

Heindel & Noyes, Inc.

P.O. Box 4503 Burlington, VT 05406-4503

- Consulting Hydrogeologists
- Engineers
- Environmental Scientists

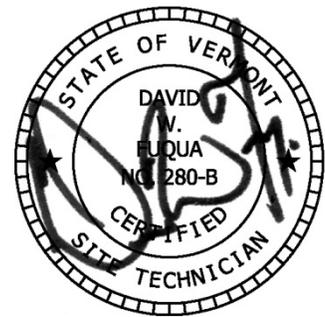
Voice 802-658-0820/Fax 802-860-1014

PETDIA II, LLC DEVELOPMENT
of
1021 Town Line Road - Charlotte, Vermont

State of Vermont
Wastewater System & Potable Water Supply
Permit Application

Prepared for:
Peter Swift

Prepared by:
David W. Fuqua
Heindel and Noyes, Inc.



September 23, 2010

Petdia II, LLC

State of Vermont Wastewater System & Potable Water Supply Permit Application

September 23, 2010

This application is for the demolition of the existing two bedroom primitive cabin and the existing three bedroom house currently served by an on-site mound wastewater disposal system and existing drilled bedrock well. A new two bedroom **CABIN** will be constructed in the same general area of the existing cabin and will be connected to the existing drilled bedrock well and existing mound wastewater disposal system. A future four bedroom **HOUSE** is proposed in the same general area of the existing house. The HOUSE will be served by a filtrate disposal system that discharges to two new mound wastewater disposal areas. At the time of the HOUSE construction; a new drilled well will be constructed for the CABIN and the HOUSE will be connected to the existing drilled well.

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Engineering Drawings Attached

Wastewater Management Division - Permit Application Wastewater System & Potable Water Supply



For Office Use Only:

Application#	PIN#	Date Complete Application Received
<input type="text"/>	<input type="text"/>	<input type="text"/>

Authority:

10 V.S.A. Chapter 64, the Environmental Protection Rules, Chapter 1, Wastewater System & Potable Water Supply Rules, and Chapter 21, Water Supply Rules, Appendix A. Part 11 - Small Scale Water Systems.

General Information:

The organization and/or content of this form may not be altered, however, the form is designed to expand to allow additional information to be entered. Changes in the organization and/or content of the form may result in an invalid application or permit.

In most cases a licensed designer will be required for your project and to help complete this application form. There are also line-by-line instructions available to assist with completing this form.

NOTE: We strongly suggest referring to the application instructions while completing this application form.

Part I Applicant (Landowner) & Project Contact Information

Section A - Applicant Details (if Landowner is an Individual or Individuals)

1 Last Name		2 First Name (and Middle Initial if appropriate)	
<input type="text"/>		<input type="text"/>	
3 Mailing Address Line 1		4 Mailing Address Line 2	
<input type="text"/>		<input type="text"/>	
5 Town/City	6 State/Province	7 Country	8 Zip/Postal Code
<input type="text"/>	<input type="text"/>	United States	<input type="text"/>
9 Email Address			10 Telephone
<input type="text"/>			<input type="text"/>

[Remove This Applicant](#)

[Add Another Applicant](#)

Section B - Applicant Details (if Landowner is other than an Individual or Individuals, e.g. Corporations, Homeowner's Associations, etc.)

1 Registered Legal Entity or Organization Name		2 Telephone	
Petdia II, LLC		(802) 425-3001	
3 Mailing Address Line 1		4 Mailing Address Line 2	
1905 Mt. Philo Road		<input type="text"/>	
5 Town/City	6 State/Province	7 Country	8 Zip/Postal Code
Charlotte	VT	United States	05445

Certifying Official

The Certifying Official must be a person who has signatory authority for the legal entity or organization that is the Applicant. A copy of the document authorizing this person to act as a signatory authority must be attached to this application.

9 Certifying Official Last Name		10 Certifying Official First Name (and MI if appropriate)	
Swift		Peter	
11 Certifying Official Title			
Principal			
12 Certifying Official Email Address			13 Telephone
peterswift@me.com			(802) 425-3001

[Remove This Applicant](#)

[Add Another Applicant](#)

Section C - Primary Contact Information (if other than Applicant)			
1 Last Name		2 First Name (and Middle Initial if appropriate)	
<input type="text"/>		<input type="text"/>	
3 Mailing Address Line 1		4 Mailing Address Line 2	
<input type="text"/>		<input type="text"/>	
5 Town/City	6 State/Province	7 Country	8 Zip/Postal Code
<input type="text"/>	<input type="text"/>	United States	<input type="text"/>
9 Email Address			10 Telephone
<input type="text"/>			<input type="text"/>

Section D - Building/Business Owner Information			
1 Last Name		2 First Name (and Middle Initial if appropriate)	
<input type="text"/>		<input type="text"/>	
3 Mailing Address Line 1		4 Mailing Address Line 2	
<input type="text"/>		<input type="text"/>	
5 Town/City	6 State/Province	7 Country	8 Zip/Postal Code
<input type="text"/>	<input type="text"/>	United States	<input type="text"/>
9 Email Address			10 Telephone
<input type="text"/>			<input type="text"/>

Part II Certifying Designer(s) Information			
1 Designer Last Name		2 Designer First Name (and Middle Initial if appropriate)	
Fuqua		David W.	
3 Designer License#	4 Company Name		
00280	Heindel and Noyes, Inc.		
5 Mailing Address Line 1		6 Mailing Address Line 2	
P.O. Box 4503		434 Shelburne Road	
7 Town/City	8 State/Province	9 Country	10 Zip/Postal Code
Burlington	VT	United States	05406-4503
11 Email Address			12 Telephone
dfuqua@heindelnoyes.com			(802) 658-0820
13 Designer Role(s) (check all that apply)			
<input checked="" type="checkbox"/> Water Supply Designer <input checked="" type="checkbox"/> Wastewater Disposal System Designer			
<input type="button" value="Remove This Designer"/>			
<input type="button" value="Add Another Designer"/>			

Part III Property Location Information			
Section A - Property Parcel ID#(s) and Location(s)			
1 Please provide the property location information including Town or City Parcel ID#, Town/City, and Street or Road location in the table below:			
	(a) Town/City Parcel ID#	(b) Town or City	(c) Street or Road Location
X	00038-1021	Charlotte	1021 Town Line Road
<input type="button" value="Add Another Property"/>			

Section B - Center of Property GPS Coordinates	
1 Enter the approximate center of property coordinates using GPS set for NAD83 or as derived from a map (map must be based on NAD83).	
(a) Latitude (in decimal degrees to five decimal places, ex. 44.38181°)	(b) Longitude (in decimal degrees to five decimal places, ex. -72.31392 °)
N <input style="width: 100px;" type="text" value="44.26295557"/> °	W (-) <input style="width: 100px;" type="text" value="73.27080977"/> °

Part IV Project Information

Section A - General Project Information & Questions

1 Project Name (if applicable) <input style="width: 95%;" type="text" value="Swift & McCargo"/>	2 Total Acreage of Property <input style="width: 95%;" type="text" value="20.2"/>
--	--

3 Business Name (if applicable)

4 Detailed Project Description

This proposal is for the demolition of the existing two bedroom primitive cabin and the existing three bedroom house currently served by an on-site mound wastewater disposal system and existing drilled bedrock well. A new two bedroom CABIN will be constructed in the same general area of the existing cabin and will be connected to the existing drilled bedrock well and existing mound wastewater disposal system. A future four bedroom HOUSE is proposed in the same general area of the existing house. The HOUSE will be served by a filtrate disposal system that discharges to two new mound wastewater disposal areas. At the time of the HOUSE construction; a new drilled well will be constructed for the CABIN and the HOUSE will be connected to the existing drilled well. Please see attached addendum for additional design and construction information.

5 Were all buildings or structures, campgrounds, and their associated potable water supplies and wastewater systems substantially completed before January 1, 2007 and all improved and unimproved lots in existence before January 1, 2007? Yes No

6 Does this application include subdividing the property? Yes No

7 Has anyone from the Wastewater Management Division's Regional Office been to the property?..... Yes No

If Yes, enter the staff person's name and the date of the visit.

(a) Name of Staff Person <input style="width: 95%;" type="text" value="Spencer Harris"/>	(b) Date of Visit <input style="width: 95%;" type="text" value="June 7 & 14, 2010"/>
---	---

8 Will any construction occur within 50 feet of a wetland boundary, mapped or designated? Yes No

If Yes, contact the Wetlands Program of the Water Quality Division at (802) 241-3770.

9 Will more than one acre be disturbed during the entire course of construction, including all lots and phases? Yes No

If Yes, contact the Stormwater Program of the Water Quality Division at (802) 241-4320.

10 Will there be any stream crossings by roads, utilities, or other construction? Yes No

If Yes, contact the River Corridor Mgmt. Program of the Water Quality Division at:

Central & Northwest Vermont	(802) 879-5631
Southern Vermont	(802) 786-5906
Northeastern Vermont	(802) 751-0129

11 Is the project located in a special flood hazard area as designated on the flood insurance maps prepared for a municipality by the Federal Emergency Management Agency? Yes No

If Yes, show the special flood hazard area limits on the site plan.

12 Act 250: Has the Applicant (Landowner) subdivided any other lots of any size within a five mile radius of this subdivision, or within the environmental district within the last five years ? Yes No

If Yes, enter the town(s) and the associated number of lots in the table below:

	(a) Town	(b) Number of Lots
X	<input style="width: 95%;" type="text"/>	<input style="width: 95%;" type="text"/>
<input style="width: 100%; background-color: green; color: white;" type="button" value="Add Another Town/Lot"/>		

13 Is there any prior Act 250 jurisdiction on the tract of land?..... Yes No

If Yes, enter the Act 250 permit number:

(a) Act 250 Permit Number

Section B - Project Deed Reference

1 Please provide the Town, Book, and Page reference for the current landowner's deed(s) to this property in the table below:

	(a) Town	(b) Book	(c) Page(s)
X	Charlotte	187	650-651

Add Another Deed Reference

Section C - Project Plan Reference

1 Please provide the following information for all water supply and wastewater disposal system plans being submitted.

	(a) Sheet#	(b) Title	(c) Plan Date	(d) Plan Revision Date
X	1 of 6	Swift & McCargo - SITE PLAN	09-10-2010	
X	2 of 6	Swift & McCargo - DESIGN NOTES	09-10-2010	
X	3 of 6	Swift & McCargo - DISPOSAL AREA PLAN	09-10-2010	
X	4 of 6	Swift & McCargo - CABIN WASTEWATER & WATER DETAILS	09-10-2010	
X	5 of 6	Swift & McCargo - HOUSE WASTEWATER & WATER DETAILS	09-10-2010	
X	6 of 6	Swift & McCargo - HOUSE TREATMENT & DISCHARGE DETAILS	09-10-2010	

Add Another Plan Reference

Section D - Existing Project Lot/BuildingDetails

Please provide the existing project details. This section is used to describe what is existing for the project. For example, if you are subdividing an undeveloped 21-acre parcel, you would list the existing parcel. If you are revising the boundary lines of two commercial lots in an industrial park, and constructing an addition to an existing building you would list the existing lot numbers, existing acres, existing buildings, existing uses, construction date(s), prior permits, and answer the compliance questions.

1 Lot#	2 Lot Size (acres)	3 Existing Use of the Lot
Current	20.2	Residential

4 Provide the following information for each building on the lot:

	(a) Building ID	(b) Existing Use	(c) Date Construction of Building Substantially Complete	(d) Prior Permits	(e) In compliance with existing permits?
X	3 bdrm house	Residential	12/1985	N/A	<input checked="" type="radio"/> Yes <input type="radio"/> No
X	Primitive cabin	Campground	12/1985	N/A	<input checked="" type="radio"/> Yes <input type="radio"/> No

Add Another Building

Remove This Lot

Add Another Lot

Section E - Proposed Project Lot/BuildingDetails

This section is used to describe what you are proposing to do in this project. For example, if you were going to create 4 lots for construction of single family residences, you would list each lot, proposed acreage, proposed buildings, and proposed use.

1 Lot# <input style="width:95%;" type="text" value="Current"/>	2 Lot Size (acres) <input style="width:95%;" type="text" value="20.2"/>	3 Proposed Use of the Lot <input style="width:95%;" type="text" value="Residential"/>	
4 Is the lot being created as part of a subdivision? <input type="radio"/> Yes <input checked="" type="radio"/> No			
5 Are you requesting that the Blood, Marriage, or Civil Union special fee be applied to this lot? <input type="radio"/> Yes <input checked="" type="radio"/> No			
6 If the lot is exempt, please indicate the specific exemption from the Wastewater System and Potable Water Supply Rules? <input style="width:100%;" type="text"/>			
7 Provide the following information for each building on the lot:			
(a) Building ID	(b) If building is exempt, indicate exemption	(c) Construction or increased flow?	(d) Proposed Use
X	<input style="width:95%;" type="text" value="CABIN"/>	<input checked="" type="checkbox"/>	<input style="width:95%;" type="text" value="New 2 bdrm cabin"/>
X	<input style="width:95%;" type="text" value="HOUSE"/>	<input checked="" type="checkbox"/>	<input style="width:95%;" type="text" value="New 4 bdrm house"/>
<input style="background-color: green; color: white; border: none;" type="button" value="Add Another Building"/>			
<input style="background-color: yellow; border: none;" type="button" value="Remove This Lot"/>			
<input style="background-color: green; color: white; border: none;" type="button" value="Add Another Lot"/>			

Part V	Water Supply Information
Section A - Water Supply Screening Questions	
1 Are you proposing a new water supply for this project?	<input checked="" type="radio"/> Yes <input type="radio"/> No
2 Are you proposing changes to an existing water supply for this project?	<input checked="" type="radio"/> Yes <input type="radio"/> No
3 Is there a connection to an existing water supply for the project?	<input checked="" type="radio"/> Yes <input type="radio"/> No
<i>If you answered No to all three of the above questions, skip to Part VI. Otherwise, proceed with Part V.</i>	
Section B - General Water Supply Questions	
1 Does this project involve a failed water supply?	<input type="radio"/> Yes <input checked="" type="radio"/> No
2 Will any of the proposed water sources serve 25 or more people or have 15 or more service connections?	<input type="radio"/> Yes <input checked="" type="radio"/> No
<i>If Yes, the applicant must contact the Water Supply Division at (802) 241-3400 for source, construction and operating</i>	
3 Are any of the existing or proposed water sources located within a special flood hazard area?	<input type="radio"/> Yes <input checked="" type="radio"/> No
4 Are any of the existing or proposed water sources located within a floodway?	<input type="radio"/> Yes <input checked="" type="radio"/> No
5 Are any of the proposed water sources located within 1 mile of a hazardous waste site as designated by the Waste Management Division and identified on the Agency mapping website?	<input type="radio"/> Yes <input checked="" type="radio"/> No
<i>If Yes, please submit additional information on the site. The Waste Management Division can be reached at (802) 241-3888.</i>	
6 Does this project require an approval letter from the Water Supply Division for the construction of a public water system, municipal water line extension over 500 feet, or hydrants or sprinkler systems?	<input type="radio"/> Yes <input checked="" type="radio"/> No
<i>If Yes, please submit a copy of the approval letter from the Water Supply Division.</i>	
7 Does the proposed or existing water supply(ies) use a water treatment device to obtain compliance with the quality requirements in the Water Supply Rule?	<input type="radio"/> Yes <input checked="" type="radio"/> No
<i>If Yes, please submit additional information regarding the constituent(s) that exceeds the standards and plans, details, and specifications of the treatment device.</i>	
8 Is any portion of the proposed water supply located in or near a Water Source Protection Area as designated by the Water Supply Division?	<input type="radio"/> Yes <input checked="" type="radio"/> No
<i>If in areas of known interference issues, please contact the Water Supply Division at (802) 241-3400.</i>	
Section C - Individual Water Supply Details	
Please provide the following information for each of the existing and proposed water supply(ies) serving a building or structure, or campground on the property.	

1 Water Supply Name/Identifier <input style="width:95%;" type="text" value="Existing Well #348"/>	2 Water Supply Owner (if not Applicant) <input style="width:95%;" type="text"/>
3 Water Source Type <input style="width:95%;" type="text" value="Non-Public Drilled Bedrock Well"/>	4 Type of Change to Supply <input style="width:95%;" type="text" value="New Connection or Increased Flow"/>

5 Lots/Buildings Served by this Water Supply System

	(a) Lot#	(b) Building ID	(c) Type of Change to the Building's Supply	Design Flows (Gallons Per Day)			(g) Rule or Meter Based Flows
				(d) Existing	(e) Increase	(f) Total	
X	<input style="width:80%;" type="text" value="Current"/>	<input style="width:80%;" type="text" value="HOUSE"/>	<input style="width:80%;" type="text" value="Connection to Existing System"/>	<input style="width:80%;" type="text" value="450"/>	<input style="width:80%;" type="text" value="40"/>	<input style="width:80%;" type="text" value="490"/>	<input style="width:80%;" type="text" value="Rule-based"/>
Add Another Lot/Building Served by this Supply				6 <input style="width:80%;" type="text" value="450"/>	7 <input style="width:80%;" type="text" value="40"/>	8 <input style="width:80%;" type="text" value="490"/>	

9 Is this water supply located off-lot? Yes No

10 Is this water supply shared? Yes No

If the water supply is located off-lot or shared, submit a copy of the agreement to provide an easement prior to construction.

11 Is a variance being requested for this water supply? Yes No

If Yes, please submit additional details related to the variance request.

Remove This Water Supply

1 Water Supply Name/Identifier <input style="width:95%;" type="text" value="New CABIN Well"/>	2 Water Supply Owner (if not Applicant) <input style="width:95%;" type="text"/>
3 Water Source Type <input style="width:95%;" type="text" value="Non-Public Drilled Bedrock Well"/>	4 Type of Change to Supply <input style="width:95%;" type="text" value="New System"/>

5 Lots/Buildings Served by this Water Supply System

	(a) Lot#	(b) Building ID	(c) Type of Change to the Building's Supply	Design Flows (Gallons Per Day)			(g) Rule or Meter Based Flows
				(d) Existing	(e) Increase	(f) Total	
X	<input style="width:80%;" type="text" value="Current"/>	<input style="width:80%;" type="text" value="CABIN"/>	<input style="width:80%;" type="text" value="Connection to New System"/>	<input style="width:80%;" type="text" value="0"/>	<input style="width:80%;" type="text" value="280"/>	<input style="width:80%;" type="text" value="280"/>	<input style="width:80%;" type="text" value="Rule-based"/>
Add Another Lot/Building Served by this Supply				6 <input style="width:80%;" type="text" value="0"/>	7 <input style="width:80%;" type="text" value="280"/>	8 <input style="width:80%;" type="text" value="280"/>	

9 Is this water supply located off-lot? Yes No

10 Is this water supply shared? Yes No

If the water supply is located off-lot or shared, submit a copy of the agreement to provide an easement prior to construction.

11 Is a variance being requested for this water supply? Yes No

If Yes, please submit additional details related to the variance request.

Remove This Water Supply

Add Another Water Supply

Section D - Water Supply Design Flows Summary Table

1 If the project includes more than one water supply, please list each water supply system and provide the total water supply design flows for the project. **IMPORTANT:** Please don't include systems that were identified in this Part on Section C, Line 4 as a "Replacement Area Designation" in this summary table.

	(a) Water Supply Name/Identifier	Design Flows (Gallons Per Day)		
		(b) Existing	(c) Increase	(d) Total
X	<input style="width:95%;" type="text" value="Existing Well #348"/>	<input style="width:80%;" type="text" value="450"/>	<input style="width:80%;" type="text" value="40"/>	<input style="width:80%;" type="text" value="490"/>

X	New CABIN Well	0	280	280
Add Another Water Supply		2	3	4
		450	320	770

Part VI Wastewater Disposal System Information

Section A - Wastewater Disposal System Screening Questions

1 Are you proposing a new wastewater disposal system or replacement area for this project? Yes No

2 Are you proposing changes to an existing wastewater disposal system for this project? Yes No

3 Is there a connection to an existing wastewater disposal system for the project? Yes No

If you answered No to all three of the above questions, skip to Part VII. Otherwise, proceed with Part VI.

Section B - General Wastewater Disposal System Questions

1 Does this project involve a failed wastewater disposal system? Yes No

2 Do any of the systems require a curtain or dewatering drain as part of the design? Yes No

3 Is a hydrogeologic study required for this project? Yes No

4 If the project has a soil-based wastewater disposal system with design flows that exceed 1,000 GPD, is this project located in a Class A Watershed?..... Yes No NA

If Yes, indicate the Class A Watershed in which the system(s) is located:

(a) Class A Watershed Name

5 Are there any existing or proposed floor drains as part of this project?..... Yes No

If Yes, indicate where the floor drains will discharge:

(a) Floor Drain Discharge Point

6 If the project utilizes an Innovative/Alternative System or Product, has the applicant received a copy of the Wastewater Management Division's approval letter? Yes No NA

7 Is any portion of the proposed wastewater disposal system located in or near a Water Source Protection Area as designated by the Water Supply Division? Yes No

If Yes, contact the Water Supply Division at (802) 241-3400.

Section C - Individual Wastewater Disposal System Details

Please provide the following information for each of the existing and proposed wastewater disposal systems serving a building or structure, or campground on the property.

1 Wastewater Disposal System Name/Identifier Existing Mound	2 Wastewater Disposal System Owner (if not Applicant)							
3 Wastewater Disposal System Type Mound	4 Type of Change to System New Connection or Increased Flow							
5 Lots/Buildings Served by this Wastewater Disposal System								
(a) Lot#	(b) Building ID	(c) Type of Change to the Building's System	Design Flows (Gallons Per Day)				(h) Rule or Meter Based Flows	
(d) Existing	(e) Increase	(f) Infiltration	(g) Total					
X	Current	CABIN	Connection to Existing System	450	0	0	450	Rule-based
Add Another Lot/Building Served by this System			6	7	8	9		
			450	0	0	450		

10 Is this wastewater disposal system located off-lot? Yes No

11 Is this wastewater disposal system shared? Yes No

If the wastewater disposal system is located off-lot or shared, submit a copy of the agreement to provide an easement prior to initiation of construction.

12 Is a variance being requested for this wastewater disposal system? Yes No

If Yes, please submit additional details related to the variance request.

13 If this wastewater disposal system type is a connection to an Indirect Discharge System, please provide the Indirect Discharge System ID number.

Indirect Discharge System ID Number

14 If this wastewater disposal system type is a connection to a municipal system, please select the town.

Town

15 If this wastewater disposal system is a soil-based system, please select the design approach used.

Design Approach Used

16 For soil-based systems, please check all that apply.

Storage and Dose Filtrate

17 If this is an Innovative/Alternative soil-based system, please select the system use type.

Innovative/Alternative System Use Type

18 If this is an Innovative/Alternative soil-based system, please select the Innovative/Alternative system or product.

Innovative/Alternative System or Product

Remove This Wastewater System

1 Wastewater Disposal System Name/Identifier <input type="text" value="New Mounds"/>	2 Wastewater Disposal System Owner (if not Applicant) <input type="text"/>
3 Wastewater Disposal System Type <input type="text" value="Mound"/>	4 Type of Change to System <input type="text" value="New System"/>

5 Lots/Buildings Served by this Wastewater Disposal System

	(a) Lot#	(b) Building ID	(c) Type of Change to the Building's System	Design Flows (Gallons Per Day)			(h) Rule or Meter Based Flows	
				(d) Existing	(e) Increase	(f) Infiltration		(g) Total
X	<input type="text" value="Current"/>	<input type="text" value="HOUSE"/>	<input type="text" value="Connection to New System"/>	<input type="text" value="0"/>	<input type="text" value="490"/>	<input type="text" value="0"/>	<input type="text" value="490"/>	<input type="text" value="Rule-based"/>
Add Another Lot/Building Served by this System				6	7	8	9	
				<input type="text" value="0"/>	<input type="text" value="490"/>	<input type="text" value="0"/>	<input type="text" value="490"/>	

10 Is this wastewater disposal system located off-lot? Yes No

11 Is this wastewater disposal system shared? Yes No

If the wastewater disposal system is located off-lot or shared, submit a copy of the agreement to provide an easement prior to initiation of construction.

12 Is a variance being requested for this wastewater disposal system? Yes No

If Yes, please submit additional details related to the variance request.

13 If this wastewater disposal system type is a connection to an Indirect Discharge System, please provide the Indirect Discharge System ID number.

Indirect Discharge System ID Number

14 If this wastewater disposal system type is a connection to a municipal system, please select the town.

Town

15 If this wastewater disposal system is a soil-based system, please select the design approach used.

Design Approach Used

16 For soil-based systems, please check all that apply.

- Storage and Dose Filtrate

17 If this is an Innovative/Alternative soil-based system, please select the system use type.

Innovative/Alternative System Use Type

18 If this is an Innovative/Alternative soil-based system, please select the Innovative/Alternative system or product.

Innovative/Alternative System or Product

Remove This Wastewater System

Add Another Wastewater System

Section D - Wastewater Disposal Systems Design Flows Summary Table

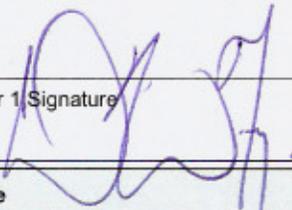
1 If the project includes more than one wastewater disposal system, please list each system on this page and provide the total wastewater disposal design flows for the project. **IMPORTANT:** Please don't include systems that were identified in this Part on Section C, Line 4 as a "Replacement Area Designation" in this summary table.

