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2003

# STRATHAM WELL SURVEY

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W35  
2003

A Final Report to  
The New Hampshire Coastal Program

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June 30, 2003

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Stratham Well Survey  
Town of Stratham

Summary of Activities  
June 30, 2003  
NH Coastal Program

**Executive Summary**

In partnership with the Stratham Board of Selectmen, Planning Board, and Conservation Commission, the Stratham Water Commission collected and analyzed information on existing wells in Stratham with the intent of determining the approximate daily water demand for the Town. Based on this study, some progress has been made on making community leaders aware of a potential need to protect Stratham's aquifers from future development.

A survey was designed and mailed to Stratham's some 3000 residences and businesses in September 2002. The survey was designed to conform to the NH Department of Environmental Services (NHDES) well data form for consistency with state data. A second mailing together with media releases were sent out in October, 2002.

Data from the surveys was used to develop a model to determine current water usage (normal and peak usage) in Stratham. The model was developed with the help of Aquarion Water Company and FEMP (Federal Energy Management Program) by using their consumption statistic for domestic usage of their residential customers based on types of residential structures. The model also included Aquarion's and FEMP consumption of businesses in Hampton that were similar in Stratham.

The Stratham Water Commission has worked with NHDES throughout the project to ensure the well data complemented and enhanced the NHDES database. The Stratham Water Commission has almost completed identifying the map and parcel numbers of all of the wells that had been in NHDES database.

Stratham Well Survey  
Town of Stratham  
Summary of Activities  
June 30, 2003  
NH Coastal Program

**Introduction**

At Town Meeting in 1996, Stratham residents authorized the establishment of a Water Commission in response to the proposal of the first commercial large volume groundwater withdrawal within the Town. The Stratham Board of Selectmen appointed members to the Commission in the spring of 2002 and charged the Commission with monitoring current water issues and forecasting the future water needs of the community. With no municipal water and sewer system, Stratham's 7,500 residents and numerous commercial and industrial sites rely on wells to supply water. Very little data existed on these existing wells, making it difficult for the Water Commission to forecast how future demand will impact Stratham's aquifers.

With funding from this grant, the Stratham Water Commission, in partnership with the Stratham Board of Selectmen, Planning Board, and Conservation Commission, surveyed all households and businesses in Stratham to gather specific well information with the intent of determining the approximate daily water demand for the Town.

**Project Goal and Objectives**

**Project Goal**

- To establish a database of well information in order to be able to forecast water sources and uses for the foreseeable future.

**Project Objectives**

To produce a final report which will:

- Assign well location data to identified aquifers to determine where the Town might experience water shortages in the future;
- Highlight well data to structures at each location to determine the approximate use of water at that location;
- Determine, approximately, the current daily water demand for the Town;
- Determine which aquifers need immediate protection from further development.

**Methods**

**1. Assign Project Leader and Establish Project Team**

George Miller served as the project leader. Project Team members included Anna Kraus, and Jeremy Smith, all of these people are members of the Stratham Water Commission. The team also had help from Paul Deschaine who is the Stratham Town Administrator.



## **2. Plan and mail out survey**

In September, 2002, the Stratham Water Commission put together a Well Survey Form for the collection of well data (see Appendix A). The final spreadsheet data form was designed to conform to the NHDES well data form for consistency with state data. Addresses for all 2,549 structures in town were compiled and entered into a database. Survey forms were prepared and mailed to all Stratham residents. Survey pick-up boxes were placed at the Stratham Post Office, Town Clerk's office, and the Town Library. Surveys were picked up 11 times during the month. A second mailing was printed and mailed in October, together with newspaper advertisements in the Portsmouth Herald, Exeter Newsletter, and Fosters Daily Democrat, to ensure good a high percentage of survey returns.

The gathering of survey data was completed in November. A total of 602 forms were returned from the two mailings. Together with information from condominiums served by community wells, a total of 1,150 units were accounted for. The surveys were sorted alphabetically, duplicates eliminated, and readied for data input.

## **3. Manipulation of the Well Survey data**

Throughout the project, the Commission worked with NH DES staff to get the data input spreadsheet in a form compatible with their needs. Data that NH DES already had for Stratham from their wells database was incorporated into the survey data.

The Water Commission has worked with NHDES staff to plot the well locations in relation to the parcels in the town without having to physically having to go on the properties. This has been done by overlaying the town property maps on aerial photo maps of the town and setting the wells up in the center of the parcel. NHDES has found that locating the wells in this way will generally put the well within twenty feet of the actual location. One of the Stratham Town Property maps with well locations plotted will be found in Appendix B of this report.

## **4. Analysis of Well Survey Data**

Data from the surveys has been used to develop a model to determine current water usage (normal and peak usage) in Stratham. The model was developed with the help of Aquarion Water Company and the FEMP (Federal Energy Management Program) by using their consumption statistic for domestic usage of their residential and business customers based on types of residential structure and types of businesses. Stratham's count of water usage entities was divided into 58 different usage classifications. Water usage for these different classifications was directly from Aquarion, FEMP, or by combining data from those two sources to apply to the classifications.

