J. E. LANDERS-CAULEY, P.E.
Civil-Environmental Engineering
P.O. Box 364
West Falmouth, MA 02574
(508)-540-7733; 508-540-3344 (fax)
jlandersca@aol.com

Bourne Board of Health   September 14, 2022
24 Perry Avenue
Buzzards Bay, MA 02532

Re: Variance/Waiver Request For Repair an Upgrade of an Existing Title V System at
         118 Old Dam Road, Bourne, MA
         Jordan Race-Owner

Dear Members:

In accordance with the State Environmental Code, Title 5: 310 CMR 15.410, please accept this letter of request to be heard before the Board of Health at their next regular meeting to discuss relief from Title 5 and/or Board of Health Regulations for the increase of daily flow from 2 to 3 bedrooms of the existing sewage disposal system and for the installation of the septic system at 118 Old Dam Road, Bourne, MA. We respectfully request your consideration of the following variances to accommodate this project:

A 75.0 foot variance from the Bourne Board of Health 150 Foot Setback regulation for the placement of a leaching facility within 75.0 feet of the coastal bank; and

A 54.7 foot variance from the Bourne Board of Health 150 Foot Setback regulation for the placement of a leaching facility within 95.3 feet of a wetland (Salt Marsh).

The owner is requesting that the two bedroom deed restriction be revoked and rescinded and that the Board approve a three bedroom system as designed.

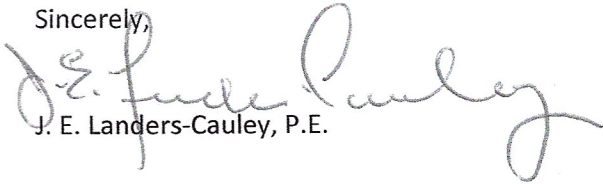The septic system is designed for 3 bedrooms as required by Title V.

The shape and size of the lot prevents full compliance with all local regulations. However, the design complies with all state Title V regulations.

In mitigation of the variances proposed the owner is proposing to install a Micro-FAST denitrification system and a U/V disinfection unit, all as shown on submitted site plan(s).

Enclosed is the completed original variance application and design plans, together with seven (7) copies thereof.

Thank you in advance for your consideration of this request.

Sincerely,

J. E. Landers-Cauley, P.E.

Encl:
Application For Septic Variance or Waiver Requests
Letter of Request For Septic Variances and Upgrade Approval
First Floor Plan of 118 Old Dam Road
Lower Level Floor Plan of 118 Old Dam Road
Bourne Assessors Property Card for 118 Old Dam Road
 Nitrogen Loading Calculation Worksheet-2 Bedrooms-Non MicroFAST
Nitrogen Loading Calculation Worksheet-3 Bedrooms-With MicroFAST
Copy of Bio-Microbics detail Sheets #1-#4
Copy of Bio-Microbics Certification for General use of MicroFAST Treatment System
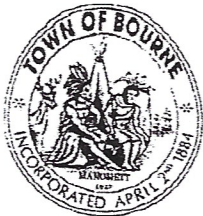Pump Calculation
U/V Specification & Operation Manual
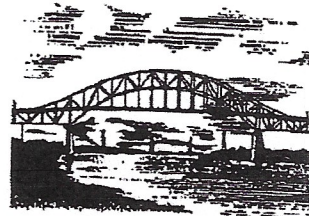Draft Copy of Disclosure Notice for I/A technology to be recorded with deed
Draft Copy of Deed Restriction
Site Plan Prepared for Brett Ellis of 118 Old Dam Road Bourne, MA Sheet #1
 dated 03/01/21; revised 05/18/21 Mitigation Plan; and Sheet 2 of 2 dated 03/01/21, revised 12/28/21

Bourne Board of Health
Application for Septic Variance or Waiver Requests

In accordance with the established procedures of the Bourne Board of Health, this application is for septic variances and waivers which have not been approved administratively and require approval at a public meeting. Please use the following application form for guidance on how to apply for variances and waivers which serve new construction, changes in use, or increases in flow to on-site sewage disposal systems with design flows of less than 10,000 gallons/ day.