		Design Flows (Gallons Per Day)			
(a) Wastewater Disposal System Name/Identifier		(b) Existing	(c) Increase	(d) Infiltration	(e) Total
X	Existing Mound	450	0	0	450
X	New Mounds	0	490	0	490
Add Another Wastewater System		2	3	4	5
		450	490	0	940

Part VII Application Fees

1 Fee Amount

2 Fee Calculation Details

Part VIII Designer Certification & Copyright License		
Section A - Certifying Designer 1 Certification & Copyright License		
<p><i>"I hereby certify that in the exercise of my reasonable professional judgment, the design-related information submitted with this application is true and correct, and that the design included in this application for a permit complies with the Vermont Wastewater System and Potable Water Supply Rules and the Vermont Water Supply Rules.</i></p> <p><i>As the individual who prepared this application, including all documents that are marked as copyrighted, I hereby grant a non-exclusive, limited license to the State to allow the documents to be made available for public review and copying in order to properly implement and operate the permitting programs for Wastewater Systems and Potable Water Supplies, and for no other purposes. As a condition to this license, the State agrees that it will not make any changes to such documents, nor will the State delete any copyright notices on such documents."</i></p>		
<p>1 Check the design(s) you are certifying. This should be the same as the Designer Role(s) you selected in Part II, Section A, Line 13.</p> <p><input checked="" type="checkbox"/> Water Supply Designer</p> <p><input checked="" type="checkbox"/> Wastewater Disposal System Designer</p>		
<p>1 Designer 1 Name</p> <p>David W. Fuqua</p>	<p>2 Designer 1 Signature</p> 	<p>3 Signature Date</p> <p>9-23-2010</p>
Section B - Certifying Designer 2 Certification & Copyright License		
<p><i>"I hereby certify that in the exercise of my reasonable professional judgment, the design-related information submitted with this application is true and correct, and that the design included in this application for a permit complies with the Vermont Wastewater System and Potable Water Supply Rules and the Vermont Water Supply Rules.</i></p> <p><i>As the individual who prepared this application, including all documents that are marked as copyrighted, I hereby grant a non-exclusive, limited license to the State to allow the documents to be made available for public review and copying in order to properly implement and operate the permitting programs for Wastewater Systems and Potable Water Supplies, and for no other purposes. As a condition to this license, the State agrees that it will not make any changes to such documents, nor will the State delete any copyright notices on such documents."</i></p>		
<p>1 Check the design(s) you are certifying. This should be the same as the Designer Role(s) you selected in Part II, Section B, Line 13.</p> <p><input type="checkbox"/> Water Supply Designer</p> <p><input type="checkbox"/> Wastewater Disposal System Designer</p>		
<p>1 Designer 2 Name</p> <p> </p>	<p>2 Designer 2 Signature</p> <p> </p>	<p>3 Signature Date</p> <p> </p>

Part IX Applicant(s) Signature & Acknowledgements

In order to insure compliance with the requirements of the regulations administered by the Department of Environmental Conservation, Wastewater Management Division, it may be necessary to visit the property. As this would involve a Department employee entering private property, we request your approval to do so.

1 If we do visit your property, do you have any special instructions?

"As landowner of the property for which I am requesting a permit from the Department of Environmental Conservation, I understand that by signing this application I am granting permission for the Department employees to enter the property, during normal working hours, to insure compliance of the property with the applicable rules of the Department.

I also understand that I am not allowed to commence any site work or construction on this project without written approval from the Department of Environmental Conservation.

If my project utilizes an Innovative/Alternative System or Product, I have received a copy of the Wastewater Management Division's approval letter and agree to abide by the conditions of the approval.

I also certify that to the best of my knowledge and belief the information submitted above is true, accurate and complete."

X	2 Print Applicant Name <input type="text" value="Peter Swift"/>	3 Applicant Signature <input type="text"/>	4 Signature Date <input type="text"/>
X	2 Print Applicant Name <input type="text" value="Peter Swift"/>	3 Applicant Signature <input type="text" value="Peter Swift"/>	4 Signature Date <input type="text" value="4/23/10"/>

Add Applicant Signature Block

Petdia II, LLC

State of Vermont Wastewater System & Potable Water Supply Permit Application

ADDENDUM

First Revision Issued 6-18-2010

Certification Statement for use in compliance with Act 145 of the 2010 Legislative Session

One of the two following certification statements shall be included with any application for a Wastewater System and Potable Water Supply Permit that is filed on or after June 2, 2010

Note: When the property subject to the permit application is owned by more than one person, only one of the landowners must sign the certification statement even though all landowners must sign the permit application itself.

When there are affected property owners, the applicant shall use this statement:

I hereby certify that the attached list of names and addresses includes all those whose property may be affected by the proposed water and wastewater systems, and their associated isolation distances and zones, and that all those listed have been sent a copy of the application and any associated plans.

Signature _____

Name (Printed) _____

Date of this certification _____

Note: It will be helpful to include property transfer work if the physical address of the property or property tax ID number is included with the certification.

When there are no affected landowners, the applicant shall use this statement:

I hereby certify that notification is not required either because there is an exemption or there are no landowners who may be affected by the proposed water and wastewater systems.

Signature Peter Swift

Name (Printed) Peter Swift

Petdia II, LLC
Date of this certification 9/23/10



VERMONT SECRETARY OF STATE

Deborah L. Markowitz

ARCHIVES

CORPORATIONS

ELECTIONS

OTHER PROGRAMS

PROFESSIONAL REGULATIONS

SECRETARY'S DESK

Limited Liability Company Information

Term Company? YES

Expiration of Term: 01/03/2036

LLC Name	PETDIA II, LLC
STATUS	ACTIVE
File Number	L0015171
Type	Domestic
State of Origin	VT
Origin Date	01/03/2006
Abbreviation	N
Description	ANY LEGAL PURPOSE
Fiscal Year End	12
Registered Agent	LIAM L MURPHY ESQ
Address	275 COLLEGE ST/POB 4485
City State Zip	BURLINGTON VT 05406-4485
Term Company?	YES
Expiration of Term	01/03/2036
Principal Address	275 COLLEGE ST
City State Zip	BURLINGTON VT 05401-
Last Annual Report Date	12/31/2009

LLC Personnel

Last Name	SWIFT	First Name	PETER	MI
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Form SS-4 (Rev. December 2001) Department of the Treasury Internal Revenue Service	Application for Employer Identification Number (For use by employers, corporations, partnerships, trusts, estates, churches, government agencies, Indian tribal entities, certain individuals, and others.) ▶ See separate instructions for each line. ▶ Keep a copy for your records.	EIN 20-5721380 OMB No. 1545-0003
1* Legal name of entity (or individual) for whom the EIN is being requested <u>PETDIA II LLC</u>		
2 Trade name of business (if different from name on line 1)		3 Executor, trustee, "care of" name
4a* Mailing address (room, apt., suite no. and street, or P.O. box) 1905 MT PHILO ROAD		5a Street address (if different) (Do not enter a P.O. box)
4b* City, state, and ZIP code CHARLOTTE VT 05446 -		5b City, state, and ZIP code
6* County and state where principal business is located County <u>CHITTENDEN</u> State <u>VT</u>		
7a* Name of principal officer, general partner, grantor, owner, or trustor PETER SWIFT		7b* SSN, ITIN, EIN 562-66-9080
8a* Type of entity (check only one)		
<input type="checkbox"/> Sole Proprietor (SSN) <input type="checkbox"/> Estate (SSN of decedent) <input checked="" type="checkbox"/> Partnership <input type="checkbox"/> Plan administrator (SSN) <input type="checkbox"/> Corporation (enter form number to be filed) ▶ <input type="checkbox"/> Trust (SSN of grantor) <input type="checkbox"/> Personal Service <input type="checkbox"/> National Guard <input type="checkbox"/> State/local government <input type="checkbox"/> Church or church-controlled organization <input type="checkbox"/> Farmers' cooperative <input type="checkbox"/> Federal government/military <input type="checkbox"/> Other nonprofit organization (specify) ▶ <input type="checkbox"/> REMIC <input type="checkbox"/> Indian tribal government/enterprises <input type="checkbox"/> Other (specify) ▶ Group Exemption NO. (GEN) ▶		
8b If a corporation, name the state or foreign country (if applicable) where incorporated		State Foreign country
9* Reason for applying (check only one)		
<input checked="" type="checkbox"/> Started new business (specify type) ▶ <u>REAL ESTATE</u> <input type="checkbox"/> Hired employees (Check the box and see line 12) <input type="checkbox"/> Compliance with IRS withholding regulations <input type="checkbox"/> Other (specify) ▶		
10* Date business started or acquired (month, day, year) JAN 1 2006		11* Closing month of accounting year DEC
12 First date wages or annuities were paid or will be paid (month, day, year) <i>Note: If applicant is a withholding agent, enter date income will first be paid to nonresident alien. (month, day, year)</i> ▶		
13 Highest number of employees expected in the next twelve months <i>Note: If the applicant does not expect to have any employees during the period, enter "-0-"</i>		Agriculture Household Other
14* Check box that best describes the principal activity of your business		
<input type="checkbox"/> Construction <input type="checkbox"/> Rental & leasing <input type="checkbox"/> Transportation & warehousing <input type="checkbox"/> Health care & social assistance <input type="checkbox"/> Wholesale-agent/broker <input checked="" type="checkbox"/> Real estate <input type="checkbox"/> Manufacturing <input type="checkbox"/> Finance & insurance <input type="checkbox"/> Accommodation & food service <input type="checkbox"/> Wholesale-other <input type="checkbox"/> Other (specify) <input type="checkbox"/> Retail		
15* Indicate principal line of merchandise sold; specific construction work done; products produced; or services provided. <u>LAND</u>		
16a* Has the applicant ever applied for an employer identification number for this or any other business? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>Note if "Yes" please complete lines 16b and 16c</i>		
16b If you checked "Yes" on line 16a, give applicant's legal name and trade name shown on prior application if different from line 1 or 2 above. Legal name ▶ Trade name ▶		
16c Approximate date when, and city and state where, the application was filed. Enter previous employer identification number if known. Approximate date when filed (month, day, year) City and state where filed Previous EIN		
Complete section only if you want to authorize the named individual to receive the entity's EIN and answer questions about the completion of this form		
Third Party Designee	Designee's name	Designee's telephone number (include area code)
	Address and ZIP code	() - Designee's fax number (include area code) () -
Under penalties of perjury, I declare that I have examined this application, and to the best of my knowledge and belief, it is true, correct, and complete. Name and title (type or print clearly)		Applicant's telephone number (include area code)

Petdia II, LLC - State Wastewater System & Potable Water Supply Permit Application
HYDROGEOLOGIC CAPACITY ANALYSIS and CALCULATIONS
WASTEWATER DISPOSAL -- EAST AREA
Swift & McCargo Residence
Town Line Rd., Charlotte, VT

Assumptions:

1. Use Sept. 29, 2007 WS&PWSR.
2. Performance-Based evaluation, using hydrogeologic analysis.
3. Effluent type:

Design Flow: **gpd** (half of total WW disposal area needed for 4-bedroom residence totally 490 gpd)
 (per H&N design; D. Fuqua, L.D.) (also see NORTH AREA)

A. Hydrogeologic capacity by Darcy's Law: $Q = K \times i \times (L \times h)$ 7.48

EAST AREA:

Parameter	Description	Value	units	Calculations
K	hydr. conduct.	50	ft/day	est., from Table 1, <i>Hydraulic Loading Method for Detailed Soil Descriptions in Vermont, 2003</i> : Soil Texture Description: sandy loam, friable Category: 2 Soil Structure: Shape: Granular Soil Structure: Grade: friable = strong (3)
i	hydr. grad.	8.0%	ft/ft	
L	cross-slope length	35	ft.	
SOLVE FOR INDUCED GROUNDWATER MOUND, h:				
h	induced groundwater mound height	<input type="text" value="0.23"/>	ft.	by Darcy's Law: $Q = K \times i \times (L \times h)$ 7.48: Q: <input type="text" value="245"/> gpd K: <input type="text" value="50"/> ft/day i: <input type="text" value="0.080"/> ft/ft L: <input type="text" value="35"/> ft convert: <input type="text" value="7.48"/> gal/cu.ft. Solve for h = <input type="text" value="0.23"/> ft.

B. Compare "h" to available freeboard at toe of mound ("Is there 0.5 feet of freeboard at toe?"):

1. Determine representative limiting condition at toe of mound:
 TP: Depth to Limit. Cond.: ft.

2. Calculate freeboard at toe, including "h":

	<input type="text" value="1.2"/>	= Limit. Cond. Depth, ft.
minus:	<input type="text" value="0.2"/>	= h, ft.
equals:	<input type="text" value="1.0"/>	= Calculated freeboard, including "h".

3. Is this final freeboard >= 0.5 ft.?

C. Calculate thickness of mound sand needed beneath disposal bed, for this effluent type:

TP/MW with Shallowest Limit. Cond. beneath Bed	Depth to Limit. Cond., ft.	Induced Groundwtr Mound ("h"), ft.	Depth to Limit. Cond. minus "h", ft.	Required Total Unsat. Soil, ft.	Therefore, Req. Sand beneath Bed, ft.
H-2, H-4	1.3	0.2	1.1	1.5	0.4

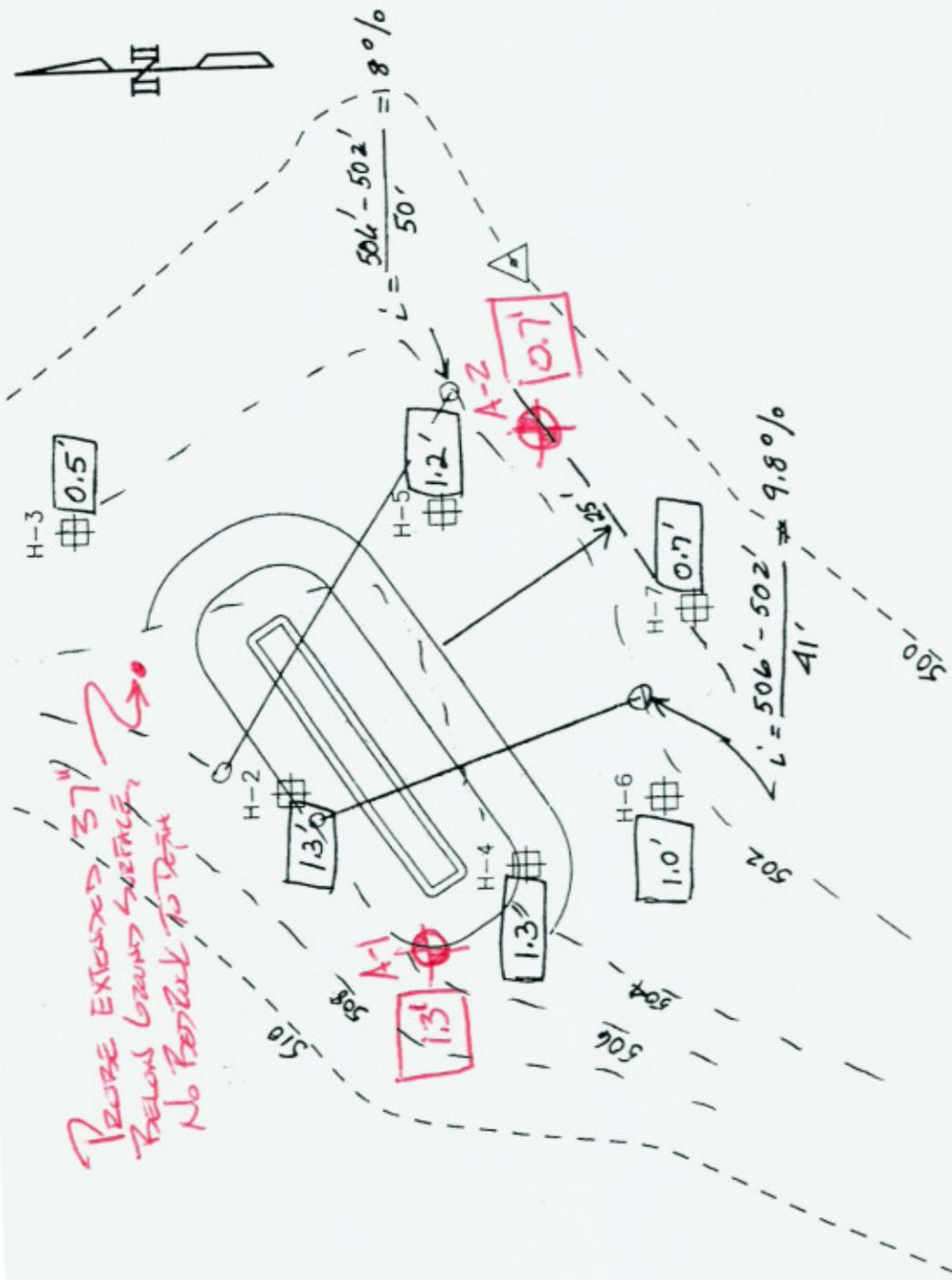
= Minimum required mound sand beneath bed
 (default minimum is 1.0 ft.)

D. Check for complying conditions 25 ft. downhill of toe ("Is there 0.5 feet of freeboard 25 ft. downhill of toe?"):

1. Determine representative limiting condition at toe of mound:
 TP: Depth to Limit. Cond.: ft.

	<input type="text" value="0.7"/>	= Limit. Cond. Depth, ft.
minus:	<input type="text" value="0.2"/>	= h at toe of mound, ft. (conserv. because does not include spread of effluent flowpath)
equals:	<input type="text" value="0.5"/>	= Calculated freeboard, including H at 25 ft. downhill.

3. Is this freeboard at 25 ft. >= 0.5 ft.?



PROBE EXTENDED 37"
BELOW GROUND SURFACE
NO PROBE TO DEPTH

HYDROGEOLOGIC CAPACITY CONDITIONS

LEGEND

- # TEST PIT
- 1.2' DEPTH TO LIMITING CONDITION, FT.
- i = HYDR. GRADIENT (GROUND SLOPE)

⊗ Sumps Here

EAST AREA
1"=20'
SWIFT & McCARGO
(JOHN DOUGLAS PROPERTY)
JULY 13, 2010
DRAWN: D.W.F.

D. FUGATE'S H&H
7-16-2010

L. HENDEL; H&H.
7-13-2010

Petdia II, LLC - State Wastewater System & Potable Water Supply Permit Application
HYDROGEOLOGIC CAPACITY ANALYSIS and CALCULATIONS
WASTEWATER DISPOSAL -- NORTH AREA
Swift & McCargo Residence
Town Line Rd., Charlotte, VT

Assumptions:

1. Use Sept. 29, 2007 WS&PWSR.
2. Performance-Based evaluation, using hydrogeologic analysis.
3. Effluent type:

Design Flow: **gpd** (half of total WW disposal area needed for 4-bedroom residence totally 490 gpd)
 (per H&N design; D. Fuqua, L.D.) (also see EAST AREA)

A. Hydrogeologic capacity by Darcy's Law: $Q = K \times i \times (L \times h)$ 7.48

NORTH AREA:

Parameter	Description	Value	units	Calculations
K	hydr. conduct.	50	ft/day	est., from Table 1, <i>Hydraulic Loading Method for Detailed Soil Descriptions in Vermont, 2003</i> : Soil Texture Description: sandy loam, friable Category: 2 Soil Structure: Shape: Granular Soil Structure: Grade: friable = strong (3)
i	hydr. grad.	8%	ft/ft	
L	cross-slope length	35	ft.	
SOLVE FOR INDUCED GROUNDWATER MOUND, h:				
h	induced groundwater mound height	<input type="text" value="0.23"/>	ft.	by Darcy's Law: $Q = K \times i \times (L \times h)$ 7.48: Q: <input type="text" value="245"/> gpd K: <input type="text" value="50"/> ft/day i: <input type="text" value="0.08"/> ft/ft L: <input type="text" value="35"/> ft convert: <input type="text" value="7.48"/> gal/cu.ft. Solve for h = <input type="text" value="0.23"/> ft.

B. Compare "h" to available freeboard at toe of mound ("Is there 0.5 feet of freeboard at toe?"):

1. Determine representative limiting condition at toe of mound:
 TP: Depth to Limit. Cond.: ft.

2. Calculate freeboard at toe, including "h":

	<input type="text" value="2.0"/>	= Limit. Cond. Depth, ft.
minus:	<input type="text" value="0.2"/>	= h, ft.
equals:	<input type="text" value="1.8"/>	= Calculated freeboard, including "h".

3. Is this final freeboard >= 0.5 ft.?

C. Calculate thickness of mound sand needed beneath disposal bed, for this effluent type:

TP/MW with Shallowest Limit. Cond. beneath Bed	Depth to Limit. Cond., ft.	Induced Groundwtr Mound ("h"), ft.	Depth to Limit. Cond. minus "h", ft.	Required Total Unsat. Soil, ft.	Therefore, Req. Sand beneath Bed, ft.
H-15	2.5	0.2	2.3	1.5	-0.8

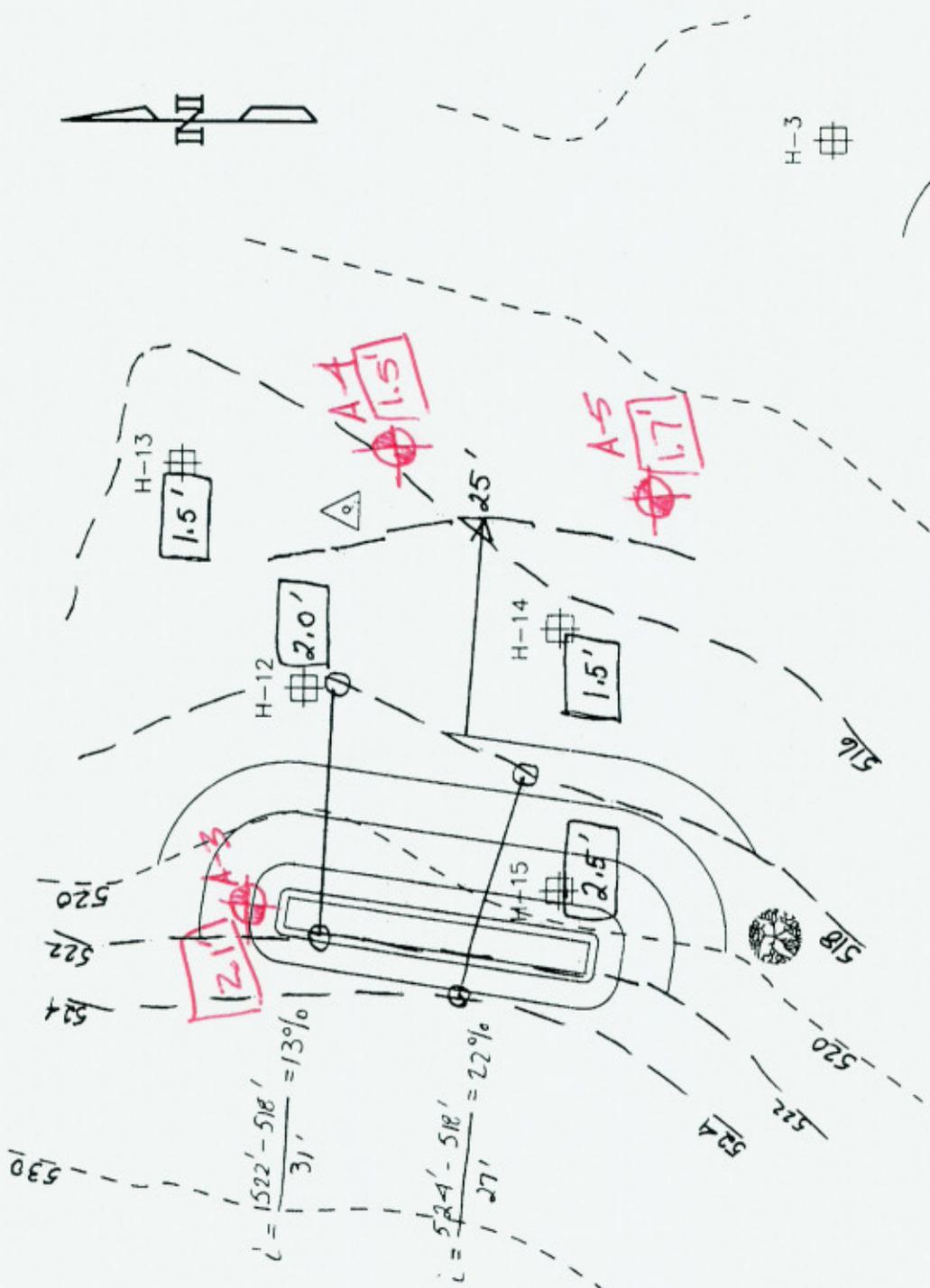
= Minimum required mound sand beneath bed
 (default minimum is 1.0 ft.)

D. Check for complying conditions 25 ft. downhill of toe ("Is there 0.5 feet of freeboard 25 ft. downhill of toe?"):

1. Determine representative limiting condition at toe of mound:
 TP: Depth to Limit. Cond.: ft.

	<input type="text" value="1.5"/>	= Limit. Cond. Depth, ft.
minus:	<input type="text" value="0.2"/>	= h at toe of mound, ft. (conserv. because does not include spread of effluent flowpath)
equals:	<input type="text" value="1.3"/>	= Calculated freeboard, including H at 25 ft. downhill.

3. Is this freeboard at 25 ft. >= 0.5 ft.?



HYDROGEOLOGIC CAPACITY CONDITIONS

LEGEND

TP Shallow Hole
 2.0' DEPTH-TO LIMITING CONDITION, FT.

i = HYDR. GRADIENT (GROUND SLOPE)

C. HEINDEL; H&N.
7-13-2010.

D. FUGA; H&N.
7-16-2010.

NORTH AREA
1"=20'

SWIFT & McCARGO
(JOHN DOUGLAS PROPERTY)
JULY 13, 2010
DRAWN: D.W.F.

Well Details

Date Completed	06/28/1985
Date Received	09/16/1985
Driller	198 Thomas Williams Spafford & Sons of Williston VT Inc
Well Report Number	348
Tag	
Comments	
Town	Charlotte
Map Cell	03D9
Tax Map	
E911 Address	
SubDivision	
Lot Number	
Owners First Name	John
Owners Last Name	Douglas
Purchaser First Name	
Purchaser Last Name	
Well Use	Domestic
Well Reason	New Supply
Drilling Method	Rotary (AP)
Well Depth	250.00 feet
Yield Gallons Per Minute	5.00
Yield Test Tested For Hours	0.00
Static Water Level	0.00 feet
Over Flowing	0
OverBurden Thickness	4 feet
Casing Length	35.00 feet
Casing Diameter	6.00 inches
Casing Length Below Land Surface	0.00 feet
Casing Length Exposed	0.00
Casing Material	
Casing Weight	0.00 lbs/foot
Casing Finish	Above ground, finished
Liner Length	0.00 feet
Liner Diameter	0.00 inches
Liner Material	
Liner Weight	0.00 lbs/foot
Grout Type	
Seal Type	
Diameter Drilled In Bedrock	0.00 inches
Depth Drilled in Bedrock	0.00 feet
Screen Make Type	

Water Supply Division

1021 Town Line Road Charlotte, VT

Page 2 of 2

Screen Material
 Screen Length 0.00 feet
 Screen Diameter 0.00 inches
 Screen Slot Size 0.000 inches
 Depth of Screen 0.00 feet
 Gravel Size Type
 Casing Sealing Method Drive shoe only
 Yield Test Method Compressed air
 Well Development
 Not Steel Casing 0
 Water Analysis 0
 Well Screen 0
 AW Partial 0
 Unique GIS Name CI348
 Lat Degree 44
 Lat Minutes 15
 Lat Seconds 45.3600
 Long Degree 73
 Long Minutes 16
 Long Seconds 16.3200
 Location DeterminationMethod E911 Address
 Well Type
 Depth To Liner Top 0.00
 Hydro Fractured 0
 Hydro Fractured Resulting Flow 0.00
 Well Location Submitted As A Dot On A Map N

Starting Depth Ending Depth Water Bearing Lithology Code Lithology Description

0.00	4.00	H	hardpan
4.00	250.00	R	blue limestone



Heindel & Noyes	
PO Box 4503	100741
Burlington, VT 05406	

PROJECT: Swift & McCargo
 WORK ORDER: **1006-08350**
 DATE RECEIVED: June 29, 2010
 DATE REPORTED: July 28, 2010
 SAMPLER: Chris Aldrich

Laboratory Report

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. All required method quality control elements including instrument calibration were performed in accordance with method requirements and determined to be acceptable unless otherwise noted.