This model projects water consumption for Stratham for peak and average usage in five-year increments. The model currently predicts the growth of water usage over twenty years, taking into assumption a 4% per year population increase. The model, which has been developed for

Stratham, can be seen in Appendix C of this report.

### **Results and Discussion/Conclusion**

The results of the survey are a positive indication that at least 602 wells exist in Stratham, but we know there are considerably more. As we know there is water in every residence and business, we concluded we would have to draw on more resources than the survey alone. The Town appraisal was useful in this regard, listing all structures by type.

The primary purposes of the survey were to raise awareness and build a database of information. In these regards the survey has worked admirably. Information has been compiled and examined. At the same time the community has taken the first steps in becoming aware of water as a resource. By being asked where their water comes from, they have become aware that the resource is a finite entity that they have responsible charge of. Even those who did not respond to the survey still were given at least a moment's thought as to where their water comes from. The positive media helped to multiply these effects throughout our community and the surrounding towns.

### **Recommendations** (for future work or management strategies)

The task of compiling an effective and complete database is ongoing. New sources of data must be discovered. Either other records or reports, combined with fieldwork, must be used to flush out the data we have received through the survey process. This new data must be analyzed to determine the validity of what we have accomplished so far.

- New information will enable us to make more accurate determinations of water usage and increasing valuable predictions of future requirements for water resources. Community planners may come to view the product of our commission as a tool in long-range development of our town.



# APPENDIX A

# Appendix A

**STRATHAM WATER COMMISSION  
COMPREHENSIVE WELL SURVEY - TOWN OF STRATHAM  
AUGUST, 2002**

(Please fill in the Column for Well # 1 if you have only one well; fill in column for Well #1 and Well #2 if you have two wells, etc.)

First Name: FRED  
 Last Name: EMMANUEL COMPANIES INC  
 Street Address: 118 PORTSMOUTH AVE  
 Town: STRATHAM  
 Tax Map # (if known): 3 CT 7-12  
 Number of Wells at this Address: \_\_\_\_\_

	Well #1	Well #2
Use of Well (check as applicable):		
Domestic	<input checked="" type="checkbox"/>	
Community H2O Supply		
Municipal		
Commercial	<input checked="" type="checkbox"/>	
Industrial		
Agricultural		
Institutional		
Test/Exploration		
Abandoned		
Other		
Well Driller:	<u>HANNA</u>	
Well Driller Address:		
Well Driller License Number (if known):		
Elevation:		
Latitude:		
Longitude:		
Date Well Was Drilled:	<u>11/13/97</u>	
Reason for Constructing Well:		
New	<input checked="" type="checkbox"/>	
Replace Existing		
Deepen Existing		
Provide Additional Supply		
Monitor Water Level or Quality		
Other		
Type of Well:		
Drilled in Bedrock	<input checked="" type="checkbox"/>	
Drilled in Gravel		
Dug		
Auger Hole (any uncased hole)		
Driven Point		
Wash Well		
Undifferentiated		
Other		
Total Depth of Well (in Feet):	<u>500</u>	
Total Depth to Bedrock (in Feet):	<u>15</u>	
Total Length of Casing Installed in Well (in Feet):	<u>40</u>	
Discharge (in Gallons per minute):	<u>75</u>	
Yield Testing Method:		
Bailed		
Pumped		
compressed air		
Yield Test Duration (in hours):	<u>48</u>	
Date of Test:	<u>7/12/98</u>	
Other Info That May be Useful:		