1. Facility Name and Address:

Owner's Name
Jordan Race

Facility's Street Address
118 Old Dam Road, Bourne, MA 02532

Owner's Telephone Number   774 269 6950

Owner's E-mail Address   jrace4@gmail.com

Owner's Mailing Address
118 Old Dam Road, Bourne, MA 02532

2. Applicant or Preparer's Name and Address (if different from above):

Preparer's Name
J. E. Landers-Cauley, P.E.

Company
J. E. Landers-Cauley, P.E.

Telephone Number   508-540-7733

E-mail Address   jlandersca@aol.com

Mailing Address
J. E. Landers-Cauley, P.E., Box 364 West Falmouth, MA 02574

State/ Zip Code
Ma 02574

3. Type of Facility (check all that apply):

☒ Residential   ☐ Commercial   ☐ Institutional   ☐ School   ☐ Industrial

4. Describe Facility (i.e. single-family dwelling, 45 seat restaurant):
   Single family dwelling

5. Type of System (check all that apply):   ☐ Conventional Title 5   ☒ I/A System

☐ Pumped System   ☐ Gravity System   ☐ Pressure Dosed   ☐ Existing   ☒ Proposed

6. Describe the existing/ proposed septic system components: _____
   Existing: 1000 gallon septic tank and leaching pit
   Proposed: Partitioned septic tank with 0.5 micro-FAST denitrification, a pump chamber,
   and a leaching field

7. Design Flow per 310 CMR 15.203 (in gallons/ day):

   330 gpd
   _____
   Design flow of system:
                            330 gpd
   _____
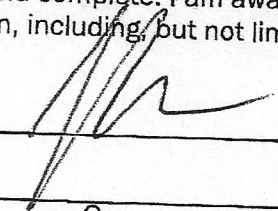   Total design flow of facility:

8. Enclose a **letter of request for variances/ waivers** which makes reference to the specific provisions of Title 5 and/ or the Board Bourne of Health Regulations for which a variance is sought. Please use this opportunity to demonstrate compliance with 310 CMR 15.410, and to justify the relevant facts and circumstances of the individual case. Note that with regard to variances for new construction, enforcement of the provision from which a variance is sought must be shown to deprive the applicant of substantially all beneficial use of the subject property in order to be manifestly unjust. Be sure to explain why full compliance with the applicable regulations is not feasible, and how a level of environmental protection that is at least equivalent to that provided under Title 5 and the Board of Health Regulations can be achieved without strict application of said regulations.
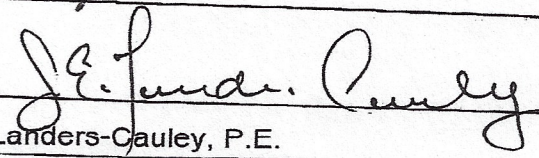
9. In order for this Application to be deemed complete, it must be accompanied by the following:

   ☒ Application Fees paid to the Town of Bourne.
   ☒ Letter of request describing nature of variances (see samples)
   ☒ Six sets of complete plans and specifications. One with original stamp of design engineer.
   ☒ Nitrogen Loading Calculation Sheet(s) if applicable
   ☒ If abutter notification is required, one of each of the following must be submitted:
      ➤ A copy of the certified list of abutters from the Assessor's Department
      ➤ Sample letter for abutter notification postmarked 10 days prior to meeting date
      ➤ Proof of certified mailing (receipts) meeting requirements of 310 CMR 15.405(2)
   ☒ Proposals for installation of Innovative/ Alternative septic systems must be accompanied by:
      ➤ A copy of the Certification for Use including technology specific conditions
      ➤ Draft disclosure notice for the I/A technology to be recorded in the deed
   ☐ Hydrogeologic data for all leaching facilities proposed within 100ft of a wetland/ watercourse
   ☐ Percentage of Increase Worksheet may be required for waivers or increases in flow

10. Certification:

"I certify under penalty of law that this document and all attachments, to the best of my knowledge and belief, are true, accurate, and complete. I am aware that there may be significant consequences for submitting false information, including but not limited to, penalties or fine and/or imprisonment for deliberate violations."