The column labeled Lab/Tech in the accompanying report denotes the laboratory facility where the testing was performed and the technician who conducted the assay. A "W" designates the Williston, VT lab under NELAC certification ELAP 11263; "R" designates the Lebanon, NH facility under certification NH 2037 and "N" the Plattsburgh, NY lab under certification ELAP 11892. "Sub" indicates the testing was performed by a subcontracted laboratory. The accreditation status of the subcontracted lab is referenced in the corresponding NELAC and Qual fields.

The NELAC column also denotes the accreditation status of each laboratory for each reported parameter. "A" indicates the referenced laboratory is NELAC accredited for the parameter reported. "N" indicates the laboratory is not accredited. "U" indicates that NELAC does not offer accreditation for that parameter in that specific matrix. Test results denoted with an "A" meet all National Environmental Laboratory Accreditation Program requirements except where denoted by pertinent data qualifiers. Test results are representative of the samples as they were received at the laboratory

Endyne, Inc. warrants, to the best of its knowledge and belief, the accuracy of the analytical test results contained in this report, but makes no other warranty, expressed or implied, especially no warranties of merchantability or fitness for a particular purpose.

Reviewed by:

Harry B. Locker, Ph.D.
 Laboratory Director

CLIENT: Heindel & Noyes
 PROJECT: Swift & McCargo

WORK ORDER: **1006-08350**
 DATE RECEIVED 06/29/2010

001 Site: Water Supply Date Sampled: 6/29/10 Time: 12:50

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Method</u>	<u>Analysis Date/Time</u>	<u>Lab/Tech</u>	<u>NELAC</u>	<u>Qual.</u>
Total Coliform	< 1	MPN/100mls	SM18 9223B	6/29/10 17:50	W KMB	A	
e. coli	< 1	MPN/100mls	SM18 9223B	6/29/10 17:50	W KMB	A	
Uranium	0.00123	mg/L	EPA 200.8	7/13/10	SWSUB	A	SBK
Gross Alpha	3.3 +/- 1.7	pCi/L	EPA 900.0	7/22/10	SWSUB	A	SBT
Chloride	5.9	mg/L	EPA 300.0	6/29/10	W CM	A	
Hardness, Total as CaCO3	431	mg/L	EPA 200.7	7/7/10	W ATH	U	
Nitrate as N	0.14	mg/L	EPA 300.0	6/29/10 18:58	W CM	A	
Nitrite as N	< 0.02	mg/L	EPA 300.0	6/29/10 18:58	W CM	A	
Odor	< 1	TON	EPA 140.1	7/2/10 10:45	W JSS	A	
pH	6.62	SU	SM 4500-H B	6/30/10 8:25	W JSS	A	
Arsenic, Total	< 0.001	mg/L	SM19 3113B	7/6/10	W MMW	A	
Calcium, Total	110	mg/L	EPA 200.7	7/7/10	W ATH	A	
Copper, Total	< 0.020	mg/L	EPA 200.7	7/7/10	W ATH	A	
Iron, Total	0.10	mg/L	EPA 200.7	7/7/10	W ATH	A	
Lead, Total	0.012	mg/L	SM19 3113B	7/2/10	W MMW	A	
Magnesium, Total	38	mg/L	EPA 200.7	7/7/10	W ATH	A	
Manganese, Total	< 0.020	mg/L	EPA 200.7	7/7/10	W ATH	A	
Sodium, Total	4.6	mg/L	EPA 200.7	7/7/10	W ATH	A	

Report Summary of Qualifiers and Notes

SBK: Analysis performed by subcontracted laboratory, Katahdin Analytical Services, Inc. The complete subcontracted report has been appended to this report.

SBT: Analysis was subcontracted to Summit Environmental Technologies, Inc. NELAC ID# E87688. The complete subcontracted report has been appended to this report.

**Summit Environmental Technologies, Inc.
Cooler Receipt Form**

Client: Endyne Inc. Order Number: 1010491

Date Received: 7/12/10 Time Received: 11:30

Number of Coolers/Boxes: 1 N/A

Shipper: FED EX UPS DHL Airborne US Postal Walk-in Pickup Other: _____

Packaging: Peanuts Bubble Wrap Paper ~~foam~~ None Other: _____

Tape on cooler/box: Y N N/A

Custody Seals intact Y N N/A

C-O-C in plastic Y N N/A

Ice X Blue ice _____ present / absent / melted N/A

Sample Temperature 4.9 °C N/A

C-O-C filled out properly Y N N/A

Samples in separate bags Y N N/A

Sample containers intact* Y N N/A

*If no, list broken sample(s): _____

Sample label(s) complete (ID, date, etc.) Y N N/A

Label(s) agree with C-O-C Y N N/A

Correct containers used Y N N/A

Sufficient sample received Y N N/A

Bubbles absent from 40 mL vials** Y N N/A

** Samples with bubbles less than the size of a pea are acceptable.

Was client contacted about samples Y N

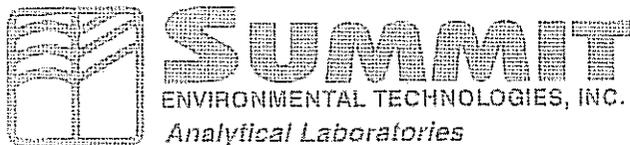
Will client send new samples Y N

Client contact: _____

Date/Time: _____

Logged in by: _____

Comments: _____



LABORATORY REPORT

Client

Endyne, Inc.
160 James Brown Dr
Williston, VT 05495

Order Number

1010491

Project Number

1006-08350-W

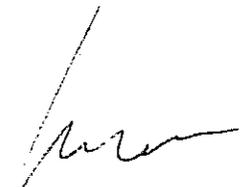
Issued

Monday, July 26, 2010

Total Number of Pages

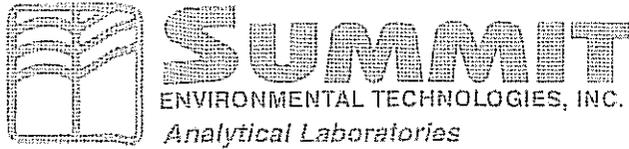
4 (excluding C.O.C. and cooler receipt form)

Approved By :


QA Manager

NELAC Accreditation #E87688

"Analytical Integrity" - EPA Certified - NELAP Certified
3310 Win Street - Cuyahoga Falls, Ohio 44223 - Phone: 330-253-8211 - Fax: 330-253-4489
Web Site: www.settek.com

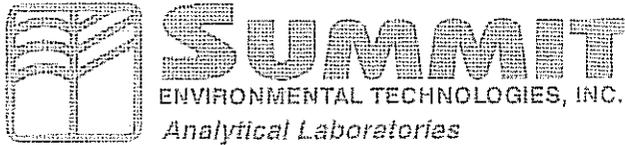


Sample Summary

Client: Endyne, Inc.

Order Number: 1010491

Laboratory ID	Client ID	Matrix	Sampling Date
1010491-01	1006-08350-001	Drinking Water	6/29/2010



Report Narrative

Client: Endyne, Inc.

Order Number: 1010491

No problems were encountered during analysis of this order number, except as noted.

Data Qualifiers:

- B = Analyte found in the method blank
- J = Estimated concentration of analyte between MDL (LOD) and Reporting Limit (LOQ)
- C = Analyte has been confirmed by another instrument or method
- E = Analyte exceeds the upper limit of the calibration curve.
- D = Sample or extract was analyzed at a higher dilution
- X = User defined data qualifier.
- S = Surrogate out of control limits
- U = Undetected
- a = Not Accredited by NELAC

ND = Non Detected at LOQ
DF = Dilution Factor

Limit Of Quantitation (LOQ) = Laboratory Reporting Limit (not adjusted for dilution factor)
Limit Of Detection (LOD) = Laboratory Detection Limit

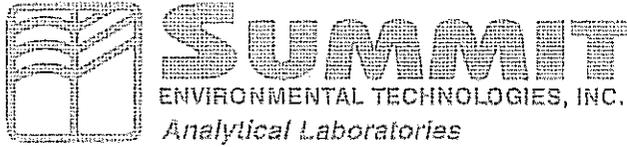
Matrices:

- A = Air
- C = Cream
- DW = Drinking Water
- L = Liquid
- O = Oil
- SL = Sludge
- SO = Soil
- S = Solid
- T = Tablet
- TC = TCLP Extract
- WW = Waste Water
- W = Wipe

Estimated uncertainty values are available upon request.

The test results meet the requirements of the NELAC standard, except where noted. The information contained in this analytical report is the sole property of Summit Environmental Technologies, Inc. and that of the client. It cannot be reproduced in any form without the consent of Summit Environmental Technologies, Inc. or the client for which this report was issued. The results contained in this report are only representative of the samples received. Conditions can vary at different times and at different sampling conditions. Summit Environmental Technologies, Inc. is not responsible for use or interpretation of the data included herein.

Petdia II, LLC - State Wastewater System & Potable Water Supply Permit Application



July 26, 2010

Client: Endyne, Inc.
Address: 160 James Brown Dr
Williston, VT 05495

Received: 7/12/2010
Project #: 1006-08350-W

<u>Client ID#</u>	<u>Lab ID#</u>	<u>Collected</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Matrix</u>	<u>Method</u>	<u>DF</u>	<u>LOQ</u>	<u>Run</u>	<u>Analyst</u>
1006-08350-001	1010491-01	29-Jun-10	Gross Alpha	3.3+/-1.7	pci/l	DW	900.0	1	3	22-Jul-10	MO

**Summit Environmental Technologies, Inc.
Method 900.0(Gross Alpha,Gross Beta)
QC Report**

Batch ID	273			
	Gross Alpha		Gross Beta	
Blank	<3 pci/l		<5pci/l	
		%Rec.	%RPD	%Rec.
				%RPD
LCS		80.7		108.5
MS		70.6		114.5
MSD		83.3		112.5
Sample/ Sample DUP			3.1	0



July 16, 2010

Mr. Mark Westover
Endyne, Inc.
160 James Brown Drive
Williston, VT 05495

RE: Katahdin Lab Number: SD4039
Project ID: 1006-08350-001
Project Manager: Ms. Shelly Brown
Sample Receipt Date(s): July 09, 2010

Dear Mr. Westover:

Please find enclosed the following information:

- * Report of Analysis (Analytical and/or Field)
- * Chain of Custody (COC)
- * Login Report

A copy of the Chain of Custody is included in the paginated report. The original COC is attached as an addendum to this report.

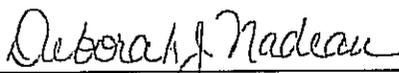
Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. The results contained in this report relate only to the submitted samples. This cover letter is an integral part of the ROA.

We certify that the test results provided in this report meet all the requirements of the NELAC standards unless otherwise noted in an attached technical narrative or in the Report of Analysis.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Please go to <http://www.katahdinlab.com/cert.html> for copies of Katahdin Analytical Services Inc. current certificates and analyte lists.

Sincerely,
KATAHDIN ANALYTICAL SERVICES



Authorized Signature

07/16/2010

Date

KATAHDIN ANALYTICAL SERVICES – INORGANIC DATA QUALIFIERS

(Refer to BOD Qualifiers Page for BOD footnotes)

The sampled date indicated on the attached Report(s) of Analysis (ROA) is the date for which a grab sample was collected or the date for which a composite sample was completed. Beginning and start times for composite samples can be found on the Chain-of-Custody.

- U Indicates the compound was analyzed for but not detected above the specified level. This level may be the Limit of Quantitation (LOQ)(previously called Practical Quantitation Level (PQL)), the Limit of Detection (LOD) or Method Detection Limit (MDL) as required by the client.
- E Estimated value. This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis.
- J Estimated value. The analyte was detected in the sample at a concentration less than the laboratory Limit of Quantitation (LOQ)(previously called Practical Quantitation Limit (PQL)), but above the Method Detection Limit (MDL).
- I-7 The laboratory's Practical Quantitation Level could not be achieved for this parameter due to sample composition, matrix effects, sample volume, or quantity used for analysis.
- A-4 Please refer to cover letter or narrative for further information.
- MCL Maximum Contaminant Level
- NL No limit
- NFL No Free Liquid Present
- FLP Free Liquid Present
- NOD No Odor Detected
- TON Threshold Odor Number
- H1 Please note that the regulatory holding time for pH is "analyze immediately". Ideally, this analysis must be performed in the field at the time of sample collection. pH for this sample was not performed at the time of sample collection. The analysis was performed as soon as possible after receipt by the laboratory.
- H2 Please note that the regulatory holding time for DO is "analyze immediately". Ideally, this analysis must be performed in the field at the time of sample collection. DO for this sample was not performed at the time of sample collection. The analysis was performed as soon as possible after receipt by the laboratory.
- H3 Please note that the regulatory holding time for sulfite is "analyze immediately". Ideally, this analysis must be performed in the field at the time of sample collection. Sulfite for this sample was not performed at the time of sample collection. The analysis was performed as soon as possible after receipt by the laboratory.
- H4 Please note that the regulatory holding time for residual chlorine is "analyze immediately". Ideally, this analysis must be performed in the field at the time of sample collection. Residual chlorine for this sample was not performed at the time of sample collection. The analysis was performed as soon as possible after receipt by the laboratory.



REPORT OF ANALYTICAL RESULTS

Client: Mark Westover
 Endyne, Inc.
 160 James Brown Drive
 Williston, VT 05495

Lab Sample ID: SD4039-001
 Report Date: 7/15/2010
 PO No.:
 Project: 1006-08350-001

Sample Description	Matrix	Filtered	Date Sampled	Date Received
1006-08350-001	AQ	No(Total)	06/29/2010	07/09/2010

Parameter	Result	Units	Adjusted PQL	Dilution Factor	PQL	Analytical Method	Analysis Date	By	Prep Method	Prepped Date	By	QC	Notes
URANIUM	0.00123	mg/L	0.000200	1	0.0002	EPA 200.8	7/13/10	DWM	EPA 200.8	7/13/10	DWM	AG13IMW9	

Katahdin Analytical Services, Inc.

Sample Receipt Condition Report

Client: <i>Endyne</i>	KAS PM: <i>SMB</i>	Sampled By: <i>CBout</i>
Project:	KIMS Entry By: <i>DD</i>	Delivered By: <i>WFS</i>
KAS Work Order#: <i>SD4039 / SD4040</i>	KIMS Review By:	Received By: <i>GN</i>
SDG#: <i>SD4041 / SD4042</i>	Cooler: <i>1</i> of <i>1</i> Box	Date/Time Rec.: <i>7-9-10 / 11:30</i>

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?		✓			
2. Chain of Custody present in cooler?	✓				
3. Chain of Custody signed by client?	✓				
4. Chain of Custody matches samples?	✓				
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.				✓	Temp (°C):
Samples received at <6 °C w/o freezing?				✓	Note: Not required for metals analysis.
Ice packs or ice present?				✓	The lack of ice or ice packs (i.e. no attempt to begin cooling process) may not meet certain regulatory requirements and may invalidate certain data.
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				✓	Note: No cooling process required for metals analysis.
6. Volatiles free of headspace: Aqueous: No bubble larger than a pea Soil/Sediment: Received in airtight container? Received in methanol? Methanol covering soil?				✓ ✓ ✓ ✓	
7. Trip Blank present in cooler?				✓	
8. Proper sample containers and volume?	✓				
9. Samples within hold time upon receipt?	✓				
10. Aqueous samples properly preserved? Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH – pH <2 Sulfide - >9 Cyanide – pH >12	✓			✓ ✓	

* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments

Bedford, LLC - State Wastewater System & Potable Water Supply Permit Application

Katahdin Analytical Services, Inc. Sample Receipt Condition Report

Client: <i>Endyne</i>	KAS PM: <i>SMB</i>	Sampled By: <i>CBart</i>
Project:	KIMS Entry By: <i>DD</i>	Delivered By: <i>W/S</i>
KAS Work Order#: <i>SD4039 / SD4040</i>	KIMS Review By:	Received By: <i>GN</i>
SBG#: <i>SD4041 / SD4042</i>	Cooler: <u>1</u> of <u>1</u> Box	Date/Time Rec.: <i>7-9-10 / 11:30</i>

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?		✓			
2. Chain of Custody present in cooler?	✓				
3. Chain of Custody signed by client?	✓				
4. Chain of Custody matches samples?	✓				
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.				✓	Temp (°C):
Samples received at <6 °C w/o freezing?				✓	Note: Not required for <u>metals</u> analysis.
Ice packs or ice present?				✓	The lack of ice or ice packs (i.e. no attempt to begin cooling process) may not meet certain regulatory requirements and may invalidate certain data.
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				✓	Note: No cooling process required for metals analysis.
6. Volatiles free of headspace: Aqueous: No bubble larger than a pea Soil/Sediment: Received in airtight container?				✓	
Received in methanol?				✓	
Methanol covering soil?				✓	
7. Trip Blank present in cooler?				✓	
8. Proper sample containers and volume?	✓				
9. Samples within hold time upon receipt?	✓				
10. Aqueous samples properly preserved? Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH - pH <2 Sulfide - >9 Cyanide - pH >12	✓			✓	

* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments

Katahdin Analytical Services



Login Chain of Custody Report (Ino1)

Jul. 09, 2010

04:20 PM

Quote/Incoming: ENDYNE001

Login Number: SD4039

Account: ENDYNE001

NoWeb

Endyne, Inc.

Project:

Login Information

ANALYSIS INSTRUCTIONS :
 CHECK NO. :
 CLIENT PO# :
 COOLER TEMPERATURE : 2.3
 DELIVERY SERVICES : UPS
 EDD FORMAT :
 PM : SMB
 PROJECT NAME : 1006-08350-001
 QC LEVEL : II
 REGULATORY LIST :
 REPORT INSTRUCTIONS : Email pdf and invoice to Mark Westover, no HC,
 email pdf also to etoomay@endyne.com
 SDG ID :
 SDG STATUS :

Primary Report Address:

Mark Westover
 Endyne, Inc.
 160 James Brown Drive

Williston, VT 05495

Primary Invoice Address:
 mwestover@endynelabs.com

Mark Westover
 Endyne, Inc.
 160 James Brown Drive

Williston, VT 05495

Report CC Addresses:

Invoice CC Addresses:

Laboratory Sample ID	Client Sample Number	Collect Date/Time	Receive Date	Verbal Date	Due Date	Mailed
SD4039-1	1006-08350-001	29-JUN-10 12:50	09-JUL-10		19-JUL-10	
Matrix	Product	Hold Date (shortest)	Bottle Type	Bottle Count	Comments	
Aqueous	S E200.8-URANIUM	26-DEC-10	250mL Plastic+HNO3			

Total Samples: 1

Total Analyses: 1



CHAIN-OF-CUSTODY-RECORD

160 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

Special Reporting Instructions/PO#: **201DOSS 2-10**

049170

Project Name: Swift + McCargo	Client/Contact Name: HN CDH	Sampler Name: Chris Aldrich
State of Origin: VT NY NH Other	Phone #: 6580820 ext 15	Phone #: 343-1422
Endyne WO # 1006-08350	Mailing Address: HN	Billing Address: HN

Sample Location	Matrix	GRAB	Date/Time Sampled	Sample Containers		Sample Preservation	Analysis Required	Field Results/Remarks	Due Date
				No.	Type/Size				
Water supply	H ₂ O	X	6/29/10	1	1 Liter	40	Odor		
				1	1 Liter		Gross Alpha		
				1	1 Liter		lead+copper		
				1	802		Urenium		
				1	802		Hardness		
				1	802		As, Fe, Mn, Na		
				1	802		CL, PH, NO ₂ , NO ₃		
				1	Beets		Total Coliform		

Relinquished by: Chris Aldrich	Date/Time: 6/29/10	Received by: Jane Parker	Date/Time: 6/29/10 1520
---------------------------------------	---------------------------	---------------------------------	--------------------------------

LAB USE ONLY	
Delivery: Client	
Temp: 0.5°C	
Comment:	
26	8270 PAH Only
27	8081 Pest
28	8082 PCB
29	PPI3 Metals
30	Total RCRA8
21	1664 TPH/FOG
22	8015 GRO
23	8015 DRO
24	8260B
25	8270 B/N or Acid
16	Sulfate
17	Coliform (Specify)
18	COD
19	VT PCF
20	VOC Halocarbons
33	Other
37	Other

marshfield
engineering
services

DONALD MARSH P.E.
18 LANGDON STREET
MONTPELIER, VERMONT 05602
802-223-6353

MOUND WASTEWATER DISPOSAL SYSTEM DESIGN

for

John Douglas Lot
Charlotte, Vermont

prepared for

John Douglas
Charlotte, Vermont

by

Marshfield Engineering Services



20 December 1984

*App'l #4 (2-14-85)
Permit 85-04-JD (2-14-85)*

General

The following design is for a mound wastewater disposal system for a single family dwelling for the Douglas property in Charlotte. The mound system is required because the high seasonal water table is only 2 feet below grade.

This system is designed to meet the Charlotte Health Ordinance and is not intended for submittal for review under the Vermont Environmental Rules Subdivision Regulation.

Wastewater Flows

This proposed mound system will serve a three-bedroom home with flows of 450 gpd.

Septic Tank Size

Capacity to be 1.5 times daily flow

Capacity = 1.5 x 450 gal = 675 gallons

Use a 1,000 gallon pre-cast concrete septic tank

The tank is to be constructed in accordance with the attached detail.

Pump tank at least every three years. Use SCH 40 PVC or C.I. within 5 feet of the septic tank.

Disposal Field Size

Design percolation rate = 6 min/in (based upon mound sand fill).

Wastewater application rate = 1.0 gal/day/SF

Required disposal field area =

$$\frac{\text{Daily Flow}}{\text{Application Rate}} = \frac{450 \text{ gal/day}}{1.0 \text{ gal/day/SF}} = 450 \text{ SF}$$

Use 150% of required area as no replacement area will be provided. Use one 6' x 112.5' seepage bed.

$$\frac{\text{Daily Flow}}{0.74 \text{ gal/SF/day}} = \frac{675 \text{ gal/day}}{0.74 \text{ gal/day/SF}} = 912 \text{ SF}$$

(ok as fill extends beyond 912 SF required absorption area.)

Pressure Distribution Network Design

The Environmental Protection Rules require that a pressure distribution system be used for all mounds. The design is as follows:

Pipe Layout - Use one 54' long lateral on each side of the supply line along the middle of the bed (2 laterals total). End laterals 2.25' from the end of the bed. Cap ends of laterals and place a 3/8" vent hole in top of end caps.

Orifice discharge $Q = CA \times \text{sqrt}(2gh)$
 Assume $C = 0.6$ for sharp-edged orifice.
 Let orifice diameter = 3/8 inch.
 Maintain minimum of 1.3 psi at end orifice:
 $h = 1.3 \times 2.3 = 3.0'$
 Then $Q = 2.87$ gpm

Place orifices 6' apart in bottom of each lateral as shown on sheet 2, so each lateral will have 9 orifices.
 Total number of orifices = 18.
 Total flow = 52 gpm.

Lateral Size

Laterals to be 54 feet long with 9 orifices. Use a 2" diameter SCH 40 PVC lateral. Total head loss in lateral will be:

Orifice	Total Flow in Segment (gpm)	Head Loss in Feet/ Section of 2" SCH 40 PVC	Total Head Loss (Feet)
1	2.87	0.01	0.01
2	5.74	0.01	0.02
3	8.61	0.02	0.04
4	11.48	0.02	0.06
5	14.35	0.03	0.09
6	17.22	0.04	0.13
7	20.09	0.05	0.18
8	22.96	0.07	0.25
9	25.83	0.08	0.33

Total lateral head losses = 0.33

Check Discharge Difference

Check difference in head loss between first and last orifice.

$$\begin{aligned} \text{Loss to last orifice} &= 0 \text{ ft. (manifold)} \\ &+ .33 \text{ ft. (lateral)} \\ &+ \underline{3.0 \text{ ft. (orifice)}} \\ &= 3.33 \text{ ft.} \end{aligned}$$

$$\begin{aligned} \text{Loss to first orifice} &= \underline{3.0 \text{ ft. (orifice only)}} \\ &= 3.0 \text{ ft.} \end{aligned}$$

Head difference = 0.33 ft. or 11% difference in head.

This results in a 6% difference in discharge which meets the requirement of no more than a 15% difference in discharge between the first and last orifice.

Pump Size

The total head loss within the seepage beds will be the same as loss to last orifice or 3.33'. Say 3.5'.

Distance from wet well to mound = 165'

Elevation of pump = 985'

Elevation at distribution lines @ 1.5' above grade = 988.5'

Total system losses:

Seepage bed	= 3.5'
Friction loss in 165' of 2" PVC @ 52 gpm	= 7.7'
Elevation head loss	= <u>3.5'</u>
Total Head Loss	= 14.7'

The pump must provide at least 52 gpm against a 15' head. Use one Myers WHRSM, 1/2 HP, 220V, 1 phase, submersible pump with an SJ Electro-Alarm with bell and light, high water level alarm with NEMA III outside box, and three 3900 mercury float controls. (A pump with equal capability may be substituted.)

Note: Contractor must ensure 220 V power available at site before ordering pump.

Dosing Volume

Dosing volume should be five to ten times the total pipe volume to minimize the difference in flows through the orifices.

Pipe Volume:

Laterals - 2 @ 54' @ 0.163 gal/ft = 17.6 gallons

Minimum dosing volume = 88 to 176 gallons

Let the dosing design be 225 gallons/dose (twice/day)

Pump Wet Well

The wet well for the pump is to be a 1,000 gallon pre-cast concrete septic tank. As solids may accumulate on the bottom of the wet well, it should be pumped out every three years.

The pump intake should be set at 0.5' off the bottom of the tank. To provide 275 gallons/dosing cycle, the pump controls should be set as follows:

Pump off	0.8' above tank bottom
Pump on	1.7' above tank bottom
High level alarm on	1.9' above tank bottom

There will be a reserve of 700 gallons when the alarm sounds. Pump station to be constructed in accordance with MES Drawing #298-02.

