Oak Creek / Butler Farms
Sediment Loading Calculations

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4/20/2006

Estimate annual sediment loading from the Oak Creek and Butler Farms

Note: The "Simple Method" or otherwise titled the "USEPA Guidance Manual Method" was used to calculate estimated annual sediment loadings.

L = [(P) (Pj) (Rv) / 12] * (C) (A) (2.72)

Where:

P = Rainfall depth in inches over a desired time interval. The value of P selected depends on the time interval over which loading estimates are desired. Average precipitation for South Burlington, VT. 1974 thru 2003 is 33.07 in/yr, ref. Local Climatological Data, year 2003 Annual Summary.

P = 33.1 inches / year

Pj = A factor used to account for the fraction of annual or seasonal rainfall that does not produce any measurable runoff.

Pj = 90% = **0.9**

Rv = Runoff coefficient, which expresses the fraction of rainfall which is converted to runoff.

Rv = 0.05 + 0.009(**I**)

where: I = The percent of site imperviousness (impervious areas are listed below).

Runoff Coefficents have been calculated for each sub-watershed. See attached summary table

C = Pollutant Concentration based on Land Use Characteristics

Land Use Characteristics	Parameter: Total Suspended Solids (TSS)		
Medium Density Residential	**C** =	70	mg/l
High Density residential	**C** =	97	mg/l
Commercial	**C** =	77	mg/l
Industrial	**C** =	149	mg/l

Source - Stormwater Offset Permit Rule, Appendix B.

A = Site Area

Areas have been calculated for each sub-watershed. See attached summary table

Note: *12 and 2.72 are unit conversion factors.*

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Sediment Load Summary Table

Area No.	Total Imp Area		Total Area	% Imp	Runoff Coefficient	Sediment Loading
	Sq. Ft	Acres	Acres		Rv	pounds/year
01	139061	3.19	10.43	30.6%	0.33	1605
02	176873	4.06	19.99	20.3%	0.23	2200
03	51897	1.19	2.67	44.6%	0.45	570
04	34754	0.80	1.77	45.2%	0.46	381
05	31928	0.73	1.41	52.0%	0.52	345
06	22287	0.51	5.87	8.7%	0.13	356
07	31615	0.73	1.43	50.7%	0.51	343
08	42815	0.98	2.08	47.2%	0.48	467
09	33707	0.77	1.79	43.2%	0.44	371
10	22421	0.51	1.11	46.6%	0.47	245
11	19365	0.44	3.78	11.7%	0.16	279
12a	26164	0.60	1.61	37.3%	0.39	294
Oak Creek Tot.	632888	14.53	53.94	26.9%	0.29	**7455**
13a	178172	4.09	11.68	35.0%	0.37	2016
14	34678	0.80	7.93	10.0%	0.14	526
15	388878	8.93	30.83	29.0%	0.31	4526
16a	64867	1.49	3.99	37.3%	0.39	728
17	64253	1.48	3.14	46.9%	0.47	702
18	82796	1.90	4.98	38.1%	0.39	926
Butler Farms Tot.	813644	18.68	62.56	29.9%	0.32	**9424**
19	27588	0.63	6.04	10.5%	0.14	412
TOTAL	1474120	33.84	122.53	27.6%	0.30	**17292**

SIMPLE METHOD

$$L = \left[\frac{(P * Pj * Rv)}{12} \right] * (C) * (A) * (2.72)$$

L = ***Sediment load (in pounds/year)***
P = ***Annual precipitation (in inches)***
Pj = ***Correction factor based on 10% of storms not producing runoff***
Rv = ***Runoff Coefficient***
C = ***Mean concentration for pollutants (in mg/l)***
A = ***Contributing Area (in acres)***
2.72 = ***Conversion factor***

INPUT VARIABLES

P = 33.1 inches

Pj = 0.9

C = 70 mg/l