WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 1: Study Area Summary Description

Street Name	Description of Properties	Number of Properties in Size Range				Municipal Water On Street
		<1/4 acre	1/4-1 acre	1-2 acres	>2 acres	
AIRPORT RD	2 Commercial 9 Residential 4 Undeveloped Land	0	7	3	5	No
BAHAN RD	6 Residential 2 Undeveloped Land	0	0	1	7	No
BANK ST	1 Other 19 Residential 2 Undeveloped Land	2	17	1	2	Yes
BARBER ST	4 Residential	0	4	0	0	Yes
BUCK HILL RD	3 Other 3 Public Buildings 13 Residential 1 Undeveloped Land	3	7	2	8	No
CHURCH ST	1 Commercial 1 Industrial 1 Multi-Family 1 Public Buildings 13 Residential	0	14	2	1	Yes
CIDER MILL RD	1 Residential	0	0	0	1	No
CIRCLE DR	2 Residential	0	2	0	0	No
CLEVELAND AV	1 Multi-Family 4 Other 35 Residential 3 Undeveloped Land	12	26	4	1	Yes
COLVIN AV	1 Commercial 2 Other 3 Residential	4	2	0	0	Yes
COREY DR	12 Residential	1	11	0	0	Yes
DANIELS RD	11 Residential 2 Undeveloped Land	0	0	1	12	No
DON GREENE RD	1 Residential	0	0	0	1	No

Source: Town of Shaftsbury Grand List and Vermont e911 database, 2005.
Path: O:\Proj-05\1624-W-Shaftsbury\Data\GISData\Shaftsbury.mdb
Date/init: 1/5/06 anm

STONE ENVIRONMENTAL, INC
Phelps Engineering, Inc.

WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 1 (continued): Study Area Summary Description

Street Name	Description of Properties	Number of Properties in Size Range				Municipal Water On Street
		<1/4 acre	1/4-1 acre	1-2 acres	>2 acres	
DUNHAM AV	2 Other 4 Residential	2	3	1	0	Yes
EASTVIEW DR	1 Residential	0	0	1	0	No
ELM ST	1 Commercial 1 Other 9 Residential 5 Undeveloped Land	0	6	2	8	Yes
GLASTENVIEW DR	17 Residential 7 Undeveloped Land	0	4	7	13	No
GRANDVIEW ST	16 Residential 2 Undeveloped Land	5	11	1	1	Yes
GRANGE RD	2 Public Buildings 1 Residential	0	3	0	0	Yes
GRANT ST	8 Residential 2 Undeveloped Land	0	8	2	0	Yes
GRATZ RD	3 Residential 1 Undeveloped Land	2	1	0	1	Yes
GROVE RD	17 Residential 5 Undeveloped Land	0	3	17	2	No
HARVEST HILLS DR	23 Residential 4 Undeveloped Land	0	20	4	3	Partial
HAWKS AV	11 Residential 1 Undeveloped Land	3	7	2	0	Yes
HEWITT DR	13 Residential 3 Undeveloped Land	0	9	4	3	No
HOLLIDAY DR	13 Residential 2 Undeveloped Land	1	8	2	4	Yes
HOWARD PARK RD	1 Park	0	0	0	1	No
LAKE DR	45 Residential 8 Undeveloped Land	0	43	4	6	Yes

Source: Town of Shaftsbury Grand List and Vermont e911 database, 2005.
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WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 1 (continued): Study Area Summary Description

Street Name	Description of Properties	Number of Properties in Size Range				Municipal Water On Street
		<1/4 acre	1/4-1 acre	1-2 acres	>2 acres	
LAMB RD	4 Residential 1 Undeveloped Land	0	1	1	3	No
LEDGELY DR	7 Residential 1 Undeveloped Land	2	4	1	1	Yes
MATTISON RD	4 Residential 1 Undeveloped Land	0	1	0	4	No
MCCARTHY ACRES	10 Residential 2 Undeveloped Land	0	8	1	3	No
MCGUIRE ST	12 Residential 1 Undeveloped Land	0	12	0	1	Yes
MEADOW LN	10 Residential 2 Undeveloped Land	5	7	0	0	Yes
MOUNTAIN VIEW DR	14 Residential	0	3	10	1	No
NORTH RD	2 Commercial 15 Residential 9 Undeveloped Land	2	4	6	14	No
PARAN RD	16 Residential 5 Undeveloped Land	1	8	1	11	No
REDDY RD	5 Residential 1 Undeveloped Land	0	0	3	3	No
SIMEON DEAN RD	7 Residential 4 Undeveloped Land	0	0	0	11	No
SOUTHVIEW DR	6 Residential 2 Undeveloped Land	0	8	0	0	Yes
STEVENS LN	2 Residential	0	2	0	0	Yes
SUNSET DR	5 Residential 1 Undeveloped Land	0	4	2	0	Yes
SYCAMORE LN	34 Residential 2 Undeveloped Land	3	31	1	1	Yes
TOWN LINE RD W	4 Residential	0	0	0	4	No