Facility Owner's Signature _____   Date 5/4/21

Print Name   Jordan Race

Signature of Preparer _____   Date 06/01/21

Print Name   J. E. Landers-Cauley, P.E.

FIRST FLOOR EXISTING CONDITIONS

118 Old Dam Road Buzzards Bay, MA 02532

scale
3/16" = 1'

= window

= door

bedroom (10'8"x116")

bedroom (14'x12'6")

wood deck

stairs down

bathroom (5'x8'8")

living room (23'x16')

kitchen (18'x9')

sunroom (12'x14'4")

wood deck
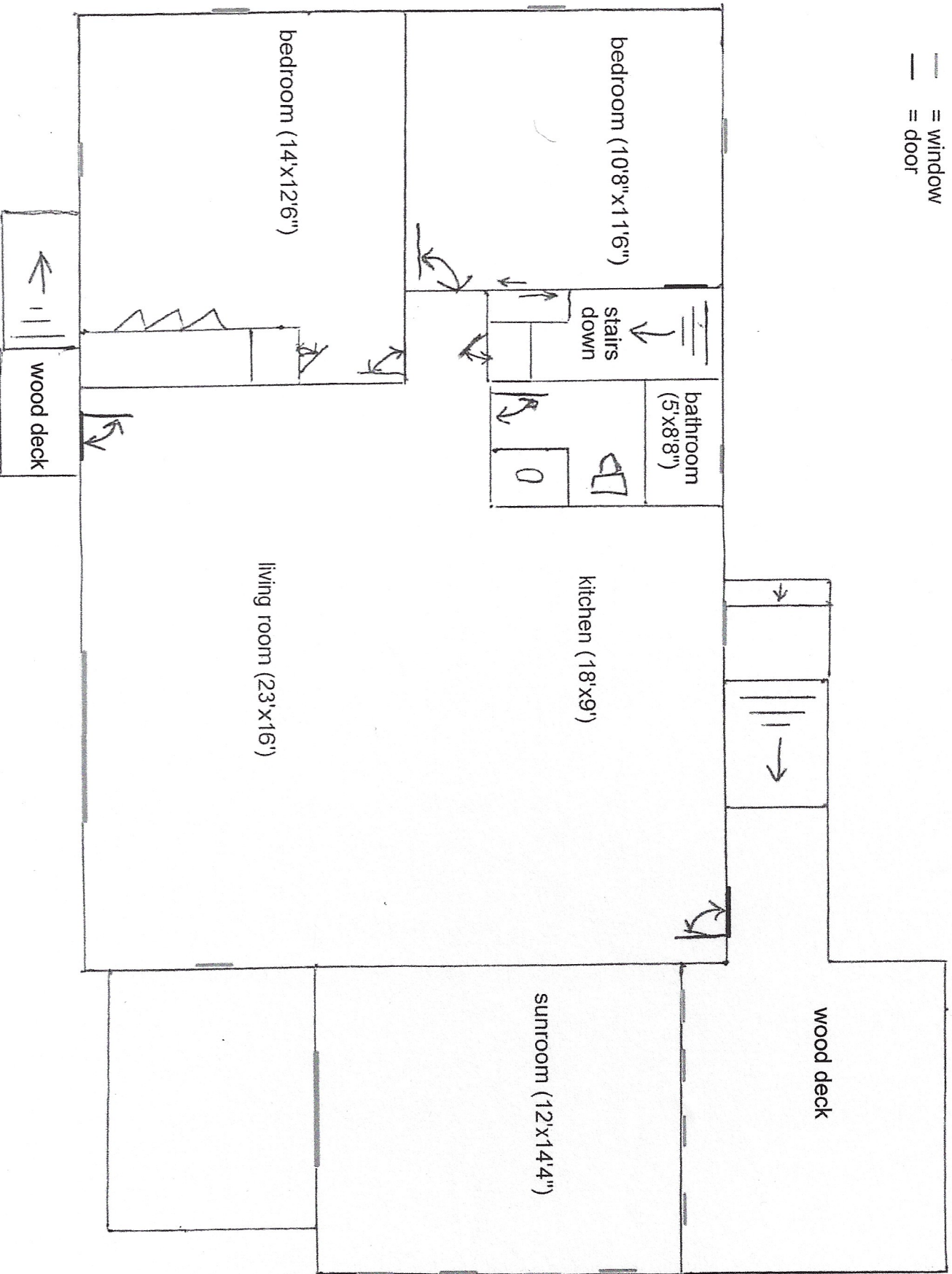
LOWER LEVEL EXISTING CONDITIONS

