



POINT BAY MARINA WASTEWATER SYSTEM AND POTABLE WATER SUPPLY APPLICATION

TCE 15-203
1401 Thompson Point Road
Charlotte, VT

Date:
March 2016

Prepared For:
PBM Acquisition, LLC
1401 Thompson Point Road
Charlotte, VT 05445

Prepared By:
John P. Pitrowiski, P.E.



WASTEWATER SYSTEM AND POTABLE WATER SUPPLY
PERMIT APPLICATION

TABLE OF CONTENTS

1. SITE REPORT
2. ANR FORM 5
3. ANR INTEREST LOCATOR MAP & HAZARDOUS SITE LIST
4. FEMA MAP
5. WASTEWATER SYSTEM AND POTABLE WATER SUPPLY APPLICATION
6. LINCOLN GEOLOGY EFFLUENT MOUNDING REPORT
7. GRAIN SIZE DISTRIBUTION – TEST PIT SAMPLES
8. PERC TEST RESULTS
9. DESIGN CALCULATIONS
10. WELL REPORTS (STATE DATABASE)
11. WSID 8204 INFORMATION
12. PUMP SPECIFICATION – BARNES SGV & RAIL SYSTEM
13. EXISTING PERMITS
14. REFERENCE MATERIAL PREVIOUS PERMITS
15. ATTACHED DRAWINGS
 - a. COVER
 - b. C1-00 LEGEND AND NOTES
 - c. C1-02 EXISTING CONDITIONS
 - d. C1-03 EXISTING CONDITIONS
 - e. C2-01 OVERALL SITE PLAN
 - f. C3-01 SANITARY PLAN
 - g. C3-02 SANITARY PLAN
 - h. C3-03 MOUND CROSS SECTION
 - i. C3-04 FORCEMAIN PROFILE
 - j. C8-01 SANITARY DETAILS
 - k. C8-02 SANITARY NOTES
 - l. C8-05 PUMP STATION PROFILE VIEW
 - m. C8-04 PUMP STATION PLAN VIEW
 - n. C8-07 WATER AND SANITARY DETAILS

SITE REPORT

The applicant, PBM Acquisition LLC, is submitting this wastewater system and potable water supply permit application to approve a new wastewater system at 1401 Thompson Point Road in Charlotte, Vermont. The existing parcel is approximately 25.6 acres in size with numerous approved wastewater systems within the property. Refer to the Site Plan for permit approvals for each system. Currently the site is approved under WW-4-0209-3 and this amendment is for a new 74 seat restaurant in an existing picnic/open building area which will include new construction and 1,998 gpd additional proposed flows.

The proposed wastewater system will utilize a 3,000 gallon grease trap and a 3,000 gallon holding tank before effluent enters a duplex pump station which will pump effluent to either Mound A or Mound B, each sized to handle 2,000 gpd. The fields will be manually alternated bi-annually. Lincoln Applied Geology, Inc. has provided TCE with an effluent mounding analysis for disposal area design and their report is included with this application.

Water for the project will be provided from an on-site existing drilled well. Water supply calculations are included with this application. The WSID for the well is 8204 and is a TNC supply. A new 2,000 gallon water storage tank will be required for this project to meet the project demands.

With the submission of this application, we propose to withdraw the previously proposed 4-bedroom single family home and on-site water and wastewater under WW-4-0209-1 as it was never constructed nor will it be. The A-Frame building and Slips/Moorings flows (currently 1098 gpd) have always been included as one design flow and we have continued this pattern for the water supply since they both draw from the same source, WSID 8204. Since the WW application requires each structure list the wastewater disposal system, the flow was split. The A-Frame disposes of bathroom waste on-site, in ground and the Slips/Moorings dispose of boat waste in a 4,000 gallon holding tank. For this, 110 gpd was assigned to the A-Frame and 998 gpd for the Slips/Moorings. NO CHANGE is proposed to the A-Frame or Slips/Moorings water or wastewater demands under this application.

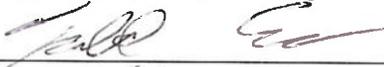
Three hazardous waste sites were identified within a one mile radius of the site and a list of these sites can be found within this application. No increased threat of contamination is anticipated to the proposed water sources as part of this project as the sites are closed.

ANR Form 5: Certification Statement for Wastewater System and Potable Water Supply Permits when there is no Required Notification of Overshadowed Property Owner(s)

A person submitting an application to the Secretary for a Wastewater System and Potable Water Supply Permit shall use this statement whenever overshadowing notification of affected landowners is not required (see guidance and instructions for examples).

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

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

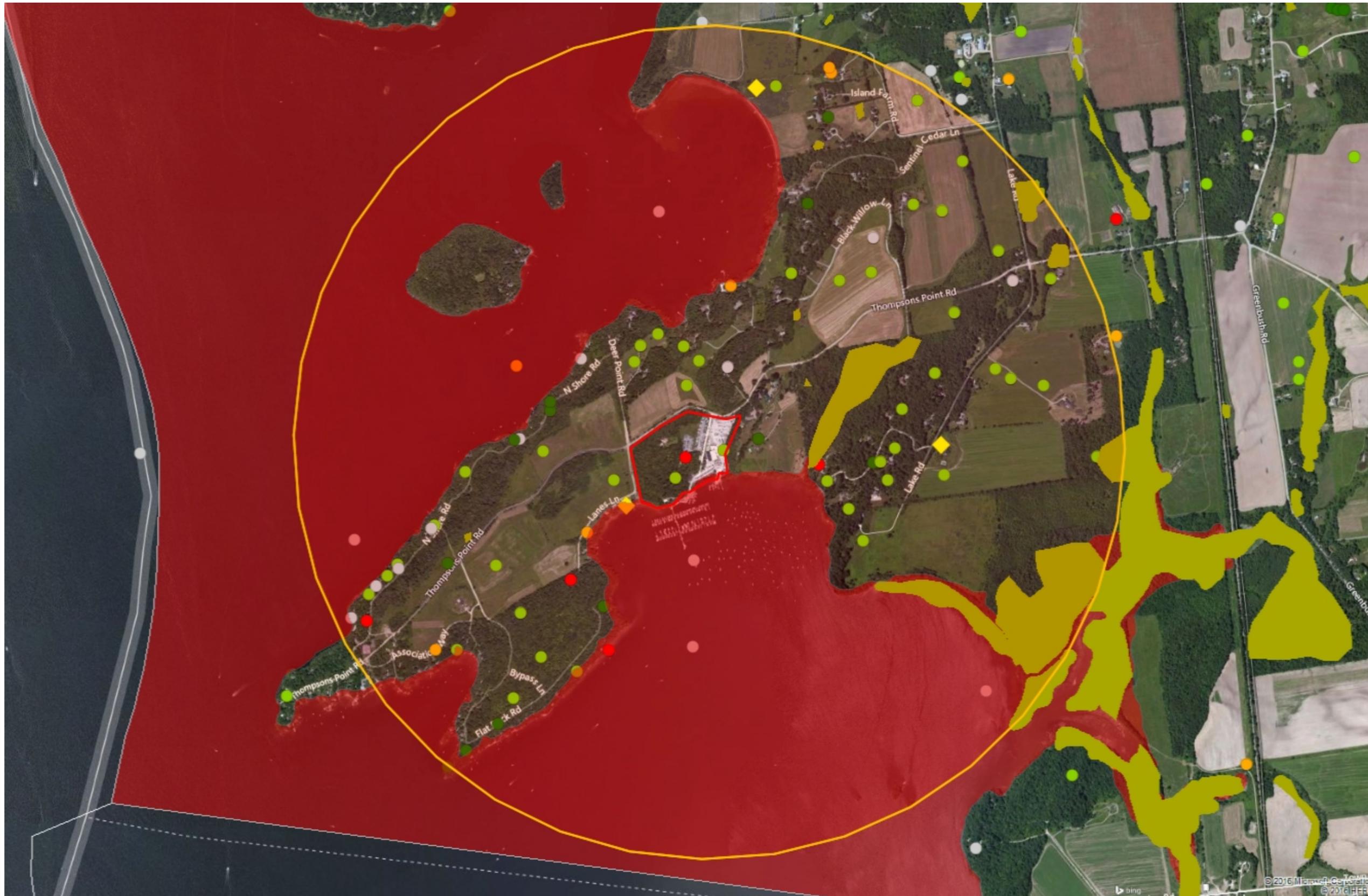
Signature 

Name (Printed) Todd Smith

Property Address or Property Tax ID # 1401 Thompson Point Road, Charlotte, VT

Date of this certification 3-1-16

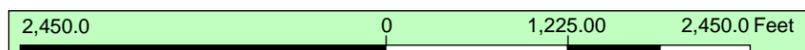
(To Comply with Act 145 and Act 117 - 8-24-12 Last Revised 9-11-12)



LEGEND

- Class A Watersheds**
 - Class A(2) Public Water Supplies
 - Class A(1) Ecological Waters
- Wetlands - VSWI**
 - Class 1 Wetland
 - Class 2 Wetland
- DFIRM Floodways**
- Special Flood Hazard Areas (All Available Counties)**
 - AE (1-percent annual chance floodplains with elevation above flood plain)
 - A (1-percent annual chance floodplains without elevation above flood plain)
 - AO (1-percent annual chance zone of shallow flooding)
 - 0.2-percent annual chance flood hazard zone
- Hazardous Site**
- Private Wells**
 - GPS Location
 - screen digitized
 - E911 Address
 - Welldriller/Clarion
 - Unknown
- SurfaceWaterSPA**
 - Active
 - Inactive
- Ground Water SPA**
 - Active
 - Proposed
 - Inactive
- Town Boundary**

1: 14,700
1in = 1225 ft.
1cm = 147 meters



DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

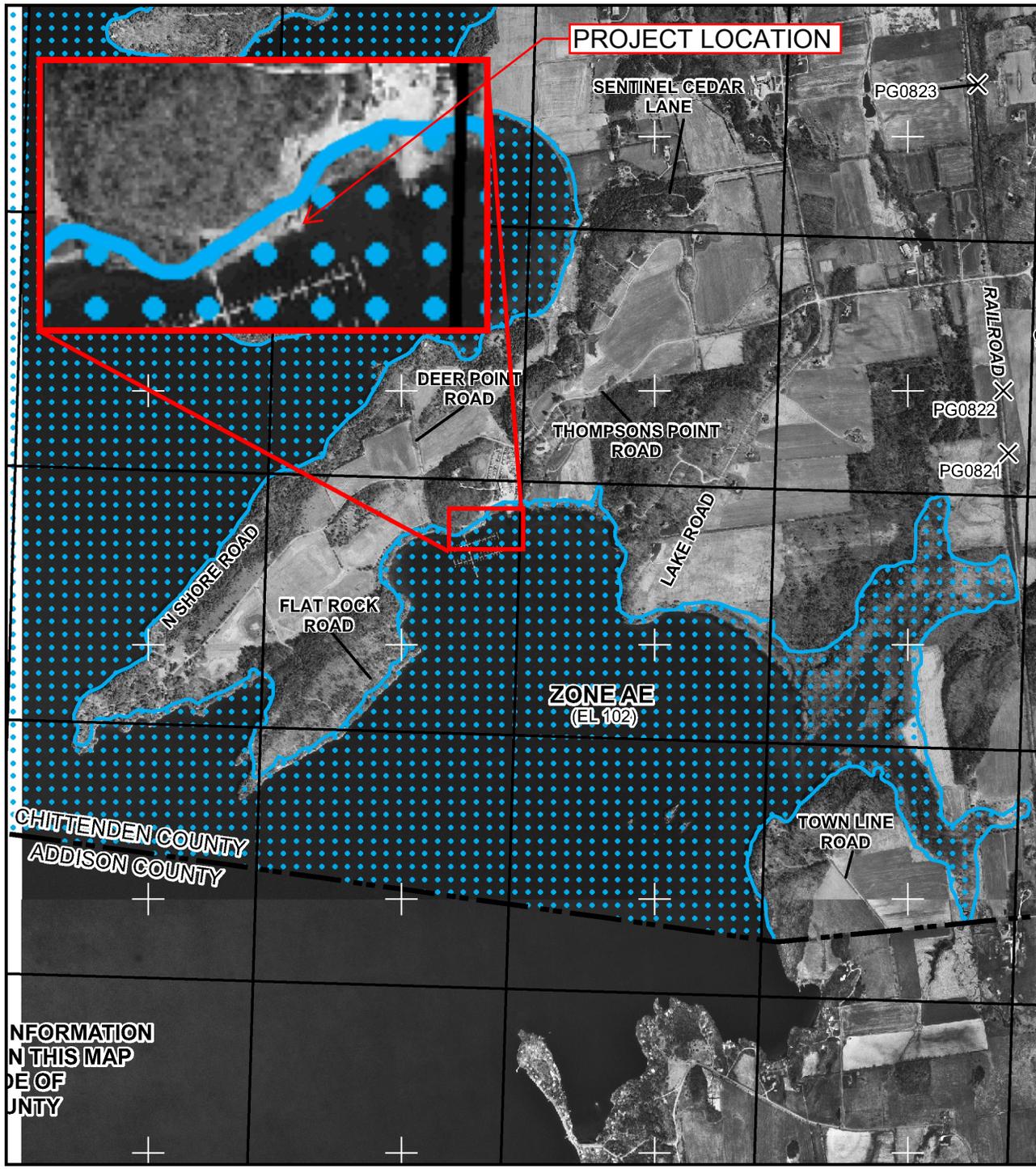
THIS MAP IS NOT TO BE USED FOR NAVIGATION

NOTES

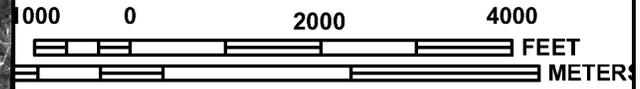
Map created using ANR's Natural Resources Atlas

Hazardous Site List - 1401 Thompson Point Road

SITE NUMBER	SITE NAME	LAND USE RESTRICTION	ADDRESS	TOWN	PRIORITY	STAFF	CLOSURE DATE	SITE STATUS	SOURCE OF CONTAMINATION	CONTAMINANTS
982352	Point Bay Marina	No	1401 Thompsons Point Rd	Charlotte	SMAC	Lynda Provencher	6/27/2011		UST-Gasoline	Gasoline
20053385	Gellis Residence	No	45 Island Farm Rd	Charlotte	SMAC	Ashley Desmond	5/8/2006		UST-Heating Oil	Heating Oil
20053428	Sheuer Property	No	5261 Lake Rd	Charlotte	SMAC	Ashley Desmond	12/30/2005		UST-Heating Oil	Heating Oil



MAP SCALE 1" = 2000'



PANEL 0375D

FIRM
FLOOD INSURANCE RATE MAP
CHITTENDEN COUNTY,
VERMONT
 (ALL JURISDICTIONS)

PANEL 375 OF 500
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CHARLOTTE, TOWN OF	500309	0375	D
SHELBURNE, TOWN OF	500193	0375	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



MAP NUMBER
50007C0375D
EFFECTIVE DATE
JULY 18, 2011

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

INFORMATION
 IN THIS MAP
 IS THE PROPERTY OF
 FEDERAL EMERGENCY
 MANAGEMENT AGENCY

Drinking Water & Groundwater Protection 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
PBM Acquisition LLC			<input type="text"/>
3 Mailing Address Line 1		4 Mailing Address Line 2	
1401 Thompson's Point 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.

9 Certifying Official Last Name		10 Certifying Official First Name (and MI if appropriate)	
Smith		Todd	
11 Certifying Official Title			
Member			
12 Certifying Official Email Address			13 Telephone
skipper@pointbaymarina.com			802-425-2431

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)	
Pitrowiski		John P.	
3 Designer License#	4 Company Name		
8104	Trudell Consulting Engineers (TCE)		
5 Mailing Address Line 1		6 Mailing Address Line 2	
478 Blair Park Road		<input type="text"/>	
7 Town/City	8 State/Province	9 Country	10 Zip/Postal Code
Williston	Vt	United States	05495
11 Email Address			12 Telephone
john.pitrowiski@tcevt.com			802-879-6331
13 Designer Role(s) (check all that apply)			
<input checked="" type="checkbox"/> Water Supply Designer			
<input checked="" type="checkbox"/> Wastewater Disposal System Designer			
<div style="background-color: yellow; border: 1px solid black; padding: 2px; display: inline-block;">Remove This Designer</div>			
<div style="background-color: green; color: white; border: 1px solid black; padding: 2px; display: inline-block;">Add Another Designer</div>			

Part III Property Location Information	
Section A - Property Location	
1 Please provide the property Town and the property address or a brief description of the location.	
(a) Town or City	(b) Street or Road Location
Charlotte	1401 Thompson's Point Road
Section B - Center of Property GPS Coordinates	
<input type="text"/>	

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 ° **W (-)** °

Part IV Project Information

Section A - General Project Information & Questions

1 Project Name (if applicable) <input type="text" value="Point Bay Marina"/>	2 Total Acreage of Property <input type="text" value="26.78"/>
---	---

3 Business Name (if applicable)

4 Detailed Project Description

5 (a) Were all existing buildings or structures, campgrounds, and their associated potable water supplies and wastewater systems substantially completed before January 1, 2007? Yes No

(b) Were all existing 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 Drinking Water & Groundwater Protection 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 type="text" value="Brian Tremback"/>	(b) Date of Visit (m/d/yyyy) <input type="text" value="11/11/2015"/>
---	---

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 Watershed Management Division at (802) 338-4835.

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 Watershed Management 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 Watershed Management 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 type="text"/>	<input type="text"/>

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, Book, and Page reference for the current landowner's deed(s) to this property:

	(a) Town	(b) Parcel ID	(c) Book	(d) Page(s)
X	Charlotte	41-50-19	71	682

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	C1-01	Legend and Notes	2/1/2016	
X	Cover	Cover	2/1/2016	
X	C1-02	Existing Conditions	2/1/2016	
X	C1-03	Existing Conditions	2/1/2016	
X	C2-01	Overall Site Plan	2/1/2016	
X	C3-01	Sanitary Plan	2/1/2016	
X	C3-02	Sanitary Plan	2/1/2016	
X	C3-03	Mound Cross Sections	2/1/2016	
X	C3-04	Forcemain Profile	2/1/2016	
X	C8-01	Sanitary Details	2/1/2016	
X	C8-02	Sanitary Notes	2/1/2016	
X	C8-05	Pump Station Profile View	2/1/2016	
X	C8-06	Pump Station Plan View	2/1/2016	
X	C8-07	Water and Sanitary Details	2/1/2016	

Add Another Plan Reference

Section D - Existing Project Lot/Building Details

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
1	26.78	Commercial

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	A-Frame/Boats	Commercial	01-01-1974	WW-4-0209-2,-3	<input checked="" type="radio"/> Yes <input type="radio"/> No
X	Office/Supply Store	Commercial	1-1-1968	WW-4-0209-1	<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#	2 Lot Size (acres)	3 Proposed Use of the Lot
1	26.78	

4 Is the lot being created as part of a subdivision? Yes No

5 Are you requesting that the Blood, Marriage, or Civil Union special fee be applied to this lot? Yes No

6 If the lot is exempt, please indicate the specific exemption from the Wastewater System and Potable Water Supply Rules?

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	A-Frame/Boats		<input type="checkbox"/>	Commercial - No Change
X	Office/Supply Store		<input type="checkbox"/>	Commercial - No Change
X	Restaurant		<input checked="" type="checkbox"/>	Commercial - New Flows

Add Another Building

Remove This Lot

Add Another Lot

Part V Water Supply Information

Section A - Water Supply Screening Questions

1 Are you proposing a new water supply or water service line or changes to a permitted but not constructed water supply or water service line for this project? Yes No

2 Are you proposing changes to an existing water supply or water service for this project (including changes to location, design flows, or operational change)? Yes No

3 Is there an existing connection to a water supply or water service line for this project? Yes No

Complete Part V if you answered Yes to any of the above questions. A project with no existing or proposed water supply may skip to Part VI.

Section B - General Water Supply Questions

1 Does this project involve a failed water supply? Yes No

2 Will any of the proposed water sources serve 25 or more people or have 15 or more service connections? Yes No

If Yes, the applicant must contact the Drinking Water & Groundwater Protection Division at (802) 241-3400 for source, construction and an operating permit.

3 Are any of the existing or proposed water sources located within a special flood hazard area? Yes No

4 Are any of the existing or proposed water sources located within a floodway? Yes 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? Yes No

If Yes, please submit additional information on the site. The Waste Management Division can be reached at (802) 241-3888.

6 Does this project require an approval letter from the Drinking Water & Groundwater Protection Division for the construction of a public water system, municipal water line extension over 500 feet, or hydrants or sprinkler systems? Yes No

If Yes, please submit a copy of the approval letter from the Drinking Water & Groundwater Protection Division.

Yes No

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?

8 *If Yes, please submit additional information regarding the constituent(s) that exceeds the standards and plans, details, and specifications of the treatment device.*
 Is any portion of the proposed water supply located in or near a Water Source Protection Area as designated by the Drinking Water & Groundwater Protection Division? Yes No

If in areas of known interference issues, contact the Drinking Water & Groundwater Protection Division at (802) 241-3400.

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 WSID 8204	2 Water Supply Owner (if not Applicant) Point Bay Marina
3 Water Source Type Public Community	4 Type of Change to Supply 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) Change	(f) Total	
X	1	A-Frame/Boats	No Change	1,098	0	1,098	Rule-based
X	1	Restaurant	Connection to Existing System	0	1,998	1,998	Rule-based
Add Another Lot/Building Served by this Supply				6	7	8	
				1,098	1,998	3,096	

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 Office Well	2 Water Supply Owner (if not Applicant)
3 Water Source Type Non-Public Drilled Bedrock Well	4 Type of Change to Supply No Change

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) Change	(f) Total	
X	1	Office/Supply Store		150	0	150	Rule-based
Add Another Lot/Building Served by this Supply				6	7	8	
				150	0	150	

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.

Yes No

11 Is a variance being requested for this water supply?

Remove This Water Supply Additional details related to the variance request.

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.