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WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 1 (continued): Study Area Summary Description

Street Name	Description of Properties	Number of Properties in Size Range				Municipal Water On Street
		<1/4 acre	1/4-1 acre	1-2 acres	>2 acres	
TRAILER PARK RD	1 Undeveloped Land	0	0	0	1	No
TWITCHELL HILL RD	1 Other 34 Residential	1	24	2	8	Yes
UNDERPASS RD	1 Commercial 1 Residential 1 Undeveloped Land	0	3	0	0	Yes
VT RT 67 EAST	1 Industrial 1 Multi-Family 7 Other 1 Public Buildings 45 Residential 16 Undeveloped Land	9	41	8	13	Partial
VT RT 67 WEST	8 Residential 3 Undeveloped Land	0	2	4	5	Partial
VT RT 7A	15 Commercial 1 Industrial 3 Other 38 Residential 9 Undeveloped Land	7	26	10	23	Partial
WESTVIEW PL	8 Residential	1	5	2	0	Yes
WHITE CREEK RD	1 Commercial 1 Multi-Family 5 Residential 4 Undeveloped Land	0	4	2	5	No

Source: Town of Shaftsbury Grand List and Vermont e911 database, 2005.
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WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 2
Summary of Soil Characteristics Regarding Onsite Wastewater Disposal Within Study Area

Series Name	Mapping Unit	Slope (Percent)		Water Table (Feet)		Hydric Soil	Depth to Bedrock (Inches)		Potential On-Site System Suitability	% Study Area
		Low	High	Low	High		Low	High		
ADRIAN AND SACO SOILS	23A	0	2	-1	0.5	Y	60	60	Not Suited	6.2
CARLISLE MUCKY PEAT	24A	0	2	-1	0.5	Y	60	60	Not Suited	0.5
COPAKE GRAVELLY FINE SANDY LOAM	3A	0	3	6	6	N	60	60	Conventional Subsurface	4.6
COPAKE GRAVELLY FINE SANDY LOAM	3B	3	8	6	6	N	60	60	Conventional Subsurface	14.0
COPAKE GRAVELLY FINE SANDY LOAM	3C	8	15	6	6	N	60	60	Conventional Subsurface	7.5
COPAKE GRAVELLY FINE SANDY LOAM	3D	15	25	6	6	N	60	60	Conventional Subsurface	2.8
COPAKE GRAVELLY FINE SANDY LOAM	3E	25	60	6	6	N	60	60	Conventional w/Excessive Slope or Permeability	6.5
GALWAY-FARMINGTON COMPLEX, VERY ROCKY	41C	8	15	6	6	N	10	40	Not Suited	0.2
GALWAY-FARMINGTON COMPLEX, VERY ROCKY	41D	15	25	6	6	N	10	40	Not Suited	0.6
GALWAY-NELLIS-FARMINGTON COMPLEX, ROCKY	40C	8	15	6	6	N	10	60	At-grade or Filtrate + Conventional	1.5
GALWAY-NELLIS-FARMINGTON COMPLEX, ROCKY	40D	15	25	6	6	N	10	60	Mound or Filtrate + At-grade	0.1
GEORGIA LOAM	66B	3	8	1.5	3	N	60	60	Mound w/Curtain Drain or Filtrate + Mound	8.8
GEORGIA LOAM	66C	8	15	1.5	3	N	60	60	Mound w/Curtain Drain or Filtrate + Mound	3.8
GEORGIA LOAM, VERY STONY	67B	3	8	1.5	3	N	60	60	Mound w/Curtain Drain or Filtrate + Mound	1.5
GEORGIA LOAM, VERY STONY	67C	8	15	1.5	3	N	60	60	Mound w/Curtain Drain or Filtrate + Mound	2.6
GROTON GRAVELLY FINE SANDY LOAM	70A	0	3	6	6	N	60	60	Conventional Subsurface	0.2
GROTON GRAVELLY FINE SANDY LOAM	70B	3	8	6	6	N	60	60	Conventional Subsurface	4.7
GROTON GRAVELLY FINE SANDY LOAM	70C	8	15	6	6	N	60	60	Conventional Subsurface	0.9
GROTON GRAVELLY FINE SANDY LOAM	70D	15	25	6	6	N	60	60	Conventional Subsurface	0.5
GROTON GRAVELLY FINE SANDY LOAM	70E	25	60	6	6	N	60	60	Conventional w/Excessive Slope or Permeability	0.5
HERO GRAVELLY FINE SANDY LOAM	71A	0	3	1.5	2.5	N	60	60	Mound w/Curtain Drain or Filtrate + Mound	2.4
HERO GRAVELLY FINE SANDY LOAM	71B	3	8	1.5	2.5	N	60	60	Mound w/Curtain Drain or Filtrate + Mound	1.2

Source: National Resource Conservation Service (NRCS), Stone field notes.