118 Old Dam Road
Buzzards Bay, MA 02532

Scale

3/16" = 1'

——— = window
WH = water heater
FHA = forced hot air
WS = wood stove

bathroom (12'x7'6")

kitchen (7'6"x4')

finished closet (7'6"x4')

shwr

WC

stairs up

finished room (12'x12')

2864 door

unfinished room (25'x11')

washer/dryer

WH

FHA

finished room (25'x14')

2864 door

WS

wood deck

unfinished storage (12'x14'4")

unfinished storage (10'3"x8')

2864 door

3064 door
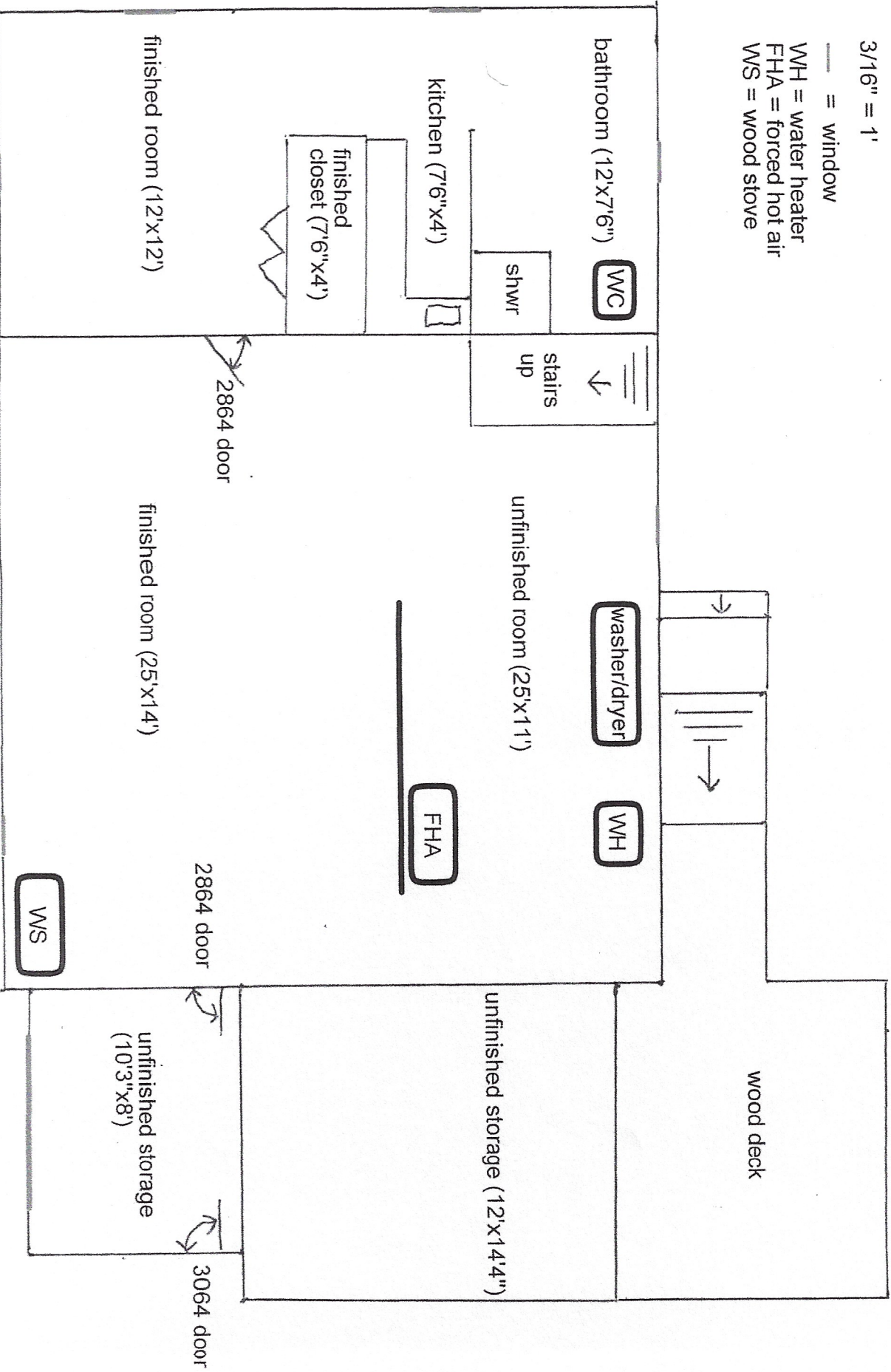
Town of Bourne - Fiscal Year 2021