Pressure Sewer Line

A 2" PVC pressure sewer line is required from the pump station to the mound manifold. Use 4" ring-tite sewer pipe if the dosing siphon is used. This line is to be SCH 40 PVC or SDR 21 (100 psi) PVC pipe or an equivalent pressure pipe. The line is to be laid with 6 inches of clean sand bedding around the pipe. As the line will be full of effluent, any portions of the line which are not 4 feet deep should be insulated. Lay the line 6 feet deep, place in 6" CMP and insulate with 2 inches of rigid insulation under and within 10 feet of any road. The contractor must lay line with proper protection against freezing.

Seepage Bed Construction

The mound and seepage bed shall be constructed in accordance with these specifications, MES Drawings #298-01 and 02, and the attached guidelines from State Regulations.

All trees within the limits of fill are to be cut flush with the ground and the entire area must be plowed with a mold board plow along the contours prior to placing the sand fill. No equipment is to drive on the site after plowing.

The select sand fill shall meet the following specification using standard sieves.

- 85% passing the #10 sieve
- 30-50% passing the #40 sieve
- Less than 5% passing the #200 sieve

This material must be approved by the Engineer prior to construction. Once the sand fill is properly placed, the bed is to be constructed within the mound.

The bottom of the bed is to be level at approximately 1' above the existing grade (elevation 988.0'). Every effort should be made to prevent excessive compaction of the bottom of the bed. The smallest equipment capable of performing the job should be used. The sides and the bottom of the bed must be raked with a steel rake prior to placement of the crushed stone. Six inches of crushed stone (3/4 inch to 1 1/2 inch) is to be placed in the bed with the 1 1/2" diameter SCH 40 PVC distribution laterals, with 3/8" holes drilled in the bottom every 6 feet, to be laid level on top of the 6 inches of stone. The first hole is to be placed in the top of the lateral end cap. The distribution laterals are to be arranged as shown on the approved plans.

The laterals are to be covered with 4 inches of crushed stone (10" total), then a 4 to 6 inch layer of hay or straw, and 12 to 18 inches of topsoil. The topsoil is to be graded to promote runoff, and the top and sides of the mound should be seeded and mulched immediately after construction. No parking or driving is to be permitted on the mound.

Low Flow Fixtures

Reduced wastewater flows are essential to extend the useful life of the proposed mound. Therefore, low flow (water saving) fixtures must be used whenever possible. The low flow fixtures should meet the following criteria.

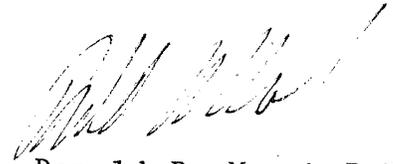
- a. showers - maximum flow 2 gal/min
- b. lavatories & kitchen sinks - maximum flow 2 gal/min
- c. toilets - 3.5 gal/flush

Maintenance of System

For proper use of this system the septic tanks must be pumped regularly. Even with proper pumping solids may block the holes in the distribution laterals. To prevent failure of the system it is recommended that the holes be cleaned at least every three years. The cleaning consists of applying 80-100 psi of air pressure to the laterals at the air intake in the wet well while the pumps are operating. Repeat this process several times.

Conclusion

Marshfield Engineering Services requests that no changes be made to the design or construction of this system without contacting the Engineer.



Donald R. Marsh P.E.

DRM/ccs

KEY INSTALLATION FACTS READ THESE DETAILS BEFORE INSTALLATION!

1. Absolutely **NO WATER REQUIRED** for backfill. The tank is specifically designed to be backfilled **WITHOUT WATER**. The use of water prior to backfilling is not necessary and may cause installation problems. A nominal amount of water (6-8") may be used to ballast tank during backfilling.
2. The tank **MUST BE BEDDED IN SCREENED MATERIAL** (sand, pea gravel, stone dust, or other flowable fines). Native material is acceptable if it exhibits the same characteristics as select fill.
3. It is imperative that the **TANK HAUNCH BE SUPPORTED WITH FILL**. This is the area of the tank under the mold part-line along the sidewalls curving down to the belly of the tank.
4. The **TANK BELLY MUST BE SUPPORTED WITH FILL**. Due to the unique process, our tanks have a slight concave shape to the belly. Make sure that tank feet seated in the backfill and that the tank belly is well supported.
5. Our tanks achieve full structural integrity once installed properly. **SIDEWALL COMPRESSION THROUGH COMPACTED BACKFILL** is the key to this integrity. Use backhoe to compact sidewall backfill if possible.
6. **CORRUGATIONS MUST BE PACKED SOLIDLY** with backfill to achieve this. Compact backfill in 6" lifts as you backfill excavation.
7. Backfill tank to top of roof all the way around, then **BACKFILL BETWEEN RISERS FIRST**, then around the endwalls of tank. This technique will prevent backfill from pushing risers "in" or toward one another.
8. In areas of high groundwater, the tank **MUST BE FILLED** immediately following backfill.
9. Tanks are not designed or rated for vehicular traffic. Avoid operation of vehicles heavier than 2500 pounds. Maximum burial depth is 36" below grade.
10. Drill the "A" dimples for **ALL STATES AND PROVINCES (CANADA) EXCEPT FLORIDA, ILLINOIS, ARIZONA AND NEBRASKA**. The dimples are pre-offset at the factory. Drill the "B" dimples for Illinois, Arizona and Nebraska. All Florida destined tanks are pre-drilled.
11. For burial depths of 36" – 48", please follow the above steps but use select material for backfill to at least the top of the tank. Native material may be used for the cover providing it is absolutely free of clay and is a material that drains well. If surface water or saturated soils are a concern, install gravel or other well-draining material in lieu of any native material except for a minimum amount of top soil necessary to establish ground cover.
12. For burial depths great than 48" (no greater than 72"), follow all of the above steps. In addition, a Schedule 40 PVC pipe support must be added between the roof and the floor just inside the edge of each manway in the mid-body of the tank. From the outside of the tank you can easily observe the pipe mounting tenons that are molded into the top of the first "trough" or inward corrugation past the manway. Each pipe should be field measured and cut due to nominal differences in the internal dimension of the tank.



INSTALLATION PROCEDURES

These installation instructions apply to sites with free-flowing native soils.
(See separate instructions for sites with clay or high groundwater.)

Step 1: Site Preparation & Notes

- Read "Key Roth Installation Facts" first (applies to Roth MultiTank® OR the FRALO Septec Tank)
- Max burial depth is 36" below grade, unless deep burial instructions (steps 11 & 12) on "Key Installation Facts" are followed.
- Absolutely no clay should be used for backfill.
- Inspect tank for any damage during handling or transportation.
- Tank must be uniformly supported.
- Failure to properly bed tank and compact fill will void the warranty.
- Absolutely no water is required for backfill. The tank is designed to be backfilled without water. Filling the tank with water prior to backfilling is not necessary and may cause installation problems. A nominal amount of water (6-8") may be used to ballast the tank during backfilling.

Step 2: Excavation Size

- Width and length of excavation shall be 12-18" greater than the tank on all sides and ends (FIG.1).
- Depth of the excavation shall be 6" greater than the tank (FIG.1).
- Do no over excavate or "belly-out" the excavation.

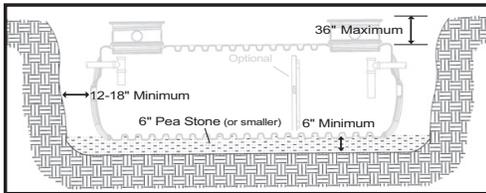


FIG.1 Excavation

Step 3: Bedding the Tank

- Add pea stone, sand, gravel or other similar granular material to bed the tank and ensure uniform compaction and that bed is level (FIG.1)
- Native material may be used to bed the tank providing it is properly placed and compacted.

Step 4: Tank Installation

- Prepare the tank for installation. Identify the inlet and outlet ends of the tank. Inlet and outlet may be located on the end or either side ports (per code requirements).
- For standard installation, identify drill location A (40" Liquid Level). Drill the inlet and outlet holes using a 5-inch diameter hole saw. (FL & IN tanks are pre-drilled)
- * **IMPORTANT NOTE:** For AZ, IL, NE drill dimple B (42" Liquid Level). Florida & Indiana tanks are pre-drilled at the factory.
- Install provided rubber gasket in inlet and outlet ports. (Fig. 2)

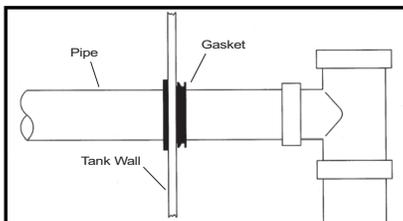


FIG.2 Gasket Detail

- Install the inlet and outlet tees, as required. (Fig. 3) Plumbing tees shall be located as close to the entrance point of the tank as possible (just inside the manway opening). Plumbing tees and gas-baffles are factory provided for Indiana tanks.

Step 4: Tank Installation (cont'd)

- Install the required Roth threaded Septic Access Riser System (STAR™), provided separately. (Fig. 3) See reverse for directions for sealing the riser system.
- Using the corner lifting holes, lower the tank into the excavation. Level the tank, and verify the outlet is lower than the inlet. Install remaining inlet and outlet plumbing. (Fig. 3)

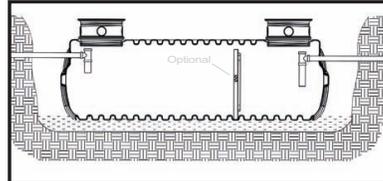


FIG.3 Plumbing Install

- Perform required water tightness, plumbing and/or tank inspection if applicable.

Step 5: Backfill

- Backfill in an alternating method around the tank using native material free of debris, sharp stones, and stones greater than 2" in diameter. Soil MUST flow freely into corrugations between tank ribs, including midpoint to belly of tank.
- Compact backfill in 6 inch lifts always working on the sides first and then the bulkheads (ends of tank).
- Use a hand tamper to achieve sidewall compression through compacted backfill. Mechanical compactors may be used if available on the site. Sidewall compression is essential to provide sidewall restraint after covering the tank. (Fig. 4)

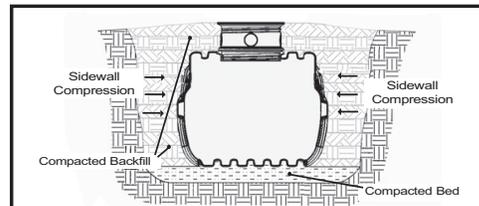


FIG.4 Backfilling

- When backfilling the top of the tank, backfill between risers first.
- Complete backfilling and grade the area.
- Failure to compact fill voids the tank warranty.

WARNING

- Tanks are designed for underground use only.
- Installer shall comply with all federal, state, and local regulations.
- Tanks are not rated for vehicular traffic. Avoid operation of vehicles heavier than 2500 pounds over the tank.
- Internal water temperatures should not exceed 140° F.
- Verify no underground utilities or pipes are located in the excavation vicinity.
- Where saturated soil or seasonal high water tables are indicated between the bottom of the tank and the ground surface, see separate supplemental installation instructions for these site conditions.
- Secure tank access by installing provided stainless steel fastener to the riser and cover.

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INSTALLATION PROCEDURES

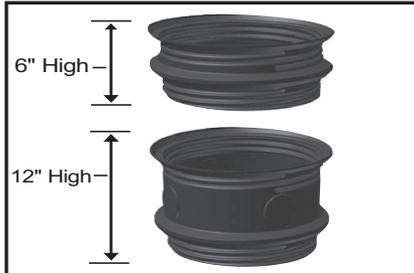


FIG.1 Riser Elevation

STEP 1 Determine riser elevation and required riser combination as per tank installation (see reverse). STAR™ risers are available in 6" (STAR-24R6) and 12" (STAR-24R12) height increments. (Fig.1)



FIG.2 Apply Gasket

STEP 2 Apply gasket (not included*) on the innermost flat ring on the tank surface. Be careful not to allow the gasket to overhang the threads where it would interfere with the thread engagement. (Fig.2)
*Indiana tanks and risers include gaskets.

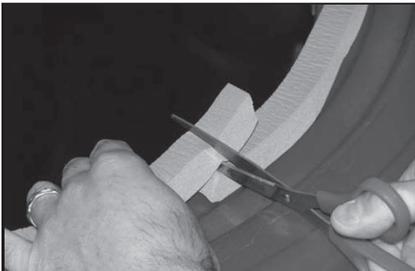


FIG.3 Trim Gasket

STEP 3 Trim gasket 1/4" too long. A properly trimmed gasket is then compressed end to end. Ensure that the gasket is uniformly positioned and makes good contact with the tank surface. (Fig.3)



FIG.4 Install Riser

STEP 4 Screw the riser into the tank joint, being careful that the gasket remains in position. Properly installed, the gasket should show uniform compression around the entire joint. (Fig.4)



FIG.5 Additional Gaskets

STEP 5 Apply the gasket on the first riser on the thread portion which is facing up. (Fig.5). Trim the gasket to connect the pieces end to end. Screw the additional riser(s) into position.

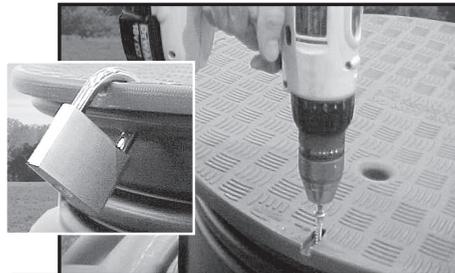


FIG.6 Secure Cover

STEP 6 Locate the "Secure Here" hole on the cover and install a tamper-resistant screw (STAR-SSCREW provided) through the lid and into the riser below. (Fig.6) To secure with padlock, drill a larger hole to accommodate the lock.

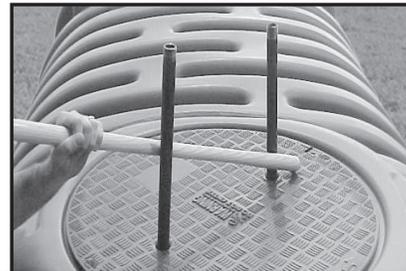


FIG.7 Remove Cover

STEP 7 If unable to remove cover by hand, insert 1" OD steel pipe into cover indentations and twist using a shovel handle, pipe or piece of wood. (Fig.7)



- To prevent unauthorized access, never install STAR™ Riser System without the factory provided tamper resistant screw.
- Not rated for vehicular traffic loading.

Roth Global Plastics, Inc.

Innovative/Alternative System Approval
General Use per §1-1001 of the
Wastewater System and Potable Water Supply Rules, effective September 29, 2007

#2001-01-R3 (2009 Renewal)

Vendor Information

Orenco Systems, Inc.
814 Airway Avenue
Sutherlin, OR 97479

Technology Name

Advantex™ Treatment System

Contact

Orenco Systems, Inc.
814 Airway Avenue
Sutherlin, OR 97479
(541) 459-4449
Fax (541) 459-2884
Web Site: www.orenco.com
Contact: Sam Carter

Technology Type

Textile Based Recirculating Packed
Bed Filter

Expiration Date

September 15, 2011

Local Contact

David Cotton
Wastewater Technologies, Inc.
19 Precast Road
Milton, VT 05468
Tel: 877-212-3219
802-893-6581
Fax: 802-893-6605
wti@wastewatertechnologies.com
www.wastewatertechnologies.com

Approval

The Advantex™ Treatment System operating in Modes AX-1 (includes Model AX20-RT) and AX-3 may be used as part of a subsurface wastewater disposal system approved under the Wastewater System and Potable Water Supply Rules, effective September 29, 2007 under the following conditions:

1. The treatment units must be installed and operated as described in the Innovative/Alternative System application package filed with the Agency of Natural Resources (Agency) on March 1, 2001.



Petdia II, LLC - State Wastewater System & Potable Water Supply Permit Application
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2. Unit sizing must be in accord with the technical information submitted with the Innovative/Alternative System application package on March 1, 2001. The sizing shall be based on the calculated design flow per §1-808 of the Wastewater System and Potable Water Supply Rules, effective September 29, 2007.
3. This approval is based on treatment only of domestic wastewater of low and moderate strength as specified in §1-915(a)(1)(C) & (D) of the Wastewater System and Potable Water Supply Rules, effective September 29, 2007.
4. The system may be used for both new and replacement systems.
5. All effluent from the AdvantexTM Treatment System shall be discharged to a filtrate disposal system that conforms to the requirements of §1-916 of the Wastewater System and Potable Water Supply Rules, effective September 29, 2007. If the rules are revised during the term of this approval, this approval shall be revised as needed to conform to the revisions.
6. All treatment modules shall be equipped with anti-flotation flanges unless there is a demonstration that flotation is not a problem on a particular site or that an alternative system has been approved by the Agency.
7. Detailed operating instruction shall be provided in writing to the owner/operator.
8. The vendor shall have an inventory of replacement parts available locally.
9. The vendor shall provide a copy of this approval letter to any landowner who is a prospective purchaser of an AdvantexTM Treatment System prior to the sale of the system and prior to the filing of any application for a site-specific approval by the Agency for the purchaser's property. The application filed with the Agency shall include the landowner's written acknowledgement of this approval letter. Prior to any sale of the property or completion of a sales agreement to sell the property, a copy of the site-specific permit shall be provided to the prospective purchaser.
10. The owner of a property where an AdvantexTM system has been installed shall have a valid maintenance contract in force at all times. The minimum length of any contract shall be for a period of two years. A copy of the initial and each succeeding contract shall be submitted to the appropriate Regional Environmental Office of the Agency. Maintenance shall be performed by, or shall be supervised by, a Licensed Class 1 Designer or a Licensed Class B Designer, approved by the Vendor or their representative, who shall provide written inspection reports detailing the maintenance performed on the specific system, any problems that have occurred since the previous inspection, any modifications made to the system, the date of the inspection, and any work required to ensure the system operates in compliance with this approval.

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The inspection shall be performed in accordance with the manufacturer's Operation and Maintenance Manual submitted as part of the Innovative/Alternative System application package. If at any inspection the effluent is cloudy or pungent smelling a sample shall be collected and tested for BOD₅ and TSS. The results of any testing shall be submitted with the annual inspection report.

11. The first inspection shall be completed no later than 6 months after placing the system in service. The second inspection shall be completed no later than 12 months after placing the system in service. Subsequent inspections shall be completed at least once per year based on the date when the system was first placed in service. More frequent inspections or additional testing, required by the manufacturer to ensure proper functioning of the system, shall be conducted in accordance with the manufacturer's specifications. All reports shall be filed with the appropriate Regional Environmental Office of the Agency and the land owner no later than 30 days after the date of inspection.
12. All systems shall be equipped with an hour meter, an audible alarm, and a visual alarm. These indicators shall be located outside of any buildings and visible to the building users in the normal course of routine occupancy of the building.
13. The vendor shall submit an annual report to the Agency by April 1st of each year containing the following information for the previous 12 month period ending December 31st of the previous year:
 - A. The number of permitted systems installed in Vermont.
 - B. The address of each installation.
 - C. The name of the owner at the time of installation and any known change in ownership.
 - D. All known problems or failures, with a brief summary of the cause and remedial measures taken.
14. This approval is based on information submitted by the Vendor indicating that the specified models and treatment modes will routinely provide effluent with no more than 30 mg/l of BOD₅ or more than 30 mg/l of TSS.
15. A site specific permit for the use of this system may be revoked if the system fails to function properly or if the property owner fails to have a valid contract for the required maintenance and inspection of the system. Revocation of the permit will require that the use of the building be discontinued unless another wastewater disposal system is installed based on prior written approval by the Agency.

16. This approval is not a representation or guarantee of the effectiveness, efficiency or operation of an Advantex™ Treatment System.

Design and Review Conditions

The following conditions will be used by the Department in reviewing permit applications that include an Advantex™ Treatment System:

Equipment

- Advantex™ Treatment System operating in Modes AX-1 (including model AX20-RT) and AX-3.

Design and Application

- The treatment unit shall be installed in accordance with the approved plans and the manufacturer's recommendations. The designer shall assure that the system will properly function in all seasons.
- The designer must assess the structural needs of the unit for the specific application site and place the requirements on the design plans.
- The designer must determine the type of backfill required and any necessary placement specification.
- The designer must assess the ventilation path for the particular application and make any necessary provisions to assure proper flow and control of odor emissions.
- The designer shall include in the design a septic tank effluent filter with easy access for inspection and cleaning.
- The designer must assure routine access to the unit as well as the septic tank effluent filter.
- The designer must address flotation issues if the SHWT will be above the bottom of any of the tanks.

Installation Inspection

- The treatment unit shall be set up under the instruction and guidance of an installer/inspector trained by the manufacturer.
- The treatment unit shall be inspected by a Licensed Class 1 Designer or a Licensed Class B Designer, approved by the Vendor, after construction of the

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unit and installation of the tanks before backfilling, and after backfilling and grading is complete. The inspection shall include checking for an adequate structural foundation to support the unit, checking for levelness of the tanks, and inspecting for damage and proper assembly.

- Before backfilling, the unit and tankage shall be tested for watertightness by filling the unit or tank with water and holding it at a constant level for 24 hours; there shall be no measurable leakage. During the test the entire unit and tanks shall be inspected for visible leaks. Should the unit or tanks fail the test they may be repaired and retested. The testing and repairs shall be conducted under the direction and in the presence of the inspecting Licensed Class 1 Designer or a Licensed Class B Designer.
- The Licensed Class 1 Designer or a Licensed Class B Designer shall inspect all piping for proper installation and watertightness before backfilling.

Start-up

- Start-up of the system and initial operational checks shall be conducted by an installer/inspector trained by the manufacturer, who shall submit a report to the owner, and to the inspecting Licensed Class 1 Designer or a Licensed Class B Designer indicating any problems encountered, their resolution, and affirmation that the system is operating as intended.

Operational Maintenance and Inspection

- The owner shall have a valid maintenance contract in force at all times. The minimum length of any contract shall be for a period of two years. A copy of the initial and each succeeding contract shall be submitted to the appropriate Regional Environmental Office of the Agency. Maintenance shall be performed by, or shall be supervised by, a Licensed Class 1 Designer or a Licensed Class B Designer, approved by the Vendor, who shall provide written inspection reports detailing the maintenance performed on the specific system, any problems that have occurred since the previous inspection, any modifications made to the system, the date of the inspection, and any work required to ensure the system operates in compliance with this approval.

The inspection shall be performed in accord with the manufacturers Operation and Maintenance Manual submitted as part of the Innovative/Alternative System application package. If at any inspection the effluent is cloudy or pungent smelling a sample shall be collected and tested for BOD₅ and TSS. The results of any testing shall be submitted with the annual inspection report.

- The first inspection shall be completed no later than 6 months after placing the system in service.

Petdia II, LLC - State Wastewater System & Potable Water Supply Permit Application
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#2001-01-R3 (2009 Renewal)

- The second inspection shall be completed no later than 12 months after placing the system in service.
- Subsequent inspections shall be completed at least once per year based on the date when the system was first placed in service.
- All inspection reports shall be filed with the appropriate Regional Environmental Office of the Agency and the landowner no later than 30 days after the date of inspection.

Permitting

- The permit shall run with the land.
- A copy of the permit shall be provided to any prospective buyers prior to the sale.
- Each new owner of the property shall inform the appropriate Regional Environmental Office of the Agency within 30 days of the transfer of the property and include the name and mailing address of the new owner.

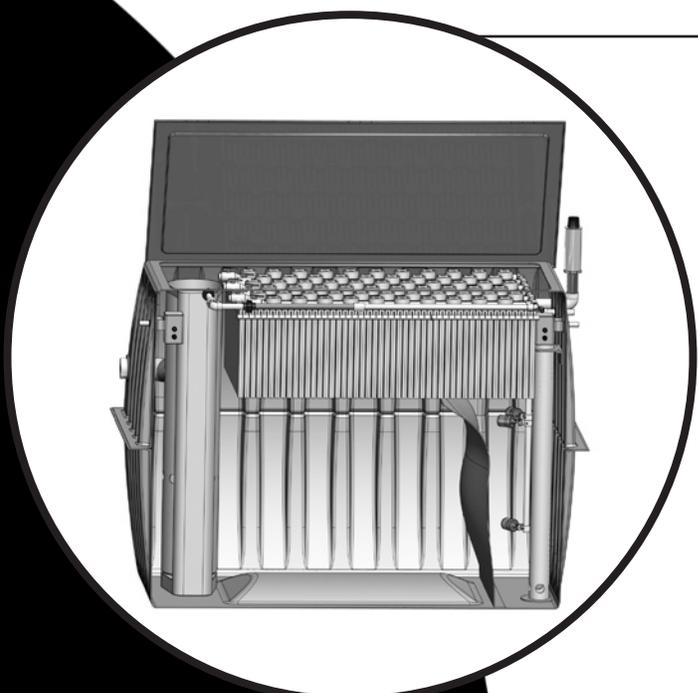
Effective August 13, 2009

By Roger Thompson, Jr.
Roger Thompson, Jr.
Regional Office Program Manager

Installation Manual

**AdvanTex -AX20-RT
Treatment Systems**

Residential Applications



*An illustrated guide to installing
an Orenco AdvanTex® AX20-RT
Treatment System.*



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World Does Wastewater®*

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Before You Begin

As the installer of an onsite wastewater treatment system, you play a crucial role. Homeowners, neighbors, service providers, regulators, Dealers, manufacturers ... we all rely on your expertise and good work. At Orenco, we've worked hard to make your installation as easy and "hassle-free" as possible.

We're very proud of this wastewater treatment system. Like all our products, the AdvanTex® AX20-RT Treatment Unit has gone through extensive research, development, and field-testing. Then each component is built to written specifications and subjected to quality review before shipping. If this system or any of its components possesses flaws that would inhibit its proper functioning, please contact your authorized AdvanTex Dealer. The Dealer can also provide repair and replacement instructions and replacement components. If there is no authorized AdvanTex Dealer in your area, call Orenco Systems®, Inc. at 800-348-9843 or +1-541-459-4449.



Property owners, neighbors, regulators, Dealers, manufacturers, and service providers all depend on your careful installation.

Products described in this manual are covered by one or more of the following U.S. Patents: 6,540,920; 6,372,137; 5,531,894; 5,492,635; 5,480,561; 5,360,556; 4,439,323. Products are also covered by foreign patents.

This manual covers installation of all models of our AdvanTex AX20-RT Treatment Units. In addition to this manual, the installation manual for the system's electrical control panel describes installation, wiring, and operating instructions for Orenco control panels. Please read all other control panel documentation, as well.

