

Subject: Re: Proposed IW Regulations
From: Tom Grimaldi <tdgrimaldi@gmail.com>
Date: 9/9/2020, 6:12 PM
To: Abby Conroy <aconroy@salisburyct.us>

Hi Abby:

We have reviewed the proposed Regulation change along with all of the provided attachments and have the following comments. Please note, each comment will refer to the numbered attachments below.

Attachment [1] - High EI (Erodibility index) Soils define how the erodibility index is determined, which combines the effects of slope and soil type, rainfall intensity and land use. This was established, as you will see in one of the other attachments, by the US Department of Agriculture for farming land in which the soils are exposed during the growing season and during the winter months when the ground is frozen, with no established permanent vegetative cover.

Attachments [2] & [3] - These attachments explain how Agricultural producers can enter into compliance during the farming activities. This further demonstrates the intent for the Highly Erodible (HEL) soil determination and the potential effects of compliance on the USDA Benefits . See "What is Highly Erodible land?" (HEL) for a simple definition within attachment [2]

Attachments [4] & [5] - Attachment [4] Provides the procedure for the determination of a Highly Erodible Land (HEL) Soil Designation. Please note that in #2 under "Procedure", the field area must contain 33-1/3% or 50 acres of Highly Erodible Land (HEL) or Potentially Highly Erodible Land (PHEL) to be classified as Highly Erodible Land, otherwise the land will be designated as Not Highly Erodible Land (NHEL). Attachment [5] is a detailed introduction to Highly Erodible land and really defines the complexity of making the HEL, PHEL, or the NHEL land soil designations. It involves the entire watershed area to be considered as an Engineer would do for a hydrologic study within a drainage analysis.

Attachment [6] - This is a list of map units that qualify as Highly Erodible (HEL) and Potentially Highly Erodible (PHEL) Soils for Litchfield County. Please take note that the minimum percent of grade (slope) is at least 8%, however, the PHEL percent of grade is less. Don't be confused here, what the list is saying is that the slopes to be considered for HEL soils are at 8% minimum. The reason the PHEL soils are at lower slopes is that they are Potentially Highly Erodible NOT highly Erodible soils.

In closing, I would recommend that the Commission choose a distance (300 feet) such as that of the Lake Protection Overlay District (LP). This would limit the Commission's liability, be less time consuming, less expensive (the Town may have to hire a third-party independent soil scientist and engineer to review/refute), and reduce the potential for an Applicant's Engineer and/or Attorney to manipulate the HEL designation due to the complexity of the detailed determination.

Any questions, please don't hesitate to contact us.

Regards,

Subject: Fwd: Proposed IW Regulations
From: Tom Grimaldi <tdgrimaldi@gmail.com>
Date: 9/10/2020, 10:08 AM
To: Abby Conroy <aconroy@salisburyct.us>

Hi Abby:

I would like to add one more item that I believe could protect the wetlands/watercourses/water body. The implementation of a Staging Plan where the limit of disturbance exceeds a certain threshold area such as 0.25 Acres or 10,890 S.F. The limit of disturbance should be shown on the plan as well. The Staging Plan would include the staging of the construction as well as the erosion & sedimentation control measures. Hence, as an area is restored with a permanent vegetative cover additional erosion & sedimentation control measures will be added to protect the restored area(s). The attachment [6] below could be used as a guide to help the Commission in their decision making as it pertains to staging as well. For instance, if the entire limit of disturbance contains Highly Erodible and/or Potentially Highly Erodible soils, this could also trigger the implementation of a Staging Plan, even if the limit of Disturbance is less than the threshold determined by the Commission. The soil types would have to be shown on the plans by means of using the NRCS/USDA Web Soil Survey or by a Soil Scientist onsite investigation/mapping.

Thanks,
Tom

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From: Tom Grimaldi <tdgrimaldi@gmail.com>
Date: Wed, Sep 9, 2020 at 6:12 PM
Subject: Re: Proposed IW Regulations
To: Abby Conroy <aconroy@salisburyct.us>

High EI (Erodibility Index) Soils

The erodibility of soils can be described as their sensitivity to the effects of wind and water on the soil structure.

The erodibility index is determined by combining the effects of slope and soil type, rainfall intensity and land use. These aspects are represented by terrain morphology (soil and slope), mean annual rainfall and broad land use patterns.

NRCS DC Administrative Area
Tecumseh Service Center

Source: USDA NRCS SSURGO
Soils Database



Highly Erodible Land and Wetland Conservation Compliance: *Don't Risk Your USDA Benefits!*

What Activities Could Put Me At Risk?

Activities that could affect HEL/Wetland Compliance need to be evaluated by NRCS. Examples:

- Land Clearing
- Filling
- Leveling
- Excavation
- Dredging
- Stump Removal
- Creating New Drainage Systems

To initiate the process, visit your local Farm Service Agency (FSA) Office to fill out Form AD-1026. FSA will forward the request to NRCS for evaluation.

Danielson Service Center
(860) 779-0557

Hamden Service Center
(203) 287-8038

Norwich Service Center
(860) 887-3604

Torrington Service Center
(860) 626-8852

Wallingford FSA Office
(203) 269-6665

Windsor Service Center
(860) 688-7725

What is Conservation Compliance?

Highly Erodible Land Conservation (HELC) and Wetland Conservation (WC) provisions aim to reduce soil loss on erosion-prone lands, and protect wetlands for the benefits they provide. These provisions apply to all land considered highly erodible or wetland, and is owned or farmed by persons voluntarily participating in USDA programs, unless USDA determines an exemption applies.

Provision Objectives

- Reduce soil loss due to wind and water erosion
- Protect the nation's long-term capability to produce food and fiber
- Reduce sedimentation and improve water quality
- Assist in preserving the functions and values of the nation's wetlands

How Do I Maintain Conservation Compliance and my USDA Program Benefits?

