Wastewater Treatment with Peat Biofilters

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Presentation Overview

- What is Peat?
- Treatment Process
- Advantages
- Case Studies
- Design Considerations
- Certification Programs
- Maintenance Requirements

What is Peat?

What is Peat?

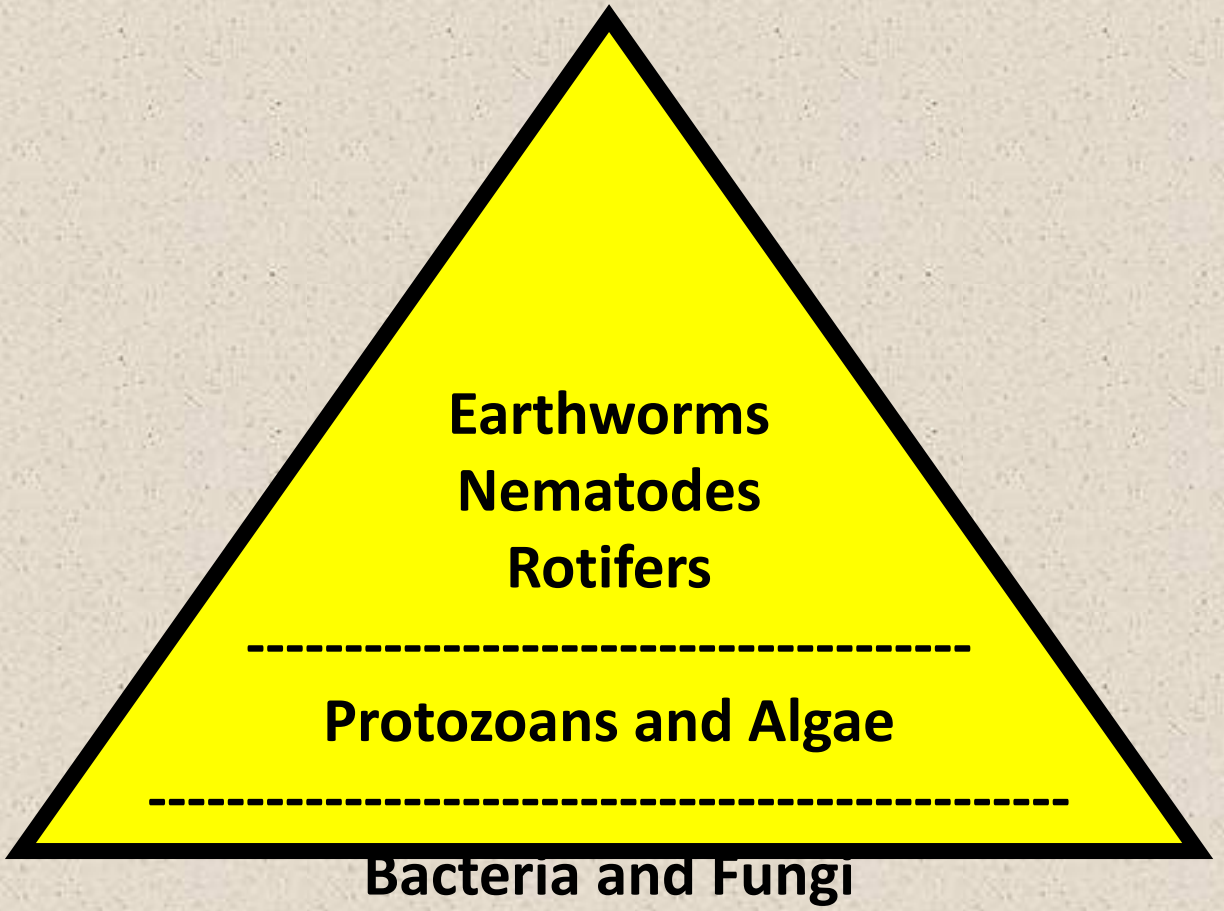
- Peat is an accumulation of partially decayed organic matter, which is formed under anaerobic conditions.
- It has been laid down in layers over time.
- Peat has a high capacity to bind and retain water.
- Peat provides long retention time within the modules allowing slow filtration of the effluent.
- It is a very durable media with long life expectancy.

Handful of Milled Peat

What is Peat?