# APPENDIX B

STRATHAM, NEW HAMPSHIRE  
WATER WELL INVENTORY



**LEGEND**

Map Sheet Number

0		10
1		11
2		12
3		13
4		14
5		15
6		16
7		17
8		18
9		

Well Location



NH Geological Survey  
1000 North Hill, Dover

APPENDIX B

10P2



Stratham Well Survey Return Data															
		Map &								Drill					
Street	#	Parcel	WRB#	Well #	Use	Lisc.#	Elev.	Lat.	Long.	Date	Type	Deep	BRk.	Case	G/Min
Aberdeen	1*23	16.3													
Academic Way	10	2.15.3	225.057	1045	1	177				5/24/99	1	500	32	50	3
Alderwood	1*60	6.24													
Apple Way	1	2.2.4													
Apple Way	2	2.2.5	225.003	92	1	177	160	425927	705450	9/17/84	1	260	100	126	3
Apple Way	3	2.2.6	225.009	105	1	177	160	425923	705455	10/8/84	1	240	10	148	3
Apple Way	4	2.2.11			1	177				1/18/86	1	260	115	148	3
Apple Way	5	2.2.7	225.022	843	1	406				5/25/87	1	202	151	169	3
Apple Way	6	2.2.10	225.014	398	1	177				1/20/86	1	200	40	84	3
Apple Way	7	2.2.8	225.036	17-89	1	457				2/24/89	1	300	157	172	3
Apple Way	8	2.2.9	225.041	145	1	177				2/15/90	1	280	80	136	3
Apple Way	9	2.2.19			1	177				11/24/93	1	180	70	102	3
Apple Way	11	2.2.20	225.014	397	1	177				1/18/86	1	260	115	148	3
Apple Way	13	2.2.21													
Apple Way	14	2.2.24													
Apple Way	15	2.2.22	225.06	490	1	177				11/24/93	1	180	70	102	3
Apple Way	16	2.2.23													
Apple Way	off	2.2A													
Autumn Ln.	1	4.8.1	225.526	4083	1	1				27/7/99	1	220	22	41	3
Autumn Ln.	2	4.8.12	225.525	4081	1	1				7/27/99	1	220	24	41	3
Autumn Ln.	3	4.8.3	225.053	3982	1	1				6/8/99	1	180	22	41	3
Autumn Ln.	4	4.8.11	225.056	1058	1	177				6/8/99	1	140	39	61	3
Autumn Ln.	5	4.8.4	225.053	4355	1	1				11/30/99	1	100	11	41	3

Example of a work sheet of data used in the mapping process.



# APPENDIX C

**Summary**

The projection of the Stratham Water Study over the next 20-year period was conducted using a basis of the 2002 Structure-by-type Data.

Appendix C

Water Consumption Calculations

Address	Apt Count
261 Portsmouth Ave	6
105 Winnicutt	1
82 High	1
193R Bunker Hill	1
159 Portsmouth ave	1
<b>total</b>	<b>10</b>

Water Consumption Table by Home style (2002 Data)

Home Style	Acreage	# in Town	Predicted # of occupants	Daily Consumption	Monthly Consumption	Annual	Summer Peak (gpd) Daily	Winter Low (gpd) Daily
Cape/Ranch	0.4	500	3	220	6,585	79,020	271	168
Colonial (old)	0.6	1200	4	424	12,705	152,460	533	314
Colonial (new)	0.6	600	4	613	18,375	220,500	873	352
Condo	0	300	2	114	3,420	41,040	123	105
Restaurant	0	5	0	844	25,320	303,840	944	744
Apartment Unit	0	6	3	102	3,060	36,720	106	98
Car Wash (open loop)	0	1	0	4,562	136,845	1,642,140	4,684	4,439
Car Wash (closed loop)	0	0	0	912	27,369	328,428	937	888
Hotel Unit	0	0	0	140	4,200	50,400	182	98

Annual average (in Gallons) of Total consumption

Type Totals	Daily Consumption	Monthly Consumption	Annual	Summer Peak (gpd) Daily	Winter Low (gpd) Daily
Cape/Ranch	109,750	3,292,500	39,510,000	135,500	84,000
Colonial (old)	508,200	15,246,000	182,952,000	639,600	376,800
Colonial (new)	367,500	11,025,000	132,300,000	523,800	211,200
Condo	34,200	1,026,000	12,312,000	36,900	31,500
Restaurant	4,220	126,600	1,519,200	4,720	3,720
Apartment Unit	612	18,360	220,320	636	588
Car Wash (open loop)	4,562	136,845	1,642,140	4,684	4,439
Car Wash (closed loop)	0	0	0	0	0
Hotel Unit	0	0	0	0	0

Annual average (in Gallons) of Total consumption

Class Totals	Daily Consumption	Monthly Consumption	Annual	Summer Peak (gpd) Daily	Winter Low (gpd) Daily
Residential	1,020,262	30,607,860	367,294,320	1,336,436	704,088
Business	8,782	263,445	3,161,340	9,404	8,159
<b>Town Total</b>	<b>1,029,044</b>	<b>30,871,305</b>	<b>370,455,660</b>	<b>1,345,840</b>	<b>712,247</b>

Calculated Stratham Statistics

# of homes	2600
# of Restaurants	5
# of Apartment Units	6
# of Car Washes	1
# of Hotel Rooms	0
Total Population	9318
Avg. Water usage (gpd) per person	110
Peak Water usage (gpd) per person	144
Total Developed acres	1280

Average Annual Growth Rate 4%

Water Consumption Table by Home style (Base Data)