		Design Flows (Gallons Per Day)		
(a) Water Supply Name/Identifier		(b) Existing	(c) Change	(d) Total
X	8204 Point Bay Marina TNC	1,098	1,998	3,096
X	Office Well	150	0	150
Add Another Water Supply		2	3	4
		1,248	1,998	3,246

Part VI Wastewater Disposal System Information

Section A - Wastewater Disposal System Screening Questions

1 Are you proposing a new or replacement wastewater disposal system, a new wastewater service line, or changes to a permitted but not constructed wastewater disposal system or wastewater service line for this project? Yes No

2 Are you proposing changes to an existing wastewater disposal system, replacement wastewater disposal system, replacement area, or wastewater service line for this project (including changes to location, design flows, or operational change)? Yes No

3 Is there an existing connection to a wastewater disposal system or wastewater service line for this project?..... Yes No

*Complete Part VI if you answered Yes to any of the above questions.
A project with no existing or proposed wastewater disposal systems may skip to Part VII.*

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 For projects using soil-based wastewater systems having a total design flow that exceeds 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 Drinking Water & Groundwater Protection 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 Drinking Water & Groundwater Protection Division? Yes No

If Yes, contact the Drinking Water & Groundwater Protection 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 <input type="text" value="Restaurant Mound"/>			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								
			Design Flows (Gallons Per Day)				(h) Rule or Meter Based Flows	
(a) Lot#	(b) Building ID	(c) Type of Change to the Building's System	(d) Existing	(e) Change	(f) Infiltration	(g) Total		
X	<input type="text" value="1"/>	<input type="text" value="Restaurant"/>	<input type="text" value="Connection to New System"/>	<input type="text" value="0"/>	<input type="text" value="1,998"/>	<input type="text" value="0"/>	<input type="text" value="1,998"/>	<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="1,998"/>	<input type="text" value="0"/>	<input type="text" value="1,998"/>		
10 Is this wastewater disposal system located off-lot? <input type="radio"/> Yes <input checked="" type="radio"/> No								
11 Is this wastewater disposal system shared? <input type="radio"/> Yes <input checked="" type="radio"/> No								
<i>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.</i>								
12 Is a variance being requested for this wastewater disposal system? <input type="radio"/> Yes <input checked="" type="radio"/> No								
<i>If Yes, please submit additional details related to the variance request.</i>								
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 <input type="text"/>								
14 If this wastewater disposal system type is a connection to a municipal system, please select the town. Town <input type="text"/>								
15 If this wastewater disposal system is a soil-based system, please select the design approach used. Design Approach Used <input type="text" value="Performance Based"/>								
16 For soil-based systems, please check all that apply (Note: Store and dose does not apply to standard pump/pump chamber systems). <input type="checkbox"/> Storage and Dose <input type="checkbox"/> Filtrate <input type="checkbox"/> Constructed Wetlands								
17 If this is an Innovative/Alternative soil-based system, please select the system use type. Innovative/Alternative System Use Type <input type="text"/>								
18 If this is an Innovative/Alternative soil-based system, please select the Innovative/Alternative system or product. Innovative/Alternative System or Product <input type="text"/>								
Remove This Wastewater System								
1 Wastewater Disposal System Name/Identifier <input type="text" value="On-Site A-Frame"/>			2 Wastewater Disposal System Owner (if not Applicant) <input type="text"/>					
3 Wastewater Disposal System Type <input type="text" value="In-ground"/>			4 Type of Change to System <input type="text" value="No Change"/>					
5 Lots/Buildings Served by this Wastewater Disposal System								
Design Flows (Gallons Per Day)								

(a) Lot#	(b) Building ID	(c) Type of Change to the Building's System	(d) Existing	(e) Change	(f) Infiltration	(g) Total	(h) Rule or Meter Based Flows
X 1	Bathhouse	No Change	110	0	0	110	Rule-based
Add Another Lot/Building Served by this System			6 110	7 0	8 0	9 110	

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 (Note: Store and dose does not apply to standard pump/pump chamber systems).

Storage and Dose Filtrate Constructed Wetlands

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="On-Site Office"/>	2 Wastewater Disposal System Owner (if not Applicant) <input type="text"/>
3 Wastewater Disposal System Type <input type="text" value="In-ground"/>	4 Type of Change to System <input type="text" value="No Change"/>

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) Change	(f) Infiltration	(g) Total	
X 1	Office/Supply Store	No Change	150	0	0	150	Rule-based
Add Another Lot/Building Served by this System			6 150	7 0	8 0	9 150	

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 (Note: Store and dose does not apply to standard pump/pump chamber systems).
 Storage and Dose Filtrate Constructed Wetlands

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="Boat Waste Holding Tank"/>	2 Wastewater Disposal System Owner (if not Applicant) <input type="text"/>
3 Wastewater Disposal System Type <input type="text" value="Holding Tank"/>	4 Type of Change to System <input type="text" value="No Change"/>

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)			(g) Total	(h) Rule or Meter Based Flows
				(d) Existing	(e) Change	(f) Infiltration		
X	<input type="text" value="1"/>	<input type="text" value="Boats"/>	<input type="text" value="No Change"/>	<input type="text" value="988"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="988"/>	<input type="text" value="Rule-based"/>
Add Another Lot/Building Served by this System				<input type="text" value="988"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="988"/>	

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 (Note: Store and dose does not apply to standard pump/pump chamber systems).

Storage and Dose Filtrate Constructed Wetlands

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) Change	(d) Infiltration	(e) Total
X	Restaurant Mound	0	1,998	0	1,998
X	On-Site Bathhouse	110	0	0	110
X	On-Site Office	150	0	0	150
X	Boat Waste Holding Tank	988	0	0	988
		2	3	4	5
		1,248	1,998	0	3,246

Add Another Wastewater System

Part VII Application Fees

1 Fee Amount

2 Fee Calculation Details

One New Commercial Unit = \$500.00

Part VIII Designer Certification & Copyright License

Section A - Certifying Designer 1 Certification & Copyright License

"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.

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."

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.

- Water Supply Designer
- Wastewater Disposal System Designer

1 Designer 1 Name <input style="width: 95%;" type="text" value="John P. Pitrowiski, P.E."/>	2 Designer 1 Signature <input style="width: 95%;" type="text"/>	3 Signature Date <input style="width: 95%;" type="text"/>
--	--	--

Section B - Certifying Designer 2 Certification & Copyright License

"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.

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."

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.

- Water Supply Designer
- Wastewater Disposal System Designer

1 Designer 2 Name <input style="width: 95%;" type="text"/>	2 Designer 2 Signature <input style="width: 95%;" type="text"/>	3 Signature Date <input style="width: 95%;" type="text"/>
---	--	--

Part IX Applicant(s) Signature & Acknowledgements

In order to insure compliance with the requirements of the regulations administered by the Department of Environmental Conservation, Drinking Water & Groundwater Protection 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 Drinking Water & Groundwater Protection 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 style="width: 95%;" type="text" value="Todd Smith"/>	3 Applicant Signature <input style="width: 95%;" type="text"/>	4 Signature Date <input style="width: 95%;" type="text"/>
----------	---	---	--

Add Applicant Signature Block

	(a) Wastewater Disposal System Name/Identifier	Design Flows (Gallons Per Day)			
		(b) Existing	(c) Change	(d) Infiltration	(e) Total
X	Restaurant Mound	0	1,998	0	1,998
X	On-Site Bathhouse	135	0	0	135
X	On-Site Office	150	0	0	150
X	Boat Waste Holding Tank	1,098	0	0	1,098
Add Another Wastewater System		2	3	4	5
		1,383	1,998	0	3,381

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

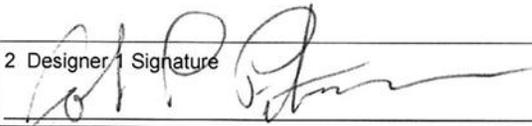
"I hereby certify that in the exercise of my reasonable professional judgment, the design-related information submitted with this application is true and correct, and that the design included in this application for a permit complies with the Vermont Wastewater System and Potable Water Supply Rules and the Vermont Water Supply Rules.

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."

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.

Water Supply Designer

Wastewater Disposal System Designer

1 Designer 1 Name	2 Designer 1 Signature	3 Signature Date
John P. Pitrowiski, P.E.		3/1/16

Section B - Certifying Designer 2 Certification & Copyright License

"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.

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."

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.

Water Supply Designer

Wastewater Disposal System Designer

1 Designer 2 Name	2 Designer 2 Signature	3 Signature Date
<input type="text"/>	<input type="text"/>	<input type="text"/>

Part IX Applicant(s) Signature & Acknowledgements

In order to insure compliance with the requirements of the regulations administered by the Department of Environmental Conservation, Drinking Water & Groundwater Protection 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.

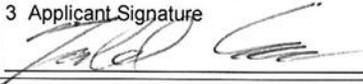
1 If we do visit your property, do you have any special instructions?

"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.

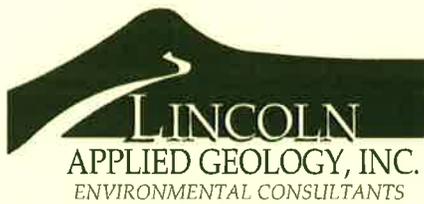
I also understand that I am not allowed to commence any site work or construction on this project without written approval from the Department of Environmental Conservation.

If my project utilizes an Innovative/Alternative System or Product, I have received a copy of the Drinking Water & Groundwater Protection 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 <div style="border: 1px solid black; padding: 2px;"> <i>Teodilo Surti</i> </div>	3 Applicant Signature <div style="border: 1px solid black; padding: 2px;">  </div>	4 Signature Date <div style="border: 1px solid black; padding: 2px;"> <i>3-1-16</i> </div>
----------	--	---	---

Add Applicant Signature Block



December 24, 2015

Mr. John Pitrowiski, P.E.
Trudell Consulting Engineers
478 Blair Park Road
Williston, VT 05495

RE: Point Bay Marina, Thompson Point Road, Charlotte, Vermont – Proposed Restaurant Disposal System Hydrogeological/Effluent Mounding Analysis

Dear John:

In an attempt to consider a restaurant to serve Point Bay Marina, the area shown on Trudell Consulting Engineers (TCE) sheet C3-02 was evaluated for site and soil conditions which could support the on-site disposal of high strength waste generated by a restaurant. The site and soil conditions were evaluated by myself with test pits and by TCE with the preparation of a detailed topographic site plan (C3-02). With a combination of the soil profile descriptions (generated from the test pits) and the site topographic plan, two potential mound disposal areas were defined which are hydraulically isolated from each other. Following the layout of the two mound disposal areas, a site specific hydrogeologic evaluation was conducted by myself to define effluent mounding conditions, so the design details of each mound could be finalized.

The soil evaluation was conducted on November 11, 2015 with Brian Tremback, the Town of Charlotte's Septic Consultant in attendance to confirm the results and on November 30, 2015 (by myself) to fill in data gaps. The soil profile descriptions are attached. Sixteen test pits were evaluated on 11/11/15 and ten test pits were evaluated on 11/30/15. The soil profile across the site is very consistent with three horizons. The site is underlain by brown silt loams over red-brown to brown silt loams which are loose to friable with strong to moderate/strong fine blocky structure. They are well drained to a depth ranging from 18 to 24". These upper well drained soil horizons are underlain by gray-brown to olive silt loams which are friable to firm with redoximorphic features indicating the presence of a shallow seasonal groundwater system at a depth of 18 to 24" (depending on the test pit). Based upon the texture, consistency and structure of the upper horizons, a permeability (hydraulic conductivity) of 20 feet/day was defined for the site specific effluent mounding analysis. Shallow bedrock conditions were noted in four test pits (TCE-17, 18, 19 and 25) at depths of 22", 22", 18" and 12" respectively. The shallow depth to bedrock helped define the limits of the two mound disposal areas shown on C3-01.

Based on topography, the site was broken into two proposed mound disposal areas (field A and field B) which were evaluated to determine their capacity. Additionally because of the high strength characteristics of the waste and site and soil constraints, it was determined that wastewater should be pretreated in order to maximize the ability and longevity of each mound disposal area and to ensure that they are hydraulically isolated. In his regard, two independent 2,000 gpd pretreated mounds were sited in order to conduct the site specific mounding analysis.

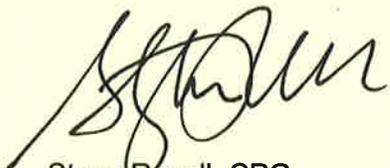
The site specific analyses are attached which indicate the induced effluent mound height below the leading (downhill) side of the application area in order to be conservative and realistic at the same time. The upper disposal area (Field A) analysis is based upon a silt loam permeability of 20 feet/day,

an average gradient of 8.3%, the availability of 20" of well drained silt loam and a mound application area length of 140'. The results of the analysis indicate that Field A will result in an effluent mound of 1.15' with 0.52' of unsaturated native soil remaining below ground surface. With a required separation of 2.0' between the bottom of the application area and the pretreated effluent induced mound, 1.48' of state approved mound sand is required.

The lower disposal area (Field B) analysis is based upon a silt loam permeability of 20 feet/day, an average gradient of 18%, the availability of 22" of well drained silt loam and a mound application area length of 110'. The results of the analysis indicate that Field B will result in an effluent mound of 0.68' with 1.15' of unsaturated native soil remaining beneath the surface. With the required separation of 2' between the bottom of the application area and the effluent induced mound, 0.85' of mound sand would theoretically be required. Because of the 1.0' minimum imposed by the regulations, 1.0' of sand must be used.

Based upon the preceding analysis, the overall disposal site shown on TCE Plan C3-02 is capable of handling the (2) 2,000 gpd hydraulically isolated pretreated mound disposal fields that you have shown and described. The mounds, as designed, will result in at least 0.5' of naturally occurring unsaturated soils beneath the leading edge of the application area of each mound, and in excess of 0.5' of unsaturated soil beneath the downhill toe of each mound. It is my professional opinion as a qualified hydrogeologist that this overall analysis is accurate and in compliance with the requirements of the state water/wastewater regulations.

Very Truly Yours,
Lincoln Applied Geology, Inc.



Steve Revell, CPG
Senior Hydrogeologist

SR/ih
Enclosures

cc:

F:\CLIENTS\2015\15130\John Pitrowiski Letter 12-24-15.doc



**Point Bay Marina
Soil Profile Descriptions
November 11, 2015
By Stephen Revell CPG
Senior Hydrogeologist
with John Pitrowiski P.E., Trudell Consulting Engineers
and Brian Tremback Soil Scientist for the Town of Charlotte**

Test Pit TCE-1

- 0-9" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 9-18" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)
- 18-40" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-2

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-20" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)
- 20-38" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots



Test Pit TCE-3

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-18" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)
- 18-48" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-4

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-22" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)
- 22-38" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-5

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-20" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)



20-45" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-6

0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained

8-20" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)

20-36" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-7

0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained

8-20" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)

20-40" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots



Test Pit TCE-8

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-20" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)
- 20-36" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-9

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-20" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)
- 20-36" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-10

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-20" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)
- 20-36" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse



fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-11

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-24" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)
- 24-36" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-12

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-24" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)
- 24-48" Red-brown to brown stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots, redoximorphic features

Test Pit TCE-13

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained



8-24" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)

24-40" Red-brown to brown stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots, redoximorphic features

Test Pit TCE-14

0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained

8-20" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)

20-48" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-15

0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained

8-24" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)

24-42" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by



seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-16

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-18" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)
- 18-40" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability

Supplemental Soil Profile Descriptions

November 30, 2015

**By Stephen Revell, CPG
Senior Hydrogeologist**

Test Pit TCE-17

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-22" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)
- +22" Rock

Test Pit TCE-18

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-22" Red-brown to brown silt loam, friable, moderate to strong fine



blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)

+22" Rock

Test Pit TCE-19

0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained

8-18" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)

+18" Rock

Test Pit TCE-20

0-9" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained

9-22" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)

22-42" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-21

0-10" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained

10-22" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)



22-42" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-22

0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained

8-20" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)

20-42" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-23

0-9" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained

9-20" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)

20-40" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots



Test Pit TCE-24

- 0-9" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 9-24" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, redoximorphic features at 22"
- 24-42" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots

Test Pit TCE-25

- 0-12" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- +12" Rock

Test Pit TCE-26

- 0-8" Medium brown silt loam, strong fine blocky structure, loose, roots, well drained
- 8-24" Red-brown to brown silt loam, friable, moderate to strong fine blocky structure, roots to 18", well drained, no redoximorphic feature (no depletions)
- 24-48" Gray-brown to olive stony silt loam, till derived, moderate to strong medium to coarse blocky structure, 20 to 30% (coarse fraction/gravel), friable overall but some firm matrix, redoximorphic features but not overly distinct and obvious, although limited by seasonal shallow water table effects this horizon has a great deal of permeability, no roots



**Site Specific Effluent Mounding Analysis
Point Bay Marina
Mound Disposal Field A
1401 Thompson Point Rd, Charlotte, VT.**

In order to support the proposed performance based mound-type disposal system design and show that the soils can accommodate the 2000 gpd design flow rate associated with a restaurant, a site specific hydrogeologic analysis using Darcy's Law was conducted. The following formula was used to determine the ability of the soil to accept the proposed amount of wastewater and determine its impact on the shallow seasonal ground water system.

Using the equation:

$$Q = k \cdot i \cdot h \cdot l$$

Where: Q= Volume= 2000 gallons/ day = 267.4 ft³/ day;
k= Hydraulic Conductivity = 20 ft./ day (approved k value for silt loam with moderate to strong blocky structure);
i= Gradient = 8.3% = 0.083 ft./ ft.;
h= effluent mound height in feet;
l= 140' mound length.

When solving this equation for h, an effluent mound of 1.15' was calculated. Since evidence of a seasonal high ground water system was identified at 20" or 1.67' with an induced mound of 1.15', 0.52' of unsaturated soil will remain. To maintain the required 2' separation to the pretreated induced mound, 2' - 0.52' or 1.48' of state approved mound sand is required beneath the application area.

F:\CLIENTS\2015\15130\Site Specific Effluent Mounding Analysis Mound Disposal Field A.doc



**Site Specific Effluent Mounding Analysis
Point Bay Marina
Mound Disposal Field B
1401 Thompson Point Rd, Charlotte, VT.**

In order to support the proposed performance based mound-type disposal system design and show that the soils can accommodate the 2000 gpd design flow rate associated with a restaurant, a site specific hydrogeologic analysis using Darcy's Law was conducted. The following formula was used to determine the ability of the soil to accept the proposed amount of wastewater and determine its impact on the shallow seasonal ground water system.

Using the equation:

Q= k·i·h·l Where: Q= Volume= 2000 gallons/ day = 267.4 ft³/ day;
k= Hydraulic Conductivity = 20 ft./ day (approved k value for silt loam with moderate to strong blocky structure);
i= Gradient = 18% = 0.18 ft./ ft.;
h= effluent mound height in feet;
l= 110' mound length.

When solving this equation for h, an effluent mound of 0.68' was calculated. Since evidence of a seasonal high ground water system was identified at 22" or 1.83' with an induced mound of 0.68', 1.15' of unsaturated soil will remain. To maintain the required 2' separation to the pretreated induced mound, 2' – 1.15' or 0.85' of state approved mound sand is required beneath the application area. Since a minimum of 1.0' of mound sand is required, 1.0' of mound sand must be used.

F:\CLIENTS\2015\15130\Site Specific Effluent Mounding Analysis Mound Disposal Field B.doc



Amanda Raab

From: Steve Revell <SRevell@lagvt.com>
Sent: Monday, January 18, 2016 3:13 PM
To: John Pitrowiski, P.E.
Subject: RE: Point Bay Marina- Hydro Report

John, I think most designers dealing w/ 4000gpd of high strength waste would naturally consider pretreatment to speak to system longevity. That doesn't mean that the overall system can't be designed w/o pretreatment as long as it all fits. In this regard, each 2000gpd mound requires 500 linear feet of 4' wide trench using an application rate of 1.0gpd/sqft. For field A which is 140' long that would work out to 3.57 trenches or 4 trenches. Another way would be to have 4-3.57' x 140' trenches. This non pretreated mound would require 2.5' of mound sand beneath the application area. For Field B which is 110' long, you would need 4.55 4' wide trenches or 5- 3.64' x 110' trenches. This non pretreated mound would require 1.85' of mound sand beneath the application area.

I would see how the 2 non pretreated mounds layout from an isolation stand point. The only shallow rock/ledge pit that might affect Field B is TP-19 w ledge at 18" but it looks like it is to the side enough not to be a concern.

Doing non-pretreated mounds for restaurant wastewater can't be taken lightly. There must be some safety factor involved because restaurant wash and cleanup is never done as well as it should, especially w/ 180 degrees commercial dishwasher discharge w/ one load after another w/ very short turnover. In this regard, I would add additional grease trap volume to ensure proper grease cooling and coagulation. In short, if the design called for 2000gal of grease trap, I'd put in 2-2000gal grease traps in series. From an O & M standpoint, I would pump the grease traps monthly or at least twice a season and I would pump the septic tankage at least once at the end of the season. If the organic loading(BOD) is very high, I might consider adding an aeration tank before the pump station to knock it down. Hope this helps. Regards, Steve

Stephen Revell, CPG
Lincoln Applied Geology, Inc.
163 Revell Drive
Lincoln, Vermont 05443
srevell@lagvt.com
(802) 453-4384

From: John Pitrowiski, P.E. [<mailto:John.Pitrowiski@tcevt.com>]
Sent: Wednesday, January 13, 2016 8:05 AM
To: Steve Revell
Subject: RE: Point Bay Marina- Hydro Report

1/13/16

Hi Steve

I met with John E. and Steve yesterday. They asked a question about the pre-treatment as they are a bit concerned about the added cost. I told them we needed it for the 4000 gpd and they did accept that. The question is; what would the capacity be without pre-treatment if it were an option, which I told them it may not be? Any thoughts you have on this will be most helpful. They clearly have a 2000 gpd project and that may be all they do for the first 5 to 10 years.

I wonder if we built the best area first but taller and without pre-treatment, we could add it later for phase 2. Just a thought. Please let me know what we have for options on your end. I can imagine the mounding analysis gets a lot harder when you lose the 2 extra feet to ledge and the 1 extra foot to spring GW.