To comply with HELC and WC provisions, producers must fill out and sign Form AD-1026, certifying they will not:

- Plant or produce an agricultural commodity on highly erodible land without following an NRCS approved conservation plan or system
- Plant or produce an agricultural commodity on a converted wetland
- Convert a wetland which makes the production of an agricultural commodity possible

In addition, producers planning to conduct activities that may affect their HEL or WC compliance (i.e., removing fence rows, conducting drainage activities, or combining fields) must notify FSA by filing Form AD-1026. FSA will notify NRCS; NRCS will provide highly erodible land or wetland technical evaluations and issue determinations, if needed.

What is Highly Erodible Land?

Highly erodible land is any land that can erode at excessive rates because of its soil properties and is designated by field and based on the proportion of the total field acreage that contains highly erodible soils.

What are Federal Wetlands?

An area will be considered wetland if it has all three of the following characteristics: 1) primarily wet soils; 2) supportive of wetland plants; and 3) possesses wetland characteristics. NRCS can make a wetlands determination upon request.

USDA Benefits That Can Be Affected

- Producers who are not in compliance with HELC and WC provisions are not eligible to receive benefits for most programs administered by FSA, NRCS, and the Risk Management Agency (RMA). If a producer received program benefits and is later found to be non-compliant, the producer may be required to refund all benefits received and/or may be assessed a penalty.
- In particular, unless specific exemptions apply, a producer participating in FSA, NRCS, or RMA programs must be in compliance with an NRCS approved conservation plan or system for all highly erodible land used for agricultural commodity production; not have planted or produced an agricultural commodity on a wetland converted after 12/23/1985; and after 11/28/ 1990, must not have converted a wetland making the production of an agricultural commodity possible on such converted wetland.
- A producer who violates HELC or WC provisions is ineligible for applicable FSA, NRCS, RMA benefits for the year(s) in violation. A planting violation, whether on highly erodible land or a converted wetland, results in ineligibility for benefits for the year(s) when the planting occurred. A wetland conversion violation results in ineligibility beginning with the year in which the conversion occurred and continuing for subsequent years, unless the converted wetland is restored or mitigated before January 1 of the subsequent year.

Non-compliance with the HEL/Wetland Conversion Provisions may affect the following USDA program benefits. *(Violations could affect your ability to rent or sell the land in the future.)*

Commodity Programs

- Agriculture Risk Coverage/Price Loss Coverage
- Conservation Reserve Program
- Loan Deficiency Payments
- Farm Loan Programs
- Non-Insured Disaster Assistance Program (NAP) (fruit & vegetable producers)
- Livestock Forage Program
- Livestock Indemnity Program
- Emergency Forest Restoration Program
- Emergency Feed Program
- Farm Storage Facility Loans
- Margin Protection Program for Dairy
- Marketing Assistance Loans
- Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish
- Crop Insurance Subsidy

Conservation Programs

- Conservation Reserve Program
- Conservation Stewardship Program
- Environmental Quality Incentives Program
- Agricultural Conservation Easement Program –Agricultural Land Easements
- Agricultural Conservation Easement Program –Wetlands Reserve Easements

Variances and exemptions to the provisions may be granted under some conditions



Conservation Compliance – Highly Erodible Land and Wetlands

OVERVIEW

Conservation compliance:

- Requires producers to farm according to an approved system or conservation plan if they plant annually tilled crops on highly erodible land; and
- Prohibits producers from planting on converted wetlands or converting wetlands for crop production.

The 2014 Farm Bill requires producers, and any affiliated individuals or entities to participating producers, to comply with these provisions who participate in most programs administered by the Farm Service Agency (FSA), the Natural Resources Conservation Service (NRCS) and the Risk Management Agency (RMA). Non-compliance may affect the following types of U.S. Department of Agriculture (USDA) program benefits:

- FSA loans and disaster assistance payments;
- NRCS and FSA conservation program benefits; and
- Federal crop insurance premium support.

COMPLIANCE WITH HELC AND WC PROVISIONS

Highly erodible land conservation (HELC) and wetland conservation (WC) provisions (known as “conservation compliance”) aim to reduce soil loss on erosion-prone lands and to protect wetlands for the multiple benefits they provide. HELC and WC provisions apply to all land that is considered highly erodible or a wetland, and that is owned or farmed by persons voluntarily participating in USDA programs,

unless USDA determines an exemption applies.

To comply with HELC and WC provisions, producers and affiliated persons must fill out and sign form AD-1026 certifying they will not:

- Plant or produce an agricultural commodity on highly erodible land without following an NRCS-approved conservation plan or system;
- Plant or produce an agricultural commodity on a converted wetland; or
- Convert a wetland that makes the production of an agricultural commodity possible.

In addition, producers planning to conduct activities that may affect their HELC or WC compliance; for example bringing new land into production, removing fence rows, conducting drainage activities or combining fields; must notify FSA by filing form AD-1026. FSA will notify NRCS, and NRCS will then provide highly erodible land or wetland technical evaluations and issue determinations if needed.

Form AD-1026 can be found at www.fsa.usda.gov/ad1026form.

AGRICULTURAL COMMODITY

An agricultural commodity is any crop planted and produced by annual tilling of the soil, including one-trip planters and sugarcane.

HIGHLY ERODIBLE LAND

Highly erodible land is any land that can erode at excessive rates because of its soil

properties and is designated by field and based on the proportion of the total field acreage that contains highly erodible soils.

Producers who produce agricultural commodities on land identified as highly erodible are required to farm such land in accordance with a conservation plan or system that is approved by NRCS and that substantially reduces soil loss. Producers proposing to produce agricultural commodities on highly erodible land that has no crop history prior to Dec. 23, 1985, (known as sodbusting) are required to farm such land in accordance with a conservation plan or system that provides for no substantial increase in soil erosion. A conservation plan or system to reduce soil erosion is not required for land that is not highly erodible.

WETLAND

A wetland is an area that:

- Has a predominance of hydric soils (wet soils);
- Is inundated or saturated by surface or groundwater (hydrology) at a frequency and duration sufficient to support a prevalence of hydrophytic (water tolerant) vegetation typically adapted for life in saturated soil conditions; and
- Under normal circumstances, supports a prevalence of such vegetation except that this term does not include lands in Alaska identified as having a high potential for agricultural development and a predominance of permafrost soils.