- Filtration media which provides treatment via physical filtration, adsorption, and microbiological activity
- Biofilters create a microbial eco-system in an aerobic environment
- Used in the form of peat moss or peat fibers
- Significant Treatment Capabilities

Biology of a Peat Biofilter



Treatment Capabilities

	Eco-pure	Puraflo	Ecoflo
BOD	90-97%	96%+	95%
TSS	92-98%	95%+	90%
Bacteria	99.99%	99.9%+	99%+

- High rate of contaminant removal allows for reduced disposal bed zone of treatment

NJDEP Approved Manufacturers

Puraflo
WASTEWATER TREATMENT

- Individual biofilter per bedroom (scalable)
- Uses loose peat fibre
- Comes fully assembled

ECO PURE™
Waste Water Systems

- One biofilter handles a four bedroom house (650 gallons)
- Uses peat pillows with loose peat filling voids
- Fully encapsulated water tight unit
- 300 Series Biofilter Units

Ecoflo Biofilter

- One biofilter handles a four bedroom house (650 gallons)
- Uses peat pillows with loose peat filling voids
- Unit comes open or closed bottom
- ST-500, STB-500, ST-650, & STB-650 Units

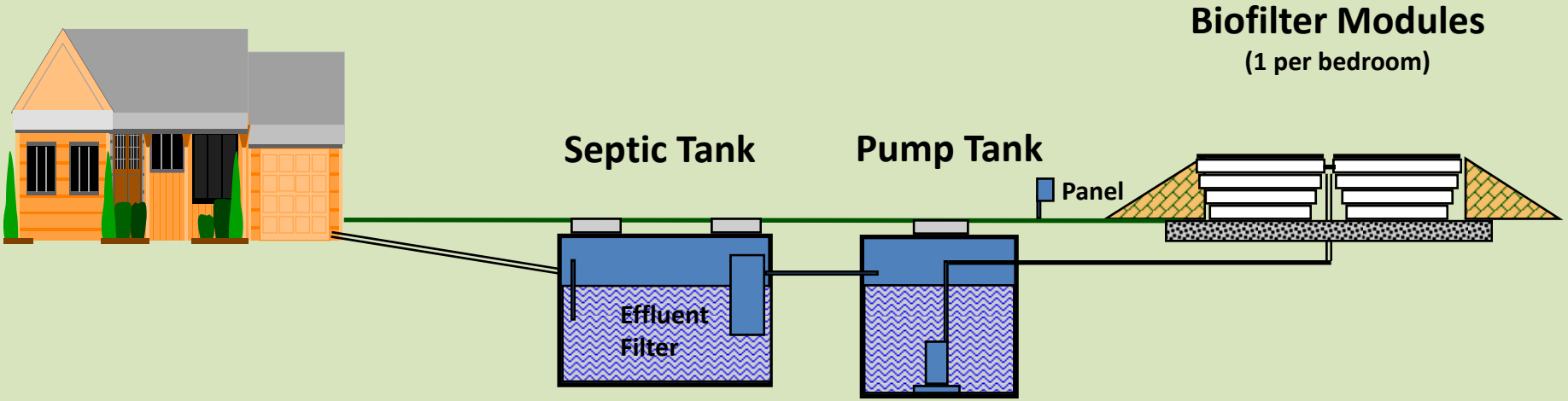
When is a Peat Biofilter Advantageous?

- High water table areas (<4')
- Small or oddly shaped lots
- Poor or no passing percolation test
- Well setbacks can not be maintained
- "Green Design"

Use of Peat Biofilter Allows:

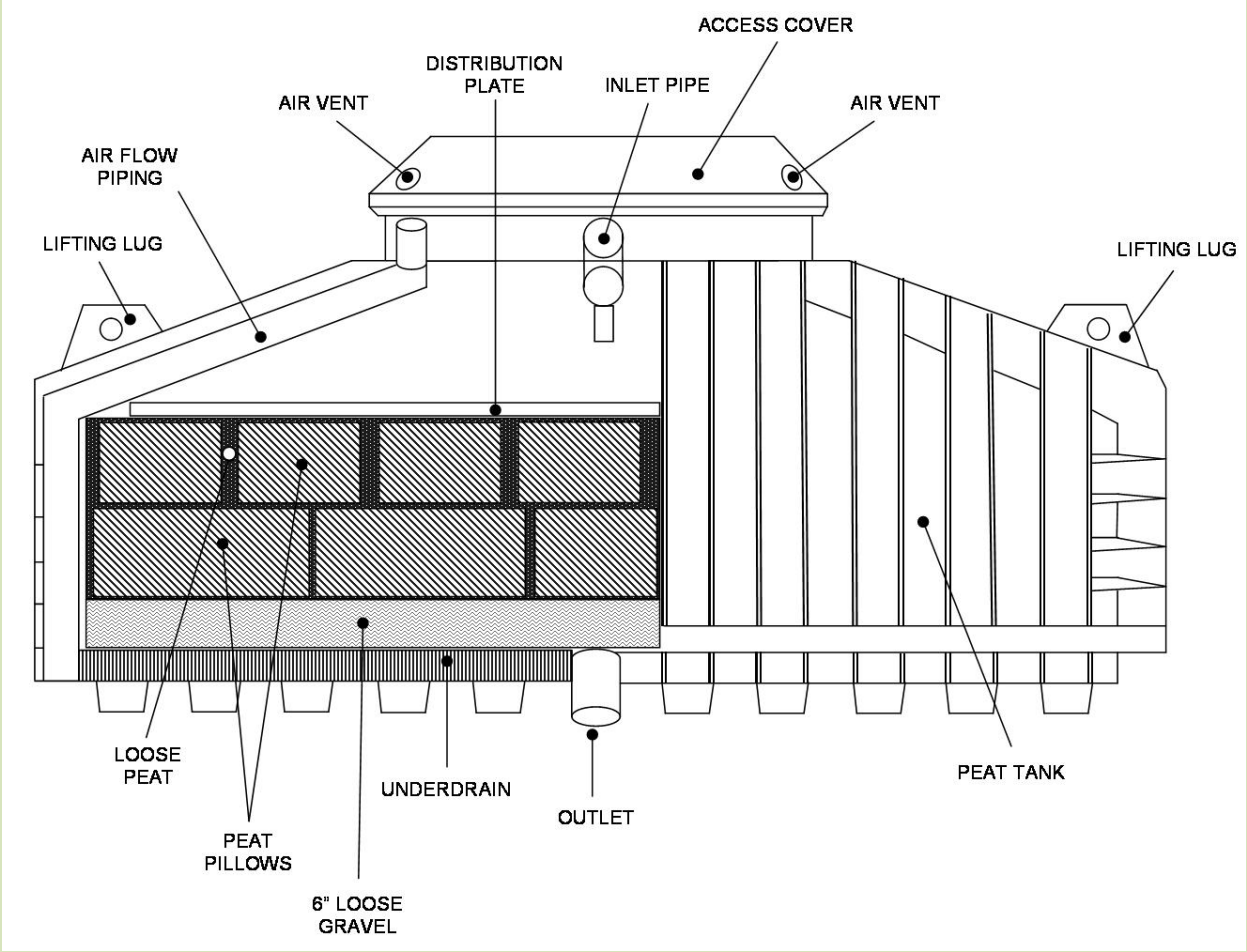
- Reduction of a traditional zone of treatment of 48” to 18” (typical)
- Reductions in plan view field size up to 15-28% depending on site conditions

Typical Installation



Eco-pure Install

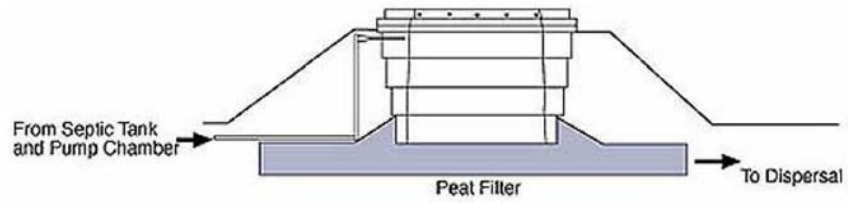
Layout of Ecopure 300 Biofilter Unit



Traditional Mounded System

Reconstructed Peat Biofilter System

Peat Biofilter
Wastewater Treatment Systems
Guidance Document



NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER QUALITY
BUREAU OF NONPOINT POLLUTION CONTROL

JANUARY 2008

Provides Guidance for:

- Design
- Installation
- Operations & Maintenance
- Reporting

Disposal Field Sizing Requirements

					Minimum Bed Size (sq.ft.)			
Soil Class	**Permeability (in/hr)**	**Percolation Rate (min/in)**	**Standard A/Q (sqft/gpd)**	**Adjusted A/Q (sqft/gpd)**	**350gpd/ 2BDRM**	**500gpd/ 3BDRM**	**650gpd/ 4BDRM**	**800gpd/ 5BDRM**
K4	6-20	3-15	1.61	1.233	432	617	802	987
K3	2-6	16-30	2.08	1.704	597	853	1,108	1,364
K2	0.6-2	31-45	2.56	2.190	767	1,095	1,424	1,752
K1	0.2-0.6	46-60	2.96	2.596	909	1,298	1,688	2,077
Pressure Dosing Design			1.33	0.956	400*	479	622	765

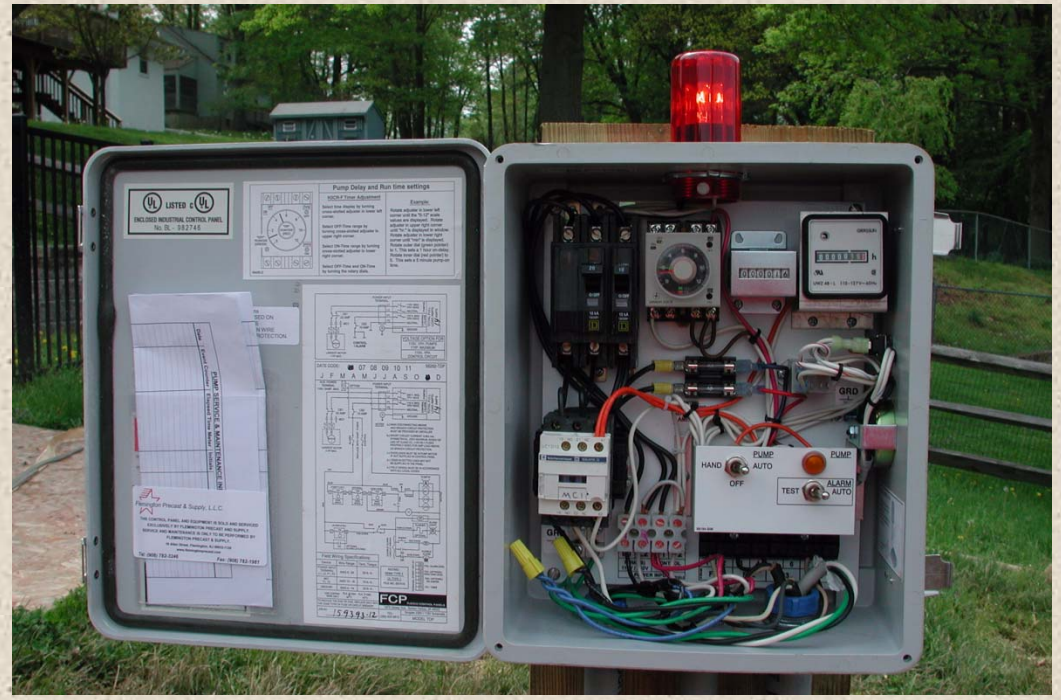
* The Department does not recommend sizing disposal beds at less than 400 sq.ft.

Design Elements

- All tanks to be tested watertight
- Only single piece water tight biofilters may be installed within the watertable
- Design engineer must notify NJDEP within 24 hours of design submittal
- All designs shall include an effluent filter