Home Style	Acreage	# in Town	Predicted # of occupants	Calculated # of residents	Annual average (in Gallons)			Summer Peak (gpd)		Winter Low (gpd)		Summer Peak Totalized
					Daily Consumption	Annual	Class Total	Daily	Daily	Daily	Daily	
3-Family/Tri-plex		9	7	63	939	337,860	8,447	1,273	604		11457	
Apartments/Residential		10	1.5	15	102	36,720	1,020	106	98		1060	
Auto/Car Dealer		3	0	0	563	202,500	1,688	750	375		2250	
Bakery		1	0	0	79	28,440	79	104	54		104	
Bank		3	0	0	70	25,200	210	100	40		300	
Booth		1	0	0	14	5,040	14	20	8		20	
Bungaglow		1	1.5	2	102	36,720	102	106	98		106	
Camp		3	0	0	180	64,800	540	300	60		900	
Cape		385	2.5	963	220	79,020	84,508	271	168		104335	
Chalet		2	3	6	674	242,460	1,347	960	387		1920	
Chateau		1	3	3	674	242,460	674	960	387		960	
Church		1	4	3	44	15,840	44	16	16		72	
Conventional/Colonial (new)		39	4	156	613	220,500	23,888	873	352		34047	
Colonial/Duplex		1	6	6	735	264,420	735	1,047	422		1047	
Colonial (old)		575	3.5	2,013	424	152,460	243,513	533	314		306475	
Commercial		2	0	0	613	220,500	1,225	873	352		1746	
Community College		1	0	0	15,000	5,400,000	15,000	20,000	10,000		20000	
Condex		5	4	20	228	82,080	1,140	246	210		1230	
Condo		583	3	1,749	114	41,040	66,462	123	105		71709	
Contemporary/Modern/NE/Tudor		130	3	390	613	220,500	79,625	873	352		113490	
Day Care		1	0	0	675	243,000	675	900	450		900	
Double Wide		27	3.25	88	270	97,020	7,277	321	218		8667	
Duplex		14	6	84	439	158,040	6,146	542	336		7588	
Dutch Colonial		2	5	10	613	220,500	1,225	873	352		1746	
Equipment Shed		1	0	0	0	0	0	0	0		0	
Factory		3	0	0	2,250	810,000	6,750	3,000	1,500		9000	
Fast Food		1	0	0	1,100	396,000	1,100	1,600	600		1600	
Federal Cape		1	2.5	3	220	79,020	220	271	168		271	
Federal		1	2	2	220	79,020	220	271	168		271	
Firestation		1	2	0	1,700	612,000	1,700	2,300	1,100		2300	
Gambrel		89	3.75	334	613	220,500	54,513	873	352		77697	
Garage/Apppt		3	0	0	375	135,000	1,125	375	375		1125	
Garage/Service station/Sunnocco		5	0	0	375	135,000	1,875	375	375		1875	
Garden Store		1	0	0	1,070	385,200	1,070	2,100	40		2100	
Garrison		124	4	496	424	152,460	52,514	533	314		66092	
Golf Course w/80 turf acres		1	4	4	68,840	24,782,400	68,840	131,680	6,000		131680	
Ice cream Stand		1	0	0	750	270,000	750	1,500	0		1500	
Industrial		2	0	0	2,250	810,000	4,500	3,000	1,500		6000	
Log Cape/Home		3	2.5	8	220	79,020	659	271	168		813	
Med office/Medical		2	0	0	70	25,200	140	100	40		200	
Day School (no gym, café)		2	0	0	15,000	5,400,000	30,000	20,000	10,000		40000	
School (gym, café, showers)		2	0	0	67,500	24,300,000	135,000	90,000	45,000		180000	



Water Consumption Table by Home style (Base Data)

Home Style	Acreage	# in Town	Predicted # of occupants	Calculated # of residents	Annual average (in Gallons)			Summer Peak (gpd)		Winter Low (gpd)	Summer Peak Totalized
					Daily Consumption	Annual	Class Total	Daily	Daily		
Mobile Home		23	2.5	58	220	79,020	5,049	271	168	6233	
Offices/Post office/Print shop		22	0	0	112	40,320	2,464	160	64	3520	
Public Works		1	0	0	1,700	612,000	1,700	2,300	1,100	2300	
Raised Ranch/Split-level		146	3.25	475	459	165,240	67,014	654	264	95484	
Ranch		206	3	618	220	79,020	45,217	271	168	55826	
Retail/Shop/Store		17	0	0	140	50,400	2,380	200	80	3400	
Saltbox		53	4	212	490	176,220	25,944	698	281	36994	
Telephone utility		2	0	0	0	0	0	0	0	0	
Tri-level		8	5	40	735	264,600	5,880	1,048	422	8384	
Victorian		4	4	16	424	152,460	1,694	533	314	2132	
Warehouse		4	0	0	0	0	0	0	0	0	
Total Residents				7,833			1,063,895	(GALLONS)	Peak Usage	1,428,926	
					Average Daily total for town			(GALLONS)	Peak Usage per capita	182	
					Average Daily Consumption per capita		136				

Water Consumption Table by Home style (2002)