EXPLANATION OF AFFILIATED PERSONS WHO NEED TO FILE AN AD-1026 FOR HELC AND WC COMPLIANCE PURPOSES

An “affiliated person” is an individual or entity who has a specific connection to the

individual or entity completing the AD-1026. Affiliated persons could be family members or business partners. See the fact sheet titled “**Conservation Compliance for Highly Erodible Land and Wetlands - Affiliated Persons**” for a description of who or what are considered affiliated persons.

AD-1026 FILING REQUIREMENT FOR AFFILIATED PERSONS

Although an individual or entity may be considered an affiliated person to a producer requesting benefits, an affiliated person who does not have a farming interest does not need to file an AD-1026. A “farming interest” for this purpose is an owner, operator or other producer on any farm. An example of an affiliated person who does not need to file an AD-1026 is a minor child that does not have a farming interest.

NRCS AND FSA ROLES IN MAKING DETERMINATIONS

When making HELC and WC compliance determinations:

- NRCS responsibilities include:
 - For HELC compliance:
 - Making highly erodible land determinations;
 - Working with producers to develop conservation plans and systems; and
 - When required, determining if highly erodible land is being farmed in accordance with a conservation plan or system approved by NRCS.
 - For WC compliance:
 - Making wetland determinations, including establishing if certain technical exemptions apply, such as prior converted cropland; and
 - Determining if a wetland conversion has occurred.

- FSA makes eligibility determinations, such as who is ineligible based upon NRCS technical determinations of HELC or WC non-compliance. FSA also acts on requests for the application of certain eligibility exemptions, such as the good faith relief exemption.

HIGHLY ERODIBLE LAND AND WETLAND IDENTIFICATION

FSA maintains the official USDA records of highly erodible land and wetland determinations. The determinations are recorded within the geographic information system and the automated farm and tract records maintained by FSA; however, it is important to know that determinations may not include all of the producer's land. Producers may obtain aerial imagery of their farms and a printout of their farm and tract records from the FSA office servicing their farm. If a producer is uncertain of the highly erodible land and wetland determinations applicable to their land, the producer should contact the appropriate USDA service center for assistance. For help in locating local USDA service centers, visit <http://offices.usda.gov>.

HELC AND WC NON-COMPLIANCE

The 2014 Farm Bill:

- Re-established the applicability of HELC and WC provisions to crop insurance financial support; and
- Made no change in HELC and WC implementation with respect to NRCS and FSA programs.

FSA AND NRCS PROGRAMS

Producers who are not in compliance with HELC and WC provisions are not eligible to receive benefits for most programs administered by FSA and NRCS. If a producer

received program benefits and is later found to be non-compliant, the producer may be required to refund all benefits received and/or may be assessed a penalty.

In particular, unless specific exemptions apply, a producer participating in FSA and NRCS programs must be in compliance with an NRCS-approved conservation plan or system for all highly erodible land used for agricultural commodity production; not have planted or produced an agricultural commodity on a wetland converted after Dec. 23, 1985; and after Nov. 28, 1990, must not have converted a wetland making the production of an agricultural commodity possible.

A producer who violates HELC or WC provisions is ineligible for applicable FSA and NRCS benefits for the year(s) in violation. A planting violation, whether on highly erodible land or a converted wetland, results in ineligibility for benefits for the year(s) when the planting occurred. A wetland conversion violation results in ineligibility beginning with the year in which the conversion occurred and continuing for subsequent years, until the converted wetland is restored or mitigated before Jan. 1 of the subsequent year.

HELC AND WC NON-COMPLIANCE – RMA – POLICIES REINSURED BY FCIC

Producers obtaining federally reinsured crop insurance will not be eligible for any premium support paid by the Federal Crop Insurance Corporation (FCIC) for any policy or plan of insurance if the producer:

- Has not filed an accurately completed AD-1026 with FSA certifying compliance with HELC and WC provisions; or
- Is not in compliance with HELC and WC provisions.

Unless specific exemptions apply, a producer must:

- Be in compliance with an NRCS-approved conservation plan for all highly erodible land;
- Not plant or produce an agricultural commodity on a wetland converted after Feb. 7, 2014; and
- Not have converted a wetland after Feb. 7, 2014, to make possible the production of an agricultural commodity.

A producer is ineligible for any premium support paid by FCIC on all policies and plans of insurance for the reinsurance year(s) (July 1 – June 30) following the reinsurance year of a final determination of a violation of HELC or WC provisions, including all administrative appeals, unless specific exemptions apply. Further, a producer will be ineligible for any premium support paid by FCIC on their policy or plan of insurance if they do not have a completed AD-1026 on file with FSA certifying compliance on or before the premium billing date for their policy or plan of insurance, unless otherwise exempted.

REGAINING ELIGIBILITY FOR BENEFITS LOST BECAUSE OF A VIOLATION

Producers who are found to be in violation of HELC or WC provisions, but acted in good faith and without the intent to violate, may file a request to regain eligibility for the period in violation at the FSA office where their farm records are administered. If the request is approved, producers are required to take corrective action within an established period. There are exemptions that may apply in limited circumstances.

FOR MORE INFORMATION

This fact sheet is provided for informational purposes; other restrictions may apply.

For more information on HELC and WC compliance, contact the FSA office or the NRCS office at a local USDA service center at <http://offices.usda.gov>. Additional information can be found online at www.fsa.usda.gov/compliance for FSA, www.nrcs.usda.gov for NRCS and www.rma.usda.gov for RMA. The regulations covering these provisions are set forth in the Code of Federal Regulations at 7 CFR Part 12.

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotope, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at http://www.ascr.usda.gov/complaint_filing_cust.html and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by:

- 1) mail: U.S. Department of Agriculture Office of the Assistant Secretary for Civil Rights 1400 Independence Avenue, SW Washington, D.C. 20250-9410;
- 2) fax: (202) 690-7442; or
- 3) email: program.intake@usda.gov.