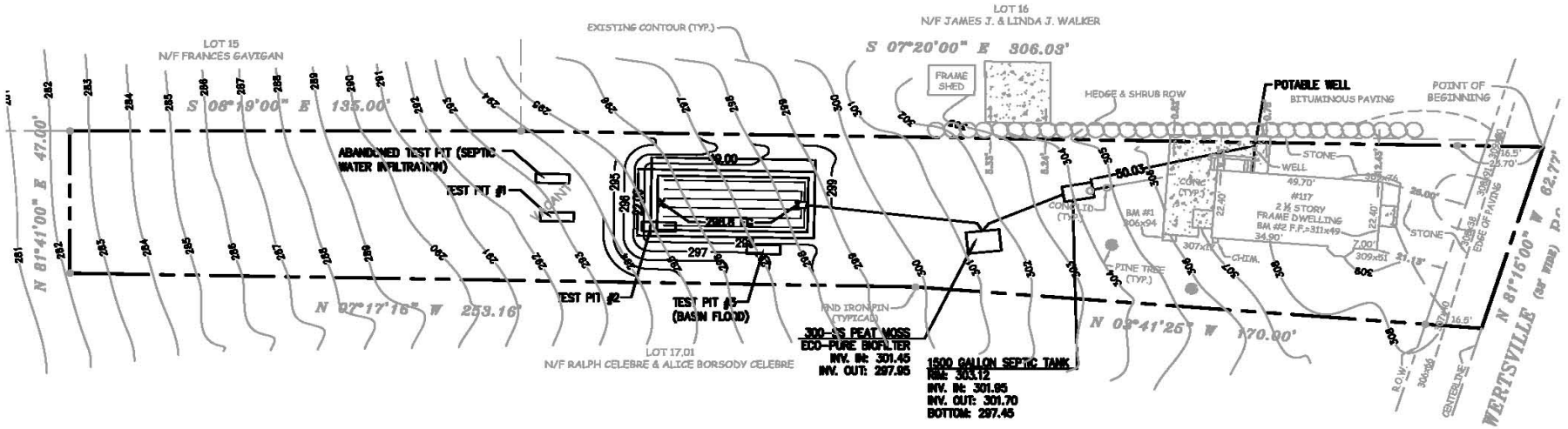
Design Elements

- Pump system to biofilter pump doses ~30 gallons on a regulated and timed dosing
- Pump tank operates with 2 floats