Home Style	# in Town	Predicted # of occupants	Calculated # of residents	Annual average (in Gallons)			Summer Peak (gpd)		Winter Low (gpd)	Summer Peak Totalized
				Daily Consumption	Annual	Class Total	Daily	Daily		
3-Family/Tri-plex	9	7	63	939	337,860	8,447	1,273	604	11457	
Apartments/Residential	10	1.5	15	102	36,720	1,020	106	98	1060	
Auto/Car Dealer	3	0	0	563	202,500	1,688	750	375	2250	
Bakery	1	0	0	79	28,440	79	104	54	104	
Bank	3	0	0	70	25,200	210	100	40	300	
Booth	1	0	0	14	5,040	14	20	8	20	
Bungaglow	1	1.5	2	102	36,720	102	106	98	106	
Camp	3	0	0	180	64,800	540	300	60	900	
Cape	385	2.5	963	220	79,020	84,508	271	168	104335	
Chalet	2	3	6	674	242,460	1,347	960	387	1920	
Chateau	1	3	3	674	242,460	674	960	387	960	
Church	1	3	3	44	15,840	44	72	16	72	
Conventional/Colonial (new)	39	4	156	613	220,500	23,888	873	352	34047	
Colonial/Duplex	1	6	6	735	264,420	735	1,047	422	1047	
Colonial (old)	575	3.5	2,013	424	152,460	243,513	533	314	306475	
Commercial	2	0	0	613	220,500	1,225	873	352	1746	

Water Consumption Table by Home style (2002)

Home Style	# in Town	Predicted # of occupants	Calculated # of residents	Annual average (in Gallons)			Summer Peak (gpd)		Winter Low (gpd)		Summer Peak Totalized
				Daily Consumption	Annual	Class Total	Daily	Daily	Daily	Daily	
Community College	1	0	0	15,000	5,400,000	15,000	20,000	10,000	20,000	20000	
Condo	5	4	20	228	82,080	1,140	246	210	1230	1230	
Condo	583	3	1,749	114	41,040	66,462	123	105	71709	71709	
Contemporary/Modern/NE/Tudor	130	3	390	613	220,500	79,625	873	352	113490	113490	
Day Care	1	0	0	675	243,000	675	900	450	900	900	
Double Wide	27	3.25	88	270	97,020	7,277	321	218	8667	8667	
Duplex	14	6	84	439	158,040	6,146	542	336	7588	7588	
Dutch Colonial	2	5	10	613	220,500	1,225	873	352	1746	1746	
Equipment Shed	1	0	0	0	0	0	0	0	0	0	
Factory	3	0	0	2,250	810,000	6,750	3,000	1,500	9000	9000	
Fast Food	1	0	0	1,100	396,000	1,100	1,600	600	1600	1600	
Federal Cape	1	2.5	3	220	79,020	220	271	168	271	271	
Federal	1	2	2	220	79,020	220	271	168	271	271	
Firestation	1	0	0	1,700	612,000	1,700	2,300	1,100	2300	2300	
Gambrel	89	3.75	334	613	220,500	54,513	873	352	77697	77697	
Garrage/Appt	3	0	0	375	135,000	1,125	375	375	1125	1125	
Garrage/Service station/Sunnocco	1	0	0	375	135,000	1,875	375	375	1875	1875	
Garden Store	1	0	0	1,070	385,200	1,070	2,100	40	2100	2100	
Garrison	124	4	496	424	152,460	52,514	533	314	66092	66092	
Golf Course w/80 turf acres	1	4	4	68,840	24,782,400	68,840	131,680	6,000	131680	131680	
Ice cream Stand	1	0	0	750	270,000	750	1,500	0	1500	1500	
Industrial	2	0	0	2,250	810,000	4,500	3,000	1,500	6000	6000	
Log Cape/Home	3	2.5	8	220	79,020	659	271	168	813	813	
Med office/Medical	2	0	0	70	25,200	140	100	40	200	200	
Day School (no gym, café)	2	0	0	15,000	5,400,000	30,000	20,000	10,000	40000	40000	
School (gym, café, showers)	2	0	0	67,500	24,300,000	135,000	90,000	45,000	180000	180000	
Mobile Home	23	2.5	58	220	79,020	5,049	271	168	6233	6233	
Offices/Post office/Print shop	22	0	0	112	40,320	2,464	160	64	3520	3520	
Public Works	1	0	0	1,700	612,000	1,700	2,300	1,100	2300	2300	
Raised Ranch/Split-level	146	3.25	475	459	165,240	67,014	654	264	95484	95484	
Ranch	206	3	618	220	79,020	45,217	271	168	55826	55826	
Retail/Shop/Store	17	0	0	140	50,400	2,380	200	80	3400	3400	
Saltbox	53	4	212	490	176,220	25,944	698	281	36994	36994	
Telephone utility	2	0	0	0	0	0	0	0	0	0	
Tri-level	8	5	40	735	264,600	5,880	1,048	422	8384	8384	
Victorian	4	4	16	424	152,460	1,694	533	314	2132	2132	
Warehouse	4	0	0	0	0	0	0	0	0	0	
Year	2002	Total Residents (BLDG)	7,833	Average Daily Consumption per capita	1,063.89	5	(GALLONS)	Peak Usage	1,428,926		
Year	2002	Total Residents (Growth)	7,833	Average Daily Consumption per capita	136		(GALLONS)	Peak Usage per capita	182		
Year	2002	Base Residents	7,833								



