i.e., lightning strikes, high winds, flooding, freezing.

This agreement DOES NOT COVER materials or parts which must be replaced due to misuse or abuse of the system. These include but are not limited to: Sewage flows exceeding the recommended daily hydraulic design capabilities, Disposal of Non-Biodegradable materials, such as chemicals, grease or oil, sanitary napkins, tampons, baby wipes, disposable diapers, Clogs in the line between the house and the tank.

This agreement DOES NOT COVER LABOR OR PARTS for out- of- warranty items.

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ACCESS BY CONTRACTOR

The contractor or anyone authorized by the contractor may enter the property at reasonable times without prior notice for the purpose of service described above.

PAYMENT AGREEMENT

The client will pay compensation to the contractor for the services in the amount of _____. This compensation shall be payable in one lump sum payment upon acceptance of this agreement. Payments not received within 30 days of the above described due date will be subject to a \$25.00 late penalty.

TERMINATION OF THIS AGREEMENT

Either party may terminate this agreement within 10 days of written notice in the event of substantial failure to perform in accordance with its terms by other party without fault of the terminating party. If this agreement is terminated, the contractor will immediately notify the appropriate health authority.

LIMIT OF LIABILITY

The Contractor will not be liable for indirect, consequential, incidental or punitive damages, whether in contract or any other theory. In no event shall the Contractor's liability for direct damages exceed the price for the services described in this agreement.

Permit # _____

The effective date of this initial maintenance agreement shall be the date the license to operate is issued.

Client

Sunny Circle, LLC

Name

156 Canyon Bend

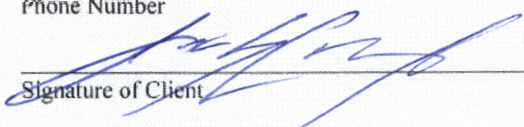
Address

Canyon Lake, Texas 78133

City/State/Zip Code

830-776-0248

Phone Number



Signature of Client


Contractor

David Winters Septic's, LLC, Inc.

P.O. Box 195

Spring Branch, Texas 780170

Office 830-935-2477 Fax 830-935-2477



Signature of Contractor

ON-SITE SEWAGE FACILITY (OSSF) SITE EVALUATION FORM

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1. OWNER INFORMATION	APR 01 2019
Property Owner's Full Legal Name: Sunny Circle, LLC	

2. PROPERTY INFORMATION				COUNTY ENGINEER	
City: Spring Branch			Zip Code: 78070		
Legal Description:					
Lot: 217	Block: 22	Subdivision: Lake of the Hills Estates	Unit:	Phase:	
If not located in subdivision: Survey:					
Abstract:			Recorded (Vol/Pg):		

3. SITE EVALUATION INFORMATION:	
Name of Site Evaluator: John J. Haag	PE #: 90158
Date Performed: 02/11/19	Proposed Excavation Depth: Surface

4. REQUIREMENTS:

- At least two soil evaluations must be performed on the site at opposite ends of the proposed disposal area. Locations of soil evaluations must be shown on the application site drawing or designer's site drawing.
- For subsurface disposal, soil evaluations must be performed to a depth of at least 2 feet below the proposed excavation depth. For surface disposal, the surface horizon must be evaluated.

Soil Profile Hole Number: 1					
Depth (ft.)	Textural Class	Gravel Analysis	Drainage (Mottles/Water Table)	Restrictive Horizon	Observations
0	Rock	<30%	No	Yes	Limestone @ surface.
1					
2					
3					
4					
5					

ON-SITE SEWAGE FACILITY (OSSF) SITE EVALUATION FORM

Soil Profile Hole Number: 2					
Depth (ft.)	Textural Class	Gravel Analysis	Drainage (Mottles/Water Table)	Restrictive Horizon	Observations
0	Rock	<30%	No	Yes	Limestone at surface
1					
2					
3					
4					
5					

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5. FEATURES OF SITE AREA:

- | | |
|---|---|
| Presence of 100 year flood zone: | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Presence of adjacent ponds, streams or water impoundments | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Existing or proposed water well in nearby area | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Organized sewage available to lot or tract | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Recharge features within 150 feet | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |

6. I certify that the above statements are true and correct and are based on my own field observations.



J. J. Haag, P.E.

02/11/19

Haag Engineering Consultants, Inc.
Firm: F-5789

**AEROBIC TREATMENT
DRIP TUBING SYSTEM
FOR:
LOT 217, BLOCK 22
LAKE OF THE HILLS ESTATES**

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COUNTY ENGINEER

SITE DESCRIPTION:

Located in Lake of the Hills Estates, lot 217, block 22 the proposed system will serve at 3 bedroom, 1154 s.f. residence situated with soils per the Site Evaluation report. An aerobic treatment plant utilizing drip irrigation was chosen as the most appropriate system to serve the conditions on this lot.

PROPOSED SYSTEM:

A 3 or 4 inch SCH-40 pipe discharges from the residence into a Aeris D-500-M (500 gpd) aerobic treatment plant containing a 568 gallon pretreatment tank and a 763 gallon pump chamber. The pump chamber contains a 0.5 HP Franklin C1-Series-20XC1-05P4-2W115 submersible well pump. The well pump is activated by a time controller allowing the distribution ten times per day with an 8 minute run time with the float setting at min. 240 gallons. A high level audible and visual alarm will activate should the pump fail. Distribution is through a self-flushing 100 micron Arkal Disk filter then through a 1" SCH-40 manifold to a minimum 1200 sf drip tubing field with Netifim Bioline drip lines approximately two feet apart with 0.61 gph emitters set every two feet as per the attached schematic. A pressure regulator Model PMR30MF 30psi installed in the pump tank on the manifold to the field will maintain pressure at 30 psi. A 1" SCH-40 return line is installed to periodically flush the system by cycling a 1" ball valve. Solids caught in the spin filter are flushed each cycle back to the trash tank. Agricultural Products, Inc. (Model #VBK-1) 1" PVC vacuum breakers installed on the highest point on each manifold will prevent siphoning of effluent from higher to lower parts in the field. Field area will be scarified and then built up so that approximately 12" of Type II or III soil is above any bedrock or type IV soils then the drip tubing will be laid and capped with approximately 6" of Type II or Type III soil (NOT SAND). The field area will be sodded with grass prior to system startup. Tank must have at grade risers on each opening with watertight caps that must be 65# or have a padlock or can only be removed with tools. A secondary plug, cap or suitable restraint must be provided below riser cap to prevent tank entry should the cap be damaged or removed.