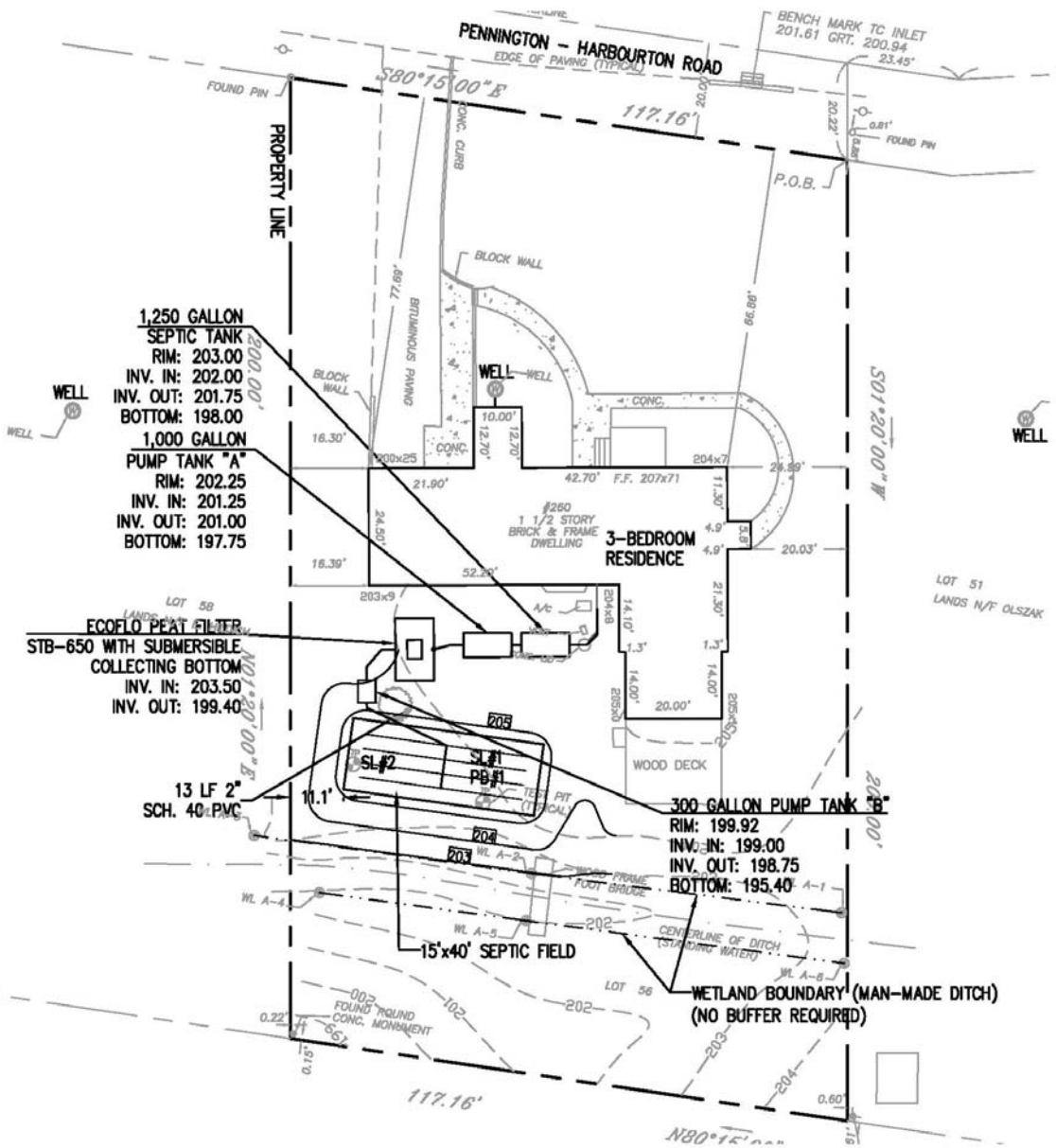
Example #1

- Exist. 3 bedroom residence on 0.6 acres
- 10% site slopes
- Seasonal high groundwater at 12”
- Machine Refusal at 5-8’
- Minimal permeability


LOT 15
N/F FRANCES GAVIGAN
LOT 16
N/F JAMES J. & LINDA J. WALKER
EXISTING CONTOUR (TYP.)
S 08°19'00" E 135.00'
S 07°20'00" E 306.03'
N 81°41'00" E 47.00'
N 07°17'16" W 253.16'
N 03°41'25" W 170.00'
N 81°16'00" W 62.77'
FRAME SHED
HEDGE & SHRUB ROW
POTABLE WELL
BITUMINOUS PAVING
POINT OF BEGINNING
ABANDONED TEST PIT (SEPTIC WATER INFILTRATION)
TEST PIT #1
TEST PIT #2
TEST PIT #3 (BASIN FLOOD)
297
25%
IRON PIN (TYPICAL)
300-S'S PEAT MOSS ECO-PURE BIOFILTER
INV. IN: 301.45
INV. OUT: 297.95
1500 GALLON SEPTIC TANK
RIM: 303.12
INV. IN: 301.95
INV. OUT: 301.70
BOTTOM: 297.45
LOT 17.01
N/F RALPH CELEBRE & ALICE BORSODY CELEBRE
CONC. I.D. (TYP.)
BM #1
306x94
CONC. (TYP.)
#117
2½ STORY
FRAME DWELLING
BM #2 F.F.=311x49
34.90'
22.40'
STONE
WELL
49.70'
7.00'
309x51
C-H.W.
PINE TREE (TYP.)
38.00'
STONE
EDGE OF PAVING
16.5'
23.70'
R.O.W.
CENTERLINE
WERTSVILLE (NO WIDE)