It's important that you read through this entire manual before beginning the installation. And make sure you have the correct equipment, materials, tools, and training to perform this installation. Please note that *you must perform the installation according to the current manual to keep the warranty in force.*

Once you become familiar with the installation process, you should be able to install an AdvanTex AX20-RT unit in less than half a day, not counting the time to install the tank and dispersal system.

Conditions for Using an AX20-RT to Repair an Existing System

Before you install an AX20-RT to repair or upgrade an existing septic system, be sure that the following conditions are met:

- The existing primary tank must be Orenco-approved and must meet all applicable regulatory requirements. (No pour-in-place tanks, no homemade tanks, etc.)
- The existing primary tank must be structurally sound.
- The existing primary tank must have at least 1000 gallons (3800 liters) capacity at the normal operating level (1000 gal. or 3800 L below the invert of the outlet).
- The existing primary tank must have an at-grade access with a securable and removable lid. If it doesn't, an at-grade access must be installed onto the primary tank and be made watertight.
- The primary tank must be tested for leakage to a height of at least 2 inches into the riser, and it must hold water for at least sixty minutes.
- An Orenco effluent filter with at least 5 ft² of filter area must be installed and accessible in the existing primary tank (models FT0822-14B, FTW0444-36V, or FTS0444-36V).
- The depth of burial of the existing primary tank must allow for a fall of at least 1/8 in. per foot (10 mm per meter or 1%) from the outlet of the existing primary tank to the inlet of the AX20-RT unit if the primary tank uses a gravity discharge. If sufficient fall cannot be met, a pumping system will need to be installed in the existing tank to move the filtered effluent to the AX20-RT unit. (Contact Orenco for assistance.)

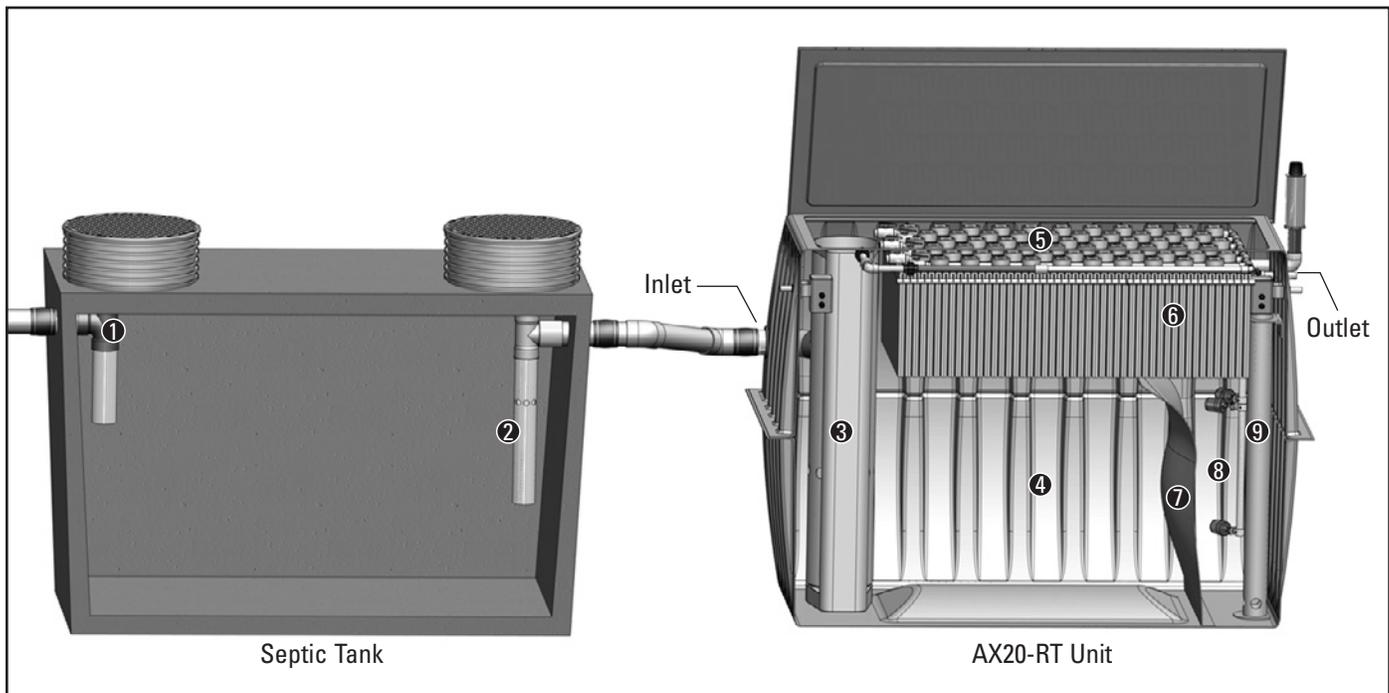
Important Notes

- *All tanks used with AX20-RT Treatment Units must be prequalified. Call your local Dealer for specifics.*
- *The backwash discharge from a salt-type water softener MUST NOT be plumbed into an AX20-RT Treatment Unit or the preceding septic tank. Failure to follow this instruction, or any other in this manual, will void the system's warranty. Contact your AdvanTex Dealer if you have any questions about household plumbing arrangements that may interfere with the functioning of the system.*
- *All pipe diameters given are U.S. nominal IPS pipe sizes. If you are using metric pipe, you may need adapters to connect to the U.S. fittings supplied.*
- *If you are not a trained AdvanTex Installer, contact your local AdvanTex Dealer or Orenco for training before installing this system.*

Overview

The AdvanTex® AX20-RT Treatment System has 10 main functional areas and components:

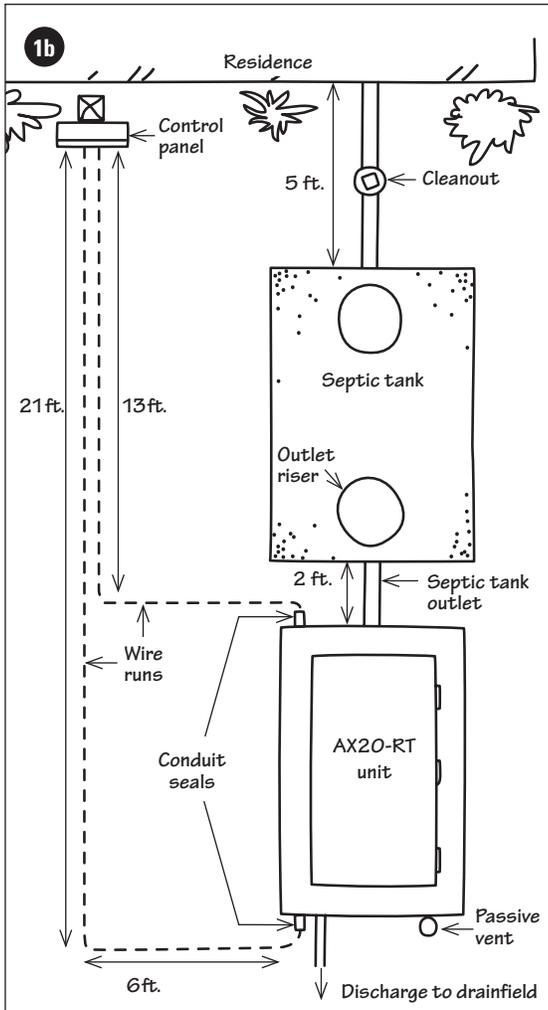
1. Septic Tank Inlet Tee
2. Biotube® Effluent Filter
3. Biotube Pump Package
4. Recirculating Treatment Tank (recirc side)
5. Manifold and Laterals
6. Textile Media
7. Tank Baffle
8. Recirculating Treatment Tank (discharge side)
9. Flow Inducer and Discharge Pump Assembly (pump discharge only)
10. Control Panel (not shown)



Concrete septic tank and AX20-RT (pump discharge model) shown

Raw sewage enters the septic tank through its inlet tee. In the septic tank, the raw sewage separates into three distinct zones: a scum layer, a sludge layer, and a clear layer. Effluent from the clear layer passes through a Biotube® effluent filter and is discharged by gravity to the recirculating treatment tank portion of the AX20-RT unit, which contains a Biotube Pump Package. The Biotube Pump Package pumps filtered effluent from the recirc side of the AX20-RT unit's recirculating treatment tank to the distribution manifold in the top of the unit. Effluent percolates down through the textile media and is distributed — by means of a tank baffle — between the recirculating side and the discharge side of the AX20-RT recirculating treatment tank.

The operation of the pump on the recirc side of the tank baffle is controlled by a timer in the control panel, which allows the pump to dose the textile media for short periods (usually a half-minute or less), typically 72 times a day. This frequent “microdosing,” which optimizes the treatment process, occurs 24 hours a day, to maintain the proper biological environment.



Sample sketch of a possible AX20-RT system layout

Step 1: Review or Sketch Site Plans

Before starting the installation, familiarize yourself with the site plans and specifics of your installation. If you are installing the AX20-RT unit more than 20 feet (6 meters) away from the tank, contact your Dealer or Orenco for assistance.

1a) Detailed Site Plans Provided:

If you are installing the AX20-RT according to a set of detailed plans, we recommend that you make sure that your plans accurately reflect conditions at the site. If there are differences between the physical site and the plans, we recommend you contact the Designer before scheduling the installation.

1b) No Site Plans Provided:

If you are installing the AX20-RT without detailed site plans, or with plans of limited detail, contact your local Dealer or Orenco for design assistance.

- Determine and sketch the exact positions of the primary tank and AX20-RT unit on the site. Account for current and likely future landscape features in your sketch.
- Be sure to position the tank and unit to allow for a minimum $\frac{1}{8}$ in. per foot (10 mm per meter or 1%) in the line from the outlet of the primary tank to the inlet of the AX20-RT unit, if the primary tank uses a gravity discharge.
- Determine and sketch the layout of your pipes, electrical conduits, and other critical buried elements. Provide measurements and distances on the sketch as accurately as possible.
- Sketch the placement of the control panel. (See Panel Installation, EIN-CP-GEN-1, for installation recommendations.)

5 Installation Manual: *AdvanTex® AX20-RT Treatment Units*

Step 2: Excavate and Set Septic Tank

This section covers excavating a hole for the septic tank and setting the tank. For information on excavating a hole for the AX20-RT unit, see Step 4.

Consider the necessary elevations and grade requirements for the tank and the AX20-RT unit before excavating the hole for the septic tank.

The septic tank must be set deep enough to allow for a minimum slope of $\frac{1}{8}$ in. per foot (10 mm per meter or 1%) from the outlet of the septic tank to the inlet of AX20-RT if the septic tank uses a gravity discharge. Also, keep in mind that the AX20-RT needs to sit 2 inches (50 mm) above final grade.

Step 2a: Outline an excavation area (with chalk, paint, string, etc.) for the tank.

Step 2b: Excavate the hole for the septic tank following the tank manufacturer's recommendations. Remember that you need the correct depth for a consistent slope of $\frac{1}{8}$ in. per foot (10 mm per meter or 1%) from the septic tank outlet to the inlet of the AX20-RT.

Step 2c: Make sure the bottom of the excavation is free of debris, especially rocks and other sharp objects. If the bottom of the excavation is uneven or rocky, lay a 4-in. (100-mm) bed of sand or pea gravel and compact the material to create an even, smooth surface.

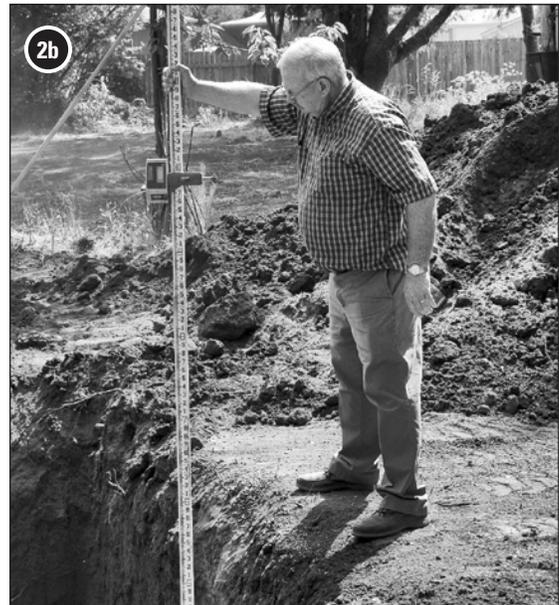
Step 2d: Set the tank following the manufacturer's instructions. Follow the tank manufacturer's guidelines for watertight testing, antiflotation measures, and backfilling to the level of the top of the tank. Do not backfill past the top of the tank at this time.

Step 3: Install Risers and Water Test Septic Tank

NOTE: This section covers riser installations on septic tanks using gravity discharge. Contact Orenco for riser installations on septic tanks using pump discharge.

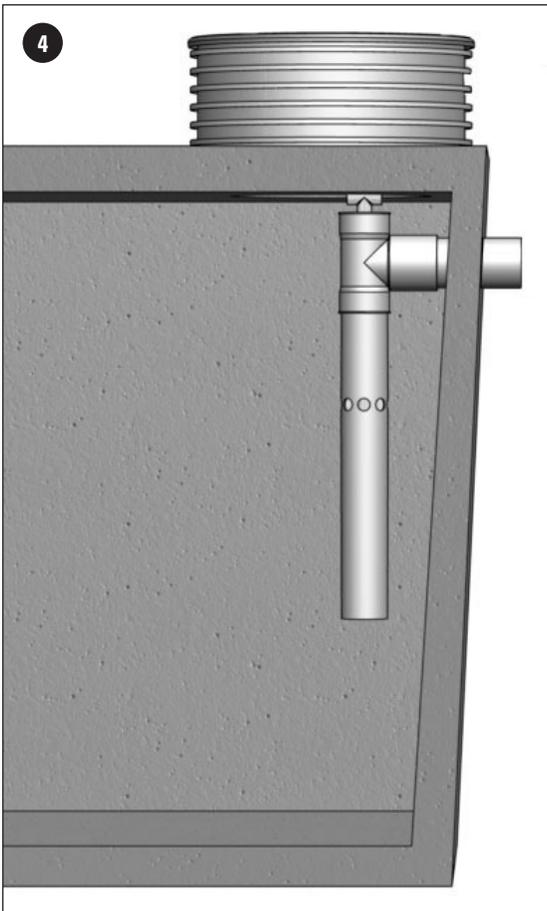
Step 3a: Be sure you are installing the right size risers for your application and the size of the tank opening.

Step 3b: Wipe the areas to be bonded with a clean rag to ensure a clean, dry bonding surface.





Carefully slide the riser onto the adapter.



Orenco® effluent filter installed on the septic tank outlet

Step 3c: To bond the riser to the riser tank adapter, you can use either ADH100 or methacrylate adhesive alone. However, because ADH100 does not provide a structural joint for approximately 24 hours, we recommend the use of both adhesives. If you use both, apply methacrylate adhesive to the outside surface of the riser tank adapter for a quick (usually an hour or less) structural joint.

Step 3d: Carefully slide the riser onto the adapter. Correctly orient the riser before the adhesive starts to set.

Step 3e: Apply a bead of adhesive to the inside of the adapter and riser joint; then use a putty knife or similar tool to form a continuous fillet between the tank adapter and the inside of the riser.

Step 3f: After the adhesives have hardened, fill the tank with clean water to a level 2 in. (50 mm) above the adhesive joint in the riser, to test the watertightness of the tank and the riser joint. Do not allow the water level to rise more than 3 in. (76 mm) into the riser because structural damage to the tank may occur. The inlet and outlet pipe into the tank needs to be turned up or plugged to allow the tank to be filled.

CAUTION: Check the tank manufacturer's guidelines before water testing the tank. Some tank manufacturers require a partial or complete backfill before a tank is water tested.

Step 3g: When the tank proves watertight, drain the excess water to the tank manufacturer's recommended level.

Step 4: Install Effluent Filter

Install the effluent filter after the tank has been water tested.

Step 4a: Test-fit the effluent filter on the septic tank's outlet pipe without gluing. Make sure it fits plumb. Make sure the filter will fit as snug to the tank wall as possible while ensuring sufficient clearance for removing the filter cartridge.

Step 4b: Secure the filter to the outlet pipe. Two attachment methods can be used:

- You can glue the filter onto the tank outlet pipe using appropriate primer and glue.
- You can use a stainless steel set screw to secure the filter.

Step 4c: For easier access when servicing, you can extend the cartridge handle with a longer length of $\frac{3}{4}$ -in. Sch 40 PVC pipe.

Step 5: Excavate and Set AX20-RT Unit

Before installing the AX20-RT, consider the depth of the septic tank and the height of the septic tank outlet. Remember that there must be a minimum $\frac{1}{8}$ in. per foot slope (10 mm per meter or 1%) from the outlet of the septic tank to the inlet of the AX20-RT, if the septic tank uses a gravity discharge. Also, remember that the AX20-RT lid needs to sit 2 in. (50 mm) above finished grade, to allow for settling and drainage. Take into account any planned landscaping that might affect the finished grade of the system.

NOTE: If you are installing counterbuoyancy flanges, complete step 6a before setting the AX20-RT unit.

Step 5a: Mark the outline of the excavation. The excavation needs to extend 18-24 inches beyond all four sides of the unit.

Step 5b: Excavate the hole for the unit. The AX20-RT unit height is 72 in. (1830 mm). Make sure that the unit will be set deep enough to facilitate a minimum slope of $\frac{1}{8}$ in. per foot (10 mm per meter or 1%) from the septic tank if the septic tank uses a gravity discharge. Also make sure that the lid will be 2 in. (50 mm) above final grade after the hole for the unit is excavated and after a compacted bed of aggregate or pea gravel — if necessary — is laid.

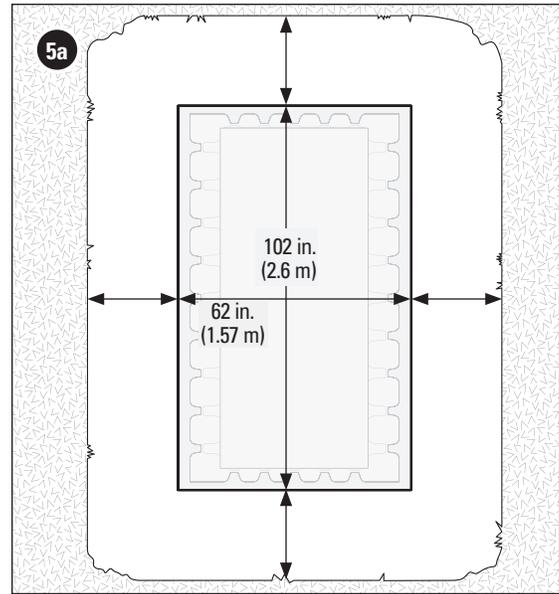
Step 5c: Make sure the bottom of the excavation is stable and free of debris, especially rocks and other sharp objects.

- If the base soil is unstable (peat, quicksand, muck, soft or highly expansive clay, etc.), overexcavate the site depth and then set a firm, 6-in. (152-mm) compacted base of $\frac{1}{2}$ -in.- to $\frac{3}{4}$ -in.-minus (13- to 19-mm) aggregate or pea gravel. In extremely unstable soil, a concrete layer may be needed to stabilize the bottom of the excavation. If you have any doubt about the soil's ability to support the tank, consult a local civil or structural engineer.
- If the base soil is rocky or uneven, lay a 4-in. (100 mm) bed of sand or pea gravel less than $\frac{3}{8}$ in. (10 mm) in diameter, and compact the material to create an even, smooth surface.

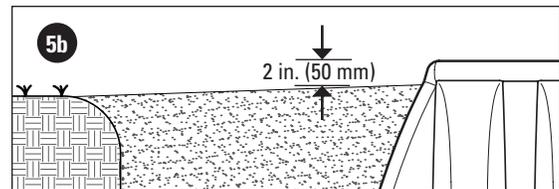
Step 5d: Use properly sized lifting equipment to attach a chain or cable to the two lifting brackets on the top of the AX20-RT unit. Carefully lift and lower the unit into the excavation. When the unit is set and level in the correct position, remove the chain/cable.

WARNING: Do not allow workers to stand in or near the excavation while placing the unit!

CAUTION: Use a lifting device that will not damage the unit or the lid of the unit.



Excavate 18-24 in. (457-610 mm) beyond all four sides of the unit.



Excavate so that the lid sits at 2 in. (50 mm) above final grade.



Step 6: Prep and Install Counterbuoyancy

Because of the shallow burial depth of the AX20-RT, you may need to install counterbuoyancy measures on the unit, especially if the site has seasonally high groundwater. If you are unsure whether or not your installation requires counterbuoyancy measures, contact your Dealer or Orenco.

There are two types of counterbuoyancy offered by Orenco, factory counterbuoyancy flange kits or counterbuoyancy tie-down hardware kits.

6a) Counterbuoyancy Flanges:

- 1:** Using properly-sized lifting equipment, Raise the AX20-RT unit 3-4 in. (75-100 mm) off of a flat, level surface.
- 2:** Lightly sand the contact surfaces on the upper surfaces of the flanges and the bottom of the AX20-RT, and then clean the sanded surfaces with acetone and clean, dry, lint-free rags.
- 3:** Apply a ¾-in. (19-mm) bead of SS115 or SS140 adhesive down the length of each flange.
- 4:** Slide the flanges under the AX20-RT unit, and then lower the unit onto the flanges. Allow the adhesive to set before moving the AX20-RT.

6b) Counterbuoyancy Tie-Downs:

Orenco's tie-down counterbuoyancy hardware kits are for use with concrete forms. Sections of 12-in. diameter PVC half-pipe or chamber material can be used as forms; simple forms 12 in. wide × 6 in. high × 4 ft long (305 mm × 152 mm × 1.22 m) can be built from wood.

NOTE: To save time, we recommend preparing the counterbuoyancy measures offsite before you install the unit.

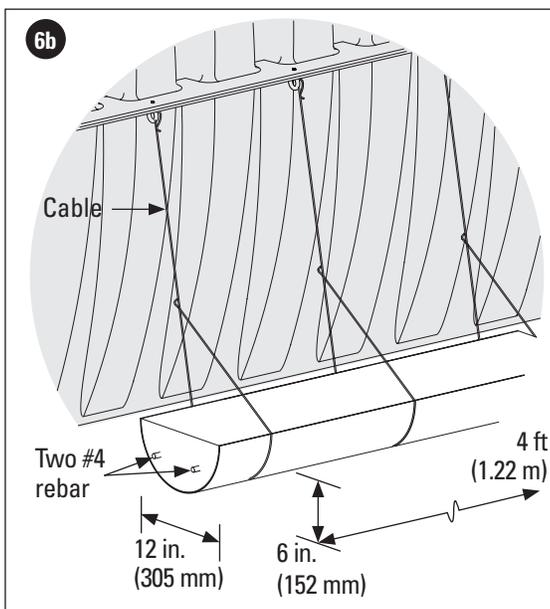
1: Fill the forms halfway with concrete, and then place two #4 reinforcing bars in each of the forms.

2: Finish filling the forms with concrete.

NOTE: Wait for the concrete to set completely before lifting the counterbuoyancy measures.

3: Use appropriate lifting equipment to set the pieces in place.

4: Secure the pieces to the unit with the supplied cables and hardware.



Counterbuoyancy tie-down cables and half-pipe concrete forms

Step 7: Partially Backfill AX20-RT Excavation

Step 7a: Fill the AX20-RT unit with about 16 in. (410 mm) of water for internal support. Be sure to fill on both sides of the tank baffle.

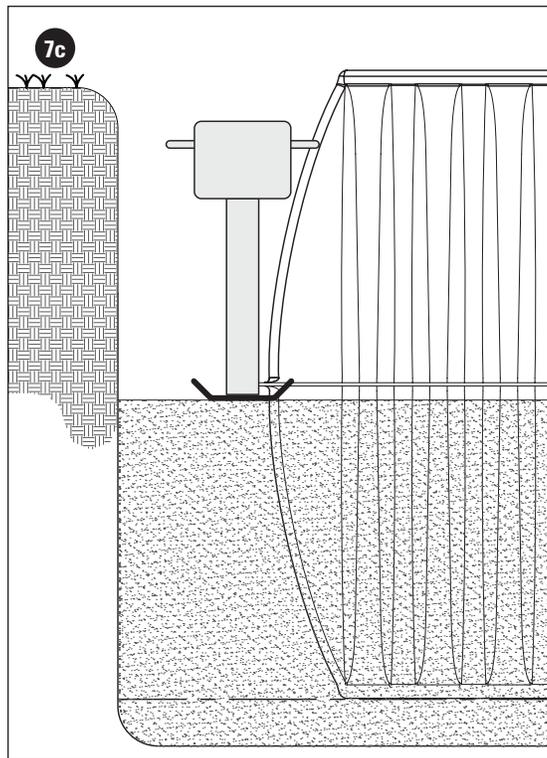
Step 7b: Backfill around the unit with a 16-in. (410-mm) layer of backfill material. Native material is acceptable if there are no large or sharp rocks that may damage the unit walls. If native material is not usable, backfill with ½-in. aggregate or pea gravel. Do not backfill with sand. Use a mechanical compactor to thoroughly compact the fill, to minimize settlement and provide support for the walls of the unit.

Step 7c: After the first layer of backfill is complete, fill the tank with water to just above the midseam flange on both sides of the tank baffle and then add another 16-in. layer of backfill. Compact the backfill so that the backfill level is 2-3 in. (50-75 mm) below the midseam flange.

Step 8: Test Watertightness of AX20-RT Unit

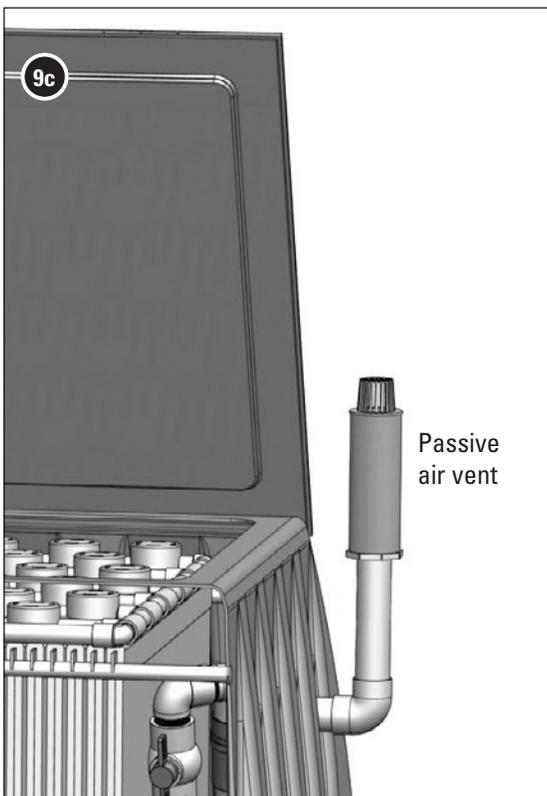
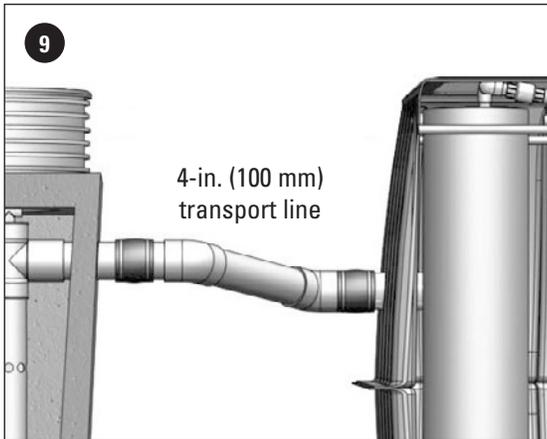
Step 8a: After backfilling the AX20-RT excavation to just below the midseam flange, make sure that the unit is filled with water to at least 1 in. (25 mm) above the midseam flange on both sides of the tank baffle.