John Pitrowiski, P.E.
Vice President, Senior Engineer

e. John.pitrowiski@tcevt.com

p. 802.879.6331 x101
d. 802.316.5077
c. 802.734.9630



Civil Engineering Land Surveying Landscape Architecture Environmental Services

478 Blair Park Road, Williston, Vermont 05495 www.tcevt.com

 Please consider the environment before printing this email

From: Steve Revell [<mailto:SRevell@lagvt.com>]
Sent: Thursday, December 24, 2015 2:08 PM
To: John Pitrowiski, P.E.
Subject: Point Bay Marina- Hydro Report

John, Here you go as promised. The hardcopy will be mailed on Monday. Happy Holidays Steve

Stephen Revell, CPG
Lincoln Applied Geology, Inc.
163 Revell Drive
Lincoln, Vermont 05443
srevell@lagvt.com
(802) 453-4384

From: scanner@lagvt.com [<mailto:scanner@lagvt.com>]
Sent: Thursday, December 24, 2015 1:57 PM
To: Steve Revell
Subject: Attached Image



TRANSMITTAL

TO: Trudell Consulting Engineers, Inc.
Attn: Andrew Mills

DATE: November 23, 2015
KCE #: 15371
PROJECT: Point Dam Marina, Charlotte

We are sending you the following items:

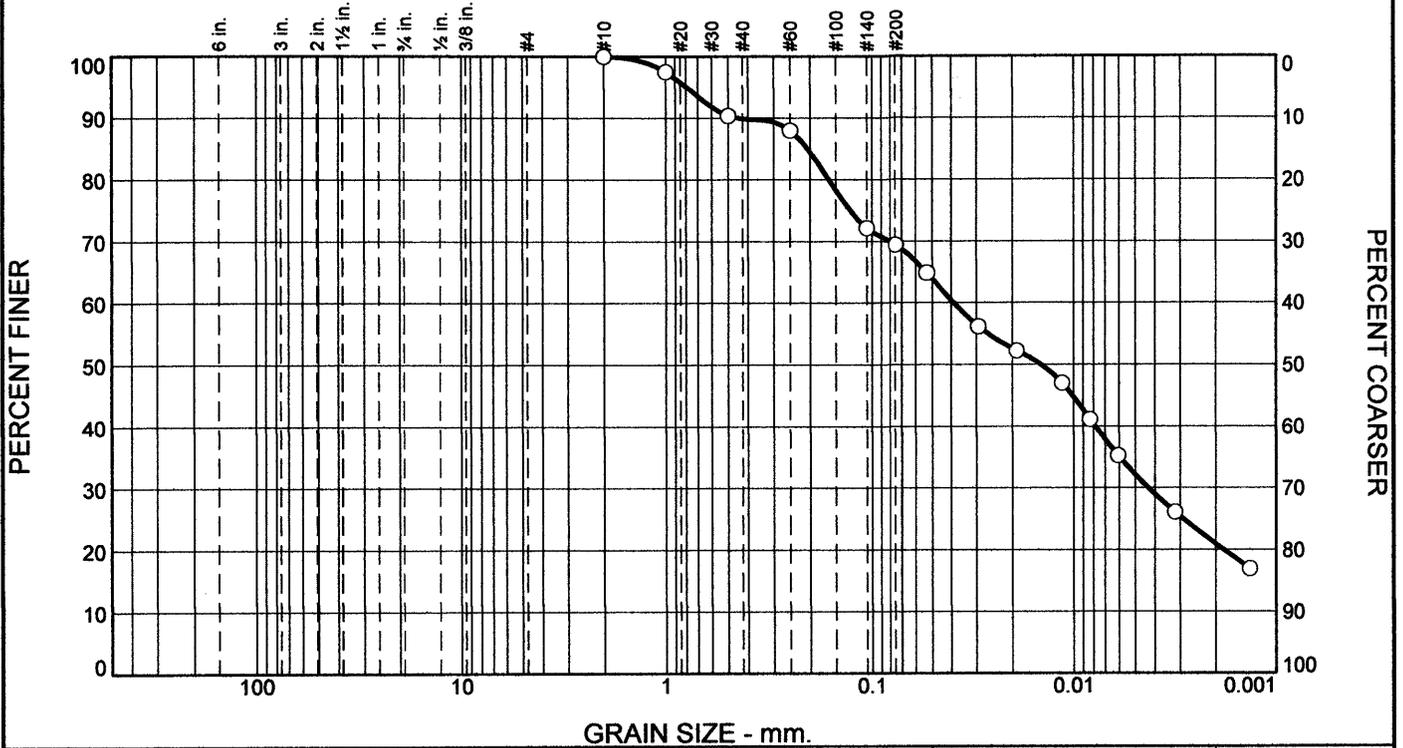
COPIES	DATE	NO. OF PAGES	DESCRIPTION
1	11-21-2015	9	USDA Classification w/Hydrometers

Signed: Peter H. Rixford
Testing and Lab Coordinator

PHR/nmv

S:\15\15371\Transmittal 1.doc

Grain Size Distribution Report



GRAIN SIZE - mm.

% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0	0	0	0	0	2	8	2	16	8	11	32	21

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100		
#18	98		
#35	90		
#60	88		
#140	72		
#200	69		
#270	65		
0.0293 mm.	56		
0.0190 mm.	52		
0.0114 mm.	47		
0.0083 mm.	41		
0.0061 mm.	35		
0.0032 mm.	26		
0.0014 mm.	17		

* (no specification provided)

Material Description

Horizon "A"

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D₉₀= 0.4619 D₈₅= 0.2057 D₆₀= 0.0389
D₅₀= 0.0145 D₃₀= 0.0043 D₁₅=
D₁₀= C_u= C_c=

Remarks

Sampled and Delivered by Client in 11-11-15
F.M.=0.42

Date Received: 11-11-15 Date Tested: 11-21-15
Tested By: PHR
Checked By: P.Rixford
Title: Testing and Lab Coordinator

Source of Sample: Site Material
Sample Number: 1

Date Sampled: 11-11-15

**Knight Consulting
Engineers, Inc.
Williston, Vermont**

Client: Trudell Consulting Engineers
Project: Point Dam Marina - Charlotte
Project No: 15371

Figure 1-3

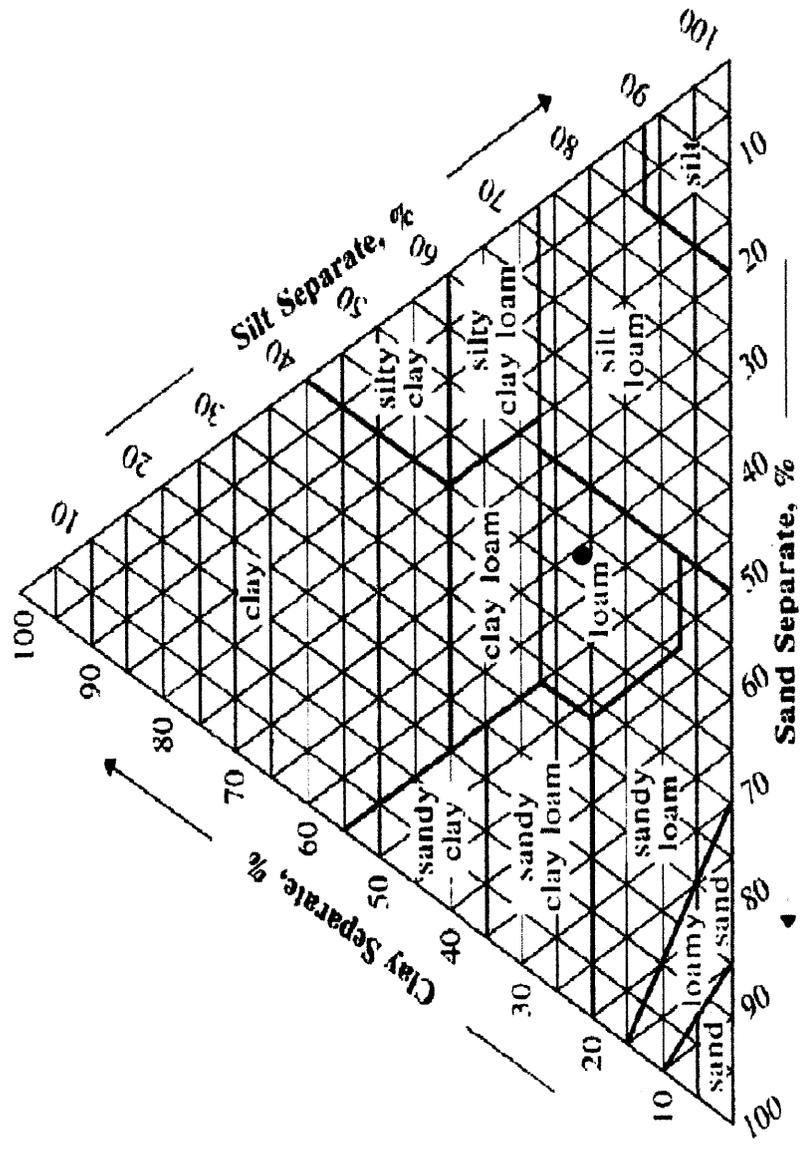
Results reflect soil gradation only and not other specification requirements.

Sand		Clay		Silt		USDA Texture	
% Sand 1	36.00%	% Clay 1	21.00%	% Silt 1	43.00%	LOAM	
			6.00%				

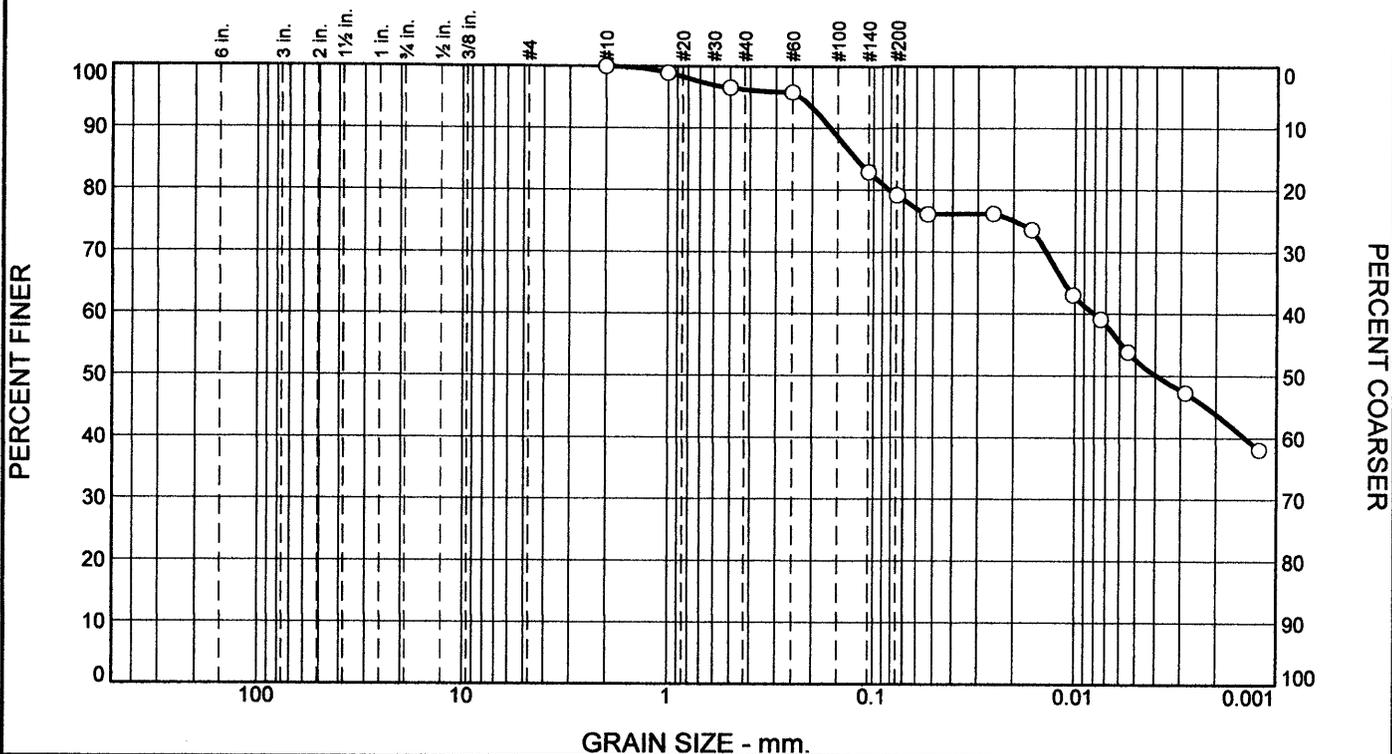
Sample : Horizon "A"

Soil Texture Triangle

Optional Sand 1	
% Very Coarse	2.00%
% Coarse	8.00%
% Medium	2.00%
% Fine	16.00%
% Very Fine	8.00%



Grain Size Distribution Report



GRAIN SIZE - mm.

% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0	0	0	0	0	1	2	1	14	6	1	31	44

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100		
#18	99		
#35	97		
#60	96		
#140	83		
#200	79		
#270	76		
0.0251 mm.	76		
0.0163 mm.	74		
0.0102 mm.	63		
0.0074 mm.	59		
0.0054 mm.	54		
0.0028 mm.	47		
0.0012 mm.	38		

* (no specification provided)

Material Description

Horizon "B"

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D₉₀= 0.1630 D₈₅= 0.1218 D₆₀= 0.0080
D₅₀= 0.0040 D₃₀= D₁₅=
D₁₀= C_u= C_c=

Remarks

Sampled and Delivered by Client on 11-11-15
F.M.=0.19

Date Received: 11-11-15 Date Tested: 11-21-15
Tested By: PHR
Checked By: P.Rixford
Title: Testing and Lab Coordinator

Results reflect soil gradation only and not other specification requirements.

Source of Sample: Site Material
Sample Number: 2

Date Sampled: 11-11-15

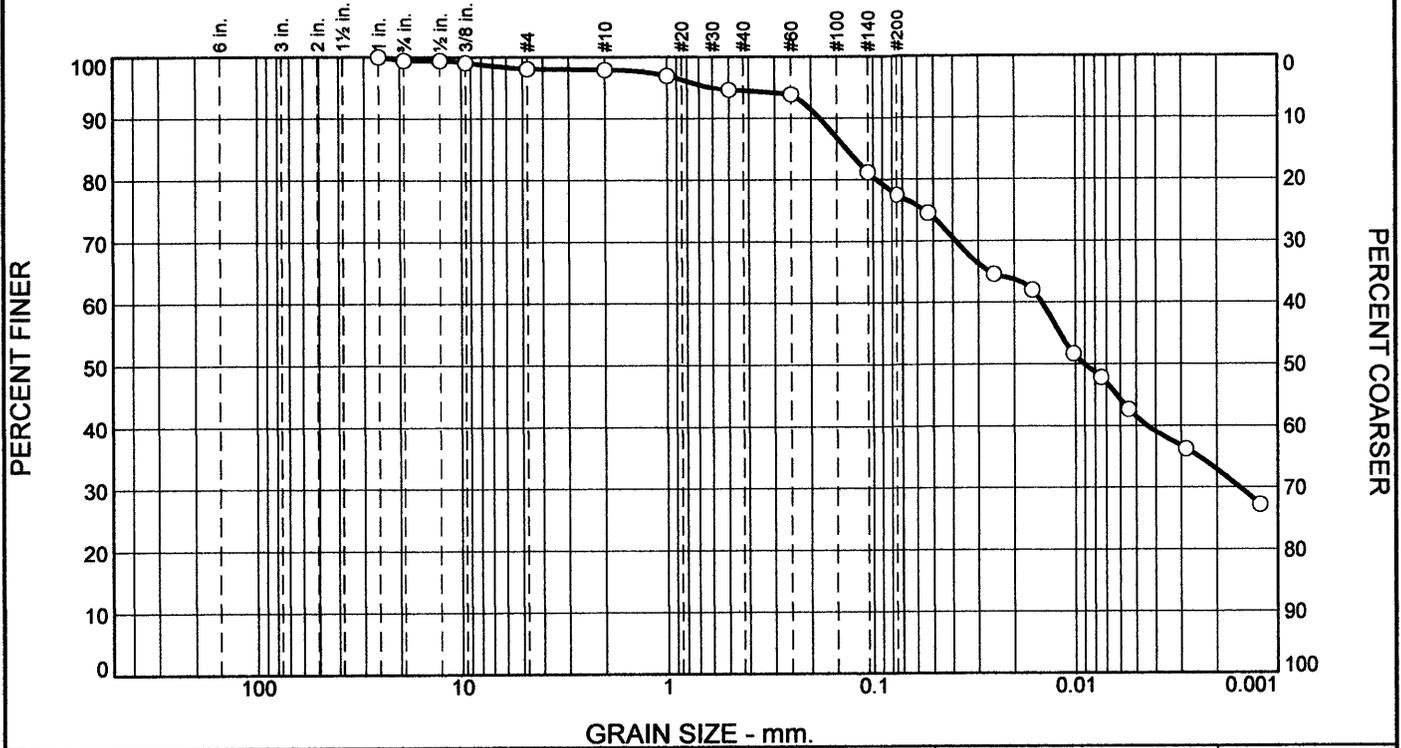
**Knight Consulting
Engineers, Inc.
Williston, Vermont**

Client: Trudell Consulting Engineers
Project: Point Dam Marina - Charlotte

Project No: 15371

Figure 2-3

Grain Size Distribution Report



GRAIN SIZE - mm.

% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0	0	1	1	0	1	2	1	14	6	10	31	33

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100		
3/4"	99		
1/2"	99		
3/8"	99		
#4	98		
#10	98		
#18	97		
#35	95		
#60	94		
#140	81		
#200	77		
#270	75		
0.0251 mm.	65		
0.0163 mm.	62		
0.0102 mm.	52		
0.0074 mm.	48		
0.0054 mm.	43		
0.0028 mm.	36		
0.0012 mm.	27		

* (no specification provided)

Material Description

Horizon "B"

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D₉₀= 0.1819 D₈₅= 0.1348 D₆₀= 0.0146
D₅₀= 0.0091 D₃₀= 0.0015 D₁₅=
D₁₀= C_u= C_c=

Remarks

Sampled and Delivered by Client on 11-11-15
F.M.=0.32

Date Received: 11-11-15 **Date Tested:** 11-21-15
Tested By: PHR
Checked By: P.Rixford
Title: Testing and Lab Coordinator

Source of Sample: Site Material
Sample Number: 2

Date Sampled: 11-11-15

Knight Consulting
Engineers, Inc.
Williston, Vermont

Client: Trudell Consulting Engineers
Project: Point Dam Marina - Charlotte

Project No: 15371

Figure 2-3

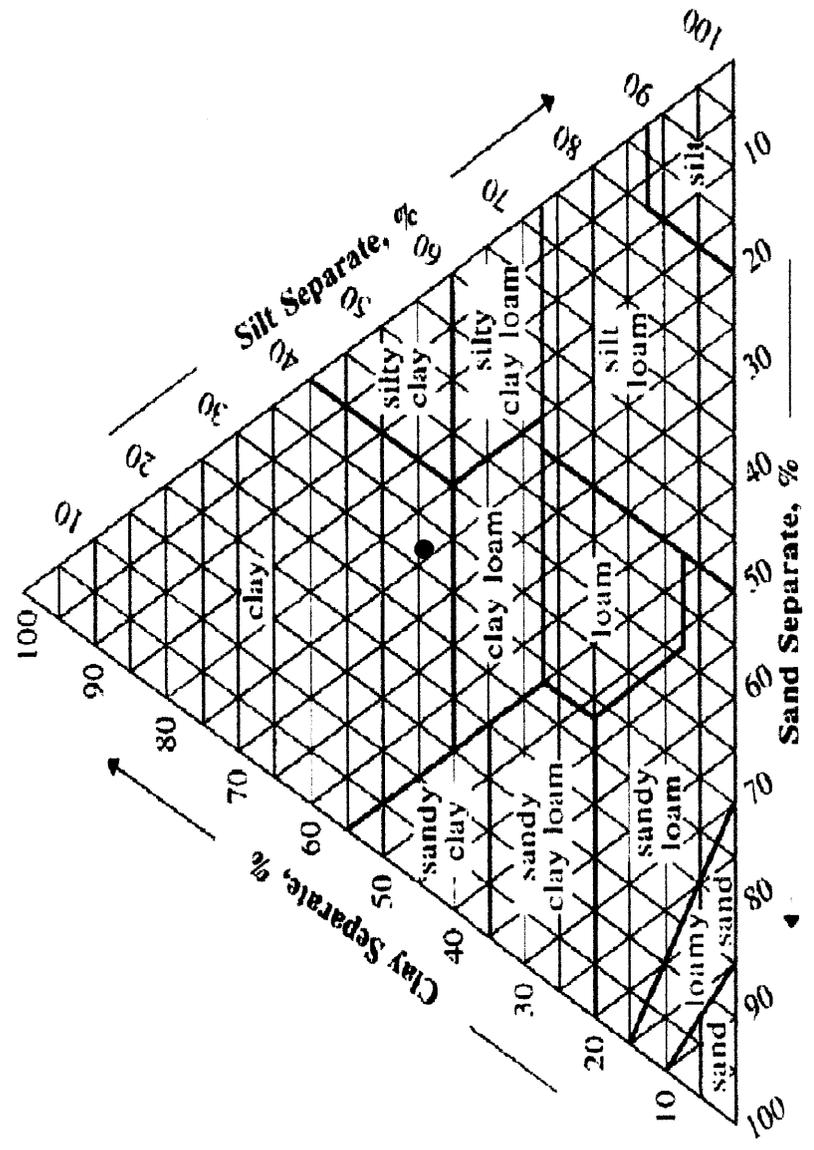
Results reflect soil gradation only and not other specification requirements.