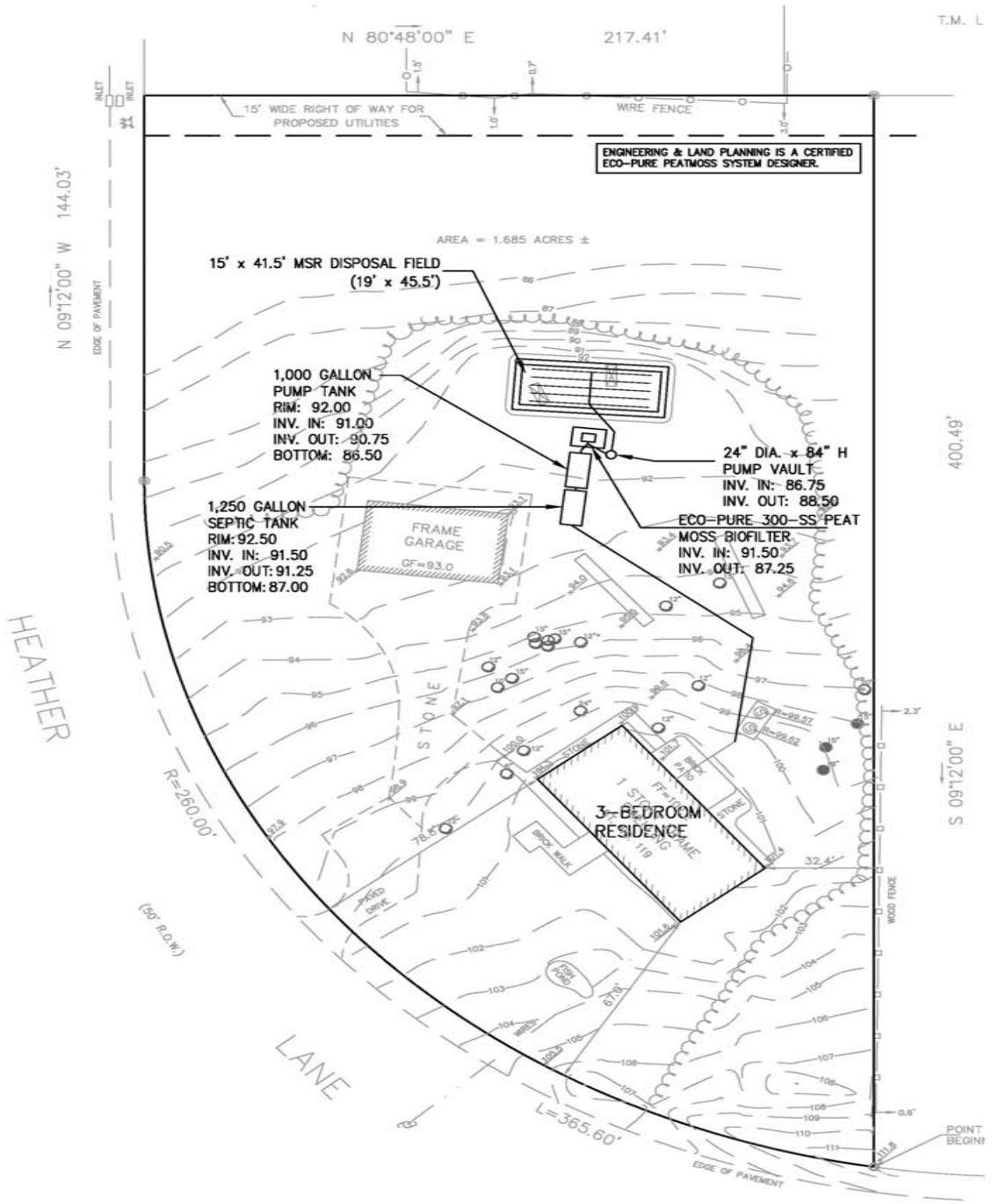
Example #2

- Exist. 3 bedroom residence on 0.5 acres
- Property bisected by wetland ditch
- Seasonal high groundwater at 24”
- Machine Refusal at 5.5’


PENNINGTON - HARBOURTON ROAD
EDGE OF PAVING (TYPICAL)
BENCH MARK TC INLET
201.61 GRT. 200.94
23.45'
FOUND PIN
S80°15'00"E
117.16'
0.81'
FOUND PIN
P.O.B.
PROPERTY LINE
CONC. CURB
BLOCK WALL
BITUMINOUS PAVING
77.69'
66.88'
S01°20'00"W
200.00'
1,250 GALLON
SEPTIC TANK
RIM: 203.00
INV. IN: 202.00
INV. OUT: 201.75
BOTTOM: 198.00
1,000 GALLON
PUMP TANK "A"
RIM: 202.25
INV. IN: 201.25
INV. OUT: 201.00
BOTTOM: 197.75
WELL
BLOCK WALL
CONC.
10.00'
12.70'
16.30'
200x25
21.90'
42.70'
F.F. 207x71
204x7
29.89'
11.30'
4.9'
5.0'
20.03'
#260
1 1/2 STORY
BRICK & FRAME
DWELLING
3-BEDROOM
RESIDENCE
24.50'
16.39'
52.25'
203x9
204x8
14.10'
1.3'
14.00'
21.30'
20.00'
205x0
205x5
LOT 58
LANDS N/F
LOT 51
LANDS N/F OLSZAK
ECOFLO PEAT FILTER
STB-650 WITH SUBMERSIBLE
COLLECTING BOTTOM
INV. IN: 203.50
INV. OUT: 199.40
N01°20'00"E
200.00'
205
SL#2
SL#1
PB#1
WOOD DECK
13 LF 2"
SCH. 40 PVC
11.1'
PIT
(TYPICAL)
300 GALLON PUMP TANK "B"
RIM: 199.92
INV. IN: 199.00
INV. OUT: 198.75
BOTTOM: 195.40
204
203
WL A-2
WOOD FRAME
FOOT BRIDGE
WL A-1
WL A-4
WL A-5
202
CENTERLINE OF DITCH
(STANDING WATER)
WL A-6
15'x40' SEPTIC FIELD
LOT 56
WETLAND BOUNDARY (MAN-MADE DITCH)
(NO BUFFER REQUIRED)
002
FOUND ROUND
CONC. MONUMENT
0.22'
0.15'
102
202
203
204
0.60'
117.16'
N80°15'00"W