Notes: % Area was calculated using data from NRCS and Geographic Information Systems (GIS) by dividing the total area (acres) of each Series in the Service Area by the total area (acres) of the Service Area.

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Date/Initials: 12/1/05 anm

WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 2 (continued)
Summary of Soil Characteristics Regarding Onsite Wastewater Disposal Within Study Area

Series Name	Mapping Unit	Slope (Percent)		Water Table (Feet)		Hydric Soil	Depth to Bedrock (Inches)		Potential On-Site System Suitability	% Study Area
		Low	High	Low	High		Low	High		
LIMERICK SILT LOAM	21A	0	3	0	1.5	Y	60	60	Not Suited	1.3
MACOMBER-TACONIC COMPLEX, ROCKY	42C	8	15	6	6	N	10	40	Not Suited	0.7
MANSFIELD MUCKY SILT LOAM, VERY STONY	52A	0	3	-1	0.5	Y	60	60	Not Suited	2.5
MASSENA SILT LOAM	68A	0	3	1	1.5	N	60	60	Not Suited	0.3
MASSENA SILT LOAM	68B	3	8	1	1.5	N	60	60	Not Suited	2.7
MASSENA SILT LOAM, VERY STONY	69A	0	3	1	1.5	N	60	60	Not Suited	5.1
MASSENA SILT LOAM, VERY STONY	69B	3	8	1	1.5	N	60	60	Not Suited	1.1
OCCUM FINE SANDY LOAM	29A	0	3	4	6	N	60	60	Conventional Subsurface	0.4
PITTSFIELD FINE SANDY LOAM	93B	3	8	6	6	N	60	60	Conventional Subsurface	2.8
PITTSFIELD FINE SANDY LOAM	93C	8	15	6	6	N	60	60	Conventional Subsurface	4.1
PITTSFIELD FINE SANDY LOAM	93D	15	25	6	6	N	60	60	Conventional Subsurface	0.7
PITTSFIELD FINE SANDY LOAM, VERY STONY	94B	3	8	6	6	N	60	60	Conventional Subsurface	1.0
PITTSFIELD FINE SANDY LOAM, VERY STONY	94C	8	15	6	6	N	60	60	Conventional Subsurface	2.3
PITTSFIELD FINE SANDY LOAM, VERY STONY	94D	15	25	6	6	N	60	60	Conventional Subsurface	0.9
PITTSFIELD FINE SANDY LOAM, VERY STONY	94E	25	50	6	6	N	60	60	Conventional w/Excessive Slope or Permeability	2.3
POOTATUCK FINE SANDY LOAM	34A	0	3	1.5	2.5	N	60	60	Filtrate + Mound w/Curtain Drain	1.4
RAYNHAM SILT LOAM	26A	0	3	0	2	Y	60	60	Not Suited	1.7
STOCKBRIDGE LOAM	64B	2	8	6	6	N	60	60	Conventional Subsurface	11.4
STOCKBRIDGE LOAM	64C	8	15	6	6	N	60	60	Conventional Subsurface	9.6
STOCKBRIDGE LOAM, VERY STONY	65C	8	15	6	6	N	60	60	Conventional Subsurface	0.7
STOCKBRIDGE LOAM, VERY STONY	65D	15	25	6	6	N	60	60	Conventional Subsurface	0.1

Source: National Resource Conservation Service (NRCS), Stone field notes.

Notes: % Area was calculated using data from NRCS and Geographic Information Systems (GIS) by dividing the total area (acres) of each Series in the Service Area by the total area (acres) of the Service Area.

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Date/Initials: 12/1/05 anm

WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 2 (continued)
Summary of Soil Characteristics Regarding Onsite Wastewater Disposal Within Study Area

Series Name	Mapping Unit	Slope (Percent)		Water Table (Feet)		Hydric Soil	Depth to Bedrock (Inches)		Potential On-Site System Suitability	% Study Area
		Low	High	Low	High		Low	High		
UDIPSAMMENTS AND UDORTHENTS	27B	0	8	99.9	99.9	N	999	999	Not Suited or 2 Year Time of Travel and/or Stor	6.4
WATER	W	0	0	0	0	W	999	999	Not Suited	0.6
WINDSOR LOAMY FINE SAND	18B	0	8	6	6	N	60	60	Conventional Subsurface	0.2
WINDSOR LOAMY FINE SAND	18C	8	15	6	6	N	60	60	Conventional Subsurface	0.3
WINDSOR LOAMY FINE SAND	18E	15	60	6	6	N	60	60	Conventional w/Excessive Slope or Permeability	0.4

Source: National Resource Conservation Service (NRCS), Stone field notes.