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Procedure for Making Highly Erodible Land Determinations

Soil map units and an erodibility index (EI) are used as the basis for identifying Highly Erodible Land (HEL) for Food Security Act compliance. Erodibility calculations are based on the “frozen” soil map units, soil loss tolerance (T), and factors for water and wind erosion as they existed in the Field Office Technical Guide on January 1, 1990. The EI of a soil map unit is determined by dividing the potential erodibility for each soil map unit by the T value established for the soil. HEL determinations are completed using offsite methods by regulation and policy. See Title 7 Code of Federal Regulations (CFR) Part 12, Subpart B, and National Food Security Act Manual (NFSAM) Parts 511.0 and 511.1.

A soil map unit with an EI of 8 or more is designated as HEL. A soil map unit with an EI less than 8 is not HEL (NHEL). A soil map unit is potentially HEL (PHEL) if the Universal Soil Loss Equation (USLE) EI value using the minimum length of slope (LS) factor for the soil map unit is less than 8 and the EI value using the maximum LS factor for the soil map unit is equal to or greater than 8. Lists of frozen HEL soil map units by county are maintained in Section II of the electronic Field Office Technical Guide (eFOTG). In completing preliminary HEL determinations, do not make a field visit to complete field slope gradient and/or slope length measurements for HEL or NHEL map units. Only PHEL map units will be examined in the field to measure the percent slope and slope length to determine if they are HEL or NHEL. Otherwise, the HEL determination and any reconsideration or appeal is completed offsite.

Procedure

1. From the county hard copy soil survey, determine the soil series for the field needing the determination.
2. Using this soil survey and the county HEL report found in Section II of the eFOTG/Soils Information, determine if either $33\frac{1}{3}\%$ or 50 acres of the field has HEL or PHEL soils. **If not, the field is NHEL.**
3. If either $33\frac{1}{3}\%$ or 50 acres of the field has HEL soils, **the field is HEL.**
4. If part of the field being determined was previously determined HEL, that area remains HEL.
5. For all of the field not previously determined HEL, if PHEL + HEL soils make up $33\frac{1}{3}\%$ or 50 acres of the undetermined portion, **go to the field** to estimate slope gradient and slope length of PHEL soils. If the PHEL soils are determined HEL, **the field is HEL.**
 - a. Select three representative areas of the PHEL soils in the field. Contact a soil scientist for assistance if you need help identifying the PHEL soils in the field.
 - b. Measure slope gradient and slope length at these three locations in the field. Record the location of these field measurements on an aerial map.
6. From the county HEL report, determine the Rainfall Erosion Index (R).
7. From the county Conservation Reserve Program (CRP)—Frozen HEL Data Report located in eFOTG/Section II/your county/soil and site information reports (pdf) determine the T and soil erodibility (K) factors for the PHEL soil.
8. Use the slope gradient and slope length measurements collected from the field to determine LS for each of the three representative areas of PHEL soil using Table 3 from Agricultural Handbook 537 (inserted below). Average these 3 LS values.

TABLE 3.—Values of the topographic factor, **LS**, for specific combinations of slope length and steepness¹

Percent slope	Slope length (feet)											
	25	50	75	100	150	200	300	400	500	600	800	1,000
0.2	0.060	0.069	0.075	0.080	0.086	0.092	0.099	0.105	0.110	0.114	0.121	0.126
0.5	.073	.083	.090	.096	.104	.110	.119	.126	.132	.137	.145	.152
0.8	.086	.098	.107	.113	.123	.130	.141	.149	.156	.162	.171	.179
2	.133	.163	.185	.201	.227	.248	.280	.305	.326	.344	.376	.402
3	.190	.233	.264	.287	.325	.354	.400	.437	.466	.492	.536	.573
4	.230	.303	.357	.400	.471	.528	.621	.697	.762	.820	.920	1.01
5	.268	.379	.464	.536	.656	.758	.928	1.07	1.20	1.31	1.52	1.69
6	.336	.476	.583	.673	.824	.952	1.17	1.35	1.50	1.65	1.90	2.13
8	.496	.701	.859	.992	1.21	1.41	1.72	1.98	2.22	2.43	2.81	3.14
10	.685	.968	1.19	1.37	1.68	1.94	2.37	2.74	3.06	3.36	3.87	4.33
12	.903	1.28	1.56	1.80	2.21	2.55	3.13	3.61	4.04	4.42	5.11	5.71
14	1.15	1.62	1.99	2.30	2.81	3.25	3.98	4.59	5.13	5.62	6.49	7.26
16	1.42	2.01	2.46	2.84	3.48	4.01	4.92	5.68	6.35	6.95	8.03	8.98
18	1.72	2.43	2.97	3.43	4.21	3.86	5.95	6.87	7.68	8.41	9.71	10.9
20	2.04	2.88	3.53	4.08	5.00	5.77	7.07	8.16	9.12	10.0	11.5	12.9

¹ $LS = (\lambda/72.6)^m (65.41 \sin^2 \theta + 4.56 \sin \theta + 0.065)$ where λ = slope length in feet; m = 0.2 for gradients < 1 percent, 0.3 for 1 to 3 percent slopes, 0.4 for 3.5 to 4.5 percent slopes, 0.5 for 5 percent slopes and steeper; and θ = angle of slope. (For other combinations of length and gradient, interpolate between adjacent values or see fig. 4.)

9. Use the formula: $EI = RKLS/T$ to determine if the PHEL soil is HEL or NHEL. If EI is equal to or greater than 8 the soil is HEL. If the PHEL soil is determined HEL, **the field is HEL**. If the PHEL soil is determined NHEL, **the field is NHEL**.
10. Use [Form KS-CPA-21](#), Potentially Highly Erodible Land (PHEL) Determination, to assist in calculating the EI value.

HIGHLY ERODIBLE LAND INTRODUCTION

General

The erodibility index of each soil map unit in a field is used as the basis for identifying Highly Erodible Land (HEL) for Food Security Act compliance. Erodibility calculations are based on the “frozen” soil map units and factors for water and wind erosion as they existed in the Field Office Technical Guide on January 1, 1990. The erodibility index of a soil is determined by dividing the potential erodibility for each soil by the soil loss tolerance (T) value established for the soil. The T value represents the maximum annual rate of soil erosion that could take place without causing a decline in long-term productivity. A soil map unit with an erodibility index of 8 or more is a highly erodible soil map unit.