DESIGN SPECIFICATIONS:

Daily flow = $Q=240$ gpd
Pretreatment tank size: 400 gal
Plant size: Aeris D-500-M; 500 gpd (TCEQ approved)
Pump tank size: 763 gal
Min. Reserve capacity after high level: 80 gal (1/3 day req'd)
Application rate: $Ra=0.2$ gal/sf
Total absorption area: $Q/Ra = \text{min. } 1200$ sf (1280 sf actual)
Total linear feet of drip tubing: 640' Netifim Bioline drip tubing 0.61 gph
Pump requirement: 320 emitters @ 0.61 gph @ 30 psi = 3.25 gpm
Pump requirement (cont.): 0.5 HP Franklin C1-Series-20AC1-05P4-2W115

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MINIMUM SCOUR VELOCITY (MSV) >2 fps
In drip tubing with nom. dia. 0.57" ID
MSV = 2 fps $(\pi \cdot d^2) / 4 \cdot 7.48 \text{ gal/cf} \cdot 60 \text{ sec/min}$
MSV = $2(3.14159(.57/12)^2) / 4 \cdot 7.48 \cdot 60$
MSV = 1.59 gpm/line * 2 lines = 3.18 gpm min. flow rate
In return manifold with nom. Dia. 1.049" ID
MSV = 2 fps $(\pi \cdot d^2) / 4 \cdot 7.48 \text{ gal/cf} \cdot 60 \text{ sec/min}$
MSV = $2(3.14159(1.049/12)^2) / 4 \cdot 7.48 \cdot 60$
MSV = 5.4 gpm

PIPE AND FITTINGS:

All pipes and fittings in this drip tubing system shall be 1" schedule 40 pvc. All joints shall be sealed with approved solvent type pvc cement. Clipper type cutters are recommended to prevent pvc burrs during cutting of pipes causing possible plugging.

Designed in accordance with Chapter 285, Subchapter D, §285 and §285.40 Texas Commission on Environmental Quality (Revised March 2013).



J. J. Haag, P.E.

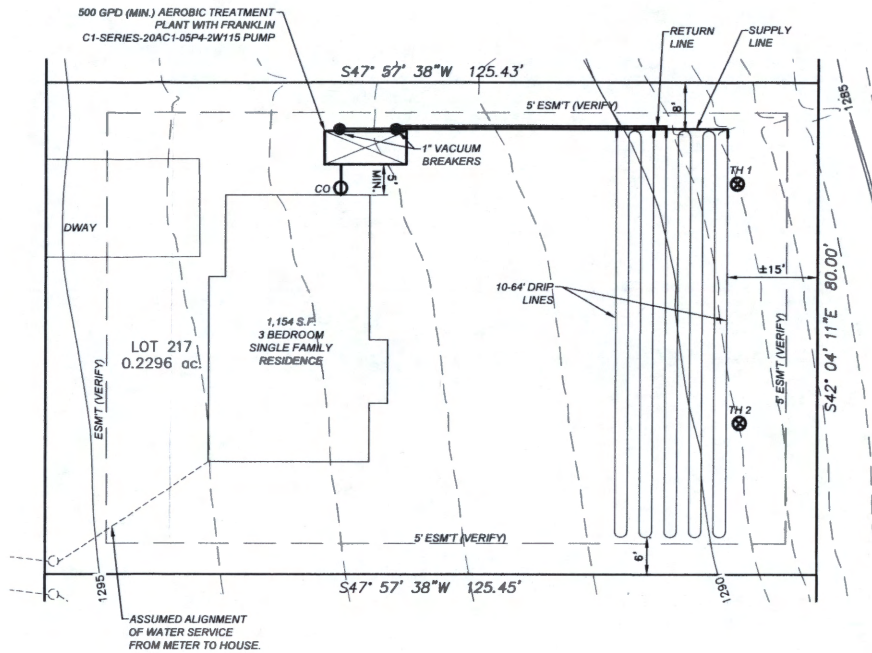
03/29/19

Haag Engineering Consultants, Inc.
Firm No.: F-5786

GENERAL NOTES:

- NO VEHICULAR TRAFFIC IS ALLOWED ON ANY PORTION OF THE DISPOSAL SYSTEM UNLESS THE DESIGN SPECIFIES OTHERWISE.
- PIPE ALIGNMENT TO THE DISPOSAL BEDS MAY BE ALTERED AS REQUIRED ANY CHANGE FROM THE PLANS MUST BE APPROVED BY THE ENGINEER AND THE APPROPRIATE GOVERNMENTAL AGENCY(IES).
- CONTRACTOR SHALL PROTECT TREES WHICH ARE NOT IN THE EXCAVATED CONSTRUCTION AREAS. CONTRACTOR SHALL MINIMIZE ROOT DAMAGE AND REASONABLY ADHERE TO THE DESIGN.
- CONTRACTOR IS RESPONSIBLE FOR VERIFYING A MINIMUM OF 1/4" PER FOOT OF FALL FROM THE BUILDING TO THE SEPTIC TANK.
- NOT AUTOMATIC SPRINKLER SYSTEM SHALL BE INSTALLED OVER THE DISPOSAL AREAS. ANY WATERING IN THESE AREAS SHALL BE DONE BY HAND AND ONLY WHEN REQUIRED TO MAINTAIN GRASS COVER.
- ALL CONSTRUCTION SHALL CONFORM TO THE RULES AND REGULATIONS OF THE APPROPRIATE AUTHORITY - TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) AND ANY APPLICABLE LOCAL BUILDING AND SAFETY CODES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND VERIFYING THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES THAT MAY BE AFFECTED BY THE CONSTRUCTION OF THIS SYSTEM.
- THE DRIP FIELD SHALL BE VEGETATED WITH EITHER ST. AUGUSTINE OR BERMUDA SOG.
- FIELDS MUST BE MOWED AT REGULAR INTERVALS. FAILURE TO PROPERLY MAINTAIN VEGETATIVE COVER MAY RESULT IN SYSTEM FAILURE AND SHALL BE THE RESPONSIBILITY OF THE OWNER.
- ALL PIPES SHALL BE SCHEDULE 40 PVC OR APPROVED EQUAL, UNLESS NOTED OTHERWISE. ALL JOINTS SHALL BE CLEANED WITH THE APPROPRIATE SOLVENT AND GLEED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION.
- ALL POTABLE WATER LINES SHALL BE A MINIMUM OF 10 FEET FROM ANY DISPOSAL SYSTEM OR SEWERAGE PIPE. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF WATER LINES LESS THAN 10 FEET FROM THE DISPOSAL AREA.
- HIGH WATER ALARM SHALL BE LOCATED IN A NOTICEABLE LOCATION. THE ALARM SHALL BE A VISUAL AND AUDIBLE ALARM AND WIRED ON A SEPARATE CIRCUIT FROM THE PUMPS. ALL EXTERIOR CONTROLS AND CONNECTIONS SHALL BE ENCLOSED IN A WEATHER-PROOF HOUSING. ELECTRICAL CONSTRUCTION SHALL COMPLY WITH ALL LOCAL ELECTRICAL AND BUILDING CODES.
- NO EXCAVATION IS PERMITTED NEAR THE DISPOSAL FIELDS THAT WILL RESULT IN THE NONCOMPLIANCE OF APPLICABLE SETBACKS STATED IN THE RULES AND REGULATIONS OF THE APPROPRIATE AUTHORITY.
- ONLY GOOD QUALITY SANDY LOAM SHALL BE APPLIED OVER THE DISPOSAL FIELDS. CLAY LOAM IS UNACCEPTABLE AND WILL CAUSE SYSTEM FAILURE. SANDY LOAM SHALL BE DEFINED AS SHOWN IN TABLE VI (USDA SOIL TEXTURAL CLASSIFICATIONS) OF THE RULES AND REGULATIONS OF THE TCEQ. THE INSTALLER IS RESPONSIBLE FOR VERIFYING THE QUALITY OF EACH LOAD OF LOAM PLACED ON THE SYSTEM.
- STORM WATER (RAINFALL RUNOFF) SHOULD NOT BE ALLOWED TO FLOW OVER THE DISPOSAL FIELDS OR THE TANKS. DIVERSION BERMS, SWALES AND/OR RAIN GUTTERS SHOULD BE INSTALLED AS NECESSARY TO PREVENT SUCH RUNOFF.
- THE CONTRACTOR IS RESPONSIBLE FOR STAKING AND VERIFYING THE GRADES PRIOR TO EXCAVATION. ANY DISCREPANCIES OF MORE THAN 6 INCHES SHALL BE REPORTED TO THE ENGINEER PRIOR TO EXCAVATION. THE CONTRACTOR SHALL NOT DEVIATE FROM THESE PLANS WITHOUT THE WRITTEN CONSENT OF THE APPROPRIATE AUTHORITY AND THE ENGINEER.
- WATER SOFTENER AND/OR AIR CONDITIONING DRAIN LINES SHALL NOT BE CONNECTED TO THE SEPTIC TANK.
- CONTRACTOR SHALL REPORT TO THE ENGINEER ANY ELEVATION DIFFERENCES GREATER THAN 4 FEET BETWEEN THE HIGHEST AND LOWEST TRENCH IN THE FIELD. THIS SHOULD BE CHECKED PRIOR TO INSTALLING THE LATERALS AND MAINFOLD.
- THIS DISPOSAL SYSTEM HAS BEEN DESIGNED TO OPERATE PROPERLY AT SPECIFICATIONS NOTED IN THESE PLANS. ALTERATIONS TO THE SYSTEM BY THE OWNER, INCLUDING BUT NOT LIMITED TO LANDSCAPING, DRAINAGE, BUILDING AND/OR WATER USAGE, MAY CAUSE PREMATURE FAILURE AND SHALL BE THE SOLE RESPONSIBILITY OF THE OWNER.
- CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL PLUMBING FIXTURES ARE CONNECTED TO THE DESIGNATED SEPTIC TANK(S). LOW FLOW TOILETS (1.6 GAL), SHOWERHEADS AND FAUCETS SHALL BE USED IN THE STRUCTURES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR JOBSITE SAFETY AND PROTECTION OF THE PUBLIC FROM INJURY DURING CONSTRUCTION. THE OWNER SHALL BE RESPONSIBLE FOR THE PREVENTION OF PERSONAL INJURY TO ANYONE ON OR NEAR THE DISPOSAL SYSTEM.
- CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT ALL TANKS HAVE ADEQUATE STRENGTH AND INTEGRITY TO PERFORM SATISFACTORILY AS SHOWN ON THESE PLANS.
- THE WASTEWATER FLOW TO THE SEPTIC SYSTEM SHALL NOT EXCEED THE DESIGN FLOW SHOWN ON THIS PLAN.

CIMARRON



THE DRIP DISPOSAL FIELD AREA WILL BE SCARIFIED AND THEN BUILT UP SO THAT APPROXIMATELY 12" OF TYPE II OR III SOIL (NOT SAND) IS ABOVE ANY BEDROCK OR TYPE IV SOILS THEN THE DRIP TUBING WILL BE LAID ON TOP AND THEN CAPPED WITH APPROXIMATELY 6" OF TYPE II OR TYPE III SOIL (NOT SAND). THE FIELD AREA WILL BE SODED WITH GRASS PRIOR TO SYSTEM STARTUP.

ADD'L. NOTES:

- DESIGN DAILY WASTEWATER FLOW = 340 GPD (WATER SAVING DEVICES WERE ASSUMED FOR SEPTIC SYSTEM DESIGN).
- TOPOGRAPHIC DATA SOURCE: FEMA 2011 DATA
- INSTALLER SHALL VERIFY ALL EASEMENTS, SETBACKS AND PROPERTY LINE BEARINGS AND DISTANCES PRIOR TO CONSTRUCTION.



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**OSSF LAYOUT
LOT 217, BLK. 22, CIMARRON
LAKE OF THE HILLS ESTATES
SPRING BRANCH, TEXAS**

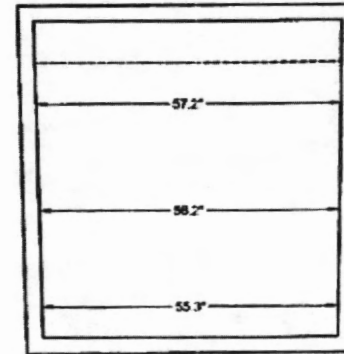
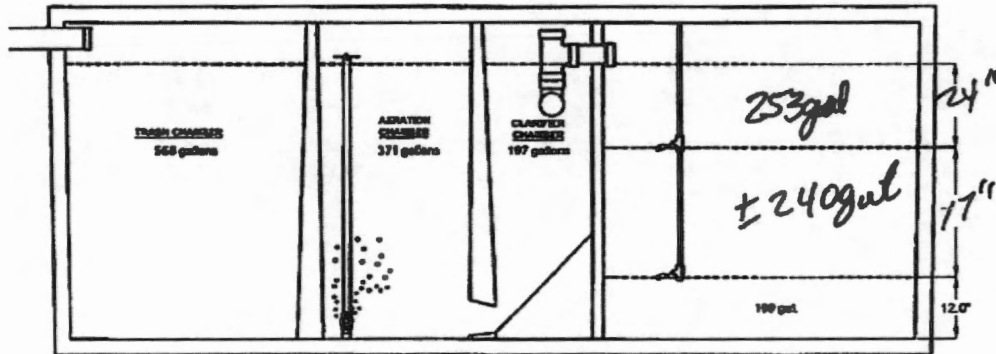
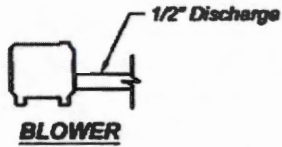
NOTE: OSSF IS NOT WITHIN THE EDWARDS AQUIFER RECHARGE ZONE OR FEMA 100 YEAR FLOODPLAIN.
SITE EVALUATION BY JOHN J. HAAG, P.E. ON 02/11/19