Notes: % Area was calculated using data from NRCS and Geographic Information Systems (GIS) by dividing the total area (acres) of each Series in the Service Area by the total area (acres) of the Service Area.

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WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 3: Site Conditions, Wastewater Treatment Options and Area Needed

Minimum Site Conditions			
Depth to Seasonal Water Table	Depth to Bedrock	Wastewater Treatment and Disposal System Type	Estimated Area Needed** (square feet)
3.5'+	4.5'+	Conventional	400 - 600
3'	4'	At-Grade*	800 - 3,900
2'-3'	2'-4'	Mound*	3,000 - 3,500
1'-3'	2'-4'	Mound w/curtain drain*	5,000 - 6,000
0.5'	1.5'	Pre-treatment (Filtrate) and Mound	2,600 - 3,500
<0.5'	<1.5'	Not suitable	N/A
		5,000 GPD Cluster	10,000 - 18,000
		10,000 GPD Cluster	20,000 - 40,000

*If pretreatment is added, the system may be reduced to 1/2 size and changed to a different system type.

**This area is estimated for the constructed leachfield area. The areas are calculated based on a single family residence with soils with a range of percolation rates.

Sources: VT EPRs, Chapter 1, eff. January 2005.; VT IDRs, eff. September 2003.

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STONE ENVIRONMENTAL, INC

Phelps Engineering, Inc.

WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 4: Representative Wastewater Flows From Various Buildings

Building Type	Flow Basis (gpd)	Estimated Units	Estimated Design Flows (gpd)
Restaurant	30-45 / Seat	100 seats	3,000-4,500
Small Commercial Business	15 / Employee	25 employees	375
Laundromat	500 / Machine	10 machines	5,000
Daycare	15-25 / Person	15 persons	225-375
Doctor's Office	35 / Staff member, 10 / Patient	6 employees, 40 patients	610
Hairdressing Salon	10 / Operator, 150 / Chair	5 employees, 3 chairs	500
Motels with bath, toilet	50 / person sleeping space, 2 beds	20 Units	4,000
Swimming Pools	5 / Person	100 persons	500
Residential*	70 / Person	3 bedrooms, 2 persons/bedroom	420

Notes: *Residential flows range from 420 gpd or by bedrooms up to 4 units, to 245 gpd for 20+ units.

Source: VT EPRs, Chapter 1, eff. January 1 2005.

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STONE ENVIRONMENTAL, INC
Phelps Engineering, Inc.

WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 5: Summary of State Onsite System Permit Information

Parcel ID	Permittee Name	Permit Number	Permit Date	Reason for Permit
162019		8B0009-1	12/17/2004	Change of use to mannequin facility with 100 employees
180128	William E. Dailey, Inc.	8B0172-3		Construction of a 2,800 sq. ft. addition to a prev. approved building (#8B0172)
180128	William E. Dailey, Inc.	8B0172-4		Interior plumbing revision to pre-approved project
172110	Chittenden Bank	8B0225-2	12/28/1984	0.257 acre lot-improved w/post office, prev. approved #8B0225 & #8B0225-1
152054		8B0245	1980	Development of park/recreational field facilities
180128		8B0271	10/21/1977	Construct 30x60 warehouse
180106	Jacques Beaudion	8B0271-1		Subdivision reconfiguration of 1-A of pre-approved subdivision to become 4.96 acres
180128		8B0271-2	1/11/1980	Manufacturing facility addition
180128		8B0271-3	12/9/1985	2800 sf addition
180128		8B0271-4	7/21/1986	Modify dimensions, plumbing
180128		8B0271-5	12/1/1993	Add sign/display; sell used cars
172145	George Brent Peacock	EC-8-0461-1		Change from 4-bedroom dwelling to duplex with 4 bedrooms total on pre-approved 1.68 acre lot
152127, 142072, 180267	George Peacock	EC-8-0463		3-lot subdivision
180227 and vicinity	Julia Bahan	EC-8-0473		4-lot subdivision, lots ranging in size from 1.81 to 6.14 acres
152150	L.H. Davis Construction & Moving Inc	EC-8-0473-1		1 lot subdivision, 5.35 acres in size to remove Deferral of Permit #DE-8-0654
152150	Craig and Kathryn Weaver	EC-8-0473-2		Further subdivision of pre-approved Lot 4, permitted under EC-8-0473, to become new Lot 4 (4.85 acres) and Lot 4A (1.24 acres)
152127, 142072, 180267	George Peacock	EC-8-0474		Further subdivision of Deferre parcel #DE-8-0619, to become 3 lots on private ROW
172012, 172154, 132050	James Hamilton	EC-8-0638		3-lot subdivision; 0.5, 0.8 & 0.4 acres
152103	Edwin Dickie	EC-8-0796		3 lot subdivision, lots being 2.199, 2.283, 2.284 acres in size
142053	Pauline H. Knapp	EC-8-0897	6/1/1997	1 lot subdivision, 2.75 acres in size to remove Deferral of Permit #D-8-0252
152127, 142072, 180267	George Brent Peacock	EC-8-1022		1 lot subdivision, 3.17 acres in size to remove Deferral of Permit #DE-8-0620

WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 5: Summary of State Onsite System Permit Information

Parcel ID	Permittee Name	Permit Number	Permit Date	Reason for Permit
172162	Walter Delendik	EC-8-1035		1 lot subdivision, 32,278 sq. ft. in size improved with Bed & Breakfast establishment. Remaining land to obtain Deferral of Permit #DE-8-1388
152033	William E. Dailey, Inc.	EC-8-1070	1/1/1997	1 lot subdivision, 3.9 acres in size with remaining land to obtain Deferral of Permit #DE-8-1437
132102, 132142	John Cicirello	EC-8-1085		1 lot subdivision, 5.8 acres in size with remaining 1.6 acres to obtain Homestead Exemption #HE-8-0358
152023	Barth VanderEls	EC-8-1092		1 lot subdivision, +/- 3 acres in size with remaining land being 24+ acres
172001, 172001.1	Richmond Galusha	EC-8-1107		1 lot subdivision, Lot #2 = 0.643 acres with Lot #1 = .402 acres to obtain Exemption #HE-8-0378.
092029.2, .3, .4, and .5	William E. Dailey, Inc.	EC-8-1136		4 lot subdivision Lot 1 = 1.906 acres, Lot 2 = 1.872 acres, Lot 3 = 1.92 acres & Lot 4 = 2.845 acres in size for commercial development,with Lot 5 = 1.86 acres to obtain Homestead Exemption #HE-8-0411
092029.2, .3, .4, and .5	William E. Dailey, Inc.	EC-8-1136-1		Revision to pre-approved Lots 2, 3 & 4 to become new Lots "A" = 2.8 acres and "B" = 3.85 acres
132041, 132051, vicinity	Edwin A. Colvin	EC-8-1178		4 lot subdivision #1 = 1.5 acres, #2 = 1.6 acres, #3 = 7.0 acres & #4 = 1.4 acres with Lot #5 (1.1 acres) to obtain Deferral of Permit
132041, 132051, vicinity	Edwin A. Colvin	EC-8-1178-1		Revision to pre-approved Lot 1 (1.5 acres), Lot 2 (1.6 acres) and Lot 3 (7.0 acres) to change from on-site water supply to municipal water service
152145	Richard Mattison	PB-8-0018-1		Repair/modifications to existing septic system at Iron Kettle Restaurant
180128	William E. Dailey, Inc.	PB-8-0351		Addition to existing office building
172110	William E. Dailey, Inc.	PB-8-0357		Construction of a building to serve a U.S. Post Office
172124	Brent Peacock	PB-8-0447		Convert garage into a 1-bedroom apt. and office/workshop
180128	William E. Dailey, Inc.	PB-8-0451		Drill new well at existing office site
172101	Paul J. Harris	PB-8-0492		Interior plumbing, install 4 showers in existing manufacturing building
172255	James Smigh	PB-8-0539		Replace failed septic system
180128	William E. Dailey, Inc.	WW-8-0025		Construct 20,000 s.f. bldg with 35 employees for use as precast concrete plant
180128	William E. Dailey, Inc.	WW-8-0025-1		Construct concrete batching plant at pre-approved precast conrete manufacturing plant
180128	William E. Dailey, Inc.	WW-8-0025-2		Construction of 2,860 sq. ft. addition to pre-approved concrete batch and precast plant

WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 5: Summary of State Onsite System Permit Information