Step 8b: Wait at least 15 minutes and then inspect the midseam of the unit for leaks. There should be no drop in liquid level and no visible leakage from the seam.



Backfill and compact to 2-3 in. below midseam.





Step 9: Connect Transport Line and Passive Air Vent

NOTE: *DO NOT* use primer on ABS parts.

Step 9a: Dry fit the 4-in. (100-mm) transport line and any fittings between the outlet of the septic tank and the inlet on the AX20-RT unit. Make sure that you maintain a $\frac{1}{8}$ in. per foot (10 mm per meter or 1%) slope from the septic tank if the septic tank uses gravity discharge.

Step 9b: Glue all of the transport line pieces in place.

Step 9c: Use 2-in (50 mm) PVC pipe to plumb the passive air vent to the 2-in. (50 mm) vent fitting that protrudes from the outlet side of the AX20-RT unit. Be sure the vent line is sloped to drain towards the unit and that the passive air vent is within 20 ft (6 m) of the unit. After installation, the top of the passive air vent should be a minimum of 3 in. (75 mm) above final grade.

Step 9d: We recommend installing the passive air vent near a wall or in a similar location where it is less likely to be damaged by a lawn mower or accidental kicking, etc. You can easily hide the air vent behind shrubbery or other landscaping and paint it if another color is desired.

IMPORTANT: *In all cases, the line between the passive air vent and the unit must be sloped back $\frac{1}{4}$ in. per foot (20 mm per meter) toward the unit. To prevent accumulation of water, do not allow any “bellies” or low points in the vent piping. Keep the 2-in. vent piping less than 20 ft (6 m) in total length.*

Step 10: Install and Test Control Panel

Install Control Panel:

For complete control panel installation instructions, see the installation manual for the electrical control panel that comes with your system. Instructions specific to your control panel ship inside of the control panel.*

Step 10a: Make sure the the items supplied conform to state and local regulations.

Step 10b: A qualified and licensed electrician should install and service the panel and ancillary wiring in compliance with the National Electrical Code, as well as state and local codes. (Wiring diagrams can be found in the installation manual* that comes with the panel.) Wiring will include the following items:

- Incoming power to the panel. One or more circuits may be required, depending upon the number of pumps and local electrical codes.
- Incoming phone line to the panel (for VeriComm® control panels)
- Wiring from the control panel to the pump and floats
- Wiring to a discharge pump and floats (if applicable)

NOTE: We do not recommend installing a control panel against the wall of a bedroom, living room, or other living space because it makes a periodic thump during operation. If it must be placed near the house, mount it on 4 × 4 (100 × 100 mm) pressure-treated post(s) next to the wall.

Test Control Panel:

VeriComm® (VCOM) telemetry-enabled panels are used for remote monitoring and control of AX20-RT pumping operations.

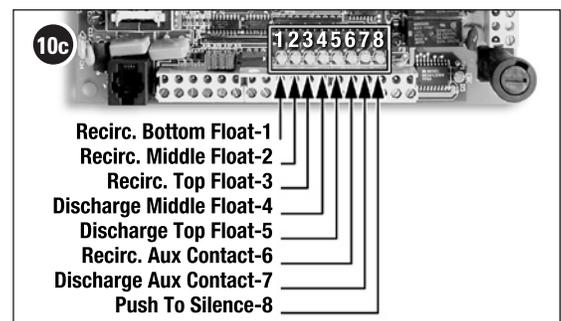
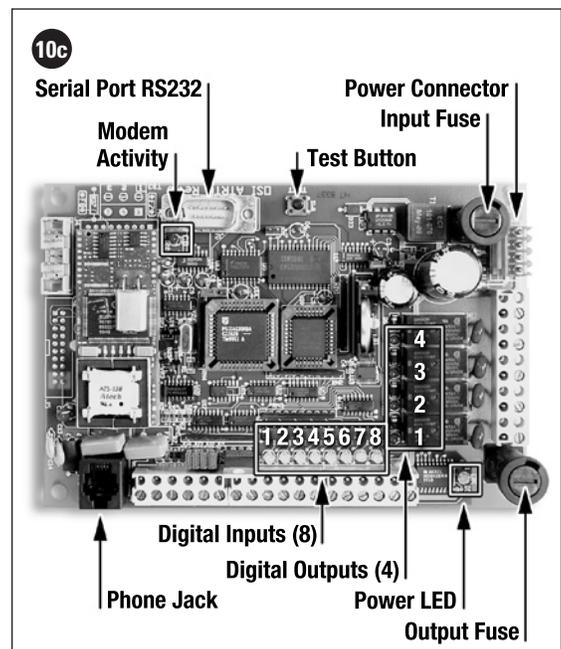
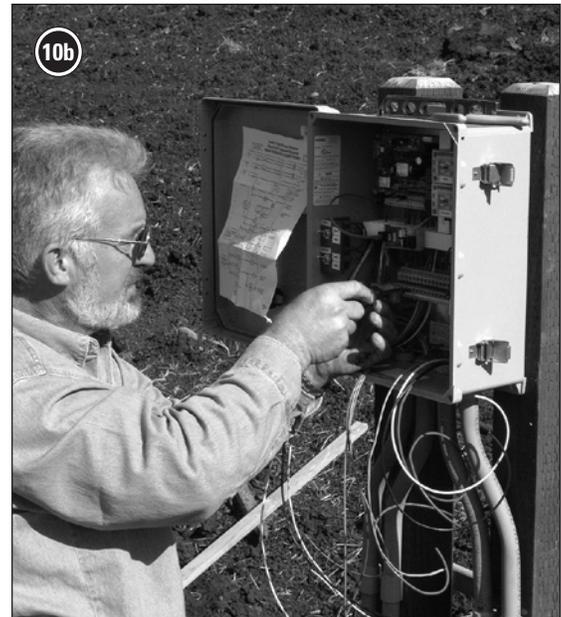
Fault conditions are automatically reported to the VeriComm Monitoring System, making the system virtually invisible to the homeowner. However, if fault conditions are not responded to, or if the system cannot communicate with the VeriComm Monitoring System, then local alarms may be activated.

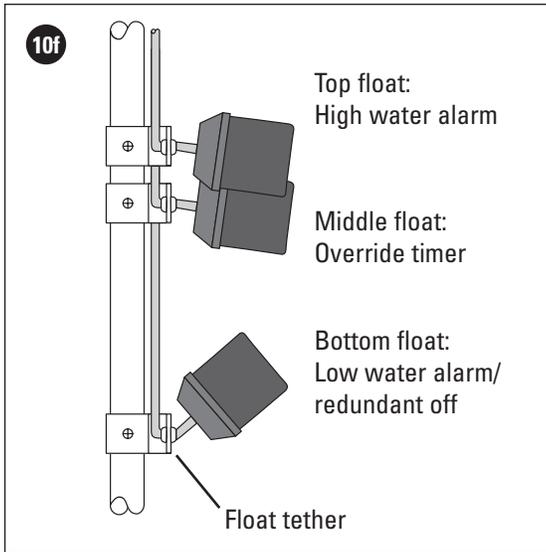
Perform the following procedures to verify proper installation of the VeriComm panel.

NOTE: For more detailed procedures specific to each panel model, refer to the documentation that comes with the panel.*

Step 10c: Familiarize yourself with the components of the telemetry control board.

* If the installation instructions are missing from the control panel, find the product model code, located on a sticker inside the panel door. Then call your local Dealer or log in to our online Document Library at www.orenco.com and download a copy of the installation instructions (Category "Instructions, Electrical"). You can also call Orenco for a replacement.





VeriComm® Recirculating Float Assembly shown

Step 10d: Make sure the panel has been completely and correctly installed, and verify that the circuit breakers are in the “On” position. Also check the controller status. The power LED, located on the control board, will be:

- *Blinking, which indicates the controller is operating normally, or*
- *Off (when power is applied), which indicates a possible problem with*
 - ~ *the input fuse on the PC board;*
 - ~ *the main fuse located inside the panel;*
 - ~ *the controls circuit breaker located inside the panel; or*
 - ~ *the incoming line voltage.*

Step 10e: To enable Test Mode, hold the “Push-To-Silence” button on the front of the panel until the audible alarm sounds (approximately 15 seconds).

- *The appropriate digital input should be illuminated when the button is held in.*
- *When the audible alarm sounds to indicate that the panel is in Test Mode, release the button.*



Measure voltage

While in Test Mode, the panel will operate in the following manner:

- *The call-in function is disabled;*
- *Local audible and visual alarms are activated as alarm conditions occur;*
- *System Data Logs are suspended; and*
- *Timer cycles are shortened.*

Step 10f: Familiarize yourself with the floats on the system.

Step 10g: Verify that the pump is submerged in water before continuing. If the bottom float drops, the alarm should sound. Press down the spring-loaded “AUTO/OFF/MAN” switch located inside the panel. The pump should immediately activate. For verification, the appropriate digital input should illuminate, indicating that the auxiliary contact is on.



Measure amperage

Measure the voltage and amperage of the pump.

- Measure the voltage at the pump terminals in the panel. Measuring the voltage with the pump off will confirm that the correct voltage is connected. Then activate the pump by toggling the AUTO/OFF/MAN switch to MAN, or using a PDA or laptop with the Bluetooth Device, and measure the voltage while the pump is running. The maximum recommended voltage drop is 3%. A low voltage condition may indicate that the site wiring is improperly sized.*
- Using a loop ammeter, place the ammeter clamp around the loop of wire located above the pump circuit breaker and read the amperage while the pump is running and connected to the discharge assembly with the valves at the end of the laterals closed. The amperage should be within the specifications of the pump.*

Step 10: Install and Test Control Panel (cont.)

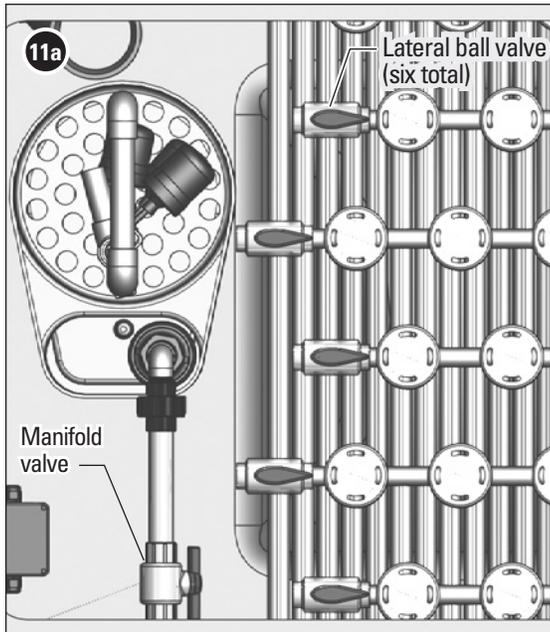
Step 10h: Refer to the control panel documentation to test the floats that activate/deactivate the pump. To perform the float test, make sure there is enough liquid in the tank. If there isn't enough liquid in the tank, turn the pump circuit breaker off.

***NOTE:** If phone service to the panel is active, complete step 10i. If not, proceed to step 10j. However, phone service should be activated before system start-up.*

Step 10i: Press and release the “Push-To-Silence” button 15 times within a one-minute period. This instructs the panel to call the VeriComm Monitoring System.

- A red LED (“Modem Activity” component) should illuminate, indicating that the controller has established communication with the host. (This may take a few minutes.)
- Once the communication session has ended, the modem will automatically disconnect.
- If the LED does not illuminate within the specified time, verify that the phone line has a dial tone. This can be done by hooking up a phone to the line that is going into the panel.

Step 10j: The panel will automatically disable Test Mode and return to normal operation after 30 minutes. To disable Test Mode manually, hold the “Push-To-Silence” button on the front of the panel until the audible alarm sounds (approximately 15 seconds). The appropriate digital input should be illuminated when the “Push-To-Silence” button is held in. When the audible alarm sounds to indicate that the panel is no longer in Test Mode, release the button.



Open the manifold valve and lateral valves.



Measure squirt height.

Step 11: Test System Function

Once power is connected to the control panel, follow these steps to prepare the system for operation.

IMPORTANT: Before using a generator to operate a pump, contact Orenco or your Dealer to make sure it can supply sufficient starting amperage.

NOTE: When testing pumps, always make sure there is enough water in the unit to safely run the pumps.

Step 11a: Open the manifold valve and the lateral ball valves and then toggle the “AUTO/OFF/MAN” switch for the recirc pump to “MAN” for 5-10 seconds to flush any debris out of the manifold and laterals. Close the lateral ball valves. With the recirc pump still in “MAN,” remove several orifice shields and measure squirt height. Squirt height should measure between 3-5 ft (0.9-1.5 m). Windy conditions will cause a lower squirt height. When finished, return the “AUTO/OFF/MAN” switch to “AUTO.”

NOTE: If the desired squirt height is not achieved or the unit does not pressurize, check for debris, breaks, or closed valves. Also verify that the pump is receiving sufficient power. If the unit still does not pressurize correctly, contact your Dealer or Orenco for technical assistance.

Step 11b: Place the panel in Test Mode. Check the function of the recirc pump floats by lifting the low-level, mid-level, and high-level float in turn and verifying that the pump cycles on and off for each. If the unit is not equipped with a discharge pump, take the control panel out of Test Mode at this time.

Step 11c: If the unit has a discharge pump, make sure there is enough water on the discharge side of the tank baffle for the pump to run. Make sure the panel is in Test Mode. Check the function of the discharge pump floats by lifting the low-level, mid-level, and high-level float in turn and verifying that the pump cycles on and off for each. When you are finished, take the control panel out of Test Mode.

Step 11d: Close and bolt down the AX20-RT unit lid when you are finished.

Step 12: Complete Final Backfilling

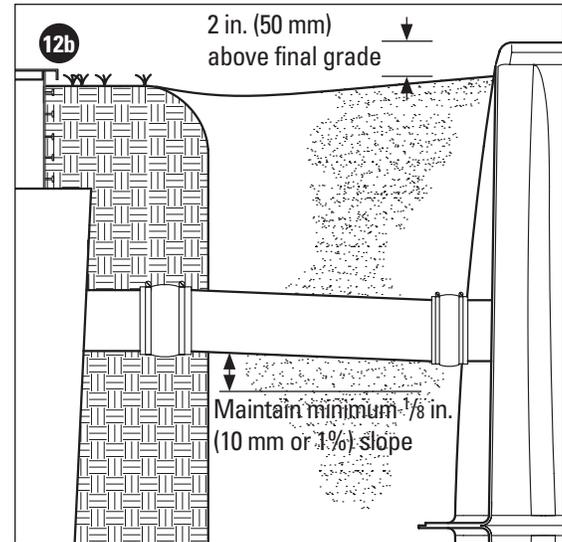
IMPORTANT: When backfilling, be careful not to alter the slope of pipes. Brace the pipes or place the pipes on a compacted bed and carefully fill around them.

NOTE: Before backfilling, make sure the AX20-RT unit lid and all riser lids are bolted down.

Step 12a: Backfill the septic tank excavation if it has not yet been done. Follow the tank manufacturer's guidelines for backfilling.

Step 12b: Backfill and compact around the AX20-RT unit in maximum 12-in. (305-mm) lifts. Native material is acceptable if there are no large or sharp rocks that may damage the unit walls. If native material is not usable, backfill with sand or pea gravel. For installations in non-cohesive soils* with high seasonal water tables, use ¼-in. crushed rock as the backfill material. The top of the AX20-RT lid should sit 2 in. (50 mm) above final grade.

IMPORTANT: After backfilling, call the system's Service Provider to arrange for the official System Start-up.



Backfill the AX20-RT in 12-in. (300 mm) lifts

* As described in OSHA Standards (29 CFR, Part 1926, Subpart P, Appendix A), noncohesive soils or granular soils include gravel, sand, or silt with little or no clay content. Granular soil cannot be molded when moist and crumbles easily when dry. Cohesive soils include clayey silt, sandy clay, silty clay, clay, and organic clay. Cohesive soil does not crumble, can be excavated with vertical sideslopes, is hard to break up when dry, and when moist, can be rolled into threads without crumbling. For example, if at least a 2-in. (51-mm) length of 1/8-in. (3-mm) thread can be held on one end without tearing, the soil is cohesive.

Notes

Installation Manual: *AvanTex*[®] AX20-RT Treatment Units

Notes

Notes

Residential Applications



Oreco Systems[®]
Incorporated

*Changing the Way the
World Does Wastewater[®]*

800-348-9843
541-459-4449
www.oreco.com
www.vericomm.net

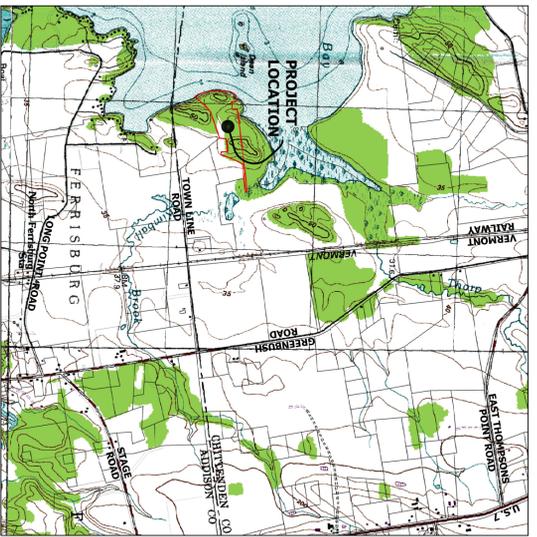


AdvanTex Treatment System AXN Models
meet the requirements of ANSI-NSF
Standard 40 for Class I Systems.



NIM-ATX-AXRT-1
Rev. 1.0, © 1/10
Oreco Systems[®], Inc.

SOIL PROFILES & PERCOLATION TESTING RESULTS



1"=2,000'

The following test pits were excavated by John Scott Excavation and the soil profiles were logged by Craig Hendrick, CEG and June 7, 2010. Also present for the soils investigation were Steve Jenks, Reisher and Spencer Harts with the Town of Charlotte.

SWMT = Seasonal High Water Table, NGWTD = No groundwater to depth, NBRTD = No bedrock to depth.

June 7, 2010

Test Pit No. H-1 Woods duff/loam, roots throughout
0'-8" Dense gray loam clay
SWMT = 9' NGWTD, NBRTD

Test Pit No. H-2 Woods duff/loam, roots throughout
0'-15" Dense tan-gray loam, roots throughout
15'-43" Dense tan-gray loam, roots throughout
SWMT = 15' NGWTD, NBRTD

Test Pit No. H-3 Woods duff/loam, roots throughout
0'-6" Dense gray clay, mottled
12'-46" Dense tan-gray loam, roots throughout
SWMT = 6' NGWTD, NBRTD

Test Pit No. H-4 Woods duff/loam, roots throughout
0'-15" Frable brown sandy loam, roots throughout
15'-36" Dense tan-gray loam, roots throughout
SWMT = 15' NGWTD, NBRTD

Test Pit No. H-5 Woods duff/loam, roots throughout
0'-14" Frable brown sandy loam, roots throughout
14'-46" Dense tan-gray loam, roots throughout
SWMT = 14' NGWTD, NBRTD

Test Pit No. H-6 Woods duff/loam, roots throughout
0'-12" Frable brown sandy loam, roots throughout
12'-37" Dense tan-gray loam, roots throughout
SWMT = 12' NGWTD, NBRTD

Test Pit No. H-7 Woods duff/loam, roots throughout, some mottling
0'-30" Dense tan-gray loam, roots throughout, some mottling
SWMT = 8' NGWTD, NBRTD

Test Pit No. H-8 Woods duff/loam, roots throughout
0'-6" Frable brown sandy loam, roots throughout
6'-12" Dense tan-gray loam, roots throughout
12'-43" Dense tan-gray loam, roots throughout
SWMT = 12' NGWTD, NBRTD

Test Pit No. H-9 Woods duff/loam, no apparent mottling
0'-15" Dense tan-gray loam, roots throughout, some mottling
15'-19" Dense tan-gray loam, roots throughout
SWMT = 15' NGWTD, NBRTD

Test Pit No. H-10 Woods duff/loam, no apparent mottling
0'-8" Frable brown sandy loam, roots throughout
8'-48" Dense tan-gray loam, roots throughout
SWMT = 8' NGWTD, NBRTD

Test Pit No. H-11 Woods duff/loam, heavy mottling
0'-6" Frable brown sandy loam, roots throughout
6'-12" Dense tan-gray loam, roots throughout
12'-48" Dense tan-gray loam, roots throughout
SWMT = 6' NGWTD, NBRTD

Test Pit No. H-12 Woods duff/loam, no apparent mottling
0'-15" Frable brown sandy loam, roots throughout
15'-24" Frable brown sandy loam, roots throughout
24'-34" Dense tan-gray loam, roots throughout
SWMT = 24' NGWTD, NBRTD

Test Pit No. H-13 Woods duff/loam, no apparent mottling
0'-18" Frable brown sandy loam, roots throughout
18'-38" Dense tan-gray loam, roots throughout
SWMT = 18' NGWTD

Test Pit No. H-14 Woods duff/loam, no apparent mottling
0'-18" Frable brown sandy loam, roots throughout
18'-38" Dense tan-gray loam, roots throughout
SWMT = 18' NGWTD

Test Pit No. H-15 Woods duff/loam, few stones, no apparent mottling
0'-30" Frable brown sandy loam, roots throughout
30'-43" Dense tan-gray loam, roots throughout
SWMT = 30' NGWTD, NBRTD

Shallow Hole No. A-2
0'-6" Woods duff/loam
6'-15" Frable brown sandy loam, roots throughout, some mottling
15'-19" Dense tan-gray loam, roots throughout
SWMT = 8' NGWTD, NBRTD

Note: Percolation test performed at depth of 40", no bedrock to depth.

Shallow Hole No. A-3
0'-6" Woods duff/loam
6'-15" Frable brown sandy loam, no apparent mottling
15'-25" Frable brown sandy loam, no apparent mottling
25'-34" Frable brown sandy loam, no apparent mottling
Percolation Rate = 17 minutes per inch

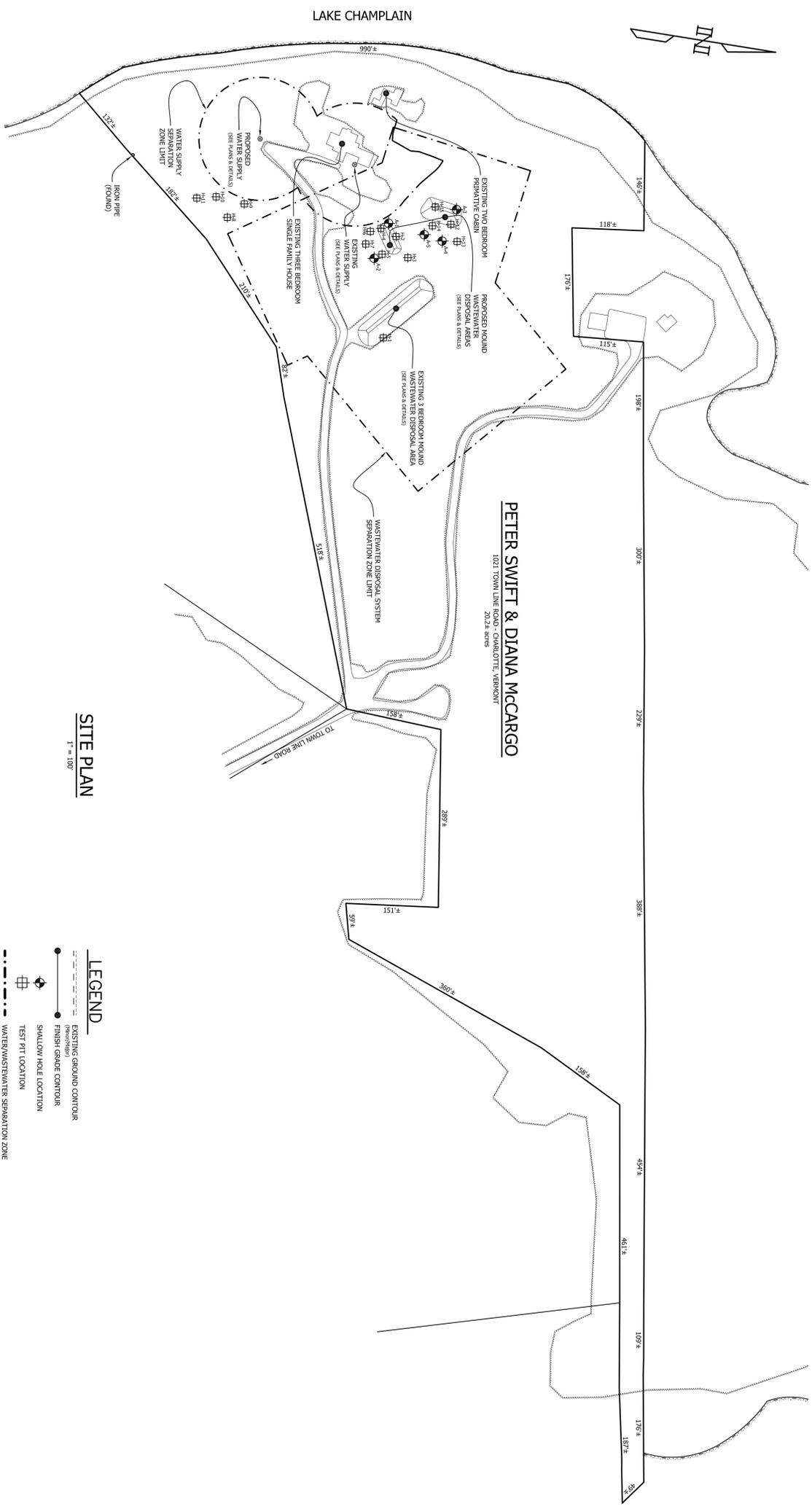
Note: Percolation test performed at depth of 24" in adjacent hole.