Example #3

- Exist. 3 bedroom residence on 1.7 acres
- Seasonal high groundwater at 24”
- Passing Permeability at 14’
- Preserved significant area of trees
- Resulted in cost savings of over $6,000


T.M. L
N 80°48'00" E
217.41'
15' WIDE RIGHT OF WAY FOR PROPOSED UTILITIES
WIRE FENCE
INLET
INLET
ENGINEERING & LAND PLANNING IS A CERTIFIED ECO-PURE PEATMOSS SYSTEM DESIGNER.
AREA = 1.685 ACRES ±
N 09°12'00" W 144.03'
EDGE OF PAVEMENT
15' x 41.5' MSR DISPOSAL FIELD
(19' x 45.5')
1,000 GALLON
PUMP TANK
RIM: 92.00
INV. IN: 91.00
INV. OUT: 90.75
BOTTOM: 86.50
24" DIA. x 84" H
PUMP VAULT
INV. IN: 86.75
INV. OUT: 88.50
ECO-PURE 300-SS PEAT
MOSS BIOFILTER
INV. IN: 91.50
INV. OUT: 87.25
1,250 GALLON
SEPTIC TANK
RIM: 92.50
INV. IN: 91.50
INV. OUT: 91.25
BOTTOM: 87.00
FRAME
GARAGE
GF=93.0
400.49'
S 09°12'00" E
3-BEDROOM
RESIDENCE
1 STORY FRAME
FF=100.0
PG 119
BRICK PATIO
STONE
BRICK WALK
PAVED DRIVE
FISH POND
WOOD FENCE
HEATHER
R=260.00'
(50' R.O.W.)
LANE
L=365.60'
EDGE OF PAVEMENT
POINT BEGINN

Completed System

Certification

- Design engineers and installers must be licensed
- Certification process is different for all three manufacturers
- Contact manufacturer's representative for licensure information

Maintenance

- Between property owner and Manufacturer's representative
- Covers Normal Routine Maintenance
- Required to have active agreement for the life of the system
- NJDEP requires two maintenance visits per year (after initial 30 day check-up)

Inspection Requirements

- Wastewater level in the tanks,
- Any effluent/pump filter for clogging,
- Clarity in NTU's
- Final effluent for odor

Inspection Requirements

- All tanks for oily film or foam
- pH of final effluent
- Ponding of effluent around a peat biofilter treatment system or dispersal area
- For pump systems, all meter readings from the control panel.

Reporting Requirements

- Number of peat biofilter treatment systems installed
- The address of each installed peat biofilter treatment system, the owners name and address, the type of use
- Date when a peat biofilter treatment system was installed and started up
- Administrative authority and permit number
- Status of the maintenance and monitoring contract
- Number of inspection/maintenance calls conducted

Reporting Requirements

- The inspection results recorded on a Department approved inspection form and/or checklist, copies of which shall be made available by the peat biofilter manufacturer. The forms must be completed by a peat biofilter treatment system service provider and submitted to the Department upon written request.
- General summary of the results for the year, all known problems or failures with a brief summary of the cause and remedial measures taken.
- Any recommended changes to the design, installation and/or operation and maintenance procedures and a schedule for implementing those changes.

New Jersey Septic Management

phone: (908) 874-4669

www.nj-septic.com

Flemington Precast

phone: (908) 782-3246

www.flemingtonprecast.com

Ecoflo

T.P. Trezza Contracting, Inc.

phone: (800) 238-0411

www.tptrezza.com

Questions?

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