Sand		Clay		Silt		USDA Texture	
% Sand 1	24.00%	% Clay 1	44.00%	% Silt 1	32.00%	CLAY	
	3.00%		6.00%				

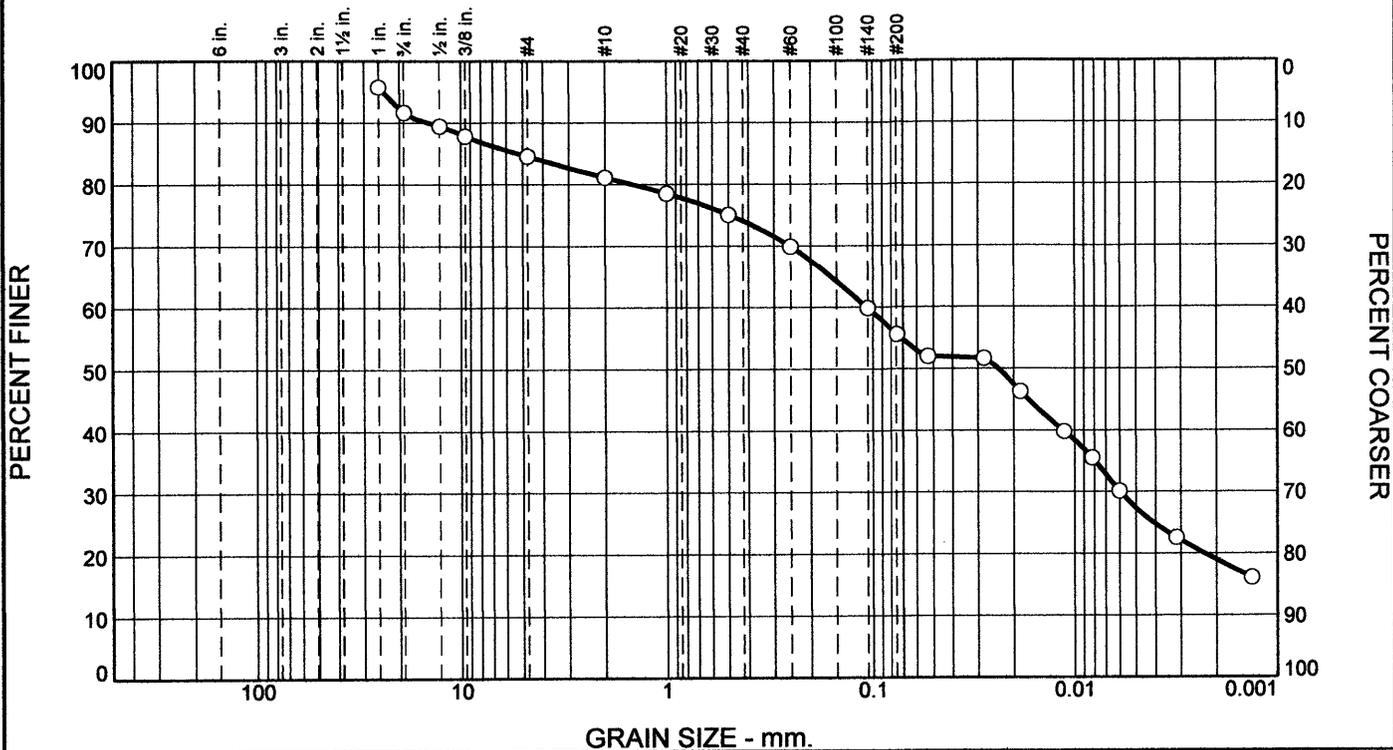
Sample : Horizon "B"

Soil Texture Triangle

Optional Sand 1	
% Very Coarse	1.00%
% Coarse	2.00%
% Medium	1.00%
% Fine	14.00%
% Very Fine	6.00%



Grain Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
			7	4	2	4	5	11	7	5	28	19

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	96		
3/4"	92		
1/2"	89		
3/8"	88		
#4	85		
#10	81		
#18	79		
#35	75		
#60	70		
#140	60		
#200	56		
#270	52		
0.0280 mm.	52		
0.0186 mm.	46		
0.0113 mm.	40		
0.0082 mm.	35		
0.0060 mm.	30		
0.0032 mm.	23		
0.0013 mm.	16		

* (no specification provided)

Material Description

Horizon "C"

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D₉₀= 14.6611 D₈₅= 5.3230 D₆₀= 0.1070
D₅₀= 0.0238 D₃₀= 0.0060 D₁₅=
D₁₀= C_u= C_c=

Remarks

Sampled and Delivered by Client on 11-11-15
F.M.=1.63

Date Received: 11-11-15 Date Tested: 11-21-15
Tested By: PHR
Checked By: P.Rixford
Title: Testing and Lab Coordinator

Source of Sample: Site Material
Sample Number: 3

Date Sampled: 11-11-15

Knight Consulting
Engineers, Inc.
Williston, Vermont

Client: Trudell Consulting Engineers
Project: Point Dam Marina - Charlotte

Project No: 15371

Figure 3-3

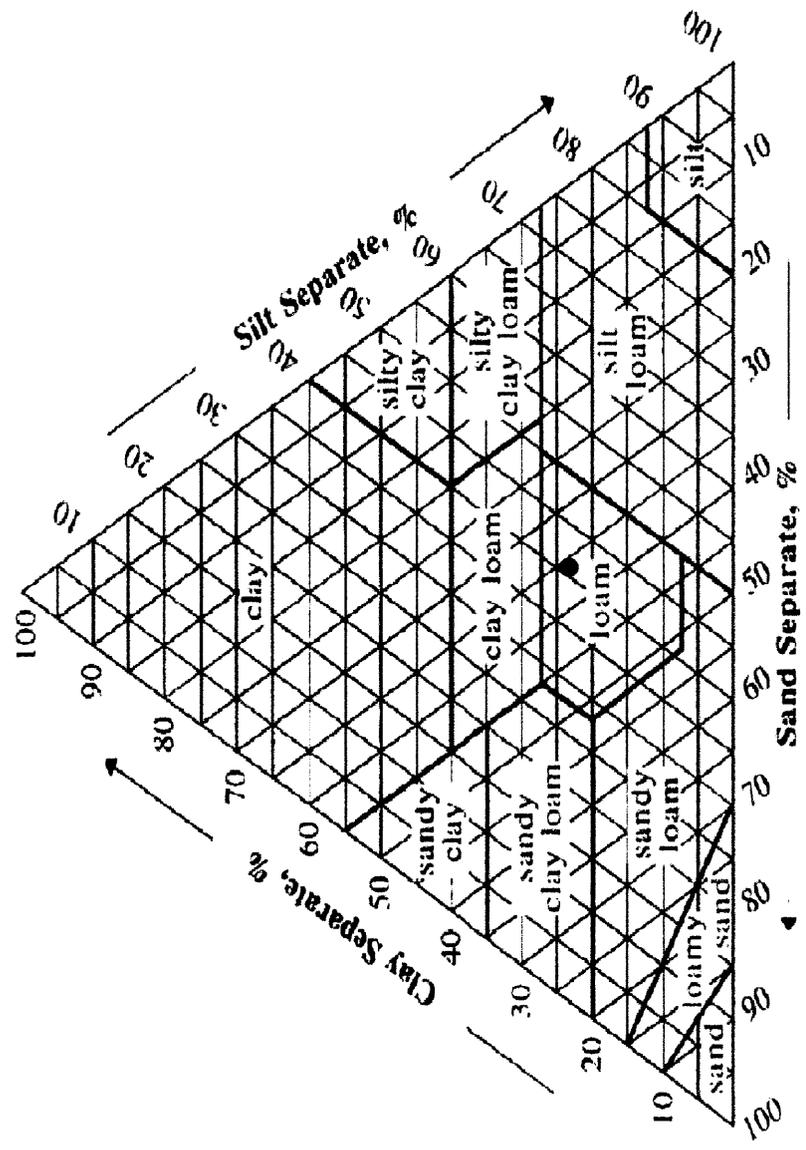
Results reflect soil gradation only and not other specification requirements.

Sand		Clay		Silt		USDA Texture	
% Sand 1	36.00%	% Clay 1	23.00%	% Silt 1	41.00%	LOAM	
	3.00%		6.00%				

Sample : Horizon "C"

Soil Texture Triangle

Optional Sand 1	
% Very Coarse	3.00%
% Coarse	4.00%
% Medium	7.00%
% Fine	13.00%
% Very Fine	9.00%



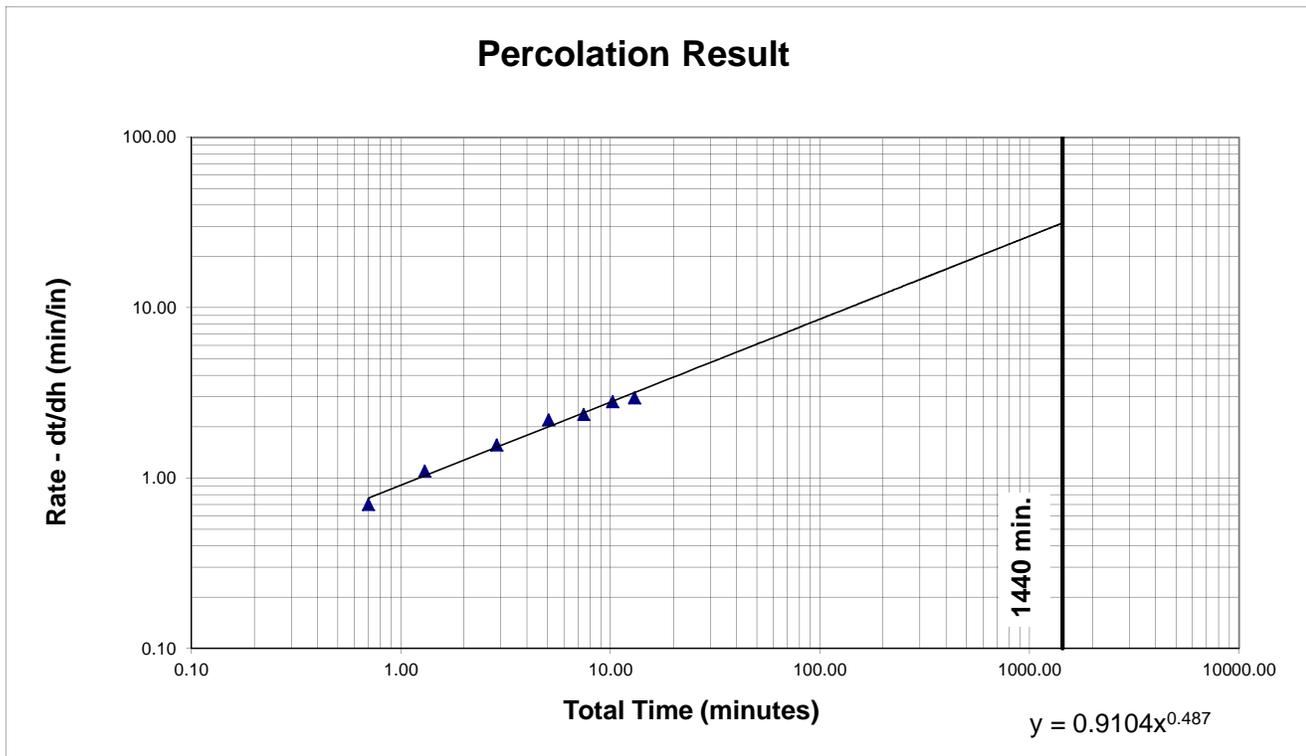
Client: Point Bay Marina
 Project #: 15-203
 Location: Thompson Point Road, Charlotte

Calculated by: AAL
 Test Date: 11/12/2015
 Sheet: 1 of 3

Percolation Test # P-1

Depth of Perc. Test: **20"**

Interval No.	Time Start (h:mm:ss)	Time Finish (h:mm:ss)	Fill Time (h:mm:ss)	Drop Time (h:mm:ss)	Total Time	Total Time (min)	Total Drop (in.)	Rate dt/dh (min/in)
1	0:00:00	0:00:42	0:00:07	0:00:42	0:00:42	0.70	1.0	0.70
2	0:00:12	0:01:18	0:00:03	0:01:06	0:01:18	1.30	1.0	1.10
3	0:01:18	0:02:52	0:00:05	0:01:34	0:02:52	2.87	1.0	1.57
4	0:02:52	0:05:04	0:00:04	0:02:12	0:05:04	5.07	1.0	2.20
5	0:05:04	0:07:26	0:00:04	0:02:22	0:07:26	7.43	1.0	2.37
6	0:07:26	0:10:15	0:00:03	0:02:49	0:10:15	10.25	1.0	2.82
7	0:10:15	0:13:13	---	0:02:58	0:13:01	13.02	1.0	2.97



Percolation Design Rate from best fit straight line through data points on graph at 1440 minutes (1-day) 32 min/in

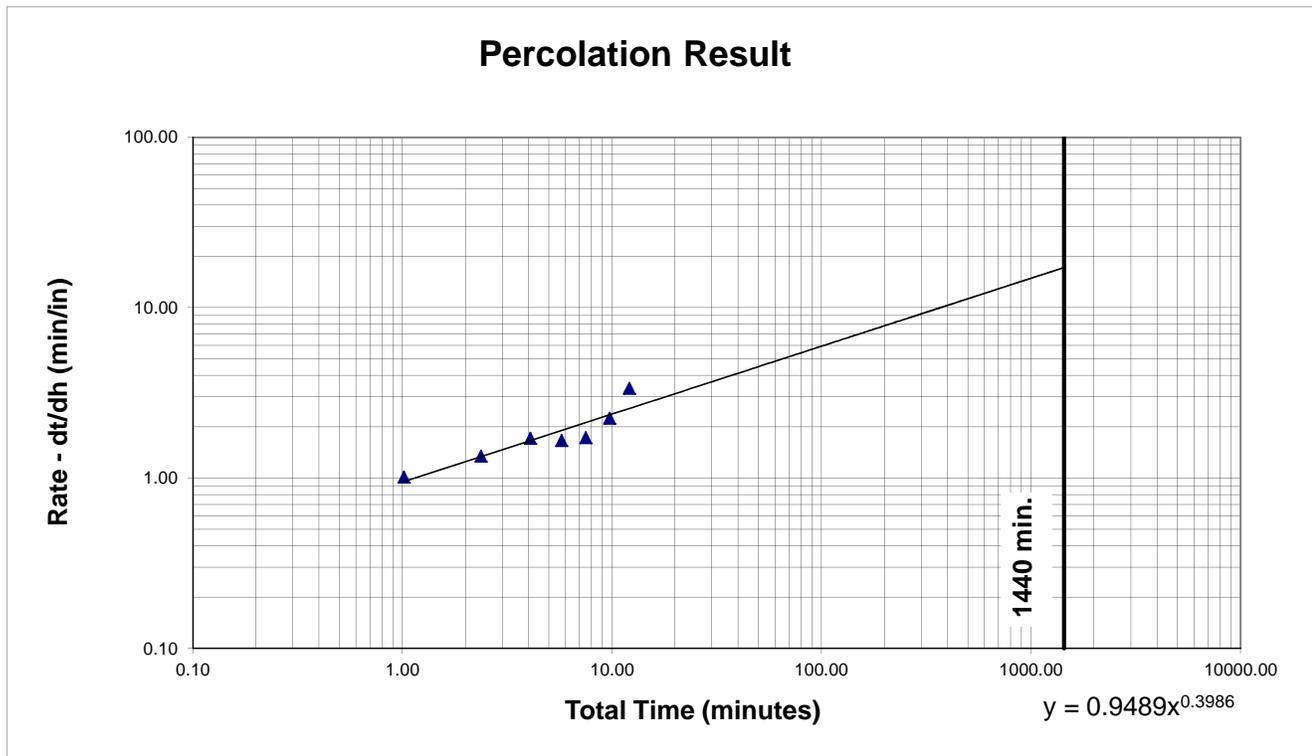
Client: Point Bay Marina
 Project #: 15-203
 Location: Thompson Point Road, Charlotte

Calculated by: AAL
 Test Date: 11/12/2015
 Sheet: 2 of 3

Percolation Test # P-2

Depth of Perc. Test: **20"**

Interval No.	Time Start (h:mm:ss)	Time Finish (h:mm:ss)	Fill Time (h:mm:ss)	Drop Time (h:mm:ss)	Total Time	Total Time (min)	Total Drop (in.)	Rate dt/dh (min/in)
1	0:00:00	0:01:01	0:00:06	0:01:01	0:01:01	1.02	1.0	1.02
2	0:01:01	0:02:22	0:00:05	0:01:21	0:02:22	2.37	1.0	1.35
3	0:02:22	0:04:05	0:00:05	0:01:43	0:04:05	4.08	1.0	1.72
4	0:04:05	0:05:45	0:00:05	0:01:40	0:05:45	5.75	1.0	1.67
5	0:05:45	0:07:29	0:00:06	0:01:44	0:07:29	7.48	1.0	1.73
6	0:07:29	0:09:44	0:00:05	0:02:15	0:09:44	9.73	1.0	2.25
7	0:09:44	0:13:06	---	0:03:22	0:12:05	12.08	1.0	3.37



Percolation Design Rate from best fit straight line through data points on graph at 1440 minutes (1-day)

17 min/in

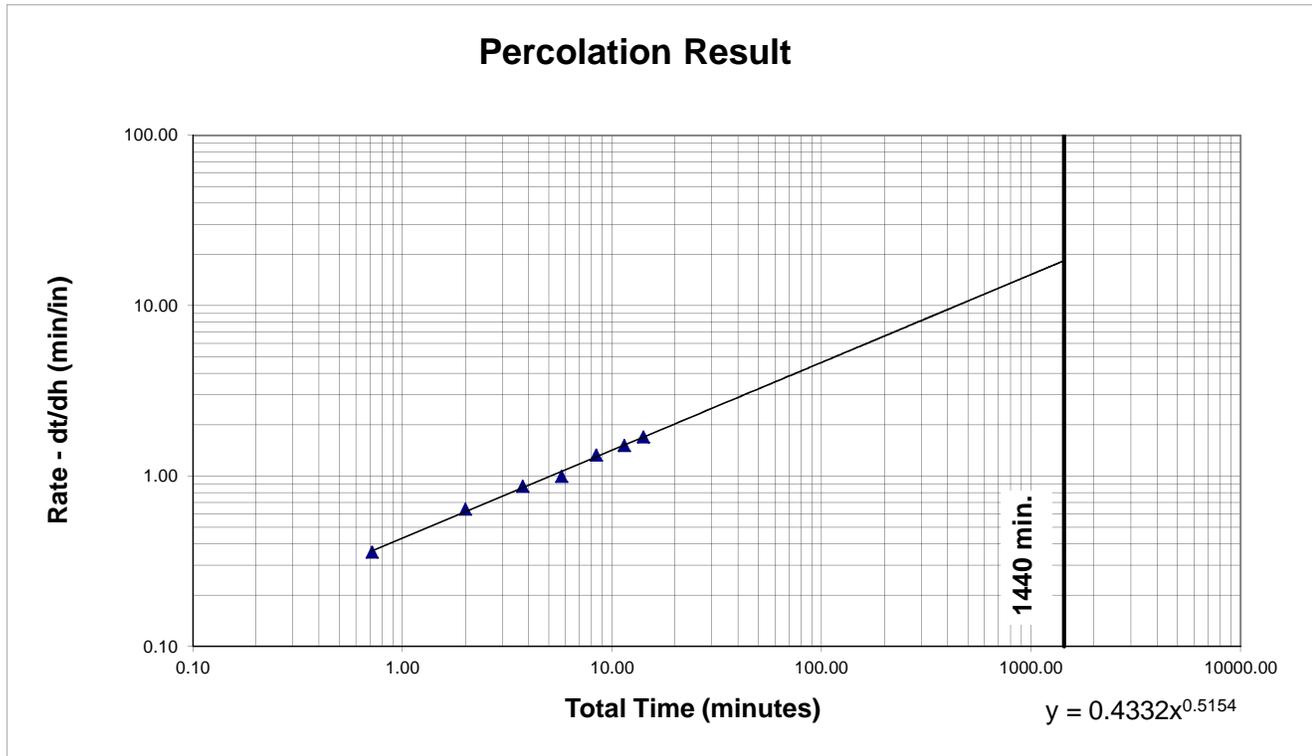
Client: Point Bay Marina
 Project #: 15-203
 Location: Thompson Point Road, Charlotte

Calculated by: AAL
 Test Date: 11/12/2015
 Sheet: 3 of 3

Percolation Test # P-3

Depth of Perc. Test: **20"**

Interval No.	Time Start (h:mm:ss)	Time Finish (h:mm:ss)	Fill Time (h:mm:ss)	Drop Time (h:mm:ss)	Total Time	Total Time (min)	Total Drop (in.)	Rate dt/dh (min/in)
1	0:00:00	0:00:43	0:00:05	0:00:43	0:00:43	0.72	2.0	0.36
2	0:00:43	0:02:00	0:00:05	0:01:17	0:02:00	2.00	2.0	0.64
3	0:02:00	0:03:45	0:00:04	0:01:45	0:03:45	3.75	2.0	0.88
4	0:03:45	0:05:45	0:00:05	0:02:00	0:05:45	5.75	2.0	1.00
5	0:05:45	0:08:25	0:00:17	0:02:40	0:08:25	8.42	2.0	1.33
6	0:08:25	0:11:27	0:00:05	0:03:02	0:11:27	11.45	2.0	1.52
7	0:11:27	0:14:51	---	0:03:24	0:14:08	14.13	2.0	1.70



Percolation Design Rate from best fit straight line through data points on graph at 1440 minutes (1-day) 18 min/in

DESIGN CALCULATIONS

WSID 8204 TNC ON-SITE DRILLED WELL

AVERAGE DAY DEMAND (ADD)

EXISTING

Use	Units	Quantity	Wastewater		Water	
			Flow Per Unit (GPD)	Total (GPD)	Flow Per Unit (GPD)	Total (GPD)
Boats	Slips	197	4	788	197	788
	Moorings	108	4	432	108	432
Total Base Flow				1220		1220
10% Low Flow Fixtures (Table 3 WSPWSR)				1098		1098
Total Existing Flow				1098		1098

PROPOSED

Use	Units	Quantity	Wastewater		Water	
			Flow Per Unit (GPD)	Total (GPD)	Flow Per Unit (GPD)	Total (GPD)
Boats	Slips	197	4	788	197	788
	Moorings	108	4	432	108	432
Restaurant	Seats	74	30	2220	74	2220
Total Base Flow				3440		3440
10% Low Flow Fixtures (Table 3 WSPWSR)				-344		-344
Total WSID 8204 Proposed Flow (ADD)				3096		3096
Total Proposed Flow to New Septic System				1998		1998

MAXIMUM DAY DEMAND (MDD)