Growth Factor is 4% since 2002  
 Water Consumption Table by Home style (2003)

Home Style	# in Town	Predicted # of occupants	Calculated # of residents	Annual average (in Gallons)			Summer Peak (gpd)		Winter Low (gpd)	Summer Peak Totalized
				Daily Consumption	Annual	Class Total	Daily	Daily		
3-Family/Tri-plex	9	7	66	939	337,860	8,784	1,273	604	11915.28	
Apartments/Residential	10	1.5	16	102	36,720	1,061	106	98	1102.4	
Auto/Car Dealer	3	0	0	563	202,500	1,755	750	375	2340	
Bakery	1	0	0	79	28,440	82	104	54	108.16	
Bank	3	0	0	70	25,200	218	100	40	312	
Booth	1	0	0	14	5,040	15	20	8	20.8	
Bungalow	1	1.5	2	102	36,720	106	106	98	110.24	
Camp	3	0	0	180	64,800	562	300	60	936	
Cape	400	2.5	1,001	220	79,020	87,888	271	168	108508.4	
Chalet	2	3	6	674	242,460	1,401	960	387	1996.8	
Chateau	1	3	3	674	242,460	700	960	387	998.4	
Church	1	3	3	44	15,840	46	16	16	74.88	
Conventional/Colonial (new)	41	4	162	613	220,500	24,843	873	352	35408.88	
Colonial/Duplex	1	6	6	735	264,420	764	1,047	422	1088.88	
Colonial (old)	598	3.5	2,093	424	152,460	253,253	533	314	318734	
Commercial	2	0	0	613	220,500	1,274	873	352	1815.84	
Community College	1	0	0	15,000	5,400,000	15,600	20,000	10,000	20800	
Condo	5	4	21	228	82,080	1,186	246	210	1279.2	
Condo	606	3	1,819	114	41,040	69,120	123	105	74577.36	
Contemporary/Modern/NE/Tudor	135	3	406	613	220,500	82,810	873	352	118029.6	
Day Care	1	0	0	675	243,000	702	900	450	936	
Double Wide	28	3.25	91	270	97,020	7,568	321	218	9013.68	
Duplex	15	6	87	439	158,040	6,392	542	336	7891.52	
Dutch Colonial	2	5	10	613	220,500	1,274	873	352	1815.84	
Equipment Shed	1	0	0	0	0	0	0	0	0	
Factory	3	0	0	2,250	810,000	7,020	3,000	1,500	9360	
Fast Food	1	0	0	1,100	396,000	1,144	1,600	600	1664	
Federal Cape	1	2.5	3	220	79,020	228	271	168	281.84	
Federal	1	2	2	220	79,020	228	271	168	281.84	
Firestation	1	0	0	1,700	612,000	1,768	2,300	1,100	2392	
Gambrel	93	3.75	347	613	220,500	56,693	873	352	80804.88	
Garrage/Appt	3	0	0	375	135,000	1,170	375	375	1170	
Garrage/Service station/Sunnocco	5	0	0	375	135,000	1,950	375	375	1950	
Garden Store	1	0	0	1,070	385,200	1,113	2,100	40	2184	
Garrison	129	4	516	424	152,460	54,615	533	314	68735.68	
Golf Course w/80 turf acres	1	4	4	68,840	24,782,400	71,594	131,680	6,000	136947.2	
Ice cream Stand	1	0	0	750	270,000	780	1,500	0	1560	
Industrial	2	0	0	2,250	810,000	4,680	3,000	1,500	6240	
Log Cape/Home	3	2.5	8	220	79,020	685	271	168	845.52	
Med office/Medical	2	0	0	70	25,200	146	100	40	208	
Day School (no gym, café)	2	0	0	15,000	5,400,000	31,200	20,000	10,000	41600	
School (gym, café, showers)	2	0	0	67,500	24,300,000	140,400	90,000	45,000	187200	
Mobile Home	24	2.5	60	220	79,020	5,250	271	168	6482.32	
Offices/Post office/Print shop	23	0	0	112	40,320	2,563	160	64	3660.8	
Public Works	1	0	0	1,700	612,000	1,768	2,300	1,100	2392	

Water Consumption Table by Home style (2003)