Parcel ID	Permittee Name	Permit Number	Permit Date	Reason for Permit
180128	William E. Dailey, Inc.	WW-8-0025-3		Expansion of pre-approved concrete plant, increase in number of employees from 35 to 45 and revision to pre-approved septic system as well as water supply system design
172323	David T. Mance, Jr.	WW-8-0136		Construction of duplex with 1 apartment and 1 professional office
172003	Thomas Paquin	WW-8-0154		12,960 s.f. manufacturing facility with 15 employees on a 5.8 acre parcel
172003	Thomas Paquin	WW-8-0154-1		Add 15,800 sq. ft. warehouse to pre-approved facility
142049	Lois R. Wade	WW-8-0368		Conversion of existing bldg. to 24 seat cafe/deli
142049	Lois R. Wade	WW-8-0368-1		Change seating capacity from 12 to 10 seats and add Bakery
152126	George Brent Peacock	WW-8-0377		Commercial Storage/Office space and 01 2-bedroom apartment
172158	Shaftsbury Elementary School	WW-8-0409		Construction of addition to existing Elementary School and addition of 1 water closet and 1 lavatory
172161	Gail E. Gardner	WW-8-0428		Open a take out deli and bakery in existing dwelling
172161	Gail E. Gardner	WW-8-0428-1		Relocate pre-approved take-out deli/bakery (Thyme Tables)
132204	John Cicirello	WW-8-0437		Construction of 2nd single family dwelling on existing 7.4 acre lot
172145	George Brent Peacock	WW-8-0483		Convert single family dwelling into duplex, total of 4 bedrooms in dwelling
092029.2, .3, .4, and .5	William E. Dailey, Inc.	WW-8-0510	1/21/2002	Construction of commercial building with 10 employees on Lot #1 (1.906 acres) approved under Subdivision Permit #EC-8-1136.
092029.2, .3, .4, and .5	William E. Dailey, Inc.	WW-8-0510-1	1/22/2002	Construction of commercial building with 10 employees on Lot #2 (1.872 acres) approved under Subdivision Permit #EC-8-1136
092029.2, .3, .4, and .5	William E. Dailey, Inc.	WW-8-0510-2	2/7/2002	Construction of commercial building with 10 employees on Lot #3 (1.92 acres) approved under Subdivision Permit #EC-8-1136
092029.2, .3, .4, and .5	William E. Dailey, Inc.	WW-8-0510-3	2/26/2002	Construction of commercial building with 10 employees on Lot #4 (2.845 acres) approved under Subdivision Permit #EC-8-1136
092029.2, .3, .4, and .5	William E. Dailey, Inc.	WW-8-0510-4	4/15/2002	Revision to pre-approved commercial buildings on revised Lots "A" and "B"
092029.2, .3, .4, and .5	Trevor Mance	WW-8-0510-5	5/22/2002	Revision to pre-approved building (10 employees) on pre-approved Lot B (3.85 acres) to relocate well and septic system

WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 5: Summary of State Onsite System Permit Information

Parcel ID	Permittee Name	Permit Number	Permit Date	Reason for Permit
132055	Thomas and Jayne Outwater	WW-8-0526	7/5/2002	Convert existing building in "Friendly's Dairy Bar" restaurant with 8 seats, 2 employees and take out window
172008	First United Church of Shaftsbury	WW-8-0544	9/19/2002	The construction of a replacement septic system for an existing Church.
152150	L.H. Davis Construction & Moving Inc	WW-8-0609	6/2/2003	Revision to pre-approved 5.35 acre lot permitted under EC-8-0473-1 lot to become 1.04 acres with remaining 4.31 acres to remain undeveloped
180128	William E. Dailey, Inc.	WW-8-0622	6/23/2003	Convert 3 bedroom dwelling into office space for 15 employees o a 1 acre lot permitted under EC-8-0007
172124		WW-8-0695	7/19/2004	
142048		WW-8-0758	9/7/2004	
142048		WW-8-0758-1	11/9/2004	
152145		WW-8-0767	5/9/2005	
162329		WW-8-0799	9/16/2005	

Source: VT DEC Wastewater Management Section, September 2005.
Notes: Only permits that could be matched with parcel IDs within the study area are
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Date/init: 12/9/05, anm

WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 6: Summary of Town Zoning Permit Information