DRAWN BY: J JH
CHECKED BY: J JH
DATE: 03/29/19
JOB NO. SUNNY18030

**H
E
C** HAAG ENGINEERING CONSULTANTS

15831 SECRET TRAILS
SAN ANTONIO, TEXAS 78247
FIRM: F-5789
TEL: (210) 705-4266
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SHEET 1 OF 1



SIDE SECTION VIEW
SCALE: 1" = 36"

END SECTION VIEW
SCALE: 1" = 36"



Pump float settings for 240 gpd design flow and min. 80 gal reserve:
 Pump off position: 12 inches above tank bottom (169 gal)
 Pump on position: 29 inches above tank bottom (411 gal)
 Alarm on position: 36 inches above tank bottom (510 gal)
 253 gal reserve capacity at approx. 53 inches above tank bottom



Title: **Model D-500-M
Night Time Pumping**

Company Name: **Aeris Aerobics**

Date: **5-6-2015**

COUNTY ENGINEER

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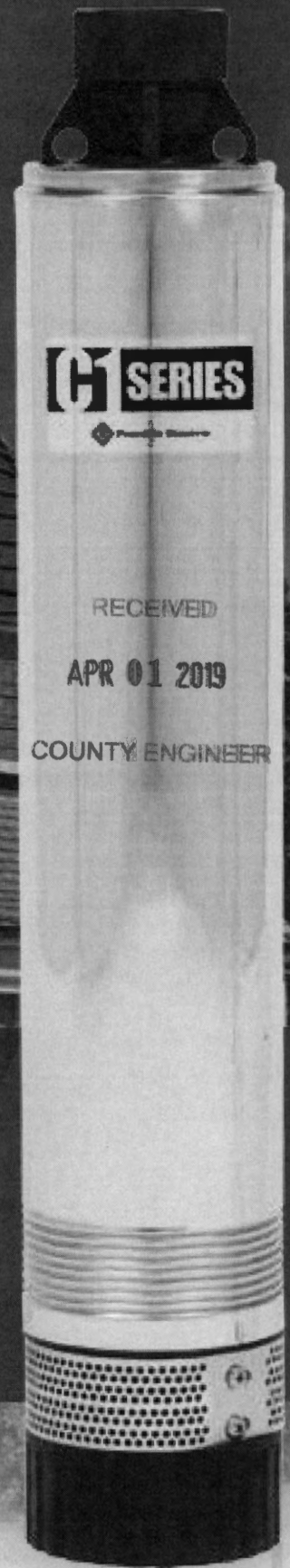
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C1 SERIES

CISTERN PUMPS

Designed for use in gray water / filtered effluent service applications, the C1 Series cistern pump provides high performance and long life in less than ideal water conditions. The C1 Series pump is able to pass solids up to 1/8" without having a negative effect on the internal hydraulic components.

The pump's unique bottom suction design allows for maximum fluid drawdown without compromising durability or overall life, and it does not require the use of a flow induction sleeve. Intended specifically for use in a cistern or tank, C1 Series pumps are suitable for use in agricultural, residential, and commercial installations.



Franklin Electric

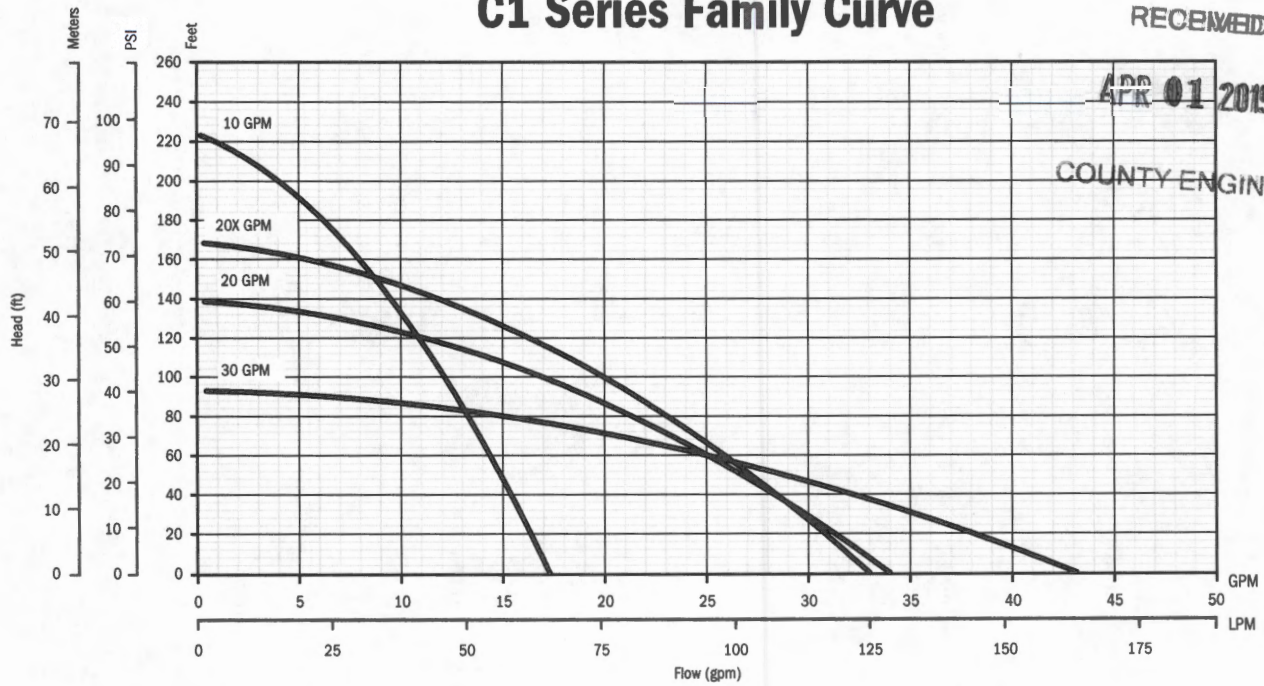
franklinwater.com

C1 Series Family Curve

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COUNTY ENGINEER



FEATURES

- Supplied with a removable 5" base for secure and reliable mounting
- Bottom suction design
- Robust thermoplastic discharge head design resists breakage during installation and operation
- Single shell housing design provides a compact unit while ensuring cool and quiet operation
- Hydraulic components molded from high quality engineered thermoplastics
- Optimized hydraulic design allows for increased performance and decreased power usage
- All metal components are made of high grade stainless steel for corrosion resistance
- Available with a high quality 115 V or 230 V, 1/2 hp motor
- Fluid flows of 10, 20, and 30 gpm, with a max shut-off pressure of over 100 psi
- Heavy duty 600 V 10 foot SJOOW jacketed lead