Shallow Hole No. A-4
0'-6" Woods duff/loam
6'-18" Frable brown sandy loam, no apparent mottling
18'-38" Frable brown sandy loam, no apparent mottling
SWMT = 18' NGWTD

Shallow Hole No. A-5
0'-6" Woods duff/loam
6'-20" Frable brown sandy loam, no apparent mottling
20'-38" Frable brown sandy loam, no apparent mottling
SWMT = 20' NGWTD

Note: Probed for bedrock to depth of 35', no bedrock to depth.

PETER SWIFT & DIANA MCCARGO
1021 TOWN LINE ROAD - CHARLOTTE, VERMONT
303.2.3400



SITE PLAN

1" = 100'

- LEGEND**
- EXISTING GROUND CONTOUR
 - PROPOSED GROUND CONTOUR
 - FINISH GRADE CONTOUR
 - SHALLOW HOLE LOCATION
 - TEST PIT LOCATION
 - WATER/WASTEWATER SEPARATION ZONE

NOTICE TO PROPERTY OWNER

- Project Description** - This proposal is for the demolition of the existing two bedroom primitive cabin and the existing three bedroom house currently served by an on-site mound wastewater disposal system and existing drilled bedrock well. A new two bedroom **CABIN** will be constructed in the same general area of the existing cabin and will be connected to the existing drilled bedrock well and existing mound wastewater disposal system. A future four bedroom **HOUSE** is proposed in the same general area of the existing house. The **HOUSE** will be served by a filtrate disposal system that discharges to two new mound wastewater disposal areas. At the time of the **HOUSE** construction, a new drilled well will be constructed for the **CABIN** and the **HOUSE** will be connected to the existing drilled well.
- The information shown on these plans and details represent the results of a field survey and testing program intended to produce a system design in accordance with state guidelines.
- Prior to engaging a contractor or commencing construction, the owner is encouraged to study this information and/or solicit information from the Designer. The proper functioning of the completed system is dependent upon careful attention to the details and notes provided. Modifications to the design and specifications or omissions of construction procedures may lead to premature failure and render the system untractable, in either case the Designer cannot be held responsible for subsequent problems.
- The owner is encouraged to seek professional assistance in monitoring and certifying compliance with the approved plans. As specified in the above construction notes, the owner or contractor is responsible for coordinating the schedule of construction and construction supervision.
- The owner/contractor is responsible for assuring proper certification testing and inspections are carried out in accordance with the notes and details provided on these drawings.
- Before commencing construction, all applicable state and local permits must be secured by the owner. This is the responsibility of the owner, not the Designer.
- This office will not certify any construction of systems depicted on these drawings unless:
 - Prior to all construction arrangements are made with this office to provide such certification services;
 - Construction is completed in strict adherence with the approved project plans;
 - All changes to these plans, whether or not independently observable by the Designer, are to be reported to the Designer by the Contractor for a suitability determination; and
 - All changes to the approved project plans have been authorized by this office and approved by all appropriate reviewing agencies.

Wastewater Disposal System Maintenance Schedule:

Use of the Advantech™ AX20-R2 Treatment system will require the owner(s) to maintain a valid maintenance contract as per the State of Vermont Innovative/Alternative System Approval #2001-01-R3 (2009 Renewal). A copy of this approval has been attached to the permit application and additional copies may be found at the following internet address:

<http://www.am.state.vt.us/dec/www/innovative.htm>

The following maintenance schedule was copied from the Vermont Wastewater System and Potable Water Supply Rules, Chapter 1, Appendix 3-A. This schedule should be followed to insure proper operation of the sewage disposal system:

3-A-01 Septic Tank Specifications & Maintenance

(b) Maintenance

(1) At least once a year, the depth of sludge and scum in the septic tank should be measured*. The tank should be pumped if:

- The sludge is closer than twelve inches to the outlet baffle, or
 - The scum layer is closer than three inches to the septic tank outlet baffle.
- (C) Following septic tank cleaning in units over 5,000 gallons, all interior surfaces of the tank should be inspected for leaks and cracks.
- (2) At least once a year, dosing tanks and distribution boxes should be opened and settled solids removed as necessary and the dosing tank or distribution box checked for leachiness.
- (3) Toxic or hazardous substances should in general, not be disposed of in septic systems. These substances may pass through the system in an unaltered state and contaminate groundwater or remain in the seepage and subsequently contaminate the soil or crops at the site of ultimate disposal.

If your system has a pump station or dosing siphon, it should also be checked once a year. There should not be any scum or solids present. Have station/siphon cleaned out if scum and/or solids are found. Inspect the station/siphon for cracks or groundwater infiltration. Repair any cracks found.

*Garbage grinders and water softeners/filtration equipment are not recommended for use with septic tank systems and may void warranty of advance treatment systems. If garbage grinder are connected to the septic tank, the frequency of septic/effluent filter inspections should be increased to quarterly. Discharge of water softeners/filtration equipment to dry wells, floor drains or to exterior ground surface will require additional permitting. Please contact your State Regional Office for assistance.



SITE PLAN

SWIFT & MCCARGO

1021 TOWN LINE ROAD
CHARLOTTE, VERMONT

Heindel & Noyes, Inc.

09-10-2010

NOTED

Hydrogeology • Ecology • Environmental Engineering • Consulting Scientists and Engineers

434 Shelburne Road - P. O. Box 4503
Burlington, Vermont 05406 (802) 658-4820

DATE:	NOTED	DATE:	09-10-2010
DESIGNED BY:	DWF	PROJECT NO.:	2010055
CHECKED BY:	CDH	PROJECT TITLE:	DWF
FILE:	Plan.dwg	DRAWN BY:	DWF
SHEET:	1	OF:	6

WATER SUPPLY & WASTEWATER DISPOSAL DESIGN: (FOR CABIN)

1. Design Flow for Residential Units:

The design flow for single-family residential units shall be calculated on the following requirements:

- A. The design flow for each person shall be 70 gallons per person per day;
- B. The first three bedrooms shall be assumed to have two persons per bedroom;
- C. Each additional bedroom may be assumed to one person per bedroom. When a building will be subject to rental use or when it is likely there will be extended or frequent high occupancy use, the system should be sized for at least 2 persons per bedroom.
- D. The design flow for a single-family residence on its own individual lot shall be based on a minimum of three bedrooms.

Therefore, for a 2 bedroom single-family residence, the design flow is 280 gal./day.

2. Water Supply:

The existing bedrock drilled well (Trag #348) was constructed in June 1985 to a depth of 250 feet below ground surface; bedrock began at 4 feet below ground surface. The well has a reported Well Driller's Yield of 5 gallons per minute. The well casing extends from just above ground surface to a depth of 35 feet. Prior to connecting the CABIN to the existing well the well casing shall be extended to a minimum of 18' above ground surface.

A. During construction of the HOUSE, a new drilled well will be constructed and connected to the CABIN. The existing well will then be connected to the HOUSE. The existing drilled well is as shown on the plan. Locations for drilled wells on any lots created in the future must meet the requirements of the Vermont Environmental Protection Rules, (Vermont Water Supply Rule - Chapter 21, Appendix A, Part 11.4), including the following minimum isolation distances:

Source of Contamination:	Isolation Distance:
Septic Tanks & Pump Stations:	50 feet
Sewer lines & Force Mains:	10 feet
Buildings:	15 feet
Drives:	15 feet

B. Maintain a 25-foot minimum isolation distance between water service lines and subsurface wastewater piping and related tanks.

C. Well Yield:

The Average Day Demand (ADD) for the CABIN is 280 gal./day. The Maximum Day Demand (MDD) is calculated by dividing the ADD by not more than 720 minutes. The resulting flow rate is expressed in gallons per minute and equals the minimum well yield allowed without required storage. The MDD is:

$$(280 \text{ gal./day}) / (720 \text{ minutes}) = 0.39 \text{ gallons per minute.}$$

D. However, wells that have yields less than the instantaneous Peak Demand of 5 gallons per minute may require some type of storage.

E. Conventional water saving plumbing fixtures including, but not limited to, maximum 3 1/2 gallons per flush toilets, maximum 2 g.p.m. low flow showerheads and faucet aerators shall be installed in the CABIN.

F. The Owner is responsible for assuring the CABIN well provides adequate quality and quantity before it is deemed ready for use. By this plan the Designer makes no guarantee as to well yield or quality.

3. Existing Mound Wastewater Disposal System Design:

The existing mound wastewater disposal system was designed by Nashfield Engineering Services (NES) in 1984 and was sized for a three bedroom house with a design flow of 430 gallons per day. The mound wastewater disposal system was inspected on June 7, 2010 and it was determined that the existing mound was operating properly and was acceptable for continued use for the proposed two bedroom CABIN reconstruction. On June 29, 2010, a test of the existing piping for the disposal of the mound was conducted and the results were equal to the design flow of the mound. The existing 1,000 gallon septic tank and pump station (A new 270 force main will be installed for the CABIN to replace the existing 1,000 gallon septic tank and pump station). A new 270 force main will be installed on the site of the existing lateral to accommodate testing of the new system and for future routine maintenance. Distribution pump string for the STEP based on tank location and MSE Mound Wastewater Disposal System Design follows:

A. Pressure Distribution Design:

The MSE design utilized eighteen 3/8"Ø orifices, 6' OC on two 2"Ø Sch. 40 PVC laterals.

To maintain a minimum pressure of 1.3 p.s.i. at the distal 3/8"Ø orifice, the flow through any one orifice is:

$$Q = CA \sqrt{2gh}$$

$$= 0.6 \text{ FT}^{3/2} \text{ s}^{-1/2} \times 1/12" \times \sqrt{2(32.2/\text{sec}^2)(3.0)}$$

$$= 3.0154 \text{ g.p.m.}$$

Use 2" Sch. 40 P.V.C. piping with solvent weld joints.

Find the head loss along the lateral assuming a central manifold:

Orifice #	Orifice Pressure (ft)	Orifice Flow (gpm)	Total Flow (gpm)	Segment headloss (ft)	Lateral Length (ft)	Sum of Headloss (ft)
1	3.0000	3.0154	3.0154	0.0013	6	0.0062
2	3.0013	3.0161	6.0315	0.0048	12	0.0562
3	3.0062	3.0185	9.0499	0.0102	18	0.164
4	3.0164	3.0236	12.0736	0.0174	24	0.0338
5	3.0338	3.0324	15.1059	0.0264	30	0.0602
6	3.0602	3.0455	18.1514	0.0371	36	0.0973
7	3.0973	3.0639	21.2154	0.0495	42	0.1468
8	3.1468	3.0883	24.3037	0.0636	48	0.2105
9	3.2105	3.1194	27.4230	0.0796	54	0.2900

B. Pump Sizing:

Total head losses: (Worst Case for CABIN)

Distribution piping & Residual Head = 9.4'

Pump Station & 490' of 2" P.V.C. @ 54.8 g.p.m. = 27.9'

Elevation = -5.4'

Total Dynamic Head = 31.9'

Use an Orenco 1/2 HP, PE3005 High Head Effluent Pump, single phase, 115 volt, or approved equivalent; Pump to provide 54.8 g.p.m. against 31.9 feet Total Dynamic Head.

4. Boundary and topographic information:

Topographic information is from a survey conducted by Heindel and Noyes. Boundary information was compiled from Town of Charlotte Tax Maps and information provided by the owner.

WATER SUPPLY & WASTEWATER DISPOSAL DESIGN: (FOR HOUSE)

1. Design Flow for Residential Units:

The design flow for single-family residential units shall be calculated on the following requirements:

- A. The design flow for each person shall be 70 gallons per person per day;
- B. The first three bedrooms shall be assumed to have two persons per bedroom;
- C. Each additional bedroom may be assumed to one person per bedroom. When a building will be subject to rental use or when it is likely there will be extended or frequent high occupancy use, the system should be sized for at least 2 persons per bedroom.
- D. The design flow for a single-family residence on its own individual lot shall be based on a minimum of three bedrooms.

Therefore, for a 4 bedroom single-family residence, the design flow is 490 gal./day.

2. Water Supply:

A. During construction of the HOUSE, a new drilled well will be constructed and connected to the CABIN. The existing well will then be connected to the HOUSE. The existing drilled well is as shown on the plan. Locations for drilled wells on any lots created in the future must meet the requirements of the Vermont Environmental Protection Rules, (Vermont Water Supply Rule - Chapter 21, Appendix A, Part 11.4), including the following minimum isolation distances:

Source of Contamination:	Isolation Distance:
Septic Tanks & Pump Stations:	50 feet
Sewer lines & Force Mains:	10 feet
Buildings:	15 feet
Drives:	15 feet

B. Maintain a 25-foot minimum isolation distance between water service lines and subsurface wastewater piping and related tanks.

C. Well Yield:

The Average Day Demand (ADD) for the HOUSE is 490 gal./day. The Maximum Day Demand (MDD) is calculated by dividing the ADD by not more than 720 minutes. The resulting flow rate is expressed in gallons per minute and equals the minimum well yield allowed without required storage. The MDD is:

$$(490 \text{ gal./day}) / (720 \text{ minutes}) = 0.68 \text{ gallons per minute.}$$

D. However, wells that have yields less than the instantaneous Peak Demand of 5 gallons per minute may require some type of storage. The Well Driller's Yield for the existing well was reported to be 5 gallons per minute.

E. Conventional water saving plumbing fixtures including, but not limited to, maximum 3 1/2 gallons per flush toilets, maximum 2 g.p.m. low flow showerheads and faucet aerators shall be installed in the HOUSE.

F. The Owner is responsible for assuring the CABIN well provides adequate quality and quantity before it is deemed ready for use. By this plan the Designer makes no guarantee as to well yield or quality.

3. Wastewater Disposal System Design:

A. Required Wastewater Disposal Area:

The mound wastewater disposal system for the HOUSE will utilize an Advantex™ AX20-RT filtrate disposal unit that will discharge to two mound wastewater disposal areas each capable of handling half of the design flow, (North & East). Based on filtrate effluent, the maximum application rate for a mound wastewater disposal system is 2.0 gal./sf./day.

The required mound wastewater disposal area for a four-bedroom house, at a design flow of 490 gal./day is:

$$(490 \text{ gal./day}) / (2.0 \text{ gal./sf./day}) = 245.0 \text{ s.f.}$$

For a 3.5 foot wide trench, 70.0 l.f. of trench is needed; use 2 - 3.5ft. X 35ft. trench mounds with 12 inches of sand beneath the uphill edge of mound disposal trench; design provides 240 s.f. of wastewater disposal area.

A Hydrogeologic Capacity Analysis prepared by Craig D. Heindel, CPG confirms depth of mound sand and minimum freeboard requirements for the two mound wastewater disposal areas. A copy of the Hydrogeologic Capacity Analysis has been attached to the Wastewater System & Potable Water Supply permit application.

B. Basal Area:

Based on a design percolation rate of 33 minutes per inch, the effective basal application rate is 0.74 gal./s.f./day.

The required basal area, for each mound, is:

$$(245 \text{ gal./day}) / (0.74 \text{ gal./s.f./day}) = 332 \text{ s.f.}$$

Minimum basal area provided by each mound is 1,453 s.f.

C. Pressure Distribution Design:

At one orifice per 25 s.f. of disposal area, a minimum of 4.9 orifices are required for each mound. Use 17 orifices on one 32 ft. line at 2.0 ft. O.C. for each mound in the distribution system.

For a 1/4" orifice and a minimum pressure of 1.3 p.s.i. at the distal orifice, the flow through any one orifice is:

$$Q = CA \sqrt{2gh}$$

$$= 0.6 \text{ FT}^{3/2} \text{ s}^{-1/2} \times 1/12" \times \sqrt{2(32.2/\text{sec}^2)(3.0)}$$

$$= 1.3402 \text{ g.p.m.}$$

Use 1 1/2" Sch. 40 P.V.C. piping with solvent weld joints.

Find the head loss along the lateral assuming an end manifold:

Orifice #	Orifice Pressure (ft)	Orifice Flow (gpm)	Total Flow (gpm)	Segment headloss (ft)	Lateral Length (ft)	Sum of Headloss (ft)
1	3.0000	1.3402	1.3402	0.0003	0	0.0003
2	3.0003	1.3402	2.6804	0.0012	2	0.0015
3	3.0015	1.3405	4.0209	0.0026	4	0.0041
4	3.0041	1.3411	5.3620	0.0044	6	0.0085
5	3.0085	1.3421	6.7041	0.0066	8	0.0151
6	3.0151	1.3435	8.0477	0.0093	10	0.0244
7	3.0244	1.3456	9.3933	0.0123	12	0.0367
8	3.0367	1.3483	10.7416	0.0158	14	0.0525
9	3.0525	1.3519	12.0935	0.0197	16	0.0722
10	3.0722	1.3562	13.4497	0.0240	18	0.0962
11	3.0962	1.3615	14.8112	0.0287	20	0.1248
12	3.1248	1.3678	16.1789	0.0337	22	0.1586
13	3.1586	1.3751	17.5541	0.0392	24	0.1978
14	3.1978	1.3837	18.9377	0.0451	26	0.2430
15	3.2430	1.3934	20.3311	0.0515	28	0.2944
16	3.2944	1.4044	21.7355	0.0583	30	0.3527
17	3.3527	1.4168	23.1523	0.0655	32	0.4182

D. Pump Sizing:

The mounds will be dosed by a Duplex Pump Basin located at the discharge of the Advantex™ AX20-RT filtrate disposal unit. The basin will have a discharge pump for each mound; the control panel will alternate pumps providing equal distribution of treated effluent. The sizing for each pump is:

Total head losses: (Worst Case for North Mound)

Distribution piping & Residual Head = 4.5'

Pump Station & 160' of 2" P.V.C. @ 23.1 g.p.m. = 2.5'

Elevation = 26.3'

Total Dynamic Head = 33.3'

Use an Orenco 1/2 HP, PE3005 High Head Effluent Pump, single phase, 115 volt, or approved equivalent; Pump to provide 23.1 g.p.m. against 33.3 feet Total Dynamic Head.

Total head losses: (Worst Case for East Mound)

Distribution piping & Residual Head = 4.5'

Pump Station & 100' of 2" P.V.C. @ 23.1 g.p.m. = 1.9'

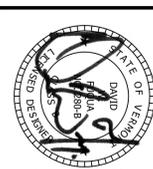
Elevation = 11.3'

Total Dynamic Head = 17.7'

Use an Orenco 1/2 HP, PE3005 High Head Effluent Pump, single phase, 115 volt, or approved equivalent; Pump to provide 23.1 g.p.m. against 17.7 feet Total Dynamic Head.

4. Boundary and topographic information:

Topographic information is from a survey conducted by Heindel and Noyes. Boundary information was compiled from Town of Charlotte Tax Maps and information provided by the owner.



DESIGN NOTES

SWIFT & MCCARGO

1021 TOWN LINE ROAD
CHARLOTTE, VERMONT

Heindel & Noyes, Inc.

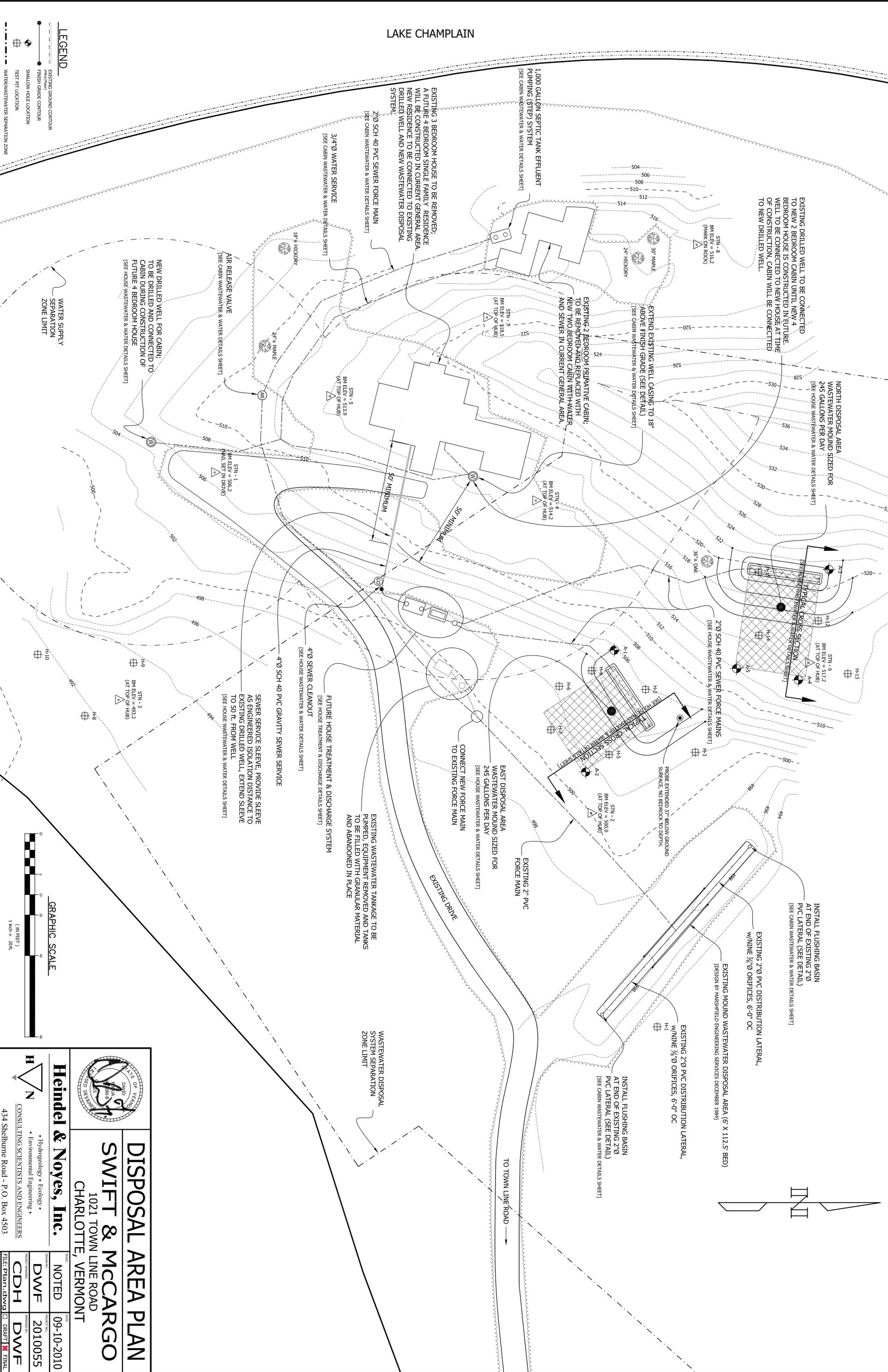
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CONSULTING SCIENTISTS AND ENGINEERS

434 Shelburne Road - P. O. Box 4503
Burlington, Vermont 05406 (802) 658-4820

DATE:	NOTED	DATE:	09-10-2010
PROJECT:	DWF	PROJECT NO.:	2010055
PROJECT QUOTE:	CDH	APPROVED BY:	DWF
FILE: Plan.dwg	DRAWN	DATE:	6
SHEET:	2	OF:	6

LAKE CHAMPLAIN



EXISTING DRILLED WELL TO BE CONNECTED TO NEW 2 BEDROOM CABIN UNTIL NEW 4 BEDROOM HOUSE IS CONSTRUCTED. IN FUTURE, WELL TO BE CONNECTED TO NEW HOUSE AT TIME OF CONSTRUCTION, CABIN WILL BE CONNECTED TO NEW DRILLED WELL.

NORTH DISPOSAL AREA
WASTEWATER MOUND SIZED FOR
245 GALLONS PER DAY
[SEE HOUSE WASTEWATER & WATER DETAILS SHEET]

EXISTING 2 BEDROOM PRIMITIVE CABIN TO BE REMOVED AND REPLACED WITH NEW TWO BEDROOM CABIN WITH WATER AND SEWER IN CURRENT GENERAL AREA.

1,000 GALLON SEPTIC TANK EFFLUENT PUMPING (STEP) SYSTEM
[SEE CABIN WASTEWATER & WATER DETAILS SHEET]

EXISTING 3 BEDROOM HOUSE TO BE REMOVED; A FUTURE 4 BEDROOM SINGLE FAMILY RESIDENCE WILL BE CONSTRUCTED IN CURRENT GENERAL AREA. NEW RESIDENCE TO BE CONNECTED TO EXISTING DRILLED WELL AND NEW WASTEWATER DISPOSAL SYSTEM.