Home Style	# in Town	Predicted # of occupants	Calculated # of residents	Annual average (in Gallons)			Summer Peak (gpd)		Winter Low (gpd)		Summer Peak Totalized
				Daily Consumption	Annual	Class Total	Daily	Daily	Daily	Daily	
Raised Ranch/Split-level Ranch	152	3.25	493	459	165,240	69,695	654	264	99303.36		
Retail/Shop/Store	214	3	643	220	79,020	47,026	271	168	58059.04		
Saltbox	18	0	0	140	50,400	2,475	200	80	3536		
Telephone utility	55	4	220	490	176,220	26,981	698	281	38473.76		
Tri-level	2	0	0	0	0	0	0	0	0		
Victorian	8	5	42	735	264,600	6,115	1,048	422	8719.36		
Warehouse	4	4	17	424	152,460	1,762	533	314	2217.28		
Year	2003	Total Residents (BLDG)	8,146	0	0	0	(GALLONS)	Peak Usage	1,486,083		
Year	2003	Total Residents (Growth)	8,146	Average Daily total for town	1,106.45	1	(GALLONS)	Peak Usage per capita	182		
Year	2002	Base Residents	7,833	Average Daily Consumption per capita	136						

Growth Factor is 80% since 2002

Water Consumption Table by Home style (2022)

Home Style	# in Town	Predicted # of occupants	Calculated # of residents	Daily Consumption	Annual	Avg. Daily	Summer Peak (gpd)		Winter Low (gpd)		Summer Peak Totalized
							Daily	Daily	Daily	Daily	
3-Family/Tri-plex	16	7	113	939	337,860	15,204	1,273	604	20622.6		
Apartments/Residential	18	1.5	27	102	36,720	1,836	106	98	1908		
Auto/Car Dealer	5	0	0	563	202,500	3,038	750	375	4050		
Bakery	2	0	0	79	28,440	142	104	54	187.2		
Bank	5	0	0	70	25,200	378	100	40	540		
Booth	2	0	0	14	5,040	25	20	8	36		
Bungalow	2	1.5	3	102	36,720	184	106	98	190.8		
Camp	5	0	0	180	64,800	972	300	60	1620		
Cape	693	2.5	1,733	220	79,020	152,114	271	168	187803		
Chalet	4	3	11	674	242,460	2,425	960	387	3456		
Chateau	2	3	5	674	242,460	1,212	960	387	1728		
Church	2	3	5	44	15,840	79	72	16	129.6		
Conventional/Colonial (new)	2	4	281	613	220,500	42,998	873	352	61284.6		
Colonial/Duplex	2	6	11	735	264,420	1,322	1,047	422	1884.6		
Colonial (old)	1035	3.5	3,623	424	152,460	438,323	533	314	551655		
Commercial	4	0	0	613	220,500	2,205	873	352	3142.8		
Community College	2	0	0	15,000	5,400,000	27,000	20,000	10,000	36000		
Condo	9	4	36	228	82,080	2,052	246	210	2214		
Contemporary/Modern/NE/Tudor	1049	3	3,148	114	41,040	119,632	123	105	129076.2		
Day Care	2	3	702	613	220,500	143,325	873	352	204282		
Double Wide	49	0	0	675	243,000	1,215	900	450	1620		
Duplex	25	3.25	158	270	97,020	13,098	321	218	15600.6		
		6	151	439	158,040	11,063	542	336	13658.4		



Water Consumption Table by Home style (2022)

Home Style	# in Town	Predicted # of occupants	Calculated # of residents	Daily Consumption	Annual	Avg. Daily	Summer Peak (gpd)	Winter Low (gpd)	Summer Peak Totalized
						Class Total	Daily	Daily	
Dutch Colonial	4	5	18	613	220,500	2,205	873	352	3142.8
Equipment Shed	2	0	0	0	0	0	0	0	0
Factory	5	0	0	2,250	810,000	12,150	3,000	1,500	16200
Fast Food	2	0	0	1,100	396,000	1,980	1,600	600	2880
Federal Cape	2	2.5	5	220	79,020	395	271	168	487.8
Federal	2	2	4	220	79,020	395	271	168	487.8
Firestation	2	0	0	1,700	612,000	3,060	2,300	1,100	4140
Gambrel	160	3.75	601	613	220,500	98,123	873	352	139854.6
Garrage/Appt	5	0	0	375	135,000	2,025	375	375	2025
Garrage/Service station/Sunnocco	2	0	0	375	135,000	3,375	375	375	3375
Garden Store	2	0	0	1,070	385,200	1,926	2,100	40	3780
Garrison	223	4	893	424	152,460	94,525	533	314	118965.6
Golf Course w/80 turf acres	4	4	7	68,840	24,782,400	123,912	131,680	6,000	237024
Ice cream Stand	2	0	0	750	270,000	1,350	1,500	0	2700
Industrial	4	0	0	2,250	810,000	8,100	3,000	1,500	10800
Log Cape/Home	5	2.5	14	220	79,020	1,185	271	168	1463.4
Med office/Medical	4	0	0	70	25,200	252	100	40	360
Day School (no gym, café)		0	0	15,000	5,400,000	54,000	20,000	10,000	72000
School (gym, café, showers)		0	0	67,500	24,300,000	243,000	90,000	45,000	324000
Mobile Home	41	2.5	104	220	79,020	9,087	271	168	11219.4
Offices/Post office/Print shop		0	0	112	40,320	4,435	160	64	6336
Public Works	2	0	0	1,700	612,000	3,060	2,300	1,100	4140
Raised Ranch/Split-level		3.25	854	459	165,240	120,625	654	264	171871.2
Ranch	371	3	1,112	220	79,020	81,391	271	168	100486.8
Retail/Shop/Store	31	0	0	140	50,400	4,284	200	80	6120
Saltbox	95	4	382	490	176,220	46,698	698	281	66589.2
Telephone utility	4	0	0	0	0	0	0	0	0
Tri-level	14	5	72	735	264,600	10,584	1,048	422	15091.2
Victorian	7	4	29	424	152,460	3,049	533	314	3837.6
Warehouse	7	0	0	0	0	0	0	0	0
Year	2022	Total Residents (BLDG)	14,099		Average Daily total for town	1,915,011	(GALLONS)	Peak Usage	2,572,067
Year	2022	Total Residents (Growth)	14,099		Average Daily Consumption per capita	136	(GALLONS)	Peak Usage per capita	182
Year	2002	Base Residents	7,833						