Water Erosion

Potential erodibility for sheet and rill erosion is calculated by multiplying the following factors of the Universal Soil Loss Equation (USLE):

1. Rainfall and runoff factor (R)
2. Susceptibility of the soil to water erosion (K)
3. Combined effects of slope length and steepness (LS)

The erodibility index for sheet and rill erosion is represented by the formula $R*K*LS/T$. For complex map units, the factors for the primary component are used.

- A soil map unit is highly erodible if the $R*K*LS/T$ value using the minimum LS factor is equal to or greater than 8.
- A soil map unit is potentially highly erodible if the $R*K*LS/T$ value using the minimum LS factor is less than 8 and the $R*K*LS/T$ value using the maximum LS factor is equal to or greater than 8.
- A soil map unit is not highly erodible if the $R*K*LS/T$ value using the maximum LS factor is less than 8.

Wind Erosion

Potential erodibility for wind erosion is calculated by multiplying the following factors of the Wind Erosion Equation (WEQ):

1. Climatic characterization of wind speed and surface soil moisture (C)
2. The susceptibility of the soil to wind erosion (I)

The erodibility index for wind erosion is represented by the formula $C*I/T$. For complex map units, the factors for the primary component are used.

- A soil map unit is highly erodible if the $C*I/T$ value is equal to or greater than 8.
- A soil map unit is not highly erodible if the $C*I/T$ value is less than 8.

Status of HEL Reports

The HEL reports in the Field Office Technical Guide show the applicable frozen factors (as of January 1, 1990) and HEL classifications for all map units in each county.

Key to 1990 Frozen Factors on the Highly Erodible Land Report

The USLE and WEQ factors in effect as of January 1, 1990 are used as a basis of determining erodibility.

- C = Climatic factor from Wind Erosion Equation (WEQ)
- R = Rainfall factor from Universal Soil Loss Equation (USLE)
- T = Soil loss tolerance
- I = Erodibility factor from Wind Erosion Equation (WEQ)
- K = Erodibility factor from Universal Soil Loss Equation (USLE)

Key to Highly Erodible Land Classification on the Highly Erodible Land Report

- 1 = HEL – The map unit is Highly Erodible Land for wind erosion, water erosion or both wind and water erosion. (The EI for wind erosion, water erosion, or both wind and water erosion is greater than or equal to 8.)
- 2 = PHEL** - The map unit is Potentially Highly Erodible Land for water erosion or factors for determining the EI were not assigned. (The EI for wind erosion is less than 8 and the EI for water erosion may be less than or greater than 8, based on slope and slope length.)
- 3 = NHEL – The map unit is Not Highly Erodible Land. (The EI for both wind and water erosion is less than 8.)

** Miscellaneous Soil Map Units without 1990 FOTG erosion factors (Such as “gravel pits”) are classified as PHEL.

Evaluating PHEL Map Units

District Conservationists are authorized to approve offsite determinations on PHEL map units as follows:

1. Document a minimum of 20 onsite conditions for a PHEL map unit. Documentation of findings must be maintained in applicable case files with summary information and reference of specific site findings maintained in correspondence file 180-12-5 labeled “PHEL Documentation”.
2. If at least 85% of any given PHEL map unit is either HEL or NHEL, the respective classification can be used for all offsite determinations for that map unit.
3. If less than 85% of any given PHEL map unit is not either HEL or NHEL, onsite determinations for that map unit must be completed when that map unit will affect the HEL determination for a field.
4. Slope and slope length to determine LS on PHEL map units are the only factors that can be determined on site. An exception is made for those miscellaneous area soil map units (such as “Gravel Pits”) that were not assigned K, T and/or I factors and were not assigned an HEL classification in 1990. In those cases, the HEL classification for both wind and water erosion is determined in the field.

Making Slope and Slope Length Determinations in the Field

Slope and slope length measurements should be taken from at least three representative areas for each PHEL map unit. Document the location of the slope length and steepness measurements on an aerial photo of the field. Less than 3 measurements may be used for small areas where multiple measurements are not practical.

Percent slope can be determined in the field using a rod and transit, hand level or clinometer. The measurement of percent slope should be taken from within the PHEL map unit along the measured slope length.

Slope length is defined as the horizontal distance from the origin of overland flow to the point where either the slope gradient decreases enough that deposition begins or runoff becomes concentrated in a defined channel. To determine the slope length for a map unit identify the point on the slope where deposition begins (Figure 1) or where overland flow enters an area of concentrated flow, either a natural or constructed waterway (Figure 2). Walk upslope from the selected point, moving perpendicular to the contour, until the origin of overland flow is reached.

Note: The formation of rills does not indicate an area of concentrated flow since RUSLE2 calculates both sheet and rill erosion for the slope.