Key: 5720

12/10/2020 5:52 pm SEQ #: 5,863

| | | | | | | | | | BN ID | BN | CARD |
| | | | | | | | | | | 1 | 1 of 1 |

CURRENT OWNER
TREVAINS ELEANOR L TRS
ELEANOR L TREVAINS TRUST
118 OLD DAM RD
BOURNE, MA 02532

PARCEL ID
27-0-36-0

LOCATION
118 OLD DAM RD

CLASS	CLASS%	CLASS%		
1010	100	100	SINGLE FAMILY	
1010	100			

TRANSFER HISTORY
	DOS	T	SALE PRICE	BK-PG (Cert)
TREVAINS ELEANOR L TRS	12/05/2016	F	100	30136-164
TREVAINS ELEANOR	08/23/2011	N		25637-208/9
TREVAINS ELEANOR &	04/22/1968	F	1	1397-944

PMT NO	PMT DT	TY	DESC	AMOUNT	INSP	BY
16465	06/07/2016	9	DECK	625		JS
980581	10/05/1998	10	WOODSTOVE		01/26/1999	

CD	T	AC/SF/UN	ADJ	Nbhd	Infl1	N_Index	ADJ BASE	SAF	Topo	Lpl	VC	CREDIT AMT	ADJ VALUE
100	S	40,000	6	1.00 100	1.00 100	1.00	361,200	1.00 A	1.00 BEX	2.15			331,610
300	A	0.382	6	1.00 100	1.00 100	1.00	24,725	1.00 A	1.00 BEX	2.15			9,440

TOTAL
1.300 Acres

			DESC		
Nbhd	1	BOURNE	ZONING	1	N
Infl1	2	AVG			O T E
N_Index	1	AVG			

FRNT 0

ASSESSED	CURRENT	PREVIOUS
LAND	341,100	337,800
BUILDING	127,600	120,800
DETACHED	9,200	9,100
OTHER	0	0
TOTAL	477,900	467,700

PHOTO 02/07/2003

BLDG COMMENTS

BUILDING
TY	QUAL	COND	DIM/NOTE	YB	UNITS	ADJ PRICE	RCNLD
DGF	A 1.00 A	0.75 A	16 X 22	1966	352	34.90	9,200

		MEASURE		
	LIST		2/7/2003	TL
	REVIEW		2/7/2003	TL
			2/7/2003	TL

DESC
	CD	ADJ		
MODEL	1		RESIDENTIAL	
STYLE	2	1.00	RAISED RANCH [100%]	1.020
QUALITY	A	1.00	AVERAGE [100%]	1.000
FRAME	1	1.00	WOOD FRAME [100%]	1.000