Parcel ID	Location	Reason for Permit	System Type	Permit Date
162019	Eagle Square	Change of use to mannequin facility	Conventional	12/17/2004
172145	Historic VT RT 7A	Change from 4-bedroom dwelling to duplex	Conventional	
142053	Daniels Road	1 lot subdivision	Mound	6/1/1997
172124	VT RT 7A	Convert garage into a 1 BR apt. and office/workshop	Conventional	
172161	Church Street	Open a take out deli and bakery in existing dwelling	Conventional	
172161	Church Street	Relocate pre-approved take-out deli/bakery	Conventional	
172145	VT RT 7A	Convert single family dwelling into duplex	Conventional	
172124	VT RT 7A (675)		Conventional	7/19/2004
172212		New septic tank and drywell for laundromat		2001
172214		Reconstructed system		1996
172118	VT RT 7A (495)	New system	Conventional	6/18/2003
142031	Glastenview Road	New construction	At-grade	2/1/2001
142033	Glastenview Road (477)	New construction	Mound	
142020	Daniels Road (424)	New construction	Alternative	2003
142048	Daniels Road	New construction	Mound	1997
142048.2	Daniels Road	New 3-bedroom home (Habitat for Humanity house)	Conventional	8/2/2005
162230	Paran Road		Conventional	
162035		Leachfield replacement	Conventional	1999
162308	Lamb Road (247)	One-lot subdivision for SFR	Conventional	
132058	Harvest Hills Drive	New construction SFR	Conventional	
132061	Harvest Hills Drive (226)	Replacement leachfield	Conventional	10/2004
132071.2	Mattison Road	New construction SFR	Mound	1993

Source: Stone and Phelps permit review notes, November 2005.

Notes: Only permits for areas of potential concern within the study area that had pertinent onsite system information are displayed in this table.

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WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 7: Summary of Wastewater Needs by Sub-Area

Sub-Area	Description	Potential Need (ERUs)	Priority	Possible Solutions
SW-1	Rt 67 east of Corey Drive and Lamb Road - high groundwater	14 residences		Connection to municipal sewer
SW-2	Bank Street – for potential Village growth	35 residences		Connection to municipal sewer
SW-3	Hewitt Drive	7 residences		One or two small cluster systems
V-1	Twitchell Hill	18 residences		Two or three small cluster systems
V-2	Rt 7A/Buck Hill Road - for potential Village growth	26 (mixed use)		Large cluster system or series of small clusters
V-3	Cleveland Avenue, Meadow Lane, Holiday Drive	24 residences		Large cluster system or series of small clusters
N-1	Rt-7A/Daniels Road - provide for expansion of existing uses	26 (mixed use)		Two or three small cluster systems
N-2	Rt 7A/Bahan Road - provide for potential commercial development	26 (mixed use)		Large cluster system

Notes: ERUs = Equivalent Residential Units

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WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 8: Comparison of Collection System Alternatives

Type of System	Advantages	Disadvantages	Suitable for Project?
Conventional	• Current standard of practice for most public systems • Low maintenance • Once system in place, any property can connect by gravity or by pumping	• Must collect downhill from connections; otherwise a private pump is required	Yes
STEP	• Utilize existing septic tanks • Collection system are small diameter pipes, not required to be laid in straight segments	• Pumps and controls needed at individual properties • Small diameter force main limits the number of additional connections • May need to replace tanks on some properties	Not for centralized, but possibily for small cluster systems
STEG	• Utilize existing septic tanks • May reduce cost for pump stations and preliminary treatment	• May need to replace tanks on some properties • Increased potential for odors in gravity sewers	Not for centralized, but possibily for small cluster systems
Low Pressure Sewer	• Collection system has small diameter pipes, not required to be laid in straight segments	• Pumps and controls needed at individual properties • Small diameter force main limits the number of additional connections	No
Vacuum Sewer	• Less obtrusive than individual pump stations • Best suited for lakeshore setting	• High maintenance costs • Municipality owns tanks and valves on private property	No

Source: Phelps Engineering, January 2006.
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WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 9: Total Project Cost Summary for Centralized Sewer Alternatives