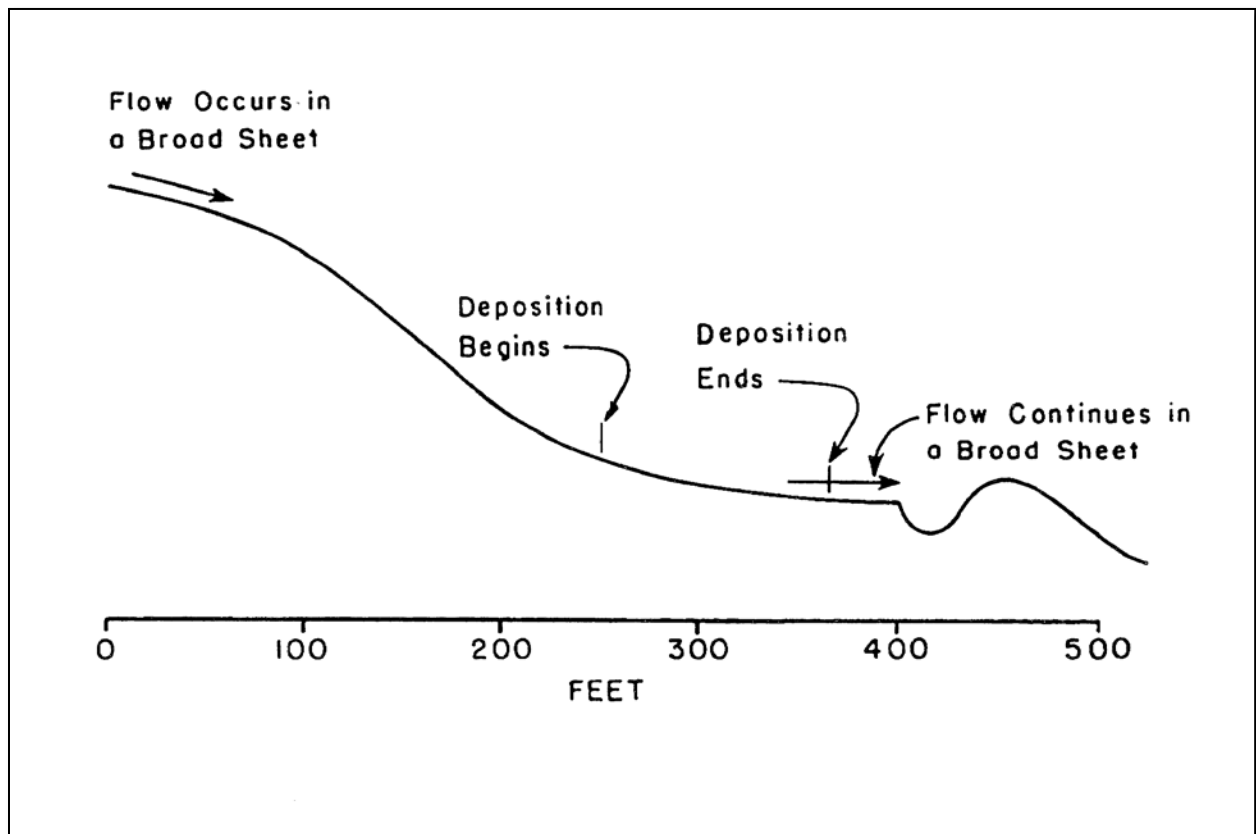


Figure 1: Illustration of slope length along a simple slope.

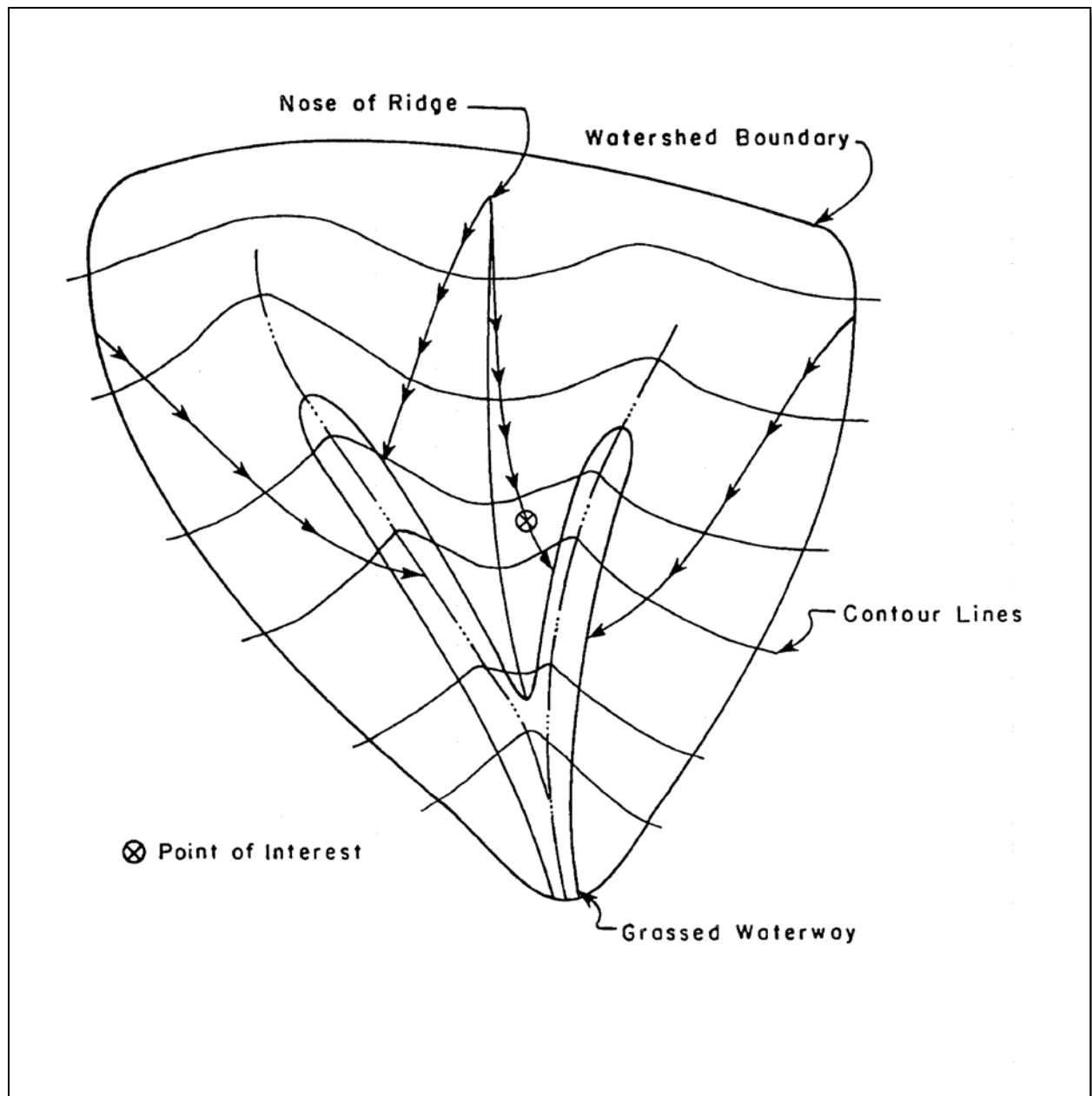


Figure 2: Illustration of the start and end points of slope lengths in a small watershed.