			SIZE ADJ		
YEAR BLT	1966		DETAIL ADJ	0.75 A	
NET AREA	925		OVERALL		
$NLA(RCN)	$182				

CAPACITY
	UNITS	ADJ	UNITS
STORIES	1	1.00	1
ROOMS	4	1.00	4
BEDROOMS	2	1.00	2
BATHROOMS	1	1.00	1
FIXTURES	6	1.00	6
GARAGE CAPACITY	0	1.00	0
% BSMT FINISH	0	1.00	0
# OF HALF BATHS	0	1.00	0
# OF UNITS	1	1.00	1

ELEMENT
ELEMENT	CD	DESCRIPTION
FOUNDATION	4	FLR/WALL(FULL)
EXT COVER	1	WOOD SHINGLE
ROOF SHAPE	1	GABLE
ROOF COVER	1	ASPH/COMP SHIN
FLOOR COVER	3	W/W CARPET
INT. FINISH	3	WOOD PANEL
HEATING/COOLING	1	FORCED AIR
FUEL SOURCE	1	OIL

S	BAT	T	DESCRIPTION	UNITS	YB	ADJ PRICE	RCN
+	BMU	N	BSMT UNFINISHED	1,093		23.81	26,027
A	BAS	L	BASE AREA	925	1966	129.34	119,637
B	WDK	N	WOOD DECK	120		25.74	3,089
C	EPA	N	ENCLOSED PORCH	168		48.10	8,080
D	ASH	N	ATT SHED	70		15.50	1,085
	BSF	N	BSMT SEMI-FIN	500		11.97	5,985
	FIX	O	XTRA FIXTURES	1		1,388.20	1,388
	MST	O	MAS/METAL STACK	1		2,602.00	2,602

		TOTAL RCN	167,894

CONDITION ELEM	CD
EXTERIOR	A
INTERIOR	A
KITCHEN	A
BATHS	A
HEAT	A
ELECT	A

EFF.YR/AGE	1992 / 27
COND	24 24 %
FUNC	0
ECON	0
DEPR	24 % GD	76
RCNLD	$127,600

Sketch (BMU / BAS / EPA / WDK / ASH)
(A) BAS BMU 37 25 7
(D) ASH 10
(C) EPA BMU 12 14
(B) WDK 10 12

Microfast

Town of Bourne

CONSERVATION COMMISSION

Nitrogen Loading Calculation Sheet for Residential Housing

The flowing calculation sheet is based upon Technical Bulletin 91-001 issued by the

Cape Cod Commission and deals with nitrate nitrogen (NO3-N)

Use this information from your PLAN OF RECORD to provide the following:

Number of bedrooms (Title 5 definition)	=	3.0 bedrooms
Lot size (in square feet)	=	56628.0 sq. ft.
Impervious surfaces; **Roof area = 1818 sq. ft. **Paved area	=	1407.0 sq. ft.
Natural Area = lot area minus all impervious surfaces	=	53403.0 sq. ft.
Lawn area in sq. ft.	=	3800.0 sq. ft.

TITLE 5 FLOW = 110 GAL. / DAY PER BEDROOM

WASTEWATER FLOWS (NITROGEN LOAD & WATER LOAD)

Nitrogen from Title 5 design = 14, 572 mg NO3-N / day / bedroom

Water from Title 5 design = 416..3 L H20 / day / bedroom

1a) Number of bedrooms	=	3.0	X	7910.5	= 23731.5 mg. NO3-N/day
1b) Number of bedrooms	=	3.0	X	416	= 1248.0 L H2O / day

Actual Nitrogen load = 6071.5 mg NO3-N / day / bedroom

Actual Water load = 173.5 L H2O / day / bedroom

*Note: This assumes 2.5 people / unit average occupancy within the Town.

2a) Number of bedrooms	=	3.0	X	3296	= 9888.0 mg. NO3-N / day
2b) Number of bedrooms	=	3.0	X	173.5	= 520.5 L H2O / day

IMPERVIOUS SURFACES (NITROGEN LOAD & WATER LOAD)

NO3-N load number sq. ft. of roof surface X 0.19395 mg NO3-N / sq. ft.