APPLICATIONS

- Gray water pumping
- Filtered effluent service water pumping
- Water reclamation projects such as pumping from rain catchment basins
- Aeration and other foundation or pond applications
- Agriculture and livestock water pumping

ORDERING INFORMATION

C1 Series Pumps							
GPM	HP	Volts	Stage	Model No.	Order No.	Length (in)	Weight (lbs)
10	1/2	115	7	10C1-05P4-2W115	9030005	26	17
		230	7	10C1-05P4-2W230	9030110	26	17
20		115	5	20C1-05P4-2W115	9030205	25	16
		230	5	20C1-05P4-2W230	9030210	25	16
20X		115	6	20XC1-05P4-2W115	9030215	26	17
		230	6	20XC1-05P4-2W230	9030220	26	17
30		115	4	30C1-05P4-2W115	9030305	25	16
		230	4	30C1-05P4-2W230	9030310	25	16

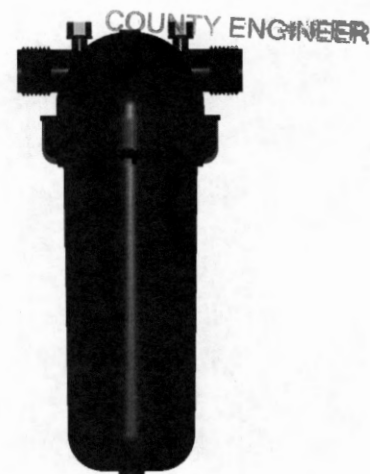
Note: All units have 10 foot long SJOOW leads.

1" SUPER/LONG MANUAL DISC FILTER

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

FEATURES

- A "T" shaped reinforced plastic filter with two 1" male connections.
- Filter element consists of grooved discs, mounted on a spine, forming a cylindrical filter element. The discs are compressed together by a spring located at the bottom of the filter cover.
- Screw-on filter cover.
- Resistant to chemicals and liquid fertilizers.
- Available filtration grades: 040, 080, 120, 140 and 200.



TECHNICAL DATA	
FLOW RANGE	10 - 35 GPM
MAXIMUM PRESSURE	140 psi
FILTERING SURFACE AREA	78 sq. in.
FILTERING VOLUME	36 cu. in.
LENGTH	13 13/32"
WIDTH	6 7/32"
WEIGHT	3.11 lbs.
DISTANCE BETWEEN ENDS	6 7/32"
INLET/OUTLET DIAMETER	1" Male
MAXIMUM TEMPERATURE	158° F
pH	5 - 11

MESH/MICRON		
MESH	MICRON	DISC COLOR
040	400	Blue
080	200	Yellow
120	130	Red
140	115	Black
200	55	Green

INSTALLATION

1. Filter can be installed either vertically or horizontally.
2. Use Teflon tape on filter threads - Do Not Use Pipe Dope.
3. Ensure correct inlet/outlet direction.
4. When connecting filter to pipe, do not overtighten.
5. Never use spanners for tightening the filter cover.

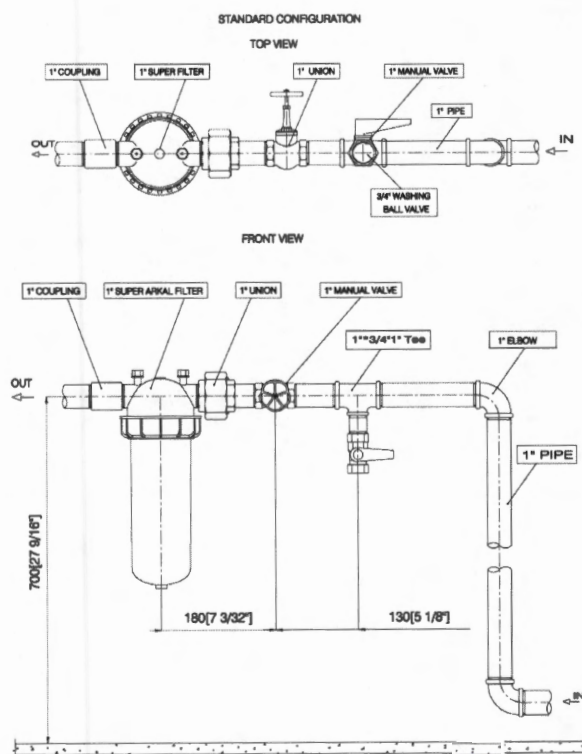
MAINTENANCE AND CLEANING

DISMANTLING

1. Ensure system is turned off and no pressure remains in the pipeline.
2. Unscrew cover from the filter body.
3. Pull out entire filter element.

CLEANING

1. Move tightening ring to end of spine and flush discs with pressurized water.
2. If discs are not clean after flushing with water:
 - a. If the discs have an accumulation of algae in the grooves, soak the discs and spine in a small bucket of Clorox bleach for one hour and then reflush with fresh water.
 - b. If the discs have an accumulation of iron in the grooves, soak the discs and spine in a small bucket of 10% Muriatic Acid for one hour and then reflush with fresh water. Muriatic Acid can be purchased at any pool supply store.



MAINTENANCE AND CLEANING

ASSEMBLY

1. Verify that spring is in place inside the filter cover.
2. Insert filter element and make sure it is seated correctly.
3. Replace cover.
4. Tighten filter cover securely by turning the fixing nut clockwise and do not overtighten.

WINTERIZATION

Drain all the water from the filter to avoid cracking due to freezing.