$MDD = ADD/720 = 3,096/720 = 4.3 \text{ GPM}$

INSTANTANEOUS PEAK DEMAND (IPD)

Fixture Group	Quantity	Fixture Units	Total Fixture Units
Bathroom Group (Bathhouse)	6	3.6	21.6
Bathroom Group (Restaurant)	2	5	10
Kitchen Sink (Restaurant)	2	4	8
Kitchen Sink (Restaurant Wash)	1	1.4	1.4
Total			41
Instantaneous Peak Demand Table E103.3(3) International Plumbing Code			Q = 26.5 gpm

WASTEWATER SYSTEM AND POTABLE WATER SUPPLY PERMIT
 15-203 POINT BAY MARINA
 CHARLOTTE, VT
 MARCH 2016

PROPOSED WATER SOURCE – EXISTING DRILLED WELL

WELL INFO:

TAG: 41162

TOTAL DEPTH: 440'

STATIC WATER LEVEL: 40'

CASING LENGTH: 55'

CASING DIA.: 6"

YIELD: 8 GPM USE ½ DRILLER'S YIELD Y = 4 GPM

STORAGE VOLUME REQUIRED

PER SECTION 11.8.2.3 SINCE Y = 4 GPM < IPD = 26.5 GPM STORAGE IS REQUIRED

SINCE Y = 4 < $\frac{2}{3}$ MDD = 2.866

STORAGE S = ADD = 3,096 GALLONS

TOTAL AVAILABLE HEAD

WELL ELEVATION: 158'

HIGHEST FAUCET ELEVATION: 110'

TAH: - 48'

DEPTH TO PREDICTED DRAWDOWN

DD = SE + (TAH (MDD/Y)) = 40' + ((-48') (4.3 GPM/4 GPM)) = -11.6, USE 0' – NO DRAWDOWN

PUMP OFF LEVEL = EST. 420'

420' - 0' = 420' STORAGE IN WELL

STORAGE VOLUME PROVIDED

0.1963 CF/FT 6" DIA. X 420' X 7.481 GAL/CF = 616 GALLONS OF STORAGE

500 GALLON STORAGE TANK NEAR BATHHOUSE

TOTAL EXISTING STORAGE = 1,116 GALLONS

ADDITIONAL STORAGE REQUIRED

3,096 GALLONS – 1,116 GALLONS = 1,980 GALLONS

USE 2,000 GALLON STORAGE TANK

SIZE WATER LINE

C = 150 FOR COPPER PIPE L = 400' WELL TO BUILDING D = NOMINAL DIAMETER Q = 26.5 GPM H = HEAD LOSS

ASSUME PRESSURE FROM BOOSTER = 60 PSI

ASSUME MINIMUM REQUIRED PRESSURE AT SINK = 30 PSI $\therefore \Delta H_{PD} = 2.31 \text{ FT/PSI} (60 \text{ PSI} - 30 \text{ PSI}) = 69.3'$

DOWNGRADIENT, NO GAIN IN HEAD DUE TO ELEVATION $\therefore \Delta H_E = 0'$

FRICTION LOSS FROM 26.5 GPM THROUGH 400' OF 1.5" (ASSUMED) DR9 5'/100' X 400' $\therefore \Delta H_f = 20'$

MAXIMUM ALLOWABLE HEAD LOSS $(H) = H_{\text{PRESSURE DROP}} + H_{\text{ELEVATION}} + H_{\text{FRICTION}} = 69.3' + 0' + 20' = 89.3'$

$$h = \frac{10.4 (L) (Q^{1.85})}{C^{1.85} D^{-4.87}} \therefore D = \left(\frac{10.4 (L) (Q^{1.85})}{C^{1.85} (h)} \right)^{0.2055} = \left(\frac{10.4 (400) (26.5^{1.85})}{150^{1.85} (89.3)} \right)^{0.2055} = \left(\frac{1,786,891}{1,020,838} \right)^{0.2055} = 1.13''$$

USE 1.5" DR9 PIPE

PUMP STATION DESIGN COMPUTATIONS

Restaurant

Project Location:

*Point Bay Marina - Mound A
1401 Thompson Point Road*

Project Name:

Point Bay Marina

Applicant:

Point Bay Marina

Date:

February 22, 2016

Project No.:

15-203



478 Blair Park Road
Williston, VT 05495
VOICE (802) 879-6331

PUMP STATION DESIGN COMPUTATIONS

Project No. 15-203

For: Point Bay Marina - Mound A

Calculated by: ALR

Date: February 22, 2016

Checked by: JPP

DESIGN DATA:

DESIGN FLOW:	2000	Gal/Day
NUMBER OF DOSES PER DAY:	8	Minimum of 4
FORCE MAIN DIA. (INCHES):	3	SDR 26 PVC
PUMP STA. PIPE DIA (INCHES):	4	SDR 26 PVC
HAZEN WILLIAMS C-VALUE:	150	

PUMP CHAMBER SPECIFICATIONS:

DIMENSIONS:

DIAMETER: (Inside)	96.00	inches =	8.00	feet
DEPTH: (inside)	60.00	inches =	11.33	feet

Weep hole at pump station? (yes / no) ⇒ **no**

STORAGE:	VOL PER FOOT:	376	gal/ft =	31	gal/in
	PRIMARY VOLUME (between on & off)	252	gal/dose		
	RESERVE VOLUME (above on float)	970	gal =	0.5	days
	VOL. IN PIPE RUN (used with weep only)	0	gal		

TOTAL STORAGE ABOVE ALARM	970	gal
----------------------------------	------------	------------

ELEVATIONS: PUMP STA. INLET: **99.7** feet

	<u>Float Elevations</u>	<u>Float Settings</u>
ALARM	97.1 feet	3 " above on
ON	96.9 feet	8 " above off
OFF	96.2 feet	14 " above sump
SUMP	95.0 feet	

Depth of Sump: **4** inches

CALCULATE STATIC HEAD:

DISCHARGE ELEVATION	160.0	feet
PUMP OFF ELEVATION	<u>96.2</u>	feet

TOTAL STATIC HEAD	⇒	63.8	feet
--------------------------	---	-------------	-------------

PUMP STATION DESIGN COMPUTATIONS

For: Point Bay Marina - Mound A
Date: February 22, 2016

Project No. 15-203
Calculated by: ALR
Checked by: JPP

CALCULATE EQUIVALENT LENGTH:

FRICITION LOSSES IN PUMP CHAMBER:

<u>QTY</u>	<u>DIA (IN)</u>	<u>LOSS/FITTING (FT)</u>	<u>FITTING</u>	<u>TOTAL</u>	
3	4	10.0	90 bend	30.0	FT
0	4	5.0	45 bend	0.0	FT
1	4	22.0	tee	22.0	FT
1	4	26.0	check valve	26.0	FT
1	4	58.0	gate or ball valve	58.0	FT
0	4	10.0	reducer (1 size)	0.0	FT
1	4	10.0	increaser (1 size)	10.0	FT
EQUIVALENT LENGTH:				146.0	FT
				146.0	FT

FRICITION LOSSES IN PIPE RUN:

<u>QTY</u>	<u>DIA (IN)</u>	<u>LOSS/FITTING (FT)</u>	<u>FITTING</u>	<u>TOTAL</u>	
0	3	8.0	90 bend	0.0	FT
20	3	4.0	45 bend	80.0	FT
1	3	17.0	tee	17.0	FT
0	3	20.0	check valve	0.0	FT
0	3	82.0	gate or ball valve	0.0	FT
0	3	5.0	reducer (1 size)	0.0	FT
0	3	5.0	increaser (1 size)	0.0	FT
				LENGTH OF RUN	⇒
EQUIVALENT LENGTH:				1310.0	FT
				1310.0	FT

TOTAL EQUIVALENT LENGTH: ⇒ 1456 FT

PUMP STATION DESIGN COMPUTATIONS

For: Point Bay Marina - Mound A
Date: February 22, 2016

Project No. 15-203
Calculated by: ALR
Checked by: JPP

PRESSURE DISTRIBUTION SYSTEM PARAMETERS:

	<u>Unit</u>	<u>Value</u>	<u>Comment</u>
GENERAL INFO:			
Min. Volume per Dose	gallons	252	
No. of Laterals		8	count each pipe off of
System Width	feet	4	
System Length	feet	140	
Number of Infiltration Areas		4	
Total System Area	sq feet	2240	manifold as one lateral
FORCE MAIN:			
Total Equivalent Length	feet	1456	
Inside Diameter	inches	3	
MANIFOLD:			
No. of Segments		1	
Segment Equiv. Length	feet	25	
Inside Diameter	inches	1.5	
EACH LATERAL:			
Equivalent Length	feet	128.3	
Inside Diameter	inches	1.5	
Design Residual Pressure	feet	2.5	2.31' = 1 psi
Orifice Diameter	inches	0.1875	0.3125=5/16;0.4375=7/16; 0.5625=9/16 0.1875=3/16
1 Orifice per Square Foot (min.)	sq feet	25	inground 1/25 sand filter 1/4
SYSTEM:			
Minimum No. of Orifices		89.60	within system
No. of Orifices		92	within system
Orifice Spacing	inches	69.98	5' 10"

PRESSURE DIFFERENTIAL PER LATERAL:

$$\text{Friction Loss (hL)} = \frac{4.72 \times L \times Q^{1.875}}{C^{1.85} \times D^{4.87}}$$

L Length of Lateral **64.15 FT**
Q Per Lateral **7.54 GPM**

PUMP STATION DESIGN COMPUTATIONS

For: *Point Bay Marina - Mound A*

Date: *February 22, 2016*

Project No. 15-203

Calculated by: *ALR*

Checked by: *JPP*

C Coefficient of Friction **150**
D Diameter of Pipe **1.5** inches
P Pressure **2.5** FT

hL = 0.1748 FT

hL final = hL / P **6.9917** %

SYSTEM PERFORMANCE SUMMARY:

FLOW VELOCITY:

Force Main	ft/sec	2.7
Manifold	ft/sec	5.5
Laterals	ft/sec	0.7

ORIFICE DISCHARGE gal/min 0.66
(per orifice)

NETWORK VOLUME gallons 97 laterals and manifold

MIN. DOSE VOL./NETWORK VOL. 3 minimum allowable = 5

NETWORK DISCHARGE **gal/min** **60** minimum pump discharge

PUMP STATION DESIGN COMPUTATIONS

For: *Point Bay Marina - Mound A*
Date: *February 22, 2016*

Project No. 15-203
Calculated by: *ALR*
Checked by: *JPP*

PRESSURE DISTRIBUTION NETWORK SYSTEM CURVE:

Pump Off Elev.	96.2	Hazen-Williams "C" Value	150
Manifold Invert Elev.	160.00	K Factor for C > 100	0.47
Lateral Invert Elev.	160.00		

FORCE MAIN

Flow (gpm)	Velocity (fps)	H _f /100 (ft./100 ft.)	Friction Loss (feet)
65	3.0	1.1	15.3
75	3.4	1.4	20.0
85	3.9	1.7	25.2
95	4.3	2.1	30.9
105	4.8	2.6	37.2
115	5.2	3.0	44.1
125	5.7	3.5	51.4
135	6.1	4.1	59.3
145	6.6	4.6	67.7

MANIFOLD (EACH SEGMENT)

Flow (gpm)	Velocity (fps)	H _f /100 (ft./100 ft.)	Friction Loss (feet)
65.0	11.8	30.8	7.69
75.0	13.6	40.1	10.03
85.0	15.4	50.6	12.64
95.0	17.2	62.1	15.54
105.0	19.1	74.8	18.70
115.0	20.9	88.5	22.13
125.0	22.7	103.3	25.83
135.0	24.5	119.1	29.79
145.0	26.3	136.0	34.00

EACH LATERAL

Flow (gpm)	Velocity (fps)	H _f /100 (ft./100 ft.)	Friction Loss (feet)
8.1	1.5	0.7	0.84
9.4	1.7	0.9	1.09
10.6	1.9	1.1	1.38
11.9	2.2	1.3	1.69
13.1	2.4	1.6	2.04
14.4	2.6	1.9	2.41
15.6	2.8	2.2	2.82
16.9	3.1	2.5	3.25
18.1	3.3	2.9	3.71

COMPOSITE SYSTEM CURVE

Flow (gpm)	Static Head (feet)	Residual Press. at Distal End	TDH (feet)
65	63.8	2.5	90.1
75	63.8	2.5	97.4
85	63.8	2.5	105.5
95	63.8	2.5	114.5
105	63.8	2.5	124.3
115	63.8	2.5	134.9
125	63.8	2.5	146.4
135	63.8	2.5	158.6
145	63.8	2.5	171.7

Plot Flow and TDH on Pump Curve to determine operating point of pump.

OPERATING POINT (From Attached Pump Curve):

NOTE: PUMP SHALL MEET THE SPECIFICATIONS ABOVE AND BE CAPABLE OF MEETING THE FOLLOWING FLOW AND HEAD CONDITION. ANY CHANGES TO THE PUMP SPECIFICATION SHALL BE APPROVED BY THE ENGINEER.

76 gpm @

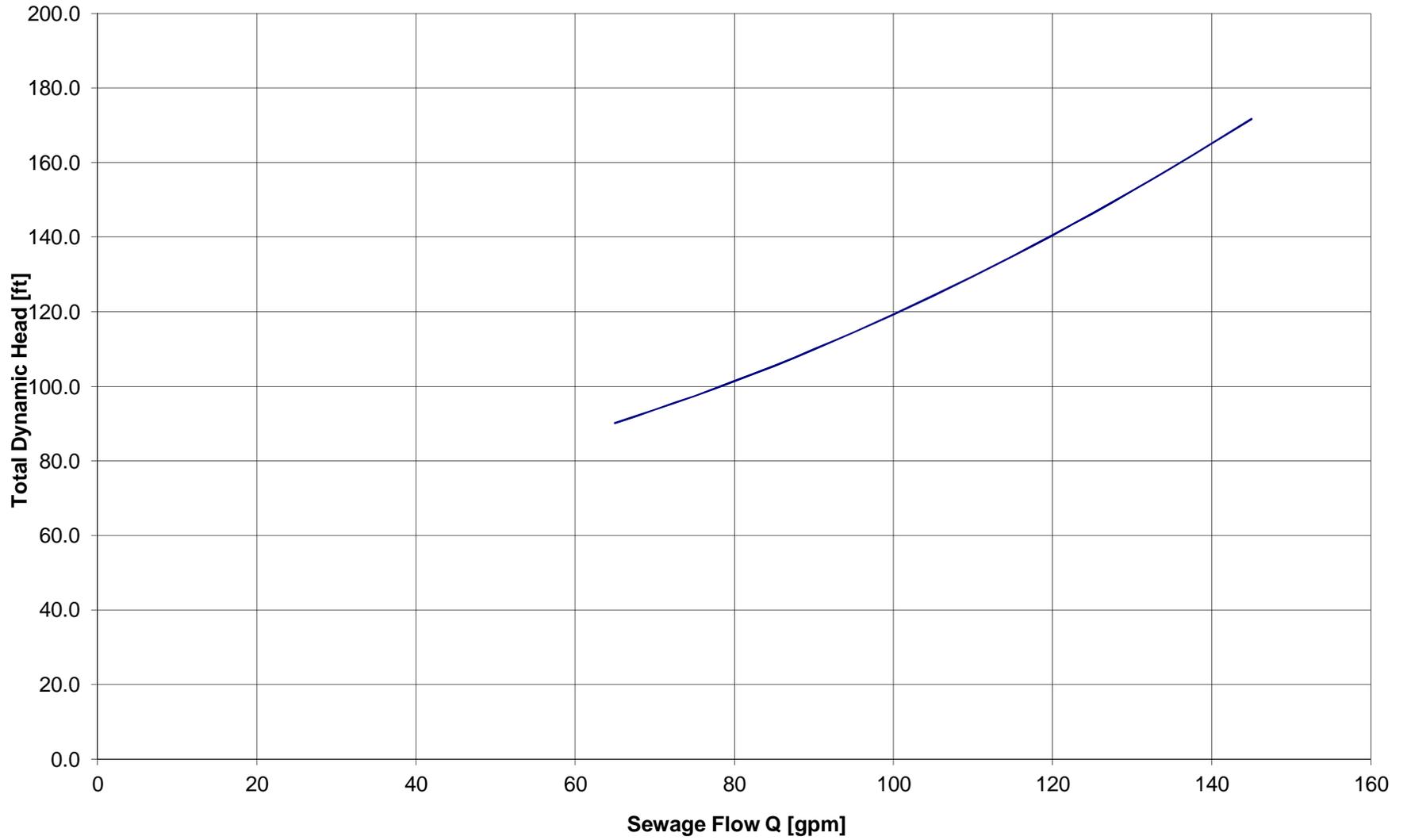
100 TDH

Run time: **5.5 min.**

SUBMERSIBLE PUMP SPECIFICATIONS:

MANUFACTURER:	Barnes	DISCHARGE:	2" NPT
MODEL #:	SGV3072L	SPEED (RPM):	3450
HORSEPOWER:	3.0	VOLTAGE:	200/240
IMPELLER DIAMETER:	5.75"	PHASE:	1
SOLIDS HANDLING:	Grinder		

Pressurized Disposal Pump Requirement Curve



PUMP STATION DESIGN COMPUTATIONS

Restaurant

Project Location:

*Point Bay Marina- Mound B
1401 Thompson Point Road*

Project Name:

Point Bay Marina

Applicant:

Point Bay Marina

Date:

February 22, 2016

Project No.:

15-203



478 Blair Park Road
Williston, VT 05495
VOICE (802) 879-6331

PUMP STATION DESIGN COMPUTATIONS

For: Point Bay Marina- Mound B
Date: February 22, 2016

Project No. 15-203
Calculated by: ALR
Checked by: JPP

DESIGN DATA:

DESIGN FLOW: 2000 Gal/Day
NUMBER OF DOSES PER DAY: 8 Minimum of 4
FORCE MAIN DIA. (INCHES): 3 SDR 26 PVC
PUMP STA. PIPE DIA (INCHES): 4 SDR 26 PVC
HAZEN WILLIAMS C-VALUE: 140

PUMP CHAMBER SPECIFICATIONS:

DIMENSIONS:

DIAMETER: (Inside) 96.00 inches = 8.00 feet
DEPTH: (inside) 60.00 inches = 11.33 feet

Weep hole at pump station? (yes / no) ⇒ no

STORAGE: VOL PER FOOT: 376 gal/ft = 31 gal/in
PRIMARY VOLUME (between on & off) 252 gal/dose
RESERVE VOLUME (above on float) 970 gal = 0.5 days
VOL. IN PIPE RUN (used with weep only) 0 gal

TOTAL STORAGE ABOVE ALARM 970 gal

ELEVATIONS: PUMP STA. INLET: 99.7 feet

	<u>Float Elevations</u>	<u>Float Settings</u>
ALARM	97.1 feet	3 " above on
ON	96.9 feet	8 " above off
OFF	96.2 feet	14 " above sump
SUMP	95.0 feet	

Depth of Sump: 4 inches

CALCULATE STATIC HEAD:

DISCHARGE ELEVATION 160.0 feet
PUMP OFF ELEVATION 96.2 feet

TOTAL STATIC HEAD ⇒ 63.8 feet

PUMP STATION DESIGN COMPUTATIONS

For: *Point Bay Marina- Mound B*
Date: *February 22, 2016*

Project No. 15-203
Calculated by: *ALR*
Checked by: *JPP*

CALCULATE EQUIVALENT LENGTH:

FRICION LOSSES IN PUMP CHAMBER:

<u>QTY</u>	<u>DIA (IN)</u>	<u>LOSS/FITTING (FT)</u>	<u>FITTING</u>	<u>TOTAL</u>	
3	4	10.0	90 bend	30.0	FT
0	4	5.0	45 bend	0.0	FT
1	4	22.0	tee	22.0	FT
1	4	26.0	check valve	26.0	FT
1	4	58.0	gate or ball valve	58.0	FT
0	4	10.0	reducer (1 size)	0.0	FT
0	4	10.0	increaser (1 size)	0.0	FT
EQUIVALENT LENGTH:				136.0	FT
				136.0	FT

FRICION LOSSES IN PIPE RUN:

<u>QTY</u>	<u>DIA (IN)</u>	<u>LOSS/FITTING (FT)</u>	<u>FITTING</u>	<u>TOTAL</u>	
0	3	8.0	90 bend	0.0	FT
20	3	4.0	45 bend	80.0	FT
1	3	17.0	tee	17.0	FT
0	3	20.0	check valve	0.0	FT
0	3	82.0	gate or ball valve	0.0	FT
0	3	5.0	reducer (1 size)	0.0	FT
0	3	5.0	increaser (1 size)	0.0	FT
				LENGTH OF RUN	⇒
EQUIVALENT LENGTH:				1310.0	FT
				1310.0	FT

TOTAL EQUIVALENT LENGTH: ⇒ 1446 FT

PUMP STATION DESIGN COMPUTATIONS

For: Point Bay Marina- Mound B
Date: February 22, 2016

Project No. 15-203
Calculated by: ALR
Checked by: JPP

PRESSURE DISTRIBUTION SYSTEM PARAMETERS:

	<u>Unit</u>	<u>Value</u>	<u>Comment</u>
GENERAL INFO:			
Min. Volume per Dose	gallons	252	
No. of Laterals		10	count each pipe off of
System Width	feet	4	
System Length	feet	100	
Number of Infiltration Areas		5	
Total System Area	sq feet	2000	manifold as one lateral
FORCE MAIN:			
Total Equivalent Length	feet	1446	
Inside Diameter	inches	3	
MANIFOLD:			
No. of Segments		1	
Segment Equiv. Length	feet	25	
Inside Diameter	inches	1.5	
EACH LATERAL:			
Equivalent Length	feet	88.89	
Inside Diameter	inches	1.5	
Design Residual Pressure	feet	2.5	2.31' = 1 psi
Orifice Diameter	inches	0.1875	0.3125=5/16;0.4375=7/16; 0.5625=9/16 0.1875=3/16
1 Orifice per Square Foot (min.)	sq feet	25	inground 1/25 sand filter 1/4
SYSTEM:			
Minimum No. of Orifices		80.00	within system
No. of Orifices		85	within system
Orifice Spacing	inches	63.49	5' 3 4/8"