H2O load number sq. ft. of roof surface X 0.2586 L / sq. ft.

3a) Roof Surface	=	1818	sq. ft. X	0.19395	= 352.6 mg NO3-N
3b) Roof Surface	=	1818	sq. ft. X	0.2586	= 470.1 L H2O

NO3-N load number sq. ft. of paved surface X 0.388 mg / sq. ft.

H2O load number sq. ft. of paved surface X 0.2586 L / sq. ft.

4a) NO3-N	=	1407	sq. ft. surface X	0.388 mg / sq.ft.=	545.9 mg NO3-N
4b) H2O	=	1407	sq. ft. surface X	0.2586 L / sq. ft. =	363.9 L H2O

LAWN NITROGEN LOAD = 0.933 mg / sq. ft. lawn surface

5) sq. ft. of lawn	=	3800	X	0.933	= 3545.4 mg

NATURAL AREA WATER LOADING

Natural area = lot size - impervious surface		=	53403.0 sq. ft.
6) Natural area	=	53403 X water recharge factor	= 7252.1 L

(0.1358 L / sq. ft. for Bourne)

SUMMARY OF NITROGEN LOADING

Estimated Title 5 Nitrogen & Water Loading

7a) ADD the above NO3-N load:

1a	3a	4a	5		
23731.5	352.6011	545.916	3545.4	=	28175.4 mg NO3-N / day

7b) ADD the above water (H2O) load:

1b	3b	4b	6		
1248	470.1348	363.8502	7252.1274	=	9334.1 L H2O / day

7c) DIVIDE 7a by 7b   =   3.0 ppm NO3-N*****

Actual Nitrogen & Water Loading

8a) ADD the above NO3-N load:

2a	3a	4a	5		
9888	352.6011	545.916	3545.4	=	14331.9 mg NO3-N / day

8b) ADD the above water (H2O) load:

2b	3b	4b	6		
520.5	470.1348	363.8502	7252.1274	=	8606.6 L H2O / day

8c) DIVIDE 8a by 8b   =   1.7 ppm NO3-N*****

FINAL CALCULATION:

ADD 7C & 8C (PPM)   =   4.683764354 **DIVIDE BY 2**   =   2.3 **PPM NO3-N**

This is the actual nitrate nitrogen load for the project as designed. The target for coastal areas is 5 ppm nitrate nitrogen. Certain critical embayments may require a LOWER figure to prevent degradation.

*****If your nitrate nitrogen load exceeds the target limit **USE A SECOND CALCULATION SHEET TO SHOW ALTERNATIVES IN TRYING TO ACHIEVE THE 5 PPM NITRATE NITROGEN LEVEL*****

Water recharge factors for data line 6: @21' / yr. use 0.1358 in Bourne and Falmouth; @19" / yr. use 0.1228 for Mashpee & Sandwich; @18" yr. 0.1164 for Barnstable, Dennis & Yarmouth; @17" / yr. use 0.1101 for Brewster & Harwich; @16" / yr. use 0.1031 for Chatham, Eastham, Orleans, Provincetown, Truro & Wellfleet

Non Microfast

Town of Bourne

CONSERVATION COMMISSION

Nitrogen Loading Calculation Sheet for Residential Housing

The flowing calculation sheet is based upon Technical Bulletin 91-001 issued by the

Cape Cod Commission and deals with nitrate nitrogen (NO3-N)

Use this information from your PLAN OF RECORD to provide the following:

Number of bedrooms (Title 5 definition)	=	2.0 bedrooms
Lot size (in square feet)	=	56628.0 sq. ft.
Impervious surfaces; **Roof area = 1818 sq. ft. **Paved area	=	1407.0 sq. ft.
Natural Area = lot area minus all impervious surfaces	=	53403.0 sq. ft.
Lawn area in sq. ft.	=	3800.0 sq. ft.