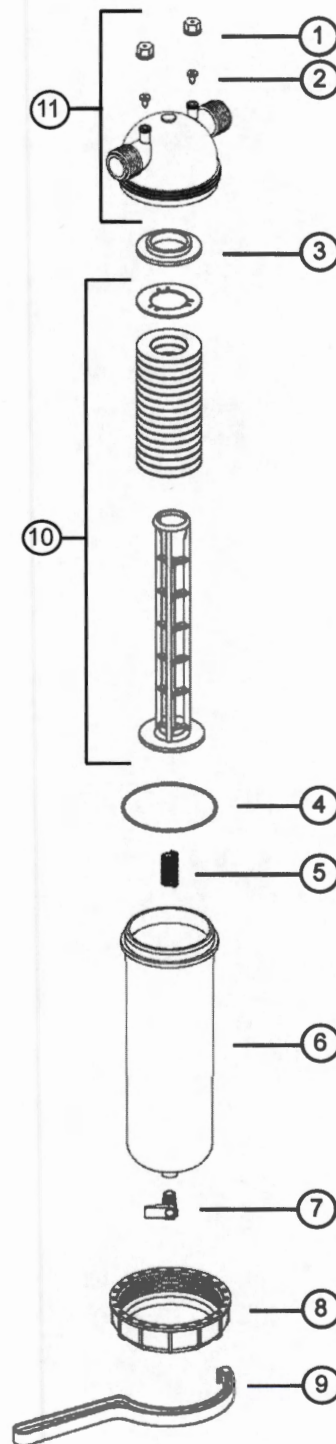
PARTS BREAKDOWN - 1" SUPER/LONG FILTER

KEY	MODEL NUMBER	DESCRIPTION	MATERIALS
1	SEE # 11	GAUGE PORT NUT	R.PP
2	SEE # 11	GAUGE PORT SEAL	EPDM
3	-	FILTER ADAPTER RING	R.PA
4	25AP531140	COVER O RING	NR
5	25AP50440011	COMPRESSION SPRING	SS
6	25AP23113	FILTER COVER	R.PA
7	-	1/4" TAP (OPTIONAL)	BRASS
8	25AP231131	FIXING NUT	R.PA
9	25AP131199	FILTER WRENCH	R.PA
10	25AP21121-***	RING SET WITH SPINE	PP
11	25AP25000101	FILTER BODY COMPLETE	-

Substitute *** for proper mesh size.

MATERIALS KEY

CODE	MATERIAL
SS	STAINLESS STEEL
PP	POLYPROPYLENE
NR	NITRILE RUBBER
R.PP	REINFORCED POLYPROPYLENE
R.PA	REINFORCED POLYAMIDE
EPDM	ETH. PROPY. RUBBER



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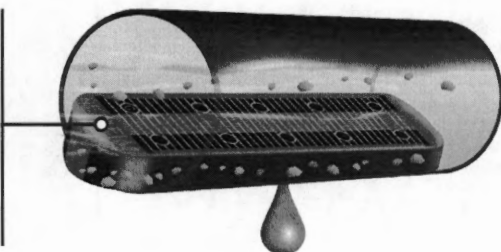
5470 E. Home Ave.
 Fresno, CA 93727
 888.638.2346 • 559.453.6800
 FAX 800.695.4753
 www.netafimusa.com

BIOLINE® DRIPLINE

THE WORLD'S MOST ADVANCED CONTINUOUS
SELF-CLEANING, PRESSURE COMPENSATING DRIPLINE
SPECIFICALLY DESIGNED FOR WASTEWATER

CROSS SECTION OF BIOLINE DRIPLINE

Bioline dripper inlets
are positioned in the
center of flow where
water is the cleanest



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PRODUCT ADVANTAGES

- Pressure compensation - all drippers deliver equal flow, even on sloped or rolling terrain.
- Unique flow path - Turbonet technology provides more control of water and a high resistance to clogging.
- Continuous self-flushing dripper design - flushes debris, as it is detected - throughout operation, not just at the beginning or end of a cycle. Ensures uninterrupted dripper operation.
- Single hole dripper outlet from tubing:
 - Better protection against root intrusion
 - Allows the dripline to be used in subsurface applications without need for chemical protection
- Drippers capture water flow from the center of the tubing - ensures that only the cleanest flow enters the dripper.
- Built-in physical root barrier - drippers are protected from root intrusion without the need for chemical protection. Water exits dripper in one location while exiting the tubing in another.
- Three dripper flow rates - provides the broadest range of flow rates available. Allows the designer to match the dripline to any soil or slope condition.
- Bioline tubing is completely wrapped in purple - easily identifying it for non-potable use, regardless of how the tubing is installed.
- Anti-bacterial-impregnated drippers - prevents buildup of microbial slime.
- Can be used subsurface - Bioline can be installed on-surface, under cover or subsurface.
- No special storage requirements - does not degrade if stored outdoors.
- Techfilter compatible - an optional level of protection, provides a limited lifetime warranty against root intrusion.

APPLICATIONS

- Typically installed following a treatment process
- Can be used with domestic septic tank effluent with proper design, filtration and operation
- Reuse applications including municipally treated effluent designated for irrigation and other disinfected and non-disinfected water sources.

SPECIFICATIONS

- Dripper flow rates: 0.4, 0.6 or 0.9 GPH
- Dripper spacings: 12", 18" or 24" dripper spacings and blank tubing
- Pressure compensation range: 7 to 58 psi (stainless steel clamps recommended above 50 psi)
- Maximum recommended system pressure: 50 psi
- Tubing diameter: 0.66" OD, 0.57" ID
- Tubing color: Purple color indicates non-potable
- Coil lengths: 500' or 1,000' (Blank tubing in 250')
- Recommended filtration: 120 mesh
- Bending radius: 7"
- UV resistant
- Tubing material: Linear low-density polyethylene

Additional spacing and pipe sizes available by special order. Please contact Netafim USA Customer Service for details.

BIOLINE DRIPLINE

MAXIMUM LENGTH OF A SINGLE LATERAL WITH 3.0 fps FLUSH VELOCITY

ADDITIONAL FLOW OF 2.3 GPM REQUIRED PER LATERAL TO ACHIEVE 3 fps

DRIPPER SPACING		12"			18"			24"		
DRIPPER FLOW RATE (GPH)		0.4 GPH	0.6 GPH	0.9 GPH	0.4 GPH	0.6 GPH	0.9 GPH	0.4 GPH	0.6 GPH	0.9 GPH
INLET PRESSURE	15	102	94	84	138	127	113	181	151	137
	25	151	136	118	203	184	161	245	223	197
	35	193	171	146	260	232	200	315	283	245
	40	211	186	158	286	254	218	347	311	267
	45	228	200	169	310	274	233	377	335	287
Flow per 100' (GPM / GPH)		0.67/40	1.02/41	1.53/42	0.44/28.67	0.68/41	1.02/41	0.34/20	0.51/21	0.77/46

Lateral lengths are based on flows allowing for a 3 fps flushing/scouring velocity

MAXIMUM LENGTH OF A SINGLE LATERAL WITH 2.5 fps FLUSH VELOCITY

ADDITIONAL FLOW OF 2.0 GPM REQUIRED PER LATERAL TO ACHIEVE 2.5 fps

DRIPPER SPACING		12"			18"			24"		
DRIPPER FLOW RATE (GPH)		0.4 GPH	0.6 GPH	0.9 GPH	0.4 GPH	0.6 GPH	0.9 GPH	0.4 GPH	0.6 GPH	0.9 GPH
INLET PRESSURE	15	128	115	100	172	155	136	205	187	165
	25	183	161	137	248	220	188	301	268	231
	35	228	198	168	310	272	229	379	333	283
	40	248	214	178	338	295	247	413	362	305
	45	266	229	190	364	316	263	447	389	327
Flow per 100' (GPM / GPH)		0.67/40	1.02/41	1.53/42	0.44/28.67	0.68/41	1.02/41	0.34/20	0.51/21	0.77/46

Lateral lengths are based on flows allowing for a 2.5 fps flushing/scouring velocity