DESCRIPTION	Estimated number of existing ERUs per segment	Total Costs[1] Scenario 1 Full Buildout to meet all identified wastewater needs	Total Costs[1] Scenario 2 Village Center only
A. CONSTRUCTION COSTS (incl. 15% contingency)[2]			
BUCK HILL ROAD SERVICE AREA	16	$85,000	$85,000
CHURCH ST. SERVICE AREA	26	$120,000	$120,000
CLEVELAND AVE. SERVICE AREA	58	$296,000	$296,000
SYCAMORE LN. SERVICE AREA	39	$184,000	$184,000
ROUTE 7A (SOUTH) SERVICE AREA	54	$374,000	$374,000
SHAFTSBURY VILLAGE PUMPSTATION AND FORCEMAIN (SHARED FOR ABOVE SERVICE AREAS)	--	$728,000	$728,000
ROUTE 7A (EAST END OF DANIELS ROAD)	8	$295,000	
ROUTE 7A (AIRPORT ROAD TO BAHAN ROAD) SERVICE AREA	10	$404,000	
TWITCHELL HILL ROAD SERVICE AREA	28	$316,000	
ROUTE 67 (TO P.S. #4) SERVICE AREA	10	$196,000	
ROUTE 67 (BERNSTEIN TO P.S. #5) SERVICE AREA	22	$313,000	
HARVEST HILLS/HEWITT DRIVE SERVICE AREA	39	$658,000	
BANK ST. (NORTH) SERVICE AREA	10	$251,000	$251,000
BANK ST. (SOUTH) SERVICE AREA	13	$102,000	$102,000
LAMB RD. SERVICE AREA	22	$400,000	
TOTAL CONSTRUCTION COST:	355	**$4,722,000**	**$2,140,000**
B: TECHNICAL SERVICES			
FEASIBILITY STUDY		$25,000	$25,000
PRELIMINARY ENGINEERING[3]		$163,000	$74,000
FINAL DESIGN/PERMITTING[3]		$326,000	$148,000
ALLOWANCE FOR ARCHEOLOGICAL SERVICES[4]		$30,000	$30,000
BID AND CONSTRUCTION PHASE[3]		$645,000	$292,000
C. LEGAL AND ADMINISTRATIVE[5]		$47,000	$21,000
D. LAND ACQUISITION AND EASEMENTS[6]		$50,000	$30,000
E. SHORT TERM INTEREST[7]		$15,000	$10,000
TOTAL PROJECT COSTS		**$6,023,000**	**$2,770,000**
COST PER ERU		**$17,000**	**$7,800**

Source: Phelps Engineering Inc., December 2005.

STONE ENVIRONMENTAL, INC
Phelps Engineering, Inc.

Notes:

ENR: 7630

[1] All costs are rounded to the nearest thousand dollars.

[2] Assumes 15% for unforeseen items/construction change orders.

[3] Based on VT State curve estimates for engineering as a percentage of total construction cost.

[4] A separate allowance for potential archeological studies is provided.

[5] Based on 1% of construction costs.

[6] An allowance for permanent easements for pump station sites and possible cross-country sewer lines.

[7] For short term loans (bridge financing) during the project.

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WASTEWATER FEASIBILITY STUDY FOR SOUTH SHAFTSBURY
TOWN OF SHAFTSBURY, VERMONT
TABLE 10: Total Project Cost Summary for Decentralized Sewer Alternatives

DESCRIPTION	Estimated number of ERUs (existing)[1]	Total Construction Costs (incl. 15% contingency)[2]			Engineering Services and Misc. Costs[3]	Legal, Fiscal, Admin, and Short Term Interest[4]	Land Acquisition and Easements[5]	Total Costs[6]		
		Scenario 3	**Scenario 4**	**Scenario 5**				**Scenario 3**	**Scenario 4**	**Scenario 5**
A. CONSTRUCTION COSTS										
CLEVELAND AVE. SERVICE AREA	22	$346,000	$346,000	$346,000	$88,000	$6,900	$10,000	$434,000	$434,000	$434,000
ROUTE 7A (SOUTH) SERVICE AREA	10	$363,000		$363,000	$92,000	$7,300	$0	$455,000		$455,000
ROUTE 7A (EAST END OF DANIELS RD.)	10	$292,000			$76,000	$5,800	$10,000	$368,000		
ROUTE 7A (AIRPORT ROAD TO BAHAN ROAD) SERVICE AREA	10	$424,000			$106,000	$8,500	$10,000	$530,000		
TWITCHELL HILL ROAD SERVICE AREA	12	$272,000	$272,000	$272,000	$71,000	$5,400	$10,000	$343,000	$343,000	$343,000
BANK ST. (NORTH) SERVICE AREA	10	$251,000			$66,000	$5,000	$0	$317,000		
BANK ST. (SOUTH) SERVICE AREA	13	$102,000			$33,000	$2,000	$0	$135,000		
LAMB RD. SERVICE AREA	22	$371,000	$371,000	$371,000	$94,000	$7,400	$0	$465,000	$465,000	$465,000
HEWITT DRIVE	6	$109,000	$109,000	$109,000	$34,000	$2,200	$10,000	$143,000	$143,000	$143,000
TOTAL CONSTRUCTION COST		**$2,530,000**	**$1,098,000**	**$1,461,000**						
TOTAL PROJECT COST								**$3,190,000**	**$1,385,000**	**$1,840,000**

Notes:

[1] Based on existing needs. For areas with growth potential, assumed 10 current ERUs would connect at startup.

[2] Assumes 15% for unforeseen items/construction change orders.

[3] Based on VT State curve estimates for engineering as a percentage of total construction cost.

[4] Based on 2% of construction costs.

[5] Allowance for land purchase or easement for pumping stations, treatment and disposal locations.

[6] All costs are rounded to the nearest thousand dollars.

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