The measurement of slope length should not be restricted to the boundaries of the PHEL map unit but should represent the sheet and rill erosion flow path that affects the PHEL map unit. When making this determination the slope length may also extend outside of the field boundary providing there are no changes in management or land use along the slope length and there are no physical boundaries, such as a fence line, that would interrupt the flow path.

Slope length can be altered by vegetative or structural practices such as terraces or contour buffer strips. When those practices occur along a slope the spacing and width of the practices should be included in the RUSLE2 calculation.

Making HEL Determinations for Fields with PHEL Map Units

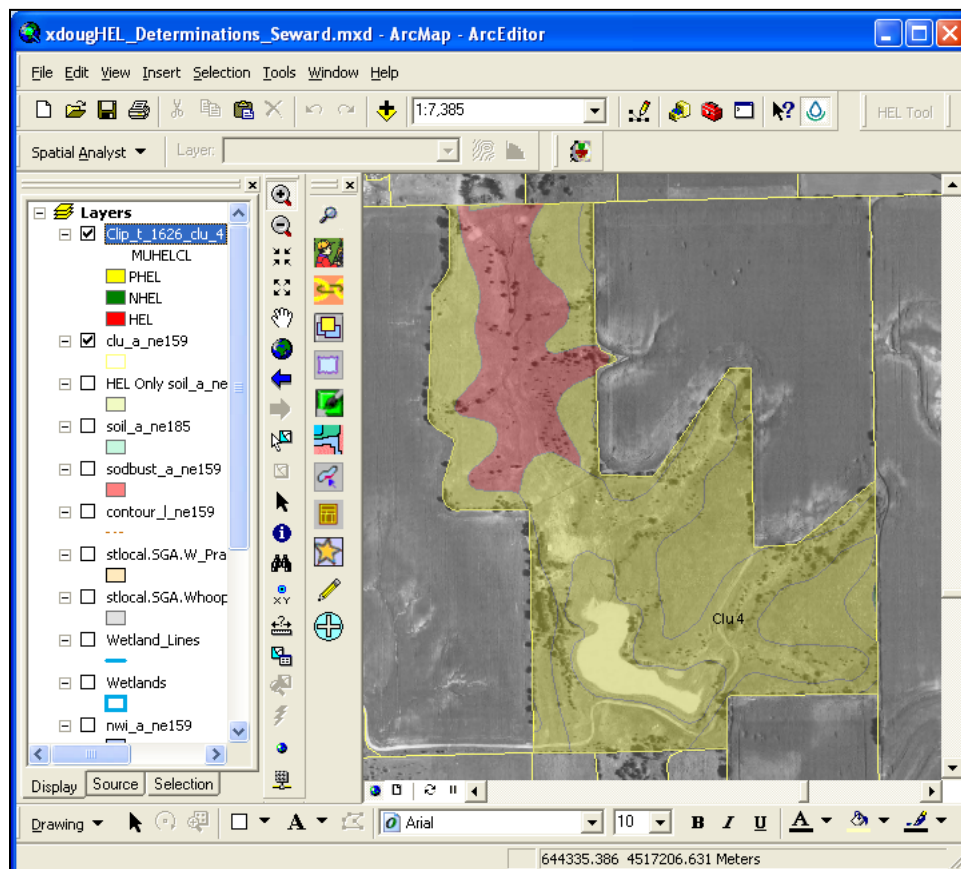
In completing preliminary HEL determinations do not make a field visit to complete field slope and/or slope length measurements. **Only PHEL map units may be examined in the field if necessary to measure the percent slope and slope length to determine if they are highly erodible or not highly erodible.** Otherwise, the HEL determination and any reconsideration or appeal is completed offsite. GIS tools for use in making HEL determinations can be found on the Nebraska SharePoint site:

<https://nrcs.sc.egov.usda.gov/central/ne/soils/GIS/Tools/Forms/AllItems.aspx>

Mechanical alterations to the landscape, such as land leveling or other land shaping, are not considered in determining HEL. If a PHEL map unit has been altered prior to making an HEL determination, use previously documented slope measurements (if available) for that map unit to make the determination. If previous documentation is not available slope measurements from a comparable site or the use of contour maps and/or LIDAR data is acceptable.

Example HEL Determination using the ArcGIS HEL Tool

The HEL Tool clips the soils for the field and generates a report showing the extent and HEL classification of each map unit in the field and makes a preliminary HEL determination based on that information.



Map view of HEL Tool clip showing PHEL map units in yellow and HEL map units in red.

Clip_t_1626_clu_4.txt - Notepad

File Edit Format View Help

Soil Data From Theme: clip_t_1626_clu_4.shp

Farmnbr	Tractnbr	Clunbr	Muהלcl	Musym	Acres
6108	1626	4	2	By	23.8
6108	1626	4	3	HsA	0.0
6108	1626	4	2	HtB2	2.0
6108	1626	4	2	HtB2	0.1
6108	1626	4	2	HtC2	6.2
6108	1626	4	2	HtC2	5.6
6108	1626	4	2	HtC3	14.1
6108	1626	4	1	HtD3	12.3
6108	1626	4	2	W	0.1
6108	1626	4	2	W	6.3

Sum					70.5
HEL = 12.3 Ac for 17.4468%					
PHEL = 58.2 Ac for 82.5532%					
(HEL + PHEL) = 70.5 Ac for 100.0000%					
NHEL = 0.0 Ac for 0.0000%					
Area is *** PHEL (HEL + PHEL) ***					
USDA/NRCS - 1/16/2013					
NE-CPA-FSA-1					
Other Data Layer Analysis:					
nwi_a_ne159: **DATA PRESENT**					
stlocal.SGA.whooping_Crane_092211: **DATA PRESENT**					
soilmu_a_hydric_soil_indicators_ne159: **DATA PRESENT**					