MAXIMUM LENGTH OF A SINGLE LATERAL WITH 2.0 fps FLUSH VELOCITY

ADDITIONAL FLOW OF 1.6 GPM REQUIRED PER LATERAL TO ACHIEVE 2.0 fps

DRIPPER SPACING		12"			18"			24"		
DRIPPER FLOW RATE (GPH)		0.4 GPH	0.6 GPH	0.9 GPH	0.4 GPH	0.6 GPH	0.9 GPH	0.4 GPH	0.6 GPH	0.9 GPH
INLET PRESSURE	15	161	141	119	217	191	164	283	233	201
	25	221	190	157	302	261	218	389	321	270
	35	269	229	187	370	316	260	455	381	324
	40	290	248	200	399	340	278	493	421	347
	45	310	261	212	427	362	296	527	448	369
Flow per 100' (GPM / GPH)		0.67/40	1.02/41	1.53/42	0.44/28.67	0.68/41	1.02/41	0.34/20	0.51/21	0.77/46

Lateral lengths are based on flows allowing for a 2 fps flushing/scouring velocity

MAXIMUM LENGTH OF A SINGLE LATERAL WITH 1.5 fps FLUSH VELOCITY

ADDITIONAL FLOW OF 1.2 GPM REQUIRED PER LATERAL TO ACHIEVE 1.5 fps

DRIPPER SPACING		12"			18"			24"		
DRIPPER FLOW RATE (GPH)		0.4 GPH	0.6 GPH	0.9 GPH	0.4 GPH	0.6 GPH	0.9 GPH	0.4 GPH	0.6 GPH	0.9 GPH
INLET PRESSURE	15	201	171	140	275	235	194	337	289	241
	25	266	222	179	366	308	251	453	383	313
	35	316	262	210	437	365	295	543	455	369
	40	337	280	223	469	381	313	583	487	383
	45	358	296	235	497	413	331	619	517	415
Flow per 100' (GPM / GPH)		0.67/40	1.02/41	1.53/42	0.44/28.67	0.68/41	1.02/41	0.34/20	0.51/21	0.77/46

Lateral lengths are based on flows allowing for a 1.5 fps flushing/scouring velocity

MAXIMUM LENGTH OF A SINGLE LATERAL WITH 1.0 fps FLUSH VELOCITY

ADDITIONAL FLOW OF 0.8 GPM REQUIRED PER LATERAL TO ACHIEVE 1.0 fps

DRIPPER SPACING		12"			18"			24"		
DRIPPER FLOW RATE (GPH)		0.4 GPH	0.6 GPH	0.9 GPH	0.4 GPH	0.6 GPH	0.9 GPH	0.4 GPH	0.6 GPH	0.9 GPH
INLET PRESSURE	15	248	205	163	344	285	228	427	355	285
	25	315	258	203	440	361	286	549	453	359
	35	367	298	234	513	419	331	643	527	417
	40	389	316	248	545	445	350	683	569	441
	45	409	332	260	574	468	367	721	589	463
Flow per 100' (GPM / GPH)		0.67/40	1.02/41	1.53/42	0.44/28.67	0.68/41	1.02/41	0.34/20	0.51/21	0.77/46

Lateral lengths are based on flows allowing for a 1 fps flushing/scouring velocity

MAXIMUM LENGTH OF A SINGLE LATERAL WITH 0.5 fps FLUSH VELOCITY

ADDITIONAL FLOW OF 0.4 GPM REQUIRED PER LATERAL TO ACHIEVE 0.5 fps

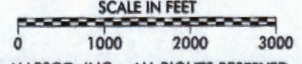
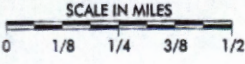
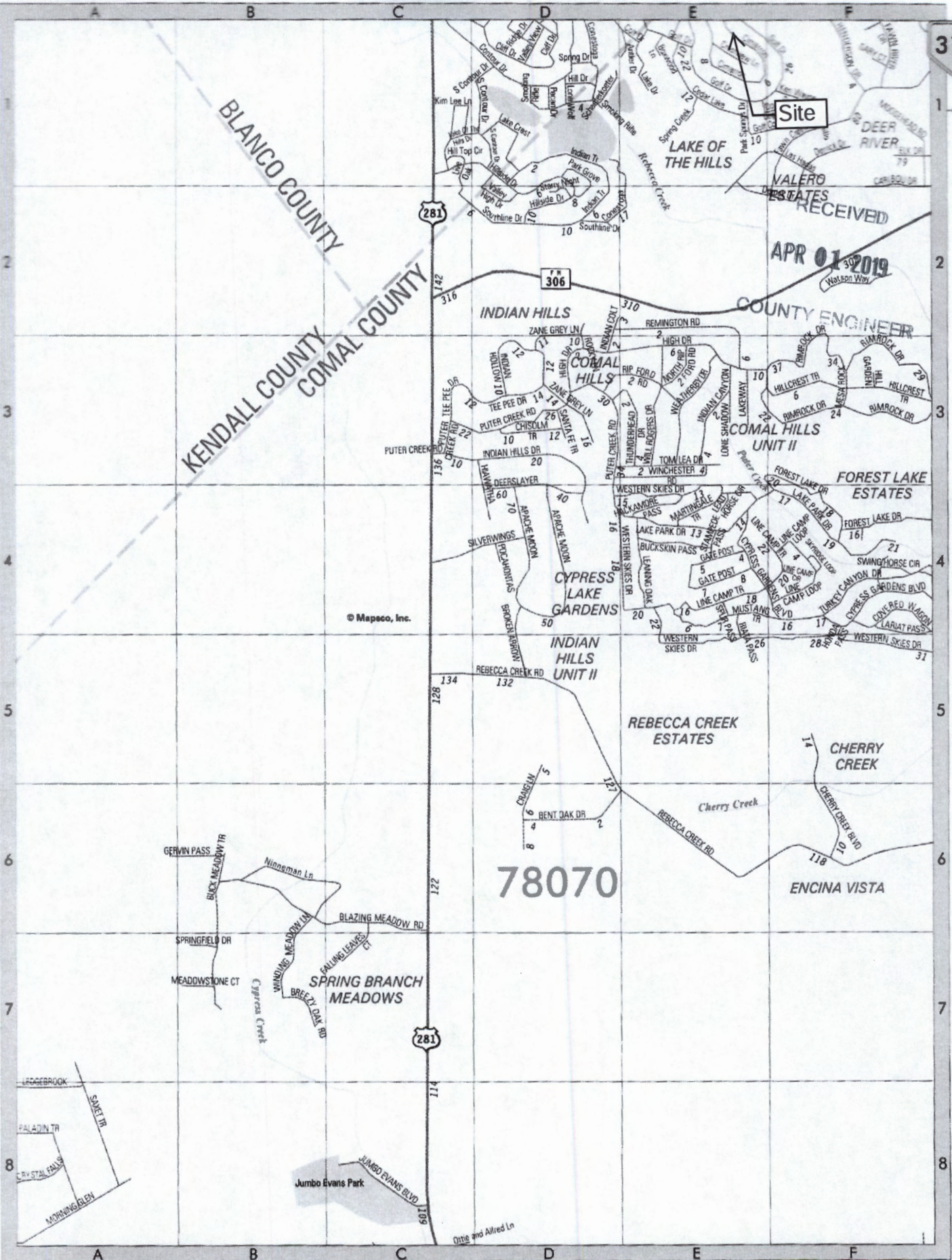
DRIPPER SPACING		12"			18"			24"		
DRIPPER FLOW RATE (GPH)		0.4 GPH	0.6 GPH	0.9 GPH	0.4 GPH	0.6 GPH	0.9 GPH	0.4 GPH	0.6 GPH	0.9 GPH
INLET PRESSURE	15	301	242	188	422	341	265	531	429	335
	25	389	296	228	520	418	323	655	527	409
	35	421	337	260	595	476	368	749	603	467
	40	443	354	273	626	501	387	790	635	491
	45	464	371	285	656	524	404	829	665	513
Flow per 100' (GPM / GPH)		0.67/40	1.02/41	1.53/42	0.44/28.67	0.68/41	1.02/41	0.34/20	0.51/21	0.77/46