PRESSURE DIFFERENTIAL PER LATERAL:

$$\text{Friction Loss (hL)} = \frac{4.72 \times L \times Q^{1.875}}{C^{1.85} \times D^{4.87}}$$

L Length of Lateral **44.445 FT**
Q Per Lateral **5.57 GPM**

PUMP STATION DESIGN COMPUTATIONS

For: *Point Bay Marina- Mound B*

Date: *February 22, 2016*

Project No. 15-203

Calculated by: *ALR*

Checked by: *JPP*

C Coefficient of Friction **140**
D Diameter of Pipe **1.5** inches
P Pressure **2.5** FT

hL = 0.0781 FT

hL final = hL / P **3.1225** %

SYSTEM PERFORMANCE SUMMARY:

FLOW VELOCITY:

Force Main	ft/sec	2.5
Manifold	ft/sec	5.1
Laterals	ft/sec	0.5

ORIFICE DISCHARGE gal/min 0.66
(per orifice)

NETWORK VOLUME gallons 84 laterals and manifold

MIN. DOSE VOL./NETWORK VOL. 3 minimum allowable = 5

NETWORK DISCHARGE **gal/min** **56** minimum pump discharge

PUMP STATION DESIGN COMPUTATIONS

For: *Point Bay Marina- Mound B*
Date: *February 22, 2016*

Project No. 15-203
Calculated by: *ALR*
Checked by: *JPP*

PRESSURE DISTRIBUTION NETWORK SYSTEM CURVE:

Pump Off Elev.	96.2	Hazen-Williams "C" Value	140
Manifold Invert Elev.	160.00	K Factor for C > 100	0.54
Lateral Invert Elev.	160.00		

FORCE MAIN

Flow (gpm)	Velocity (fps)	H _f /100 (ft./100 ft.)	Friction Loss (feet)
60	2.7	1.0	14.9
70	3.2	1.4	19.8
80	3.6	1.8	25.4
90	4.1	2.2	31.6
100	4.5	2.7	38.4
110	5.0	3.2	45.8
120	5.4	3.7	53.8
130	5.9	4.3	62.4
140	6.4	4.9	71.6

MANIFOLD (EACH SEGMENT)

Flow (gpm)	Velocity (fps)	H _f /100 (ft./100 ft.)	Friction Loss (feet)
60.0	10.9	30.2	7.54
70.0	12.7	40.1	10.03
80.0	14.5	51.4	12.84
90.0	16.3	63.9	15.97
100.0	18.2	77.7	19.41
110.0	20.0	92.6	23.16
120.0	21.8	108.8	27.21
130.0	23.6	126.2	31.56
140.0	25.4	144.8	36.20

EACH LATERAL

Flow (gpm)	Velocity (fps)	H _f /100 (ft./100 ft.)	Friction Loss (feet)
6.0	1.1	0.4	0.38
7.0	1.3	0.6	0.50
8.0	1.5	0.7	0.64
9.0	1.6	0.9	0.80
10.0	1.8	1.1	0.97
11.0	2.0	1.3	1.16
12.0	2.2	1.5	1.36
13.0	2.4	1.8	1.58
14.0	2.5	2.0	1.81

COMPOSITE SYSTEM CURVE

Flow (gpm)	Static Head (feet)	Residual Press. at Distal End	TDH (feet)
60	63.8	2.5	89.1
70	63.8	2.5	96.7
80	63.8	2.5	105.2
90	63.8	2.5	114.6
100	63.8	2.5	125.1
110	63.8	2.5	136.4
120	63.8	2.5	148.7
130	63.8	2.5	161.8
140	63.8	2.5	175.9

Plot Flow and TDH on Pump Curve to determine operating point of pump.

OPERATING POINT (From Attached Pump Curve):

NOTE: PUMP SHALL MEET THE SPECIFICATIONS ABOVE AND BE CAPABLE OF MEETING THE FOLLOWING FLOW AND HEAD CONDITION. ANY CHANGES TO THE PUMP SPECIFICATION SHALL BE APPROVED BY THE ENGINEER.

74 gpm @

100 TDH

Run time: **5.5 min.**

SUBMERSIBLE PUMP SPECIFICATIONS:

MANUFACTURER:	Barnes	DISCHARGE:	2" NPT
MODEL #:	SGV3072L	SPEED (RPM):	3450
HORSEPOWER:	3.0	VOLTAGE:	200/240
IMPELLER DIAMETER:	5.75"	PHASE:	1
SOLIDS HANDLING:	Grinder		

PUMP STATION DESIGN COMPUTATIONS

For: *Point Bay Marina- Mound B*
 Date: *February 22, 2016*

Project No. *15-203*
 Calculated by: *ALR*
 Checked by: *JPP*

Wetwell (cylindrical)

Existing Grade:	104.00	ft
Proposed Grade:	104.00	ft
Station Rim Elev:	104.50	ft
Tot. Height of Pump Station:	9.33	ft
Bottom of Pump Station Elev:	95.17	ft
Max. Ground Water Elev:	103.00	ft
Depth of Groundwater to bottom of Well:	7.83	ft
Inside Diameter of Well:	8.00	ft
Wall Thickness:	0.75	in
Outside Diameter of Well:	8.13	ft
Lid Thickness:	1.00	in
Bottom Thickness:	0.00	in
Weight of Concrete:	150	lb/ft ³

Bouyant Force:

$$(3.14)(D^2)/4 * \text{Depth of Water} * 62.4 \text{ lb/ft}^3 = 25,333 \text{ lbs} \uparrow$$

Resisting Forces:

Weight of Concrete Cylinder:	2,216	lbs
Weight of Concrete Lid:	628	lbs
Weight of Concrete Bottom:	-	lbs
Total:	2,844	lbs ↓

Factor of Safety not including skin friction and weight of internal components: 0.11 FS

Flange

	Will float without flange	
Size of flange:	2	ft
Outer diameter of flange:	12.13	ft
Outer diameter of wetwell:	8.13	ft
Flange thickness:	1	ft
Weight of flange concrete:	9543	lbs
Elevation of flange top:	96.17	ft
Vol. soil above water table:	64	ft ³
Vol. soil below water table:	435	ft ³
Unit weight of soil:	100	lbs/ft ³
Weight of soil above flange:	22699	lbs

Total Resisting Forces: 35,086 lbs ↓
Factor of Safety w/ flange: 1.38 FS

WON'T FLOAT

Valve Pit (cylindrical)

Existing Grade:	0.00	ft
Proposed Grade:	0.00	ft
Pit Rim Elev:	2.50	ft
Tot. Height of Valve Pit:	0.00	ft
Bottom of Valve Pit Elev:	2.50	ft
Max. Ground Water Elev:	0.00	ft
Depth of Groundwater to bottom of Pit:	-2.50	ft
Inside Diameter of Pit:	0.00	ft
Wall Thickness:	0.00	in
Outside Diameter of Pit:	0.00	ft
Lid Thickness:	0.00	in
Bottom Thickness:	0.00	in
Weight of Concrete:	0	lb/ft ³

Bouyant Force:

$$(3.14)(D^2)/4 * \text{Depth of Water} * 62.4 \text{ lb/ft}^3 = - \text{ lbs} \uparrow$$

Resisting Forces:

Weight of Concrete Cylinder:	-	lbs
Weight of Concrete Lid:	-	lbs
Weight of Concrete Bottom:	-	lbs
Total:	-	lbs ↓

Factor of Safety not including skin friction and weight of internal components: #DIV/0! FS

Flange

	#DIV/0!	
Size of flange:	0	ft
Outer diameter of flange:	0.00	ft
Outer diameter of pit:	0.00	ft
Flange thickness:	0	ft
Weight of flange concrete:	0	lbs
Elevation of flange top:	2.50	ft
Vol. soil above water table:	0	ft ³
Vol. soil below water table:	0	ft ³
Unit weight of soil:	0	lbs/ft ³
Weight of soil above flange:	0	lbs

Total Resisting Forces: - lbs ↓
Factor of Safety w/ flange: #DIV/0! FS

#DIV/0!

Water Supply Division



- **Critical Infrastructure Protection Information**
- **Permit, Certification & License Application Forms & Information**
- **Water System Capacity Development & DWSRF**
- **Well Driller & Well Location Program**
- **Source Water Protection**
- **Water System Operators**
- **Drinking Water Quality**
- **The TNC Handbook**
- **Rules and Regulations**
- **Staff Directory**
- **News**
- **Other Links of Interest**
- **Agency of Natural Resources GIS Internet Mapping**

Well Details

Date Completed	05/14/1981
Date Received	06/29/1981
Driller	36 Chevalier Drilling Company Inc
Well Report Number	227
Tag	
Comments	CASING: GROUT CEMENT DRILLED 8 3/4" HOLE 16' IN BEDROCK
Town	Charlotte
Map Cell	03D6
Tax Map	
E911 Address	
SubDivision	
Lot Number	
Owners First Name	AL
Owners Last Name	MARTIN
Purchaser First Name	
Purchaser Last Name	
Well Use	Domestic
Well Reason	Replace existing supply
Drilling Method	Rotary (AP)
Well Depth	323.00 feet
Yield Gallons Per Minute	4.00
Yield Test Tested For Hours	0.00
Static Water Level	20.00 feet
Over Flowing	0
OverBurden Thickness	3 feet
Casing Length	20.00 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

Quick Links

- » [List of Vermont Licensed Well Drillers](#)
- » [Well Driller Licensing Rule PDF](#)
- » [Well Driller License forms](#)

- » [Current Nationwide Threat Level: Yellow](#)

Depth Drilled in Bedrock 0.00 feet
 Screen Make Type
 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 Grout bottom only
 Yield Test Method Compressed air
 Well Development
 Not Steel Casing 0
 Water Analysis 0
 Well Screen 0
 AW Partial 0
 Unique GIS Name CI227
 Lat Degree 44
 Lat Minutes 16
 Lat Seconds 20.7600
 Long Degree 73
 Long Minutes 17
 Long Seconds 40.3621
 Location
 DeterminationMethod screen digitized
 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	3.00		C	clay and stones
3.00	323.00		R	limestone

If you would like search for a well or wells in a specific area the following link will relocate you to the ANR GIS Internet Mapping Program.

<http://www.anr.state.vt.us/site/html/maps.htm>



www.VermontDrinkingWater.org

VT DEC ■ Water Supply Division ■ 103 South Main Street, Old Pantry Building ■ Waterbury, VT 05671-0403
 Telephone toll-free in VT: 800-823-6500 or call 802-241-3400 ■ Fax: 802-241-3284

[DEC home](#) ■ [dec calendar](#) ■ [contact dec](#) ■ [topic index](#) ■ [site map](#) ■ [search](#)
[about dec](#) ■ [assistance](#) ■ [divisions & programs](#) ■ [dec permits](#) ■ [dec regulations](#) ■ [dec publications](#)
[dec grants & loans](#) ■ [dec maps & GIS](#) ■ [hotline numbers](#) ■ [related links](#) ■ [privacy policy](#) ■ [ANR home](#)



[State of Vermont Agencies & Depts.](#) • [Access Government 24/7](#) • [About Vermont.Gov](#) • [Privacy Policy](#) • [Ask a State Librarian](#)

[a ?](#)

A Vermont Government Website Copyright 2004-2006 State of Vermont - All rights reserved



Drinking Water and Groundwater Protection Division



[dwgwpd home](#) [loans](#) [notices](#) [contacts](#)

[dec home](#) > [dwgpd home](#) > [property owners](#) > well completion reports

Drinking Water Systems
Property / Business Owners & Residents
Land-Based Disposal systems
Wastewater Disposal
Certification/Licensing
e-DEC
Fees
Environmental Notices
Funding
Groundwater Reclassification
Groundwater Withdrawal
Rules
Contact Us
Wastewater Permits Searchable Database
Well Completion Reports Searchable Database
ANR Internet Mapping Page

Well Details

Date Completed	04/17/2008
Date Received	04/22/2008
Driller	191 - David Chevalier , Chevalier Drilling Co Inc
Well Report Number	41162
Tag	41162
Comments	Casing grouted with neat cement using Hallburton method. Grout type: Cement
Town	Charlotte
Map Cell	
Tax Map	
E911 Address	1401 Thompson's Point Road
Subdivision	
Lot Number	
Owners First Name	
Owners Last Name	PT Bay Marina
Purchaser First Name	
Purchaser Last Name	
Well Use	Domestic
Well Reason	New Supply
Drilling Method	
Well Depth	440.00 feet
Yield Gallons Per Minute	8.00
Yield Test Tested For Hours	1.00
Static Water Level	0.00 feet
Over Flowing	
Overburden Thickness	1 feet
Casing Length	55.00 feet
Casing Diameter	6.00 inches
Casing Length Below Land Surface	50.00 feet
Casing Length Exposed	5.00
Casing Material	Steel
Casing Weight	19.00 lbs/foot
Casing Finish	
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	
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
 Well Development
 Not Steel Casing
 Water Analysis
 Well Screen
 AW Partial
 Unique GIS Name CI41162
 Lat Degree 44
 Lat Minutes 16
 Lat Seconds 34.2100
 Long Degree 73
 Long Minutes 17
 Long Seconds 7.1500
 Location Determination Method
 Well Type Bedrock
 Depth To Liner Top 0.00
 Hydro Fractured
 Hydro Fractured Resulting Flow 0.00
 Well Location Submitted As A Dot On A Map N
 WellMainRecordNumber StartingDepth EndingDepth WaterBearing LithologyCode LithologyDescription
 104577 0.00 1.00 D soil
 104577 1.00 440.00 R limestone

If you would like search for a well or wells in a specific area the following link will relocate you to the ANR GIS Internet Mapping Program.

<http://www.anr.state.vt.us/site/html/maps.htm>



drinkingwater.vermont.gov ■ groundwater.vermont.gov ■ septic.vermont.gov ■ wastewater.vermont.gov
 VT DEC ■ Drinking Water and Groundwater Protection Division ■ 1 National Life Drive, Main Building, 2nd Floor ■ Montpelier, VT 05620-3521
 Telephone toll-free in VT: 800-823-6500 or call 802-241-3400 ■ Fax: 802-828-1541

[DEC home](#) ■ [dec calendar](#) ■ [contact dec](#) ■ [topic index](#) ■ [site map](#) ■ [search](#)
[about dec](#) ■ [assistance](#) ■ [divisions & programs](#) ■ [dec permits](#) ■ [dec regulations](#) ■ [dec publications](#)
[dec grants & loans](#) ■ [dec maps & GIS](#) ■ [hotline numbers](#) ■ [related links](#) ■ [privacy policy](#) ■ [ANR home](#)



[State of Vermont Agencies & Depts.](#) ■ [Access Government 24/7](#) ■ [About Vermont.Gov](#) ■ [Privacy Policy](#)

A Vermont Government Website Copyright 2004 State of Vermont - All rights reserved



permit file

Agency of Natural Resources

State of Vermont
Department of Environmental Conservation
Water Supply Division
The Old Pantry Building
103 South Main Street
Waterbury, VT 05671-0403
www.vermontdrinkingwater.org

[PHONE] (802) 241-3400

[FAX] (802) 241-3284

SOURCE AND CONSTRUCTION PERMIT
PUBLIC TRANSIENT NON-COMMUNITY WATER SYSTEM

PROJECT #T-2096-08.0 WSID #8204 PIN #EJ96-0210

PERMITTEE: **Allen M. and Nancy Martin**
ADDRESS: **1401 Thompson's Point Road**
 Charlotte, VT 05445

PROJECT NAME: **Point Bay Marina**TOWN LOCATION: **Charlotte**

General Findings and Conditions

1. This Source Permit, with conditions, is granted based on a review which determined that the proposed works will not constitute a public health hazard or a public health risk.
2. The conditions of this permit shall run with the land and shall be binding upon, and enforceable against, the permittee and all assigns and successors in interest. The permittee shall be responsible for recording this permit in the municipal land records within thirty (30) days of issuance of this permit; and prior to the conveyance of any land associated with this permit.
3. This permit is valid for a period of 2 years. The permit may be renewed at the discretion of the Secretary, upon written request and submittal of the appropriate amendment fee by the permittee, if the approved water system is not substantially completed prior to the expiration of this permit. This permit is not transferable or assignable and shall automatically become invalid upon change in ownership. This Source Permit does not grant permission to operate the water system; a Permit to Operate must be applied for and obtained from the Water Supply Division prior to use of the water system.
4. By acceptance of this permit, the permittee agrees to allow representatives of the State of Vermont access to the project, at reasonable times, for the purpose of ascertaining compliance with Vermont environmental laws and this permit.



5. The Department of Environmental Conservation maintains continuing jurisdiction during the life of the permit and may require the permittee periodically to file an affidavit certifying that the project is operating in accordance with the approved plans, specifications, and conditions of the permit.
6. The permittee shall obtain a new permit or an amendment to an existing permit, as appropriate, from the Wastewater Management Division for approval of the project's wastewater disposal system prior to change.
7. Project Description: The project is represented by plans and specifications prepared and submitted by **Phelps Engineering**. The total number of sheets reviewed by the Vermont Department of Environmental Conservation for this project is **six as listed below**. The project is described as follows: connection of a new well, Well 3, to the Point Bay Marina Water System with approximately 400 linear feet of 1 ½ -inch polyethylene pipe buried with 1 ½ foot of soil, and installation of a water storage tank, hypochlorination disinfection equipment (chemical feed pump and tank) to achieve 4-log inactivation of viruses, pressure booster pump and tanks, associated piping and controls, and appurtenances for the Point Bay Marina Water System.

Sheet No.	Drawing Date	Last Revision Date
1 of 6	May 21, 2008	June 13, 2008
2, 3, 4 and 6 of 6	May 21, 2008	None
5 of 6	May 20, 2008	June 13, 2008

Source Findings and Conditions

8. Source Name: Well 3
9. WSD Source Number: WL003
10. Source Site: Approved. (See attached map)
 - a. Ownership/Control of the water source has been established by deed.
 - b. No agricultural lands are found in the vicinity that are likely to affect the source.

11. Source Water Quality Results: Conditioned.
 - a. Total Coliform Bacteria: Vermont Department of Health; Reference # 08WB10053 Result Below MCL.
 - b. Inorganic Chemicals: Endyne Inc.; Reference #0710-9636; Results Below MCL. Vermont Health Department Reference #08WB10053; Results Below MCL with the exception of Iron. Iron was identified above the MCL of 0.3 mg/L and may require future treatment.
 - c. Groundwater Under the Direct Influence of Surface Water determination: Source determined not to be under the direct influence of surface water, determination letter provided June 19, 2008.
12. Source Water Quantity: Approved for 2.1 gpm (max day).
13. Source Construction: Approved.
14. Source Interference: Approved no interference.

Construction Findings and Conditions

15. The project shall be constructed, completed, maintained, and operated in accordance with the approved plans and specifications and in accordance with the conditions of this permit. No changes shall be made in the project without the written approval of the Department of Environmental Conservation.
16. Construction inspection shall be performed by a competent inspector under the general supervision of a professional engineer. It is the permittee's responsibility to ensure that inspection is undertaken to assure that the project is constructed in accordance with the approved plans and specifications, plus any authorized change orders.
17. The permittee or representative shall submit as-built Record Drawings to the Department of Environmental Conservation indicating the system as it was constructed, including any field modification. Record Drawings shall be developed by the professional engineering firm responsible for observation of construction. Record Drawings shall be submitted within 60 days of final system field approval by the responsible engineer.
18. Prior to being placed in operation for domestic use, all new portions of the system shall be flushed; pressure tested, disinfected and flushed again. Following this procedure, at least two samples must be collected in Vermont certified laboratory sample bottles, taken from representative sample points and sent to a Vermont Department of Health certified laboratory for Bacteriological Examination of Public Water Supply. Indicate on the sample form that it is an "other" sample with "source/construction" written in the comment line. Coliform-absent sample results are required before the system may be placed "on line" for potable water use.

Appeals

Pursuant to 10 V.S.A. Chapter 220, any appeal of this decision must be filed with the clerk of the Environmental Court within 30 days of the date of the decision. The appellant must attach to the Notice of Appeal the entry fee of \$225.00 payable to the State of Vermont.

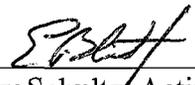
The Notice of Appeal must specify the parties taking the appeal and the statutory provision under which each party claims party status; must designate the act or decision appealed from; must name the Environmental Court; and must be signed by the appellant or their attorney. In addition, the appeal must give the address or location and description of the property, project or facility with which the appeal is concerned and the name of the applicant or any permit involved in the appeal.

The appellant must also serve a copy of the Notice of Appeal in accordance with Rule 5(b)(4)(B) of the Vermont Rules for Environmental Court Proceedings.

For further information, see the Vermont Rules for Environmental Court Proceedings, available on-line at www.vermontjudiciary.org. The address for the Environmental Court is 2418 Airport Road, Suite 1, Barre, VT 05641 (Tel. #802-828-1660).