3/4" Ø WATER SERVICE
[SEE CABIN WASTEWATER & WATER DETAILS SHEET]

2" Ø SCH 40 PVC SEWER FORCE MAIN
[SEE CABIN WASTEWATER & WATER DETAILS SHEET]

AIR RELEASE VALVE
[SEE CABIN WASTEWATER & WATER DETAILS SHEET]

NEW DRILLED WELL FOR CABIN; TO BE DRILLED AND CONNECTED TO CABIN DURING CONSTRUCTION OF FUTURE 4 BEDROOM HOUSE
[SEE HOUSE WASTEWATER & WATER DETAILS SHEET]

TYPICAL CROSS SECTION
[SEE HOUSE WASTEWATER & WATER DETAILS SHEET]

2" Ø SCH 40 PVC SEWER FORCE MAINS
[SEE HOUSE WASTEWATER & WATER DETAILS SHEET]

EAST DISPOSAL AREA
WASTEWATER MOUND SIZED FOR
245 GALLONS PER DAY
[SEE HOUSE WASTEWATER & WATER DETAILS SHEET]

CONNECT NEW FORCE MAIN TO EXISTING FORCE MAIN

EXISTING WASTEWATER TANKAGE TO BE PUMPED, EQUIPMENT REMOVED AND TANKS TO BE FILLED WITH GRANULAR MATERIAL AND ABANDONED IN PLACE

4" Ø SCH 40 PVC GRAVITY SEWER SERVICE
[SEE HOUSE WASTEWATER & WATER DETAILS SHEET]

4" Ø SEWER CLEANOUT
[SEE HOUSE WASTEWATER & WATER DETAILS SHEET]

SEWER SERVICE SLEEVE, PROVIDE SLEEVE AS ENGINEERED ISOLATION DISTANCE TO EXISTING DRILLED WELL, EXTEND SLEEVE TO 50 FT. FROM WELL
[SEE HOUSE WASTEWATER & WATER DETAILS SHEET]

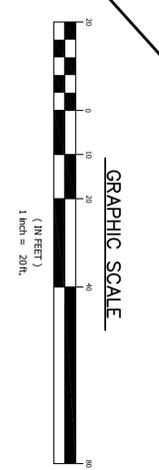
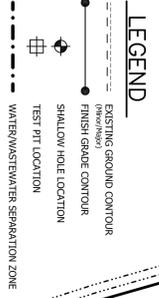
INSTALL FLUSHING BASIN AT END OF EXISTING 2" Ø PVC LATERAL (SEE DETAIL)
[SEE CABIN WASTEWATER & WATER DETAILS SHEET]

EXISTING 2" Ø PVC DISTRIBUTION LATERAL, W/NINE 3/8" Ø ORIFICES, 6'-0" OC

EXISTING MOUND WASTEWATER DISPOSAL AREA (6' X 112.5' BED)
[DESIGN BY HAWKSHIELD ENGINEERING SERVICES DECEMBER 1991]

EXISTING 2" Ø PVC DISTRIBUTION LATERAL, W/NINE 3/8" Ø ORIFICES, 6'-0" OC

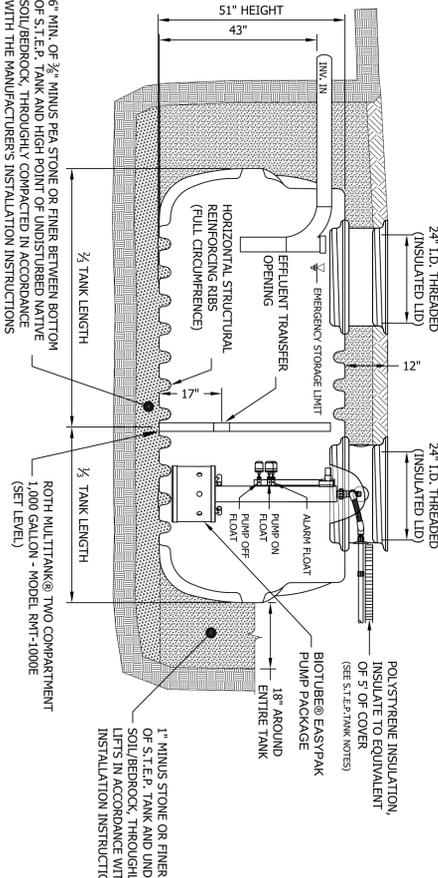
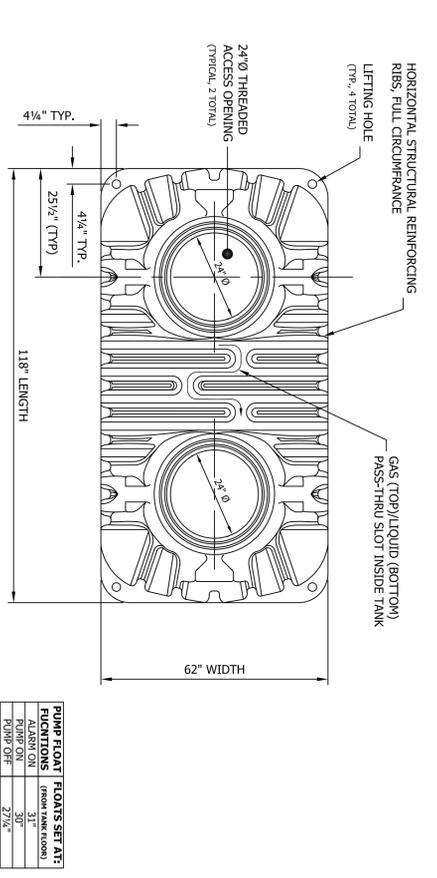
INSTALL FLUSHING BASIN AT END OF EXISTING 2" Ø PVC LATERAL (SEE DETAIL)
[SEE CABIN WASTEWATER & WATER DETAILS SHEET]



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DISPOSAL AREA PLAN
SWIFT & MCCARGO
1021 TOWN LINE ROAD
CHARLOTTE, VERMONT

DATE:	NOTED	DATE:	09-10-2010
PROJECT:	DWF	PROJECT:	2010055
PROJECT MANAGER:	CDH	PROJECT MANAGER:	DWF
FILE:	Plan.dwg	DATE:	6
SHEET:	3	OF:	6



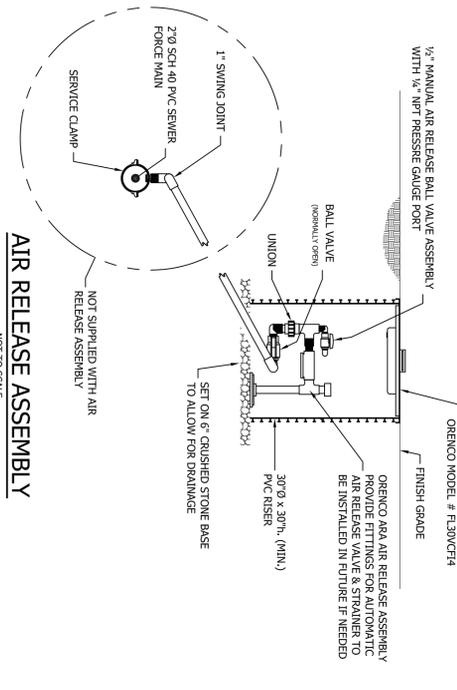
PUMP FLOAT FLOATS SET AT:	
FUNCTION	(FROM TANK LID)
PIPE ON	3/8"
PIPE OFF	27/16"

1,000 GALLON S.T.E.P. TANK DETAIL

NOT TO SCALE

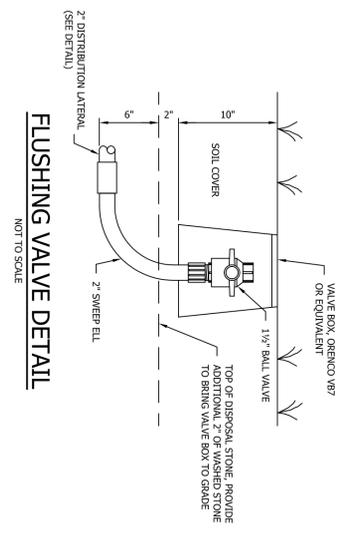
S.T.E.P. TANK NOTES:

1. PROVIDE A HIGH WATER/AUDIO AND VISUAL ALARM, TO BE INSTALLED ON BUILDING.
2. PROVIDE 280 GALLONS OF EMERGENCY STORAGE ABOVE THE ALARM FLOAT. DESIGN PROVIDES 296 GALLONS OF STORAGE BETWEEN TANK INLET INVERT AND HIGH WATER ALARM.
3. SUPPLIERS TO CERTIFY SUITABILITY OF TANK/KIT & EQUIPMENT BASED ON SITE CONDITIONS.
4. CONTRACTOR TO INSTALL TANK IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION PROCEDURES, INCLUDING BUT NOT LIMITED TO ANTI-FLOATATION MEASURES, ETC... FAILURE TO PROPERLY COMPACT BEDDING AND BACKFILL MATERIAL WILL VOID MANUFACTURER'S WARRANTY.
5. CONTRACTOR TO CONTACT DESIGNER DURING TANK EXCAVATION. TO VERIFY IF ADDITIONAL MEASURES WILL BE REQUIRED.
6. PROVIDE RIGID STRUCTURAL POLYSTYRENE INSULATION OVER FORCE MAIN SPRING FROM TANK TO MINIMUM BURY DEPTH. SEWER FORCE MAINS THAT DO NOT MEET MINIMUM BURY DEPTH SHALL BE INSULATED TO MEET MINIMUM REQUIREMENTS WITH RIGID STRUCTURAL POLYSTYRENE INSULATION. (THICKNESS AS SHOWN ON PLANS OR AS DIRECTED BY DESIGNER). 1" INSULATION IS EQUIVALENT TO 1ft. OF COVER.
7. DOSE VOLUME: 75 GALLONS/DOSE.



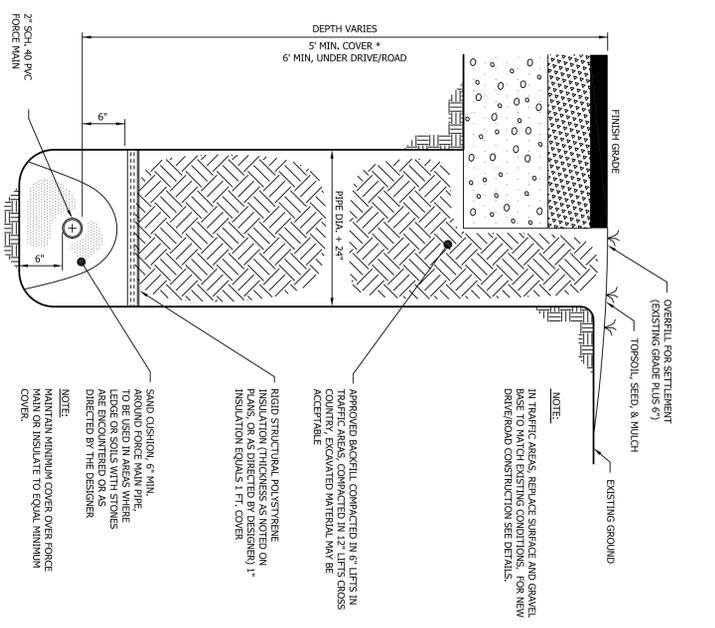
AIR RELEASE ASSEMBLY

NOT TO SCALE



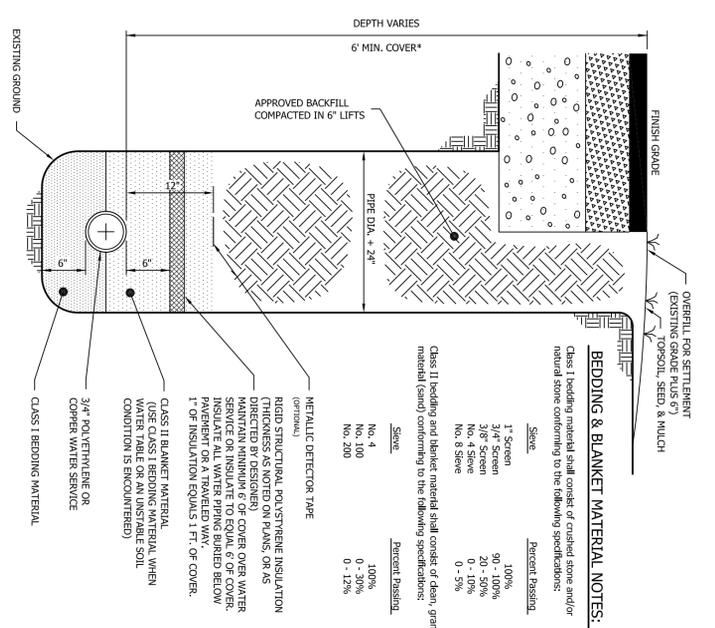
FLUSHING VALVE DETAIL

NOT TO SCALE



SEWER FORCE MAIN TRENCH DETAIL

NOT TO SCALE



WATER SERVICE TRENCH DETAIL

NOT TO SCALE

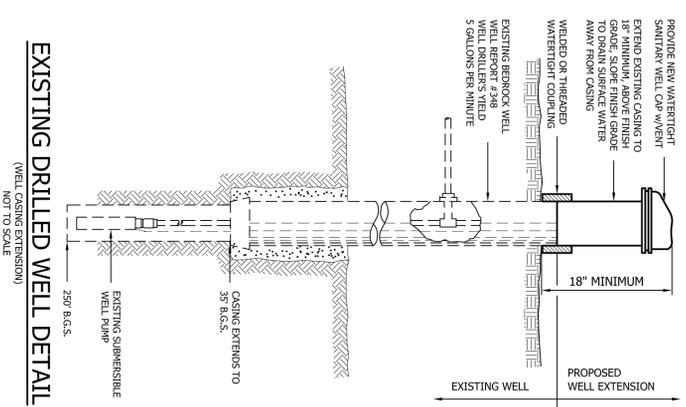
BEDDING & BLANKET MATERIAL NOTES:

Class I bedding material shall consist of crushed stone and/or natural stone conforming to the following specifications:

Screen	Percent Passing
1" Screen	100%
3/4" Screen	90 - 100%
3/8" Screen	20 - 50%
No. 4 Sieve	0 - 10%
No. 10 Sieve	0 - 5%

Class II bedding and blanket material shall consist of clean granular material (sand) conforming to the following specifications:

Screen	Percent Passing
No. 4	100%
No. 10	0 - 30%
No. 20	0 - 12%



EXISTING DRILLED WELL DETAIL

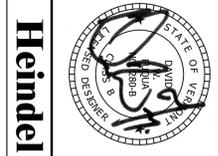
NOT TO SCALE

CABIN

WASTEWATER & WATER DETAILS

SWIFT & MCCARGO

1021 TOWN LINE ROAD
CHARLOTTE, VERMONT

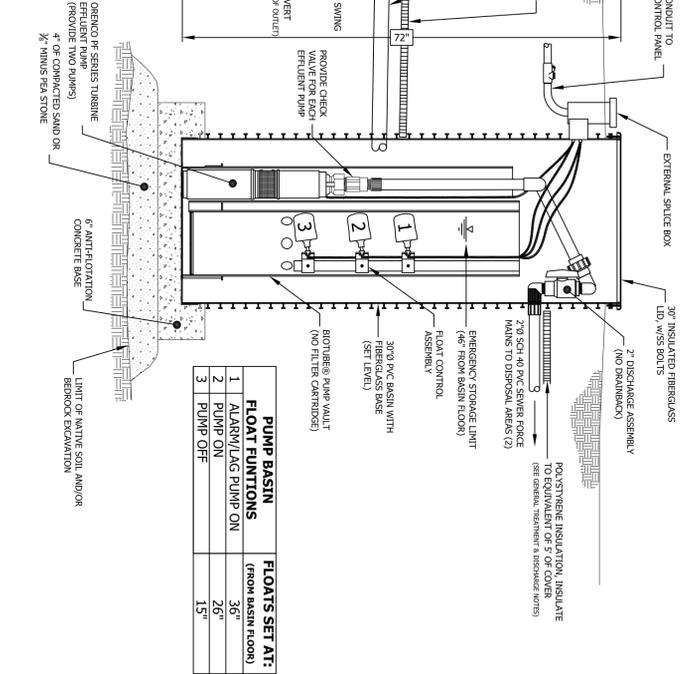
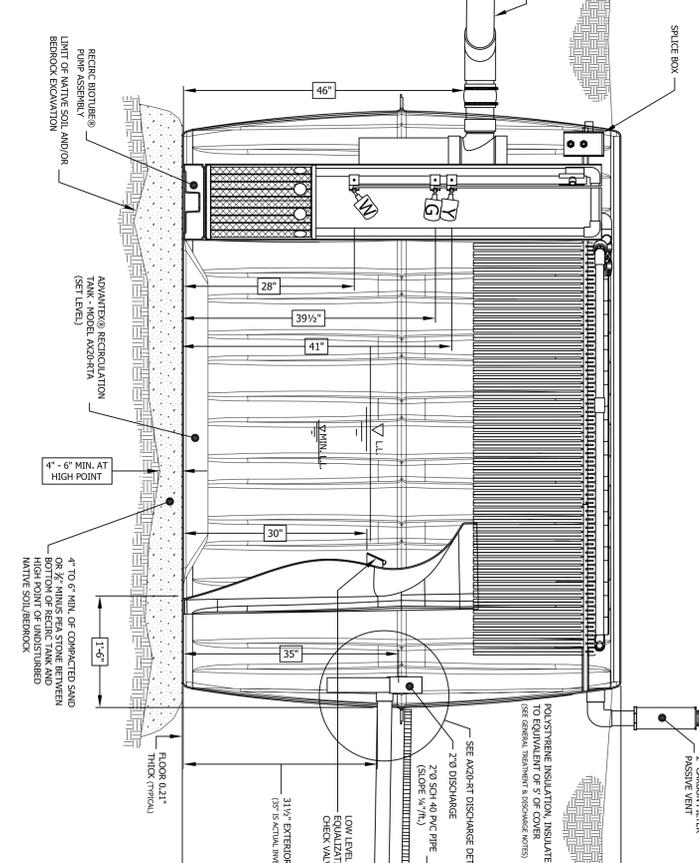
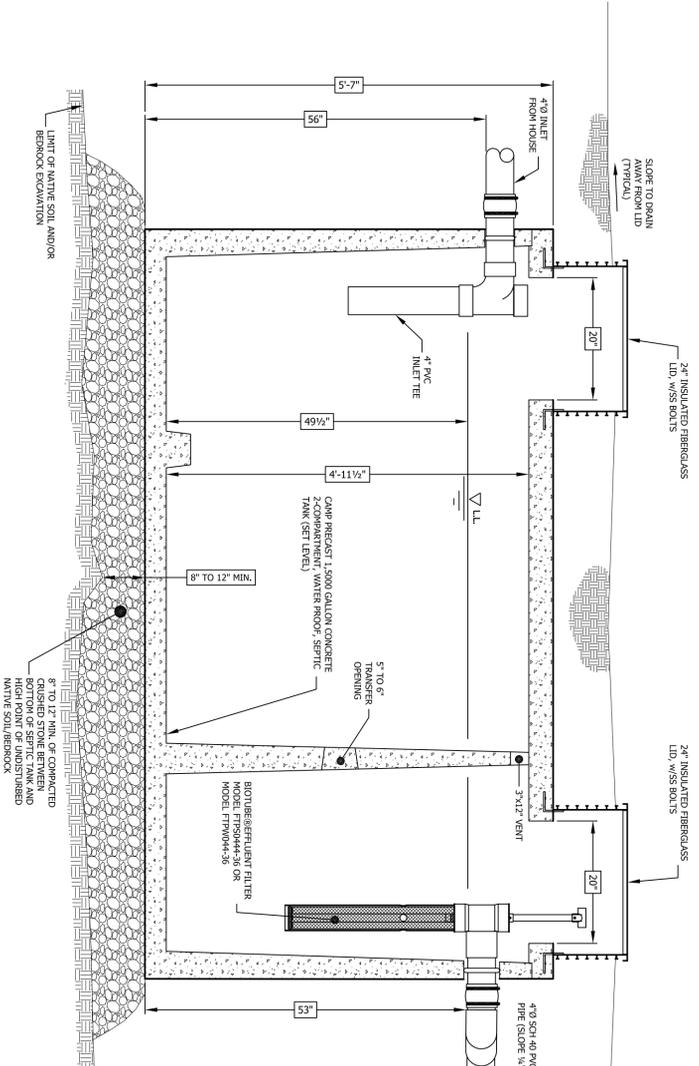
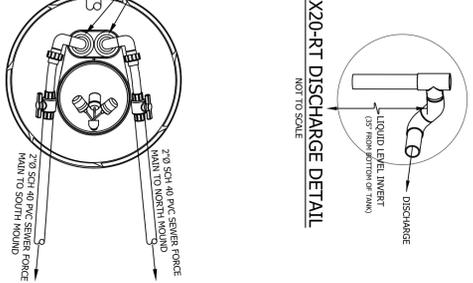
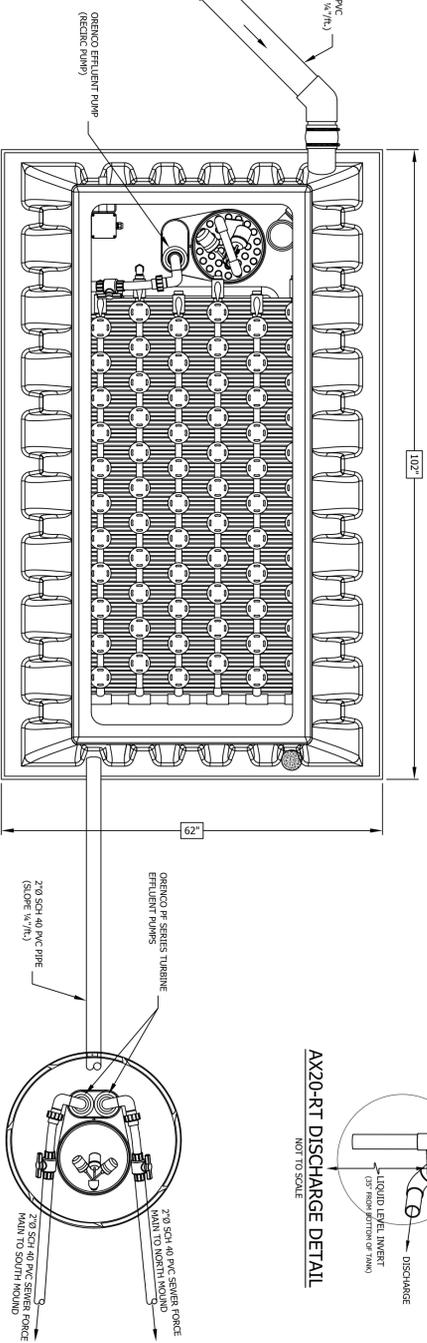
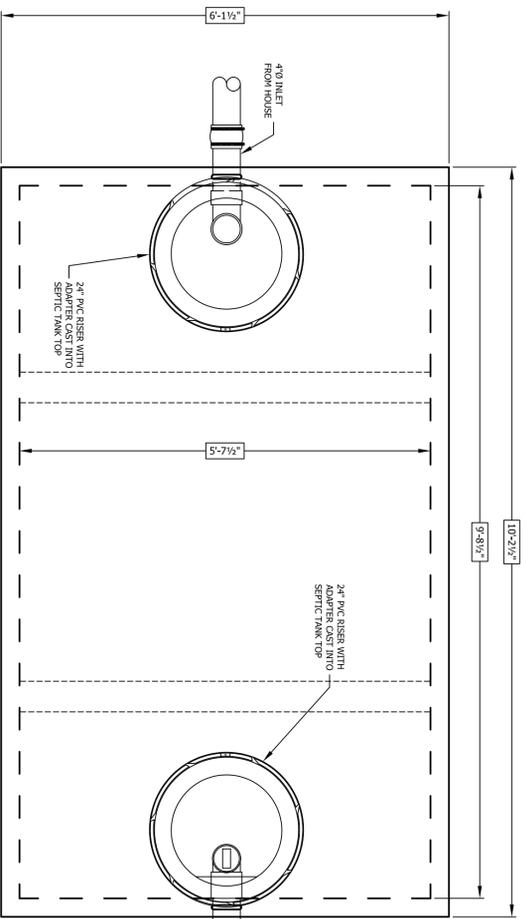


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SCALE	NOTED	DATE	09-10-2010
PROJECT	TJD	PROJECT NO.	2010055
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FILE: Detail2.dwg	DRAFT	DATE	6
SHEET	4	OF	6



PUMP BASIN	FLOATS SET AT:
1. ALARMS PUMP ON	36"
2. PUMP ON	20"
3. PUMP OFF	15"

1,500 GALLON SEPTIC TANK DETAIL
NOT TO SCALE

AX20-RT RECIRCULATION TANK DETAIL
NOT TO SCALE

30"Ø DUPLEX PUMP BASIN DETAIL
NOT TO SCALE

GENERAL TREATMENT & DISCHARGE NOTES:

1. PROVIDE A HIGH WATER AUDIO AND VISUAL ALARM, TO BE INSTALLED ON PEDISTAL.
2. PROVIDE 122.5 GALLONS OF EMERGENCY STORAGE ABOVE THE ALARM FLOAT. DESIGN PROVIDES 140 GALLONS OF STORAGE BETWEEN AX20RT INLET INVERT AND HIGH WATER ALARM. (110 GALLONS IN AX20RT TANK AND 30 GALLONS IN PUMP BASIN)
3. PROVIDE RIGID STRUCTURAL POLYSTYRENE INSULATION OVER DISCHARGE PIPING FROM AX20-RT TO DUPLEX PUMP BASIN. SEWER FORCE MAINS THAT DO NOT MEET MINIMUM BURY DEPTH SHALL BE INSULATED TO MEET MINIMUM REQUIREMENTS WITH RIGID STRUCTURAL POLYSTYRENE INSULATION. (THICKNESS AS SHOWN ON PLANS OR AS DIRECTED BY DESIGNER). 1" INSULATION IS EQUIVALENT TO 1ft. OF COVER.
4. SUPPLIERS TO CERTIFY SUITABILITY OF TANKAGE & EQUIPMENT BASED ON SITE CONDITIONS.
5. DOSE VOLUME: 30 GALLONS/DOSE.

ELEVATION VIEWS



CONTROL PANEL DETAIL
NOT TO SCALE

- AX20-RT NOTES:**
1. PHONE LINE WITH MINIMUM SERVICE IS REQUIRED. DOES NOT NEED TO BE A DEDICATED LINE.
 2. TANK COORDINATION AND APPROVAL BY WTI IS REQUIRED PRIOR TO CONSTRUCTION. TANK MUST MEET MINIMUM STRUCTURAL STANDARDS AND BE TESTED FOR WATER TIGHTNESS.
 3. PROVIDE AND INSTALL ANTI-FLOTTATION FOR AX20-RT AS PER MANUFACTURER'S/SUPPLIER'S RECOMMENDATIONS.
 4. FLOAT AND ASV SETTINGS BASED ON TYPICAL FLOW APPLICATIONS - MAY BE MODIFIED BASED UPON DESIGN/FIELD VARIATION.
 5. MANUFACTURER REQUIRES THIS SYSTEM TO BE INSTALLED AND MAINTAINED BY A TRAINED/AUTHORIZED INSTALLER/MAINTENANCE PROVIDER. FAILURE TO MAINTAIN AN ONGOING O&M PROGRAM MAY RESULT IN VOIDING OF ALL WARRANTIES. OTHER STATE AND/OR LOCAL REQUIREMENTS OR REGULATIONS MAY APPLY.
 6. FOR MORE DETAILS REGARDING COMPONENTS, INSTALLATION OR OPERATION OF THIS SYSTEM; PLEASE CONTACT WASTEWATER TECHNOLOGIES, INC. MILTON, VT 877-212-2419
- DESIGN NOTES:**
- Expected Inlet Quality
 $Q_{max} = 500$ gpd
 Up to 4 Bedrooms
- Typical Effluent Quality
 BOD: < 10 mg/L
 TSS: < 10 mg/L
 NH₃: < 22 mg/L
 TN: < 22 mg/L



Heindel & Noyes, Inc.

• Hydrogeology • Ecology •
• Environmental Engineering •

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TREATMENT & DISCHARGE DETAILS

SWIFT & MCCARGO

1021 TOWN LINE ROAD
CHARLOTTE, VERMONT

DATE: **NOTED** 09-10-2010

PROJECT: **DWF** 2010055

PROJECT NUMBER: **CDH**

DATE: **DWF**

FILE: Details.dwg

SHEET: **6** OF **6**