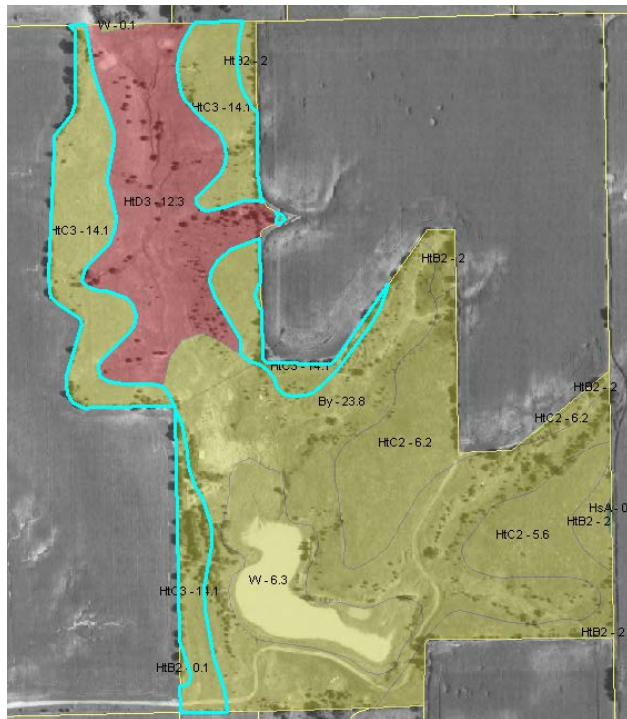
HEL Tool report for the field.

Note the HEL determination for the field is PHEL so the PHEL map units need to be evaluated. However, not all of the PHEL map units need to be evaluated. Start with the PHEL map unit with the greatest extent and work back. For preliminary HEL determinations the in-office procedure outlined in Appendix 4 of the guidance document for the HEL tool can be used. Select the polygon for analysis from the attribute table generated when the soils were clipped.

ID3CM	AREASymbol	SPATIALVER	MUSYM	MUKEY	HEWACRES	MUHELCL
0	NE159	2	HtB2	1674054	2	2
0	NE159	2	HtB2	1674054	0.1	2
0	NE159	2	HsA	1674051	0	3
0	NE159	2	HtC3	1674057	14.1	2
0	NE159	2	HtD3	1674058	12.3	1
0	NE159	2	W	1674086	0.1	2
0	NE159	2	By	1674033	23.8	2
0	NE159	2	HtC2	1674056	6.2	2
0	NE159	2	HtC2	1674056	5.6	2
0	NE159	2	W	1674086	6.3	2

Show: Records (1 out of 10 Selected)

Attribute table for the field with the PHEL map unit of greatest extent selected.



Map with the largest PHEL map unit selected.

Note that while the map unit is recognized as ONE polygon on the attribute table it looks like 4 or 5 separate polygons on the map. For field evaluations select two or three of the larger areas to evaluate for slope and slope length.

List of Map Units that Qualify as Highly Erodible Land

Litchfield County, Connecticut (Correlated and Published, 1970)

AnC	Amenia silt loam, 8 to 15 percent slopes
BoC	Branford loam, 8 to 15 percent slopes
BqC	Bernardston silt loam, 8 to 15 percent slopes
CaC	Charlton fine sandy loam, 8 to 15 percent slopes
CaC2	Charlton fine sandy loam, 8 to 15 percent slopes, eroded
CaD	Charlton fine sandy loam, 15 to 25 percent slopes
CaE	Charlton fine sandy loam, 25 to 35 percent slopes
CwC	Copake loam, 8 to 15 percent slopes
DoC	Dover fine sandy loam, 8 to 15 percent slopes
DoD	Dover fine sandy loam, 15 to 25 percent slopes
EsC	Enfield silt loam, 8 to 15 percent slopes
GaC	Gloucester sandy loam, 8 to 15 percent slopes
GaD	Gloucester sandy loam, 15 to 25 percent slopes
HbC	Hartland silt loam, 8 to 15 percent slopes
MyC	Merrimac sandy loam, 8 to 15 percent slopes
PbC	Paxton fine sandy loam, 8 to 15 percent slopes
PbC2	Paxton fine sandy loam, 8 to 15 percent slopes, eroded
PbD	Paxton fine sandy loam, 15 to 25 percent slopes
PbD2	Paxton fine sandy loam, 15 to 25 percent slopes, eroded
PbE	Paxton fine sandy loam, 25 to 35 percent slopes
SnC	Stockbridge loam, 8 to 15 percent slopes
SnC2	Stockbridge loam, 8 to 15 percent slopes, eroded
SnD2	Stockbridge loam, 15 to 25 percent slopes, eroded
WxC	Woodbridge fine sandy loam, 8 to 15 percent slopes

List of Map Units that Qualify as Potentially Highly Erodible Land

Litchfield County, Connecticut
(Correlated and Published, 1970)

AnB	Amenia silt loam, 3 to 8 percent slopes
BaB	Belgrade silt loam, 3 to 8 percent slopes
BoB	Branford loam, 3 to 8 percent slopes
BqB	Bernardston silt loam, 3 to 8 percent slopes
CaB	Charlton fine sandy loam, 3 to 8 percent slopes
CaB2	Charlton fine sandy loam, 3 to 8 percent slopes, eroded
CwB	Copake loam, 3 to 8 percent slopes
DoB	Dover fine sandy loam, 3 to 8 percent slopes
EsB	Enfield silt loam, 3 to 8 percent slopes
GaB	Gloucester sandy loam, 3 to 8 percent slopes
GrC	Groton gravelly sandy loam, 3 to 15 percent slopes
HbB	Hartland silt loam, 3 to 8 percent slopes
HeB	Hero loam, 3 to 8 percent slopes
HkC	Hinckley gravelly sandy loam, 3 to 15 percent slopes
HmC	Hinckley gravelly loamy sand, 3 to 15 percent slopes
MyB	Merrimac sandy loam, 3 to 8 percent slopes
PbB	Paxton fine sandy loam, 3 to 8 percent slopes
PbB2	Paxton fine sandy loam, 3 to 8 percent slopes, eroded
SnB	Stockbridge loam, 3 to 8 percent slopes
SnB2	Stockbridge loam, 3 to 8 percent slopes, eroded
SvB	Sutton fine sandy loam, 3 to 8 percent slopes
TwB	Tisbury and Sudbury soils, 3 to 8 percent slopes
WvC	Windsor loamy fine sand, 8 to 15 percent slopes
WxB	Woodbridge fine sandy loam, 3 to 8 percent slopes