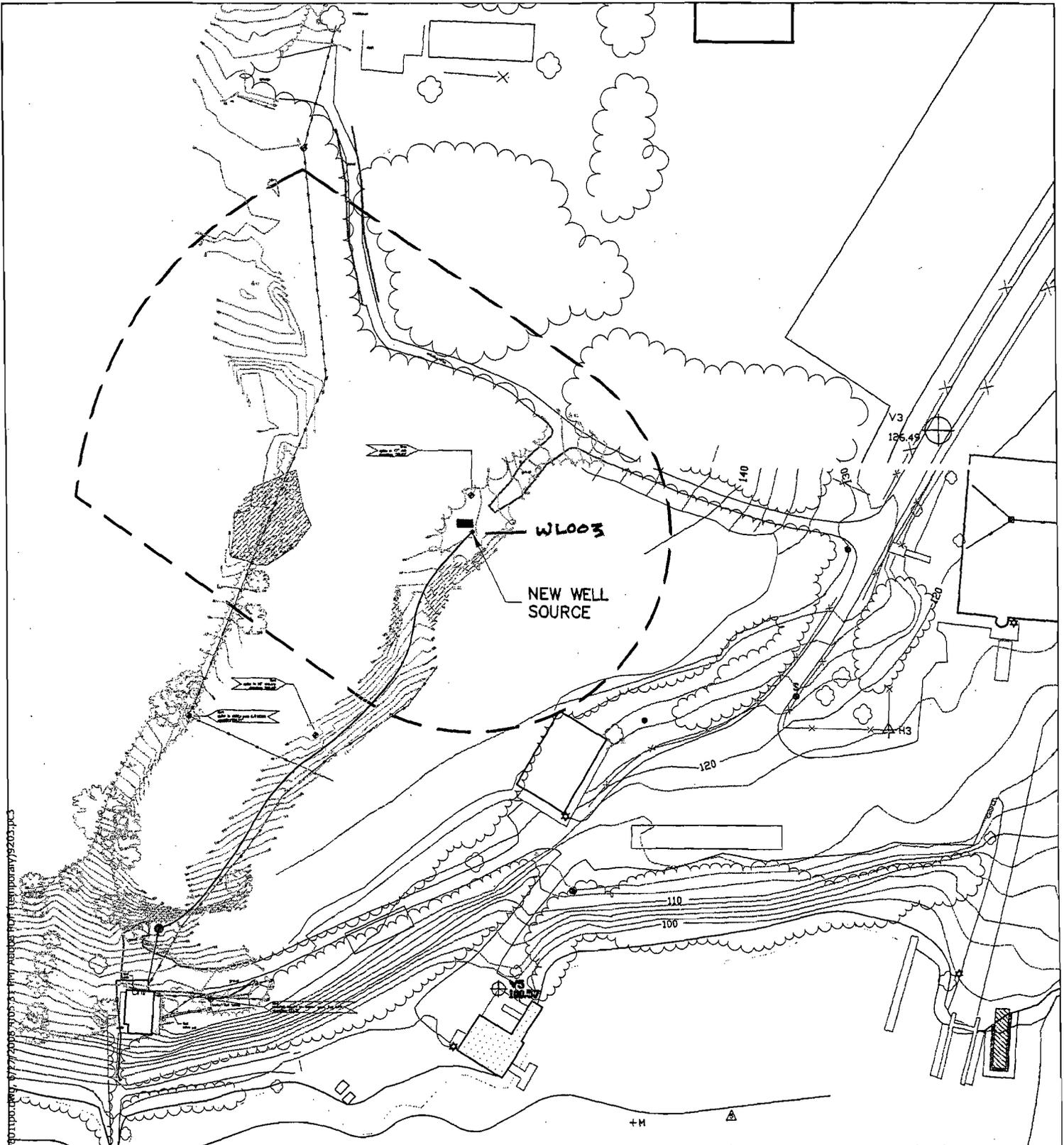
Signed at Waterbury, VT this 3rd day of July, 2008

Laura Q. Pelosi, Commissioner
Department of Environmental Conservation

for By 
Gary Schultz, Acting Director
Water Supply Division

Enclosure: Map with source location

- c Jeremy Rathbun, Phelps Engineering
- Ernie Christianson, WWMD
- Dennis Nealon, WSD
- Greg Bostock, WSD
- Rodney Pingree, WSD
- Eric Blatt, WSD
- Permit File
- PID # T-2096



PHELPS ENGINEERING, INC.

79 Court St., P.O. Box 367
 Middlebury, Vt. 05753
 Tele. (802) 388-7829

Fax (802) 388-9642

E-Mail info@phelpseng.com

PROJECT: POINT BAY MARINA

SKETCH #

TITLE: PBM SOURCE

1

SCALE: 1" = 1000

DATE: 6-27-08

ENG: JR

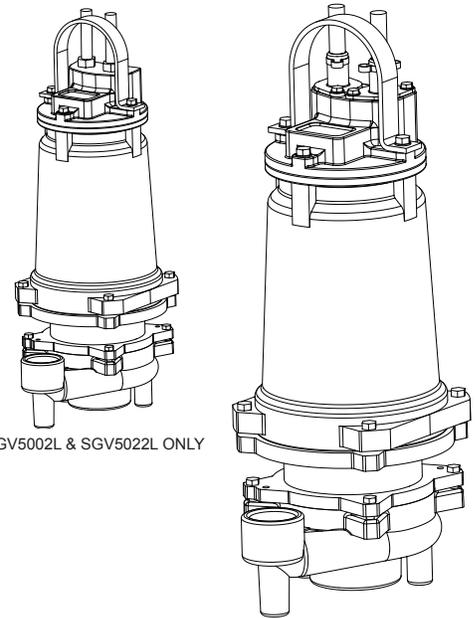
PROJECT #: 200801

REF.SHT. N/A

Submersible Grinder Pumps

Specifications:

DISCHARGE	2" NPT, Vertical
LIQUID TEMPERATURE	104°F (40°C) Continuous
VOLUTE	Cast Iron ASTM A-48, Class 30.
MOTOR HOUSING	Cast Iron ASTM A-48, Class 30.
SEAL PLATE	Cast Iron ASTM A-48, Class 30.
IMPELLER: Design	12 Vane,Vortex, With Pump Out Vanes On Back Side. Dynamically Balanced, ISO G6.3.
<i>Material</i>	Cast Iron
SHREDDING RING	Hardened 440C Stainless Steel Rockwell® C-55.
CUTTER	Hardened 440CStainless Steel, Rockwell® C-55.
SHAFT	416 Stainless Steel
SQUARE RINGS	Buna-N
HARDWARE	300 Series Stainless Steel
PAINT	Air Dry Enamel.
SEAL: Design	Tandem Mechanical, Oil Filled Reservoir.
<i>Material</i>	Rotating Faces - Carbon Stationary Faces - Ceramic Elastomer - Buna-N Hardware -300 Series Stainless
CORD ENTRY:	
<i>SGV5002L & SGV5022L</i>	30 ft. (9m) Std. Cord. Pressure Grommet for Sealing and Strain Relief.
<i>All Other Models</i>	30 ft. (9m) Std. Cord. Custom Molded Quick Connect for For Sealing and Strain Relief
CORD	CSA/UL Approved 10/4, 6/4, 8/4 Type SOW.
UPPER BEARING:	
<i>Design</i>	Single Row, Ball, Oil Lubricated
<i>Load</i>	Radial
INTERMEDIATE BEARING:	
<i>Design</i>	Single Row, Ball, Oil Lubricated
<i>Load</i>	Radial & Thrust
LOWER BEARING:	
<i>Design</i>	Sleeve, Oil Lubrication:
<i>Load</i>	Radial
MOTOR: Design	NEMA L-Single Phase, NEMA B-Three Phase Torque Curve. Oil-Filled, Squirrel Cage Induction.
<i>Insulation</i>	Class F.
SINGLE PHASE	Capacitor Start/Capacitor Run. Requires Overload Protection to be Included In control panel, Requires Barnes® Starter or Control Panel which Includes Capacitors, or Capacitor pack.
THREE PHASE	Dual Voltage 240/480; Requires Overload Protection to be Included in control panel.
OPTIONAL EQUIPMENT	Seal Material, Impeller Trims, Cord Length. Moisture Sensors, Moveable Fitting
RECOMMENDED:	
<i>Accessories</i>	Break Away Fitting (BAF) Check Valve Control Panel
<i>Seal Kit PN</i>	085223
<i>Service Kit PN</i>	115771



SGV5002L & SGV5022L ONLY

Series: SGV
3, 5, 7.5 HP,
3450RPM, 60Hz



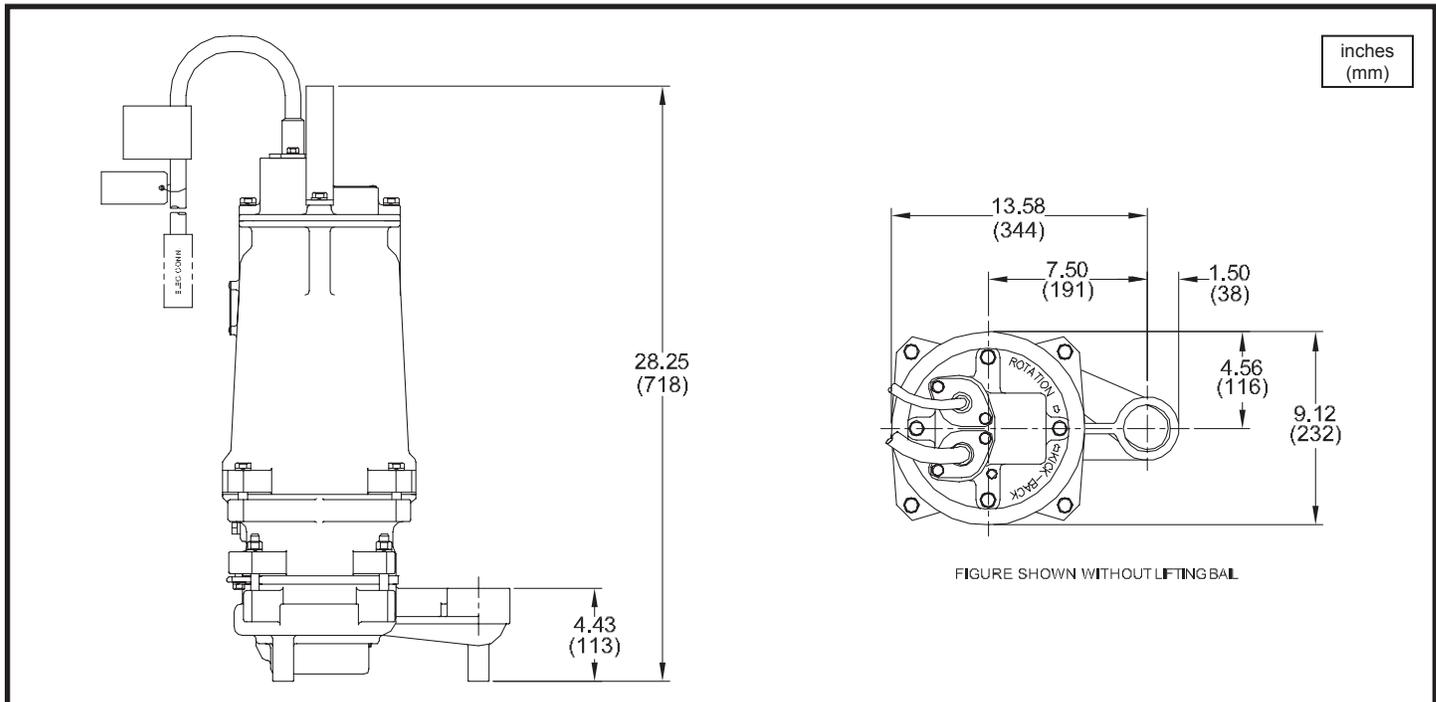
CSA 108 - File No. LR16567
UL 778

Sample Specifications: Section 3 Page 9.

DESCRIPTION:

THE GRINDER PUMP IS DESIGNED TO REDUCE DOMESTIC, COMMERCIAL, INSTITUTIONAL AND LIGHT INDUSTRIAL SEWAGE TO A FINELY GROUND SLURRY.

Submersible Grinder Pumps



MODEL NO	PART NO	HP	VOLT/PH	Hz	RPM (Nom)	NEMA START CODE	FULL LOAD AMPS	LOCKED ROTOR AMPS	CORD SIZE	CORD TYPE	CORD O.D. ± .02 (.5) in (mm)
SGV3072L	111608	3	200/240/1	60	3450	G	25.2/21.7	86/75	10/4	SOW	.75 (19)
SGV3062L	111612	3	200/3	60	3450	J	17.0	65.0	10/4	SOW	.75 (19)
SGV3032L	111609	3	240/3	60	3450	K	14.5	62.0	10/4	SOW	.75 (19)
SGV3042L	111610	3	480/3	60	3450	K	7.2	31.0	10/4	SOW	.75 (19)
SGV3052L	111611	3	600/3	60	3450	J	5.6	22.6	10/4	SOW	.75 (19)
SGV5002L	115657	5	200/1	60	3450	F	42.0	134.0	6/4	SOW	1.03 (26)
SGV5022L	115658	5	240/1	60	3450	H	39.0	136.0	8/4	SOW	.93 (24)
SGV5062L	111619	5	200/3	60	3450	K	25.0	122.0	10/4	SOW	.75 (19)
SGV5032L	111616	5	240/3	60	3450	L	21.9	120.0	10/4	SOW	.75 (19)
SGV5042L	111617	5	480/3	60	3450	L	11.0	60.0	10/4	SOW	.75 (19)
SGV5052L	111618	5	600/3	60	3450	L	8.8	46.0	10/4	SOW	.75 (19)
SGV7532L	111613	7.5	240/3	60	3450	J	22.3	136.0	10/4	SOW	.75 (19)
SGV7542L	111614	7.5	480/3	60	3450	J	11.2	68.0	10/4	SOW	.75 (19)
SGV7552L	111615	7.5	600/3	60	3450	G	8.2	45.0	10/4	SOW	.75 (19)

Temperature sensor cord for SGV5002L & SGV5022L is 14/2 SOW, 0.55 (14mm) ± .02 (.51mm) O.D.

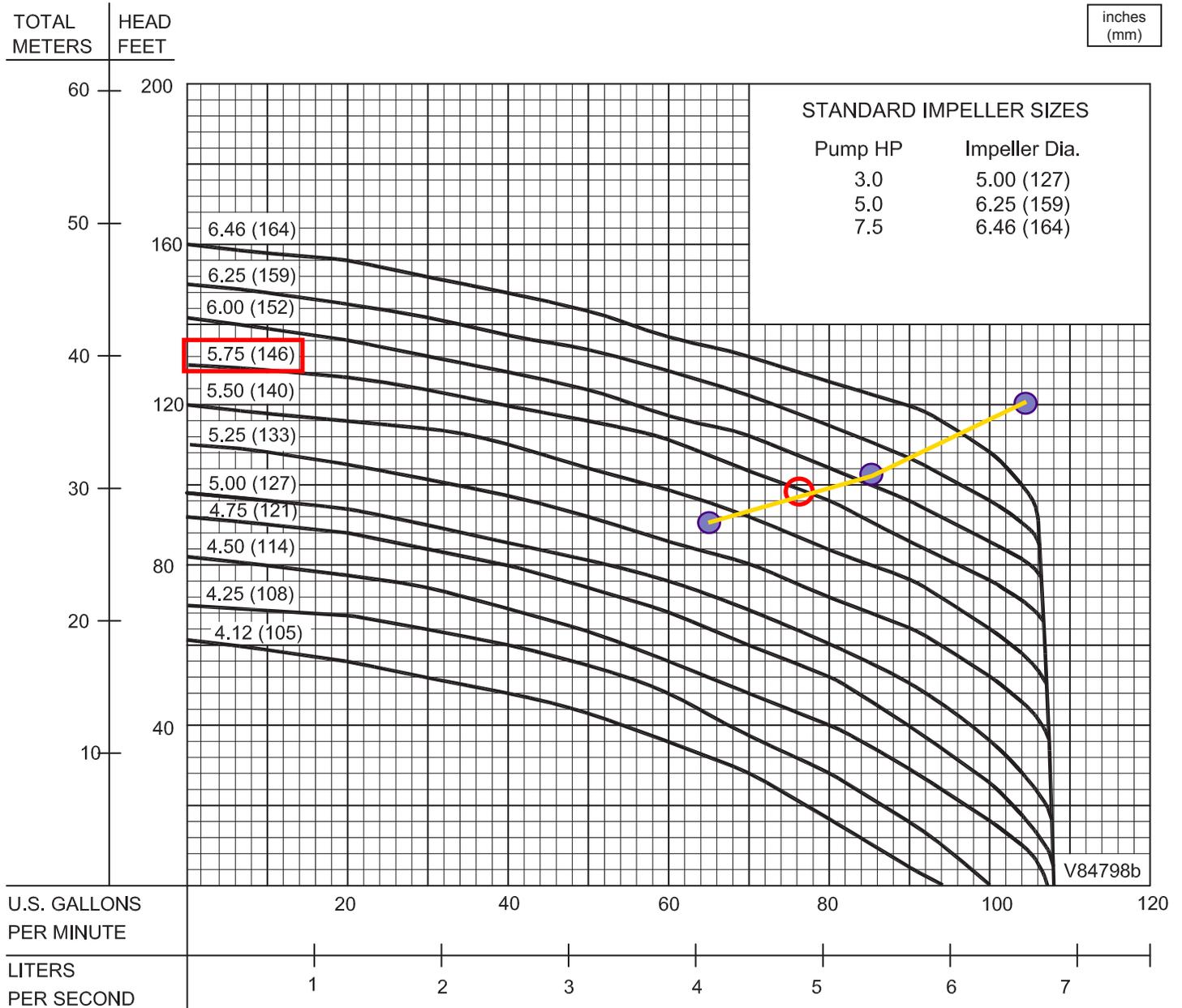
Temperature sensor cord for all other models is 14/3 SOW, 0.55 (14mm) ± .02 (.51mm) O.D.

Optional - Moisture and Temperature sensor cord for all models is 18/5 SOW, 0.47 (12mm) ± .02 (.51mm) O.D., replaces Temperature sensor cord.

IMPORTANT !

- PUMP MAY BE OPERATED "DRY" FOR EXTENDED PERIODS WITHOUT DAMAGE TO MOTOR AND/OR SEALS.
- INSTALLATIONS SUCH AS DECORATIVE FOUNTAINS OR WATER FEATURES PROVIDED FOR VISUAL ENJOYMENT MUST BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE ANSI/NFPA 70 AND/OR THE AUTHORITY HAVING JURISDICTION. THIS PUMP IS NOT INTENDED FOR USE IN SWIMMING POOLS, RECREATIONAL WATER PARKS, OR INSTALLATIONS IN WHICH HUMAN CONTACT WITH PUMPED MEDIA IS A COMMON OCCURRENCE.

Submersible Grinder Pumps



Testing is performed with water, specific gravity 1.0 @ 68° F @ (20°C), other fluids may vary performance

The BERS-0300 Base Elbow Rail System is designed for the simple installation and removal of most 3.00" vertical or horizontal discharge pumps. Its innovative design allows for pump service without the need to disconnect plumbing or physically enter the basin. In either style, its compact design allows for a greater availability in the basin.



BERS-0300 V, BERS-0320 V x2
List Price: \$1,015.00

- Designed for Vertical Discharge Pumps
- Ductile Iron Construction
- Powder Coated for Corrosion Resistance
- Compact Design for Easy Installation
- Guide Rail Pins Designed to Accept 0.75", 1.00", or 1.25" Rails
- Rated for Pumps Weighing Less than 400 lbs
- 3.00" Discharge
- BERS-0320 V = 3.00" x 2.00" Pump Adapter Flange

THE BERS-0320 V COMES WITH THIS FLANGE



BERS-0300 H, BERS-0325 H
List Price: \$1,015.00

- Designed for Horizontal Discharge Pumps
- Ductile Iron Construction
- Powder Coated for Corrosion Resistance
- Compact Design for Easy Installation
- Guide Rail Pins Designed to Accept 0.75", 1.00", or 1.25" Rails
- Rated for Pumps Weighing Less than 400 lbs
- 3.00" Discharge
- BERS-0325 H = 3.00" x 2.50" Pull-Out Flange



BERS-0300 HEX, BERS-0325 HEX
List Price: \$1,787.00

- Non-Sparking Design
- Bronze Lower Guide Rail Plate
- Designed for Horizontal Discharge Pumps
- Ductile Iron Construction
- Powder Coated for Corrosion Resistance
- Compact Design for Easy Installation
- Guide Rail Pins Designed to Accept 0.75", 1.00", or 1.25" Rails
- Rated for Pumps Weighing Less than 400 lbs
- 3.00" Discharge
- BERS-0325 HEX = 3.00" x 2.50" Non-Sparking Pull-Out Flange

Visit our webpage at www.conerymfg.com/pumps for technical data & charts regarding pump compatibility with our base elbows. Freeflo base elbows not recommended for use with submersible turbine pumps and submersible well pumps.

Replacement Flanges and Accessories



Pull-Out Flanges



Pump Adapter Flanges



Upper Guide Rail Bracket



Intermediate Guide Rail Bracket



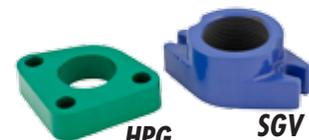
Pull-Out Flanges



O-Ring Sets



Pull-Out Kits



HPG

SGV

Adapters

Item	Description	List Price
POF-0125	Pull-Out Flange For 1.25" Elbow	\$ 248.00
POF-0125 CV	Pull-Out Flange For 1.25" Check Valve Elbow	428.00
POF-0125 EX	Pull-Out Flange For 1.25" Bronze (Ns) Elbow	445.00
POF-0150	Pull-Out Flange For 1.50" Elbow	248.00
POF-0150 CV	Pull-Out Flange For 1.50" Check Valve Elbow	428.00
POF-0150 EX	Pull-Out Flange For 1.50" Bronze Non-Sparking Elbow	445.00
POF-0200	Pull-Out Flange For 2.00" Elbow	248.00
POF-0200 CV	Pull-Out Flange For 2.00" Check Valve Elbow	428.00
POF-0200 EX	Pull-Out Flange For 2.00" Bronze Non-Sparking Elbow	445.00
POF-0300 H	Pull-Out Flange For 3.00" Horizontal Elbow	465.00
POF-0300 HEX	Pull-Out Flange For 3.00" Bronze Non-Sparking Horizontal Elbow	1,070.00
POF-0325 H	Pull-Out Flange For 3.00" X 2.50" Horizontal Elbow	465.00
POF-0325 HEX	Pull-Out Flange For 3.00" X 2.50" Non-Sparking Horizontal Elbow	1,070.00
POF-0300 V	Pull-Out Flange For 3.00" Vertical Elbow	420.00
POF-0300 VEX-BP	Pull-Out Flange For 3.00" Non-Sparking Vertical Elbow	625.00
POF-0320 V	Pull-Out Flange For 3.00" X 2.00" Vertical Elbow	420.00
POF-0300 VEX-BP	Pull-Out Flange For 3.00" X 2.00" Non-Sparking Vertical Elbow	625.00
PAF-0125	1.25" SS Pump Adapter Flange	96.00
PAF-0150	1.50" SS Pump Adapter Flange	101.00
PAF-0200	2.00" SS Pump Adapter Flange	107.00
PAF-0300	3.00" SS Pump Adapter Flange	150.00
PAF-0320	3.00" X 2.00" SS Pump Adapter Flange	150.00
x2 UGB-STNLS	SS Upper Guide Bracket For Rail Sizes 0.75", 1.00", 1.25"	178.00
UGB-PC	Powder Coated Steel Upper Guide Bracket	69.00
IGB-0075	SS Intermediate Guide Bracket For 0.75" Rail	229.00
IGB-0100	SS Intermediate Guide Bracket For 1.00" Rail	229.00
IGB-0125	SS Intermediate Guide Bracket For 1.25" Rail	229.00
LGRP-0200	SS Lower Guide Plate For Elbows 1.25"-2.00" Discharge	110.00
LGRP-0300	SS Lower Guide Plate For Elbows 3.00" Discharge	110.00
O-Ring-0200	O-Ring Set For 1.25"-2.00" Elbows	14.00
O-Ring-0300	O-Ring Set For 3.00" Vertical Elbows	17.00
POK-0300	Hardware & Gasket Kit For 3.00" Horizontal Elbows	90.00
POK-0325	Hardware & Gasket Kit For 3.25" Horizontal Elbows	90.00
HPG Spacer	Optional Spacer Kit For HPG Grinder Pumps	38.00
SGV Adapter	Optional Mounting Kit For SGV Grinder Pumps	28.00





State of Vermont

Water Supply & Wastewater Permit

LAWS/REGULATIONS INVOLVED
Environmental Protection Rules

CASE NO. WW-4-0209
APPLICANT Point Bay Marina
ADDRESS P.O. BOX 2660
Charlotte, VT 05445

Chapter 4, Public Buildings
Chapter 7, Sewage Disposal

This project, consisting of a boat pump out facility with a 1000 gallon mobile tank to discharge into a 4000 permanent storage tank to serve the 170 boat marina located off Thompson's Point Road in the Town of Charlotte, Vermont is hereby approved under the requirements of the regulations named above, subject to the following conditions.