TITLE 5 FLOW = 110 GAL. / DAY PER BEDROOM

WASTEWATER FLOWS (NITROGEN LOAD & WATER LOAD)

Nitrogen from Title 5 design = 14, 572 mg NO3-N / day / bedroom

Water from Title 5 design = 416..3 L H20 / day / bedroom

1a) Number of bedrooms	=	2	X	14572	=	29144.0 mg. NO3-N/day
1b) Number of bedrooms	=	2	X	416	=	832.0 L H2O / day

Actual Nitrogen load = 6071.5 mg NO3-N / day / bedroom

Actual Water load = 173.5 L H2O / day / bedroom

*Note: This assumes 2.5 people / unit average occupancy within the Town.

2a) Number of bedrooms	=	2	X	6071.5	=	12143.0 mg. NO3-N / day
2b) Number of bedrooms	=	2	X	173.5	=	347.0 L H2O / day

IMPERVIOUS SURFACES (NITROGEN LOAD & WATER LOAD)

NO3-N load number sq. ft. of roof surface X 0.19395 mg NO3-N / sq. ft.

H2O load number sq. ft. of roof surface X 0.2586 L / sq. ft.

3a) Roof Surface	=	1818	sq. ft. X	0.19395	=	352.6 mg NO3-N
3b) Roof Surface	=	1818	sq. ft. X	0.2586	=	470.1 L H2O

NO3-N load number sq. ft. of paved surface X 0.388 mg / sq. ft.

H2O load number sq. ft. of paved surface X 0.2586 L / sq. ft.

4a) NO3-N	=	1407	sq. ft. surface X	0.388	mg / sq.ft.=	545.9 mg NO3-N
4b) H2O	=	1407	sq. ft. surface X	0.2586	L / sq. ft. =	363.9 L H2O

LAWN NITROGEN LOAD = 0.933 mg / sq. ft. lawn surface

5) sq. ft. of lawn	=	3800	X	0.933	=	3545.4 mg

NATURAL AREA WATER LOADING

Natural area = lot size - impervious surface		=	53403.0 sq. ft.
6) Natural area	= 53403 X water recharge factor	=	7252.1 L

(0.1358 L / sq. ft. for Bourne)

SUMMARY OF NITROGEN LOADING

Estimated Title 5 Nitrogen & Water Loading

7a) ADD the above NO3-N load:

1a	3a		4a	5			
29144	352.6011		545.916	3545.4		=	33587.9 mg NO3-N / day

7b) ADD the above water (H2O) load:

1b	3b		4b	6			
832	470.1348		363.8502	7252.1274		=	8918.1 L H2O / day

7c) DIVIDE 7a by 7b   =   3.8 **ppm NO3-N*****

Actual Nitrogen & Water Loading

8a) ADD the above NO3-N load:

2a	3a		4a	5			
12143	352.6011		545.916	3545.4		=	16586.9 mg NO3-N / day

8b) ADD the above water (H2O) load:

2b	3b		4b	6			
347	470.1348		363.8502	7252.1274		=	8433.1 L H2O / day

8c) DIVIDE 8a by 8b   =   2.0 **ppm NO3-N*****

FINAL CALCULATION:

ADD 7C & 8C (PPM)   =   5.733138195 **DIVIDE BY 2**   =   2.9 **PPM NO3-N**

This is the actual nitrate nitrogen load for the project as designed. The target for coastal areas is 5 ppm nitrate nitrogen. Certain critical embayments may require a LOWER figure to prevent degradation.

*****If your nitrate nitrogen load exceeds the target limit **USE A SECOND CALCULATION SHEET TO SHOW ALTERNATIVES IN TRYING TO ACHIEVE THE 5 PPM NITRATE NITROGEN LEVEL*****

Water recharge factors for data line 6: @21' / yr. use 0.1358 in Bourne and Falmouth; @19" / yr. use 0.1228 for Mashpee & Sandwich; @18" yr. 0.1164 for Barnstable, Dennis & Yarmouth; @17" / yr. use 0.1101 for Brewster & Harwich; @16" / yr. use 0.1031 for Chatham, Eastham, Orleans, Provincetown, Truro & Wellfleet