Lateral lengths are based on flows allowing for a 0.5 fps flushing/scouring velocity

Netafim recommends flushing velocities capable of breaking free any accumulated bioslimes and debris in the piping network.

- Notes:
1. Refer to local regulations for information on flushing velocities that may be written into codes.
 2. Netafim does not endorse a specific flushing velocity.
 3. Flushing velocities should be determined based on regulations, quality of effluent, and type of flushing control.
 4. Using a flushing velocity less than 1 fps does not provide turbulent flow as defined by Reynolds Number.
 5. Higher flushing velocities provide more aggressive flushing.

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Warranty Deed with Vendor's Lien

Date: January 29, 2018

Grantor: Daniec Land & Cattle Company, Inc.

Grantor's Mailing Address:

24165 IH10 W, Ste 217-610, San Antonio TX 78257

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Grantee: Sunny Circle, LLC, a Texas Limited Liability Company

Grantee's Mailing Address:

156 Canyon Bend, Canyon Lake, Texas 78133

Consideration:

Cash and a note of even date executed by Grantee and payable to the order of Willis D. Mitchell in the principal amount of ONE HUNDRED SIXTY THOUSAND AND FOUR HUNDRED AND SIXTY-EIGHT AND 89/100 DOLLARS (\$160,468.89). The note is secured by a first and superior vendor's lien and superior title retained in this deed in favor of Willis D. Mitchell and by a first-lien deed of trust of even date from Grantee to Dean Cherer, trustee.

Property (including any improvements):

Tract 1:

Lots 140, 141, 142, 143, 153, 154, 175, 177, 179, 183, 184, 192, 195, 196, 197, 198, 199, 205, 206, 207, 212, 213, 214, 215, 216, 217, 218, 219, and 224, Block 22, Lake of The Hills Estates, Comal County, Texas, according to map and plat recorded in Volume 4, Pages 70-71, Map and Plat Records, Comal County, Texas

Tract 2:

Lots 31, 32, 34 and 35, Block 35, Lake of The Hills Estates, Comal County, Texas, according to map and plat recorded in Volume 4, Pages 70-71, Map and Plat Records, Comal County, Texas

Tract 3:

Lot RESERVE, being 2.873 acres, Block 30, Lake of The Hills Estates, a subdivision of record in Comal County, Texas, Comal CAD ID No. 152393 and being the same reserve tract as described in deeds recorded under Document Nos. 201306006626 and 201306018610 of the Official Public Records of Comal County, Texas

Reservations from Conveyance:

None

Exceptions to Conveyance and Warranty: None

Grantor, for the Consideration and subject to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty, grants, sells, and conveys to Grantee the Property, together with all and singular the rights and appurtenances thereto in any way belonging, to have and to hold it to Grantee and Grantee's heirs, successors, and assigns forever. Grantor binds Grantor and Grantor's heirs and successors to warrant and forever defend all and singular the Property to Grantee and Grantee's heirs, successors, and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof, except as to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty.

The vendor's lien against and superior title to the Property are retained until each note described is fully paid according to its terms, at which time this deed will become absolute.

Willis D. Mitchell, at Grantee's request, has paid in cash to Grantor that portion of the purchase price of the Property that is evidenced by the note. The first and superior vendor's lien against and superior title to the Property are retained for the benefit of Willis D. Mitchell and are transferred to Willis D. Mitchell without recourse against Grantor.

When the context requires, singular nouns and pronouns include the plural.

Paul A. Daniec, President
Daniec Land & Cattle Company, Inc.

STATE OF TEXAS)

COUNTY OF)

This instrument was acknowledged before me on January ²⁴ 2018, by Paul A. Daniec, President of Daniec Land & Cattle Company, Inc.

Notary Public, State of Texas

PREPARED IN THE OFFICE OF:

DWAIN W BLASCHKE
P.O. Box 1744
Canyon Lake, TX 78133
Tel: (830) 964-4442
Fax: (830) 964-4426



Filed and Recorded
Official Public Records
Bobbie Koepf, County Clerk
Comal County, Texas
02/01/2018 03:02:17 PM
TERRI 2 Page(s)
201806004070



Bobbie Koepf

OSSF DEVELOPMENT APPLICATION CHECKLIST

Staff will complete shaded

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items Date Received	Initials

APR 01 2019

Permit Number

COUNTY ENGINEER

LOT 217 CUMARROW

Instructions:

Place a check mark next to all items that apply. For items that do not apply, place "N/A". This OSSF Development Application Checklist **must** accompany the completed application.

OSSF Permit

Completed Application for Permit for Authorization to Construct an On-Site Sewage Facility and License to Operate

Site/Soil Evaluation Completed by a Certified Site Evaluator or a Professional Engineer

Planning Materials of the OSSF as Required by the TCEQ Rules for OSSF Chapter 285. Planning Materials shall consist of a scaled design and all system specifications.

Required Permit Fee

Copy of Recorded Deed

Surface Application/Aerobic Treatment System

Recorded Certification of OSSF Requiring Maintenance/Affidavit to the Public

Signed Maintenance Contract with Effective Date as Issuance of License to Operate

I affirm that I have provided all information required for my OSSF Development Application and that this application constitutes a completed OSSF Development Application.

Signature of Applicant

Date

___ COMPLETE APPLICATION	
Check No. _____	Receipt No. _____

___ INCOMPLETE APPLICATION
(Missing Items Circled, Application Refused)