GENERAL

- (1) This permit does not relieve the permittee from obtaining all other approvals and permits as may be required from the Act 250 District Environmental Commission, the Department of Labor and Industry (phone 828-2106), the Vermont Department of Health (phone 863-7220), and local officials PRIOR to proceeding with this project.
- (2) The project shall be completed as shown on the plans Sheet 89430-1 "Site Plan" for Point Bay Marina dated 12/12/89 last revised 3/8/90 prepared by Lancelot Phelps, P.E. and which have been stamped "approved" by the Division of Protection. The project shall not deviate from the approved plans without prior written approval from the Division of Protection.
- (3) In the event of a transfer of ownership (partial or whole) of this project, the transferee shall become permittee and be subject to compliance with the terms and conditions of this permit.
- (4) By acceptance of this permit, the permittee agrees to allow representatives of the State of Vermont access to the property covered by the permit, at reasonable times, for the purpose of ascertaining compliance with Vermont environmental/health statutes and regulations, with this permit.
- (5) The Protection Division now reviews the sewage and water systems for public buildings under 10 V.S.A., Chapter 61 - Water Supply and Wastewater Disposal Permit.
- (6) Point Bay Marina is authorized to use the existing practice of utilizing the tank trailer to transport boat holding tank waste from the dock to the 4000 gallon permanent holding tank. In the event of spillage, accident, or the creation of a general unhealthy condition, the owner shall be required to provide a direct connection between the boat pump-out on the dock and the 4000 holding tank. Prior to installing the direct connection, an application and fee shall be submitted to and approved by the Agency of Natural Resources. The application shall be prepared by a professional engineer, registered in the state of Vermont, identifying all components (design calculations and details) for making the connection.

- (7) Annually, during the month of November, the owner shall submit to the Protection Division, documentation showing the dates the 4000 gallon holding tank was pumped, quantity of waste removed, and the point of discharge (i.e. treatment plant or other approved treatment site) of the wastes. The owner shall further advise if any spillage, accident, or health related problems occurred as a result of utilizing the trailer to transport boat wastes from the dock to the 4000 gallon holding tank.

Timothy J. Burke, Commissioner
Department of Environmental
Conservation

By *Ernest P. Christianson*
Ernest P. Christianson
Regional Engineer

Dated at Essex Jct., Vermont this 31st day of May 1990.

cc: Donald Robisky
Charlotte Town Planning Commission
Department of Health
Department of Labor and Industry
Lance Phelps, P.E.
Division of Water Quality



State of Vermont

WATER SUPPLY AND WASTEWATER DISPOSAL PERMIT

CASE NO.	WW-4-0209-1	<u>LAWS/REGULATIONS INVOLVED</u>
APPLICANT	Allen Martin	Environmental Protection Rules
ADDRESS	Box 2660	Chapter 4, Public Buildings
	Thompsons Point Road	Chapter 7, Sewage Disposal
	Charlotte, VT 05445	Chapter 8, Water Supply

This project, consisting of constructing a replacement mound sewage disposal system to be utilized by a three bedroom single family residence and an office/boat supply building for Point Marina located off Thompsons Point Road in the town of Charlotte, Vermont is hereby approved under the requirements of the regulations named above, subject to the following conditions.

GENERAL

- (1) The project shall be completed as shown on the plans Project No. 90076 Sheet 1 of 2 "Marina Site Plan" dated 6/1/91, revised 7/10/91 and Sheet 2 of 2 "Details" dated 6/1/91, revised 7/8/91 prepared by Frank R. O'Brien, P.E. and which have been stamped "approved" by the Division of Protection. The project shall not deviate from the approved plans without prior written approval from the Division of Protection.
- (2) This permit authorizes the conversion of the existing four bedroom house into offices and boat supply store for a maximum of 10 employees, construction of one three bedroom single family residence and vacating the existing boat supply store which shall be used for storage or other use which does not require the installation of interior water or waste plumbing or the disposal of wastewater.
- (3) A copy of the approved plans and this Permit shall remain on the project during all phases of construction and, upon request, shall be made available for inspection by State or local personnel.
- (4) In the event of a transfer of ownership (partial or whole) of this project, the transferee shall become permittee and be subject to compliance with the terms and conditions of this permit.
- (5) By acceptance of this permit, the permittee agrees to allow representatives of the State of Vermont access to the property covered by the permit, at reasonable times, for the purpose of ascertaining compliance with Vermont environmental/health statutes and regulations, with this permit.
- (6) This permit shall in no way relieve you of the obligations of Title 10, Chapter 48, Subchapter 4, for the protection of groundwater.

WATER SUPPLY

- (7) The proposed house is approved for on-site water supply from a drilled well provided that the well is located as shown on the plans. The drilled well may be no closer than 100 feet to any soil-based wastewater disposal system, and 50 feet to septic tanks and below grade sewer pipes. No other means of obtaining potable water shall be allowed without prior review and approval by the Division of Protection.

- (8) The office and boat supply store is approved for the existing on-site water supply system provided the water is sampled and meets or exceeds potable water standards set forth by the Department of Health. No other means of obtaining potable water shall be allowed without prior review and approval by the Division of Protection.
- (9) The proposed mound sewage disposal system herein approved is to replace the existing on-site sewage disposal system. The proposed mound system shall be constructed and placed into operation as approved prior to the occupancy of the proposed three bedroom single family residence.
- (10) The project is approved for wastewater disposal by construction and utilization of the wastewater collection, delivery, and treatment/disposal systems depicted on the approved plans. No other method or location of wastewater disposal shall be allowed without prior review and approval by the Division of Protection.
- (11) The off-site, subsurface wastewater treatment/disposal system herein approved shall be routinely and reliably inspected during construction by a professional engineer, registered in the State of Vermont, who shall, upon completion and prior to occupancy of the subject establishment, report in writing to the Division of Protection that the installation was accomplished in accordance with the approved plans and permit conditions.
- (12) The wastewater collection, delivery, and treatment/disposal systems herein approved shall be routinely and reliably inspected during construction by a Vermont-registered professional engineer who shall, upon completion and prior to occupancy of the subject establishment, report in writing to the Division of Protection that the installation was accomplished in accordance with the approved plans and permit conditions.
- (13) No buildings, roads, water lines, or other construction that might interfere with the installation or operation of the sewage disposal field are permitted on or near the site-specific wastewater disposal system or replacement area depicted on the approved plans. All isolation distances, which are set forth in Chapter 7, of the Environmental Protection Rules, will be incorporated into the construction/installation of the sewage disposal field. Compliance with these isolation distances is required. If at any time this system fails to function properly and/or creates a health hazard, the Division of Protection is to be immediately notified.

(14) The land deed which establishes and transfers ownership of the subject lot shall contain a legal easement which grants the proprietor the right to construct, maintain, and replace a wastewater disposal system in the subject location, together with the right to enter upon the property for construction, inspection, maintenance, and other such reasonable purposes as may arise regarding the wastewater disposal system.

Dated at Essex Jct., Vermont this 30th day of July, 1991.

Reginald A. LaRosa, Acting Commissioner
Department of Environmental
Conservation

By *Ernest P. Christianson*
Ernest P. Christianson
Regional Engineer

cc: Donald Robisky
Town of Charlotte
Department of Health
Department of Labor and Industry
Frank R. O'Brien



State of Vermont

WASTEWATER SYSTEM AND POTABLE WATER SUPPLY PERMIT

LAWS/REGULATIONS INVOLVED

Environmental Protection Rules

Effective August 16, 2002

Case Number: WW-4-0209-3

PIN: EJ96-0210

Landowner: Allen M. Martin

Address: 1401 Thompson's Point Road
Charlotte VT 05445

This project, consisting of amending Water Supply and Wastewater Disposal Permit #WW-4-0209-2 for Point Bay Marina to have a maximum of 197 boat dock slips and 108 boat moorings located off Thompson's Point Road in the Town of Charlotte, Vermont, is hereby approved under the requirements of the regulations named above, subject to the following conditions.

GENERAL

1. This permit does not relieve the permittee from obtaining all other approvals and permits as may be required from the Department of Environmental Conservation and local officials **prior** to proceeding with this project.
2. The conditions of this permit shall run with the land and will be binding upon and enforceable against the permittee and all assigns and successors in interest. The permittee shall be responsible for the recording of this permit and the "Notice of Permit Recording" in the Charlotte Land Records within thirty, (30) days of issuance of this permit and prior to the conveyance of any lot subject to the jurisdiction of this permit.
3. Each prospective purchaser of the lot shall be shown copies of the Wastewater System And Potable Water Supply Permit and the approved plans prior to conveyance of the lot.
4. All conditions set forth in Water Supply and Wastewater Disposal Permits #WW-4-0209, #WW-4-0209-1 and #WW-4-209-2 shall remain in effect except as modified or amended herein.
5. The Wastewater Management Division now reviews the water supply and wastewater disposal systems for all buildings under 10 V.S.A., Chapter 64 – Potable Water Supply and Wastewater System Permit.
6. This permit shall in no way relieve you of the obligations of Title 1-, Chapter 48, Subchapter 4, for the protection of groundwater.

Wastewater System and Potable Water Supply Permit
WW-4-0209-3
Allen M. Martin
Page 2

7. A copy of the approved plans and this permit shall remain on the project during all phases of construction and, upon request, shall be made available for inspection by State of local personnel.

Dated at Essex Junction, Vermont on January 16, 2003.

Christopher Recchia, Commissioner
Department of Environmental Conservation

By 
Ernest P. Christianson
Regional Engineer

C For the Record
Charlotte Planning Commission & Select Board
Phelps Engineering, Inc.
Water Quality Division



State of Vermont

WATER SUPPLY AND WASTEWATER DISPOSAL PERMIT

CASE NO. WW-4-0209-2
APPLICANT Allen Martin
ADDRESS Thompson's Point Road
 Charlotte, VT 05445

LAWS/REGULATIONS INVOLVED
Environmental Protection Rules
Effective September 10, 1982

This project, consisting of expanding the dock slips at Point Bay Marina by 14 so that the total number of dock slips will be 189 and there will be a maximum of 100 boat moorings located off Thompson's Point Road in the Town of Charlotte, Vermont is hereby approved under the requirements of the regulations named above, subject to the following conditions.

GENERAL

- (1) The project shall be completed as shown on the plans "Site Plan" dated 11/3/93 prepared by Phelps Engineering, Inc. and which have been stamped "approved" by the Wastewater Management Division. The project shall not deviate from the approved plans without prior written approval from the Wastewater Management Division.
- (2) No alterations to any building that would change or affect the exterior water supply or sewage disposal, or the approved use of the building shall be allowed without prior review and approval from the Agency of Natural Resources.
- (3) In the event of a transfer of ownership (partial or whole) of this project, the transferee shall become permittee and be subject to compliance with the terms and conditions of this permit.
- (4) By acceptance of this permit, the permittee agrees to allow representatives of the State of Vermont access to the property covered by the permit, at reasonable times, for the purpose of ascertaining compliance with Vermont environmental/health statutes and regulations, with this permit.

- (5) This permit shall in no way relieve you of the obligations of Title 10, Chapter 48, Subchapter 4, for the protection of groundwater.
- (6) The Wastewater Management Division now reviews the sewage and water systems for public buildings under 10 V.S.A., Chapter 61 - Water Supply and Wastewater Disposal Permit.
- (7) All conditions set forth in Water Supply & Wastewater Disposal Permits #WW-4-0209 dated May 31, 1990 and WW-4-0209-1 dated July 30, 1991 shall remain in effect except as modified or amended herein.

SEWAGE DISPOSAL

- (8) The project is approved for the existing subsurface wastewater disposal system. No buildings, roads, water lines, or other construction that might interfere with the installation or operation of the sewage disposal field is permitted on or near the replacement area. All isolation distances as set forth in Chapter 7, of the Environmental Protection Rules, will be incorporated into the construction/installation of the sewage disposal field. Compliance with these isolation distances is required. "The Wastewater Management Division is to be immediately notified if at any time this system fails to function properly and/or creates a health hazard."

Dated at Essex Jct., Vermont this 23rd day of December, 1993.

Jack Long, Commissioner
Department of Environmental Conservation

By *Ernest P. Christianson*
Ernest P. Christianson
Regional Engineer

cc: For the Record
Town of Charlotte Planning Commission
Town of Charlotte Selectmen
Act 250 Coordinator
Water Supply Division
Department of Health
Department of Labor and Industry
Phelps Engineering, Inc.

FRANK R. O'BRIEN CONSULTING ENGINEERS, INC.

P.O. Box 715
Shelburne, Vermont 05842
(802)985-8595

March 6, 1991

Mr. Ernest Christianson
Regional Engineer
11 West St.
Essex Jct., VT 05452

RE: New residence at Point Bay Marina

Dear Mr. Christianson:

At your request, I have enclosed a sketch plan and three photographs for the above referenced project. Following are descriptions of the buildings on the Martin lots with their existing and proposed uses:

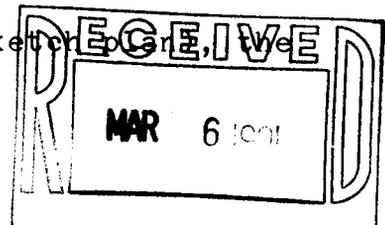
A. On photo 1 of 3, there are two buildings labeled as #'s 1 and 2. These were buildings that were used as an office and snack bar. Both buildings were removed sometime in 1972.

B. On photo 1 of 3, the building labeled as #3 was used as a storage building until 1977. In 1977, half of the building was removed and the other half was remodeled as the current store and office. This building is to be abandoned under this proposal.

C. On photo 1 of 3, the building labeled as #4 is used as the current bathhouse for the Marina and as the restroom for the seasonal 12 employees. This building was destroyed in a fire sometime in 1974, and was replaced with the current A-frame structure in the same location, as shown on photos 2 and 3 of 3. Under this proposal the sewage flows would remain the same for this building.

D. On photo 1 of 3, the building labeled as #5 is the current Allen and Nancy Martin four bedroom residence prior to being moved to its current location sometime in 1968. Please note the current location on the enclosed sketch plan. Under this proposal this building will be converted to a new boat supply store with three offices and a conference/waiting room. In conjunction with this conversion a new two bedroom house is being proposed for Allen and Nancy Martin. The current sewage flows from this building (#5) is 600 gal./day, based on 150 gal./day/bdrm. as per State and Town regulations. Under this proposal the existing in-ground sewage disposal system will be abandoned and a new mound system is being proposed, on the 9.8 AC.+/- lot., to serve both buildings with the same design flow of 600 gal/day. The breakdown of sewage flows are, 450 gal./day for the new house with the remaining 150 gal./day for the store/offices. However, it is expected that the actual sewage flow from the proposed house would be 300 gal./day based on 150 gal./day/bdrm. The store/office is expected to have a peak seasonal sewage flow of 60 gal./day based on four employees at 15 gal./day/employee.

E. On the Allen and Nancy Martin 17 AC.+/- lot, (see sketch plan)



building labeled as "boat repair shop and storage" was constructed around 1975. It was constructed in the same area as an older building that was removed in 1975. There is no interior plumbing in this building.

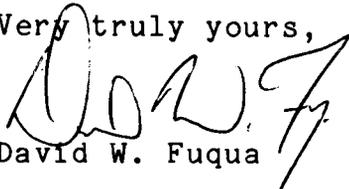
- F. On the Allen and Nancy Martin 9.8 AC.+/- lot (see sketch plan), the building labeled as "existing residence" was constructed in July of 1987 to replace an existing mobile home that was installed in the fall of 1981. This house is served by a mound system that was constructed in the fall of 1981 and under this proposal the sewage flows will remain the same.

Also enclosed please find a copy of the test pit logs that were done on November 29, 1990. As you may recall, Spencer Harris, Zoning Administrator for the Town of Charlotte, was also present when you and I viewed the test pits. Please note the test pit locations on the enclosed sketch plan.

Could you please review and comment on the acceptability of this proposal.

If you have any questions, please call.

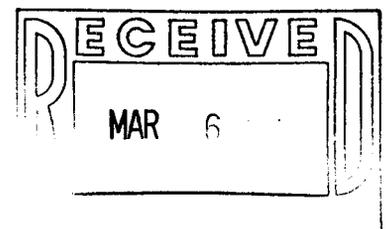
Very truly yours,


David W. Fuqua

DWF/md

Enclosure

cc: Spencer Harris, Town of Charlotte
Allen Martin





PHELPS ENGINEERING, INC.

79 Court Street
P.O. Box 367
Middlebury, Vt. 05753
Telephone (802) 388-7829

89431

November 3, 1993

Mr. Ernest Christianson
Agency of Environmental Conservation
111 West Street
Essex Junction, VT 05452

Subject: Point Bay Marina Expansion

Dear Ernie:

As we have discussed over the phone, the Point Bay Marina is currently proposing to expand its dock system to allow for 14 additional slips. To offset the additional demands on the existing wastewater system for the public bathhouse, we proposed the replacement of the two existing 4 1/2 to 5 gallon flush toilets and lavatories with water conserving low-flow fixtures. The showers have already been equipped with low-flow shower heads. The 10% reduction in average day demand more than offsets the potential increase in flows from the additional boat slips as shown on the attached calculation sheets.

We will supply product information at your request. If you need additional information or have any questions, please call at your convenience.

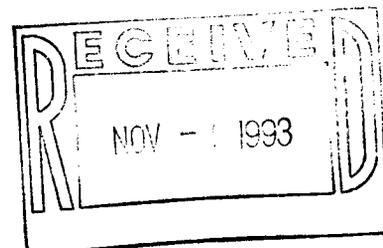
Sincerely,

A handwritten signature in cursive script, appearing to read 'Peter DeGraff'.

Peter DeGraff, P.E.
Senior Project Engineer

PD:jljg

Enclosure



Current Use:

Marina / Bathhouse - Public Toilets / Showers

$$\begin{array}{l} 100 \text{ moorings} \\ 175 \text{ Slips} \\ \hline 275 \text{ boats} \end{array} \times 4 \text{ gpd}^* = 1100 \text{ gpd}$$

Proposed Increase in Boat Slips

$$14 \text{ boats} \times 4 \text{ gpd} = 56 \text{ gpd}$$

Proposal: Convert existing toilets and faucets in bathhouse to low flow fixtures (exist. shower heads are low-flow) for a 10% reduction in ADD.

✓ $1100 \text{ gpd} \times 10\% = 110 \text{ gpd} > 56 \text{ gpd}$ proposed

(Existing Toilets are 5 gallons per flush)

* Using metered information from Tudhope Marina, ADD is 3.1 gpd

$$\begin{array}{l} 3.1 \text{ gpd} \times 275 = 853 \text{ gpd} \times 10\% = 85 > 43 \checkmark \\ 3.1 \text{ gpd} \times 14 = 43 \end{array}$$

* Using metered

NOV - 1993

PROP. LINE

NOTE: TOPOGRAPHICAL WORKSHEET PREPARED
BY EASTERN TOPOGRAPHICS OSSISPEE, NH
PHOTO DATE: 26 SEPT 89 B

DENSE TREES
GROUND OBSCURED

APPRX. EXIST. SEPTIC
PUBLIC BATHROOMS
FUEL TANKS

STORE
OFFICE

0.7
TARGET

+115.8
+119.6
+100.3
+98.8
+97.6
+M

1000 GAL. PORTABLE
HOLDING TANK

PROPOSED DOCKS (TYP.)

"APPROVED"

Department

of
Environmental Conservation

Approved by: *GMC*

Permit #: *UN-E-0209-2*

DATE: *12-23-93*

EXISTING DOCKS
TO BE RELOCATED

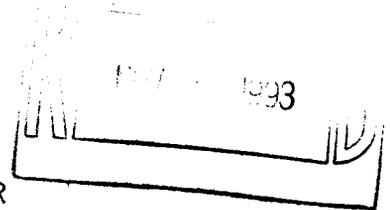
65'±

50'±

SWIM DOCK/
SITTING BENCHES

BREAKWATER

SERVICE DOCK
FUEL, PUMP OUT, WATER



(IN FEET)
1 Inch = 100 ft.

L A K E
C H A M P L A I N

PHELPS ENGINEERING, INC.



79 Court Street
P.O. Box 367
Middlebury, Vt. 05753
Telephone (802) 388-7829

POINT BAY MARINA
CHARLOTTE, VERMONT

SCALE: 1"=100' DR. BY: PD
DATE: 11/3/93 CK'D BY:

89431-1

SITE PLAN