**Appendix C – Structure Determination**

<b>St Name</b>	<b>St. #</b>	<b>Structure</b>	<b>Yr. Const</b>
River Rd.	61	3 Family	1970
Portsmouth Ave.	261	Apartments	1790
Winnicutt Rd.	105	Apt House	1875
High St	82	Apt. Bldg	1900
Bunker Hill Ave	193R	Apt/Gar	1980
Portsmouth Ave	159	Apt/off	1970
Portsmouth Ave.	50	Auto Dealer	1964
Portsmouth Ave	100	Bakery	1944
Portsmouth Ave.	15	Bakery	1970
Portsmouth Ave	160	Bank	1979
Portsmouth Ave.	28	Bank	1995
Portsmouth Ave.	38	Bank	1964
Balmoral Condos	40	Barn	1987
Balmoral Condos	41	Barn	1987
Balmoral Condos	42	Barn	1987
Fryung Pan Ln.	25	Barn	1978
Portsmouth Ave.	267	barn/Apt	1750
Balmoral Condos	22	Barrn	1987
Balmoral Condos	23	Barrn	1987
Balmoral Condos	24	Barrn	1987
Balmoral Condos	25	Barrn	1987
Balmoral Condos	26	Barrn	1987
Balmoral Condos	27	Barrn	1987
Balmoral Condos	31	Barrn	1987
Balmoral Condos	32	Barrn	1987
Balmoral Condos	33	Barrn	1987
Portsmouth Ave.	71	BMW Dir.	1997
Portsmouth Ave.	9	Booth	1998
College Rd.	68	Bungalow	1920
Boatclub Dr.	8R	Camp	1940
Bunker Hill Ave.	58	Camp	1950
Linda Ln.	Off	Camp	1930
Apple Way	4	Cape	1989
Apple Way	6	Cape	1986
Autumn Ln.	1	Cape	1999
Autumn Ln.	11	Cape	2000
Balmoral Condos	17	Cape	1987
Balmoral Condos	18	Cape	1987
Balmoral Condos	19	Cape	1987
Balmoral Condos	20	Cape	1987
Balmoral Condos	21	Cape	1987
Balmoral Condos	28	Cape	1987



**Appendix C – Structure Determination**

<b>St Name</b>	<b>St. #</b>	<b>Structure</b>	<b>Yr. Const</b>
Balmoral Condos	29	Cape	1987
Balmoral Condos	30	Cape	1987
Balmoral Condos	34	Cape	1987
Balmoral Condos	35	Cape	1987
Balmoral Condos	36	Cape	1987
Balmoral Condos	37	Cape	1987
Balmoral Condos	38	Cape	1987
Balmoral Condos	39	Cape	1987
Barker Ln.	2	Cape	1974
Barker Rd.	27	Cape	1987
Barker Rd.	32	Cape	1986
Barnes Dr.	2	Cape	1990
Barnes Dr.	3	Cape	1988
Barnes Dr.	5	Cape	1992
Barnes Dr.	6	Cape	1989
Bartlett Rd.	5	Cape	1993
Bartlett Rd.	8	Cape	1992
Benjamin Rd.	5	Cape	1983
Benjamin Rd.	9	Cape	1983
Benjamin Rd.	11	Cape	1982
Benjamin Rd.	13	Cape	1983
Benjamin Rd.	19	Cape	1984
Benjamin Rd.	22	Cape	1983
Benjamin Rd.	24	Cape	1983
Benjamin Rd.	25	Cape	1985
Berry Hill Rd.	1	Cape	1989
Birnum Woods Rd.	4	Cape	1980
Birnum Woods Rd.	6	Cape	1978
Birnum Woods Rd.	7	Cape	1980
Birnum Woods Rd.	19	Cape	1980
Birnum Woods Rd.	27	Cape	1981
Blue Ridge Circle	1	Cape	1994
Boatclub Dr.	4	Cape	1996