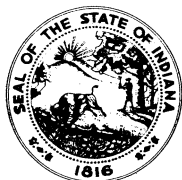


Frank L. O'Bannon  
Governor

Richard D. Feldman, M.D.  
State Health Commissioner



# Indiana State Department of Health

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**DATE:** November 30, 2000

**TO:** Soil Scientists

**FROM:** Alan M. Dunn, Supervisor *AMD*  
Residential Sewage Disposal  
Sanitary Engineering  
AC (317) 233-7177

**SUBJECT:** BC, CB, and C horizons in soils  
developed from Wisconsin glacial till.

Mr. David Ortel, staff environmental scientist, and Mr. Jerry Thomas, staff soil scientist, have discussed some of the problems that they have observed in the field over the last two years. They have investigated several failing on-site sewage disposal systems in northern Indiana that were installed in soils developed from Wisconsin age glacial till. Their soil evaluations of these sites were made from a backhoe soil pit. The original soil evaluations had been described from either a small push probe hole or a slightly larger soil auger hole. In many cases, the only characteristic that my staff was able to identify as a potential problem that may have been affecting the system was the separation distances from the BC horizon. The failures seemed to occur more frequently when the separation distance between the BC horizon and the trench bottom was less than 30 inches. Similar problems may also be occurring in sand mound systems when the ground surface is less than 20 inches above the BC horizon. In nearly all of these cases, my staff was able to observe a weak, coarse or very coarse prismatic structure or a weak, platy structure that was parting to a weak, medium or coarse subangular blocky structure. Neither of these two structures would have been observed from the use of a soil auger hole.

Several years ago, Mr. Thomas discussed this situation with Mr. Bobby Ward, State Soil Scientist, USDA-SCS. At that time, Mr. Ward stated that he had serious reservations about the values provided in the soil loading rate tables of Rule 410 IAC 6-8.1 for the BC horizons that developed from Wisconsin glacial till material. He strongly suggested that all soil materials identified as a BC horizon, and having developed from Wisconsin age glacial till, be assigned the same soil load rate as the underlying CB and C horizons. (He also stated that the zero (0) value in the soil loading rate tables was not correct, in that even the densest soil layers will exhibit some water movement. He suggested a better term when making on-site sewage disposal recommendations would be to state that these horizons have a soil loading rate of less than 0.25 gal/day/ft<sup>2</sup>.)

Mr. Thomas has reported that in the collection of soil data in the Howard County, Indiana, drainage project, the underlying BC horizons have all been more restrictive than horizons above them. Mr. William Hosteter and Mr. Scott Haley, USDA-NRCS, assisted Mr. Thomas with the description of these soil profiles. They observed that in Wisconsin glacial till soils, the BC horizons appeared to be sufficiently reduced from the values presented in the soil loading

rate tables of Rule 410 IAC 6-8.1. The BC horizons in all these Wisconsin age glacial till soils appeared to have weak, coarse or very coarse prismatic structure or weak, platy structure that was parting to a weak, medium or coarse subangular blocky structure. In many cases, a few very fine and fine roots and a few discontinuous clay films were present in the BC horizons. Even with all of these well-defined structural features, their natural permeability was extremely slow. They agreed that it would be advisable to underestimate the permeability of these horizons and over design an on-site sewage disposal system rather overestimate the permeability and cause the system to fail. Many of the local health departments in northern Indiana are routinely assigning the depth to a restrictive layer in soils underlain by Wisconsin glacial till at the depth that the soil starts to effervesce.

This memo is not intended to dictate how to describe the soil profile. It is intended to point out the existence of problems we have recently encountered when a BC horizon has been identified without taking into account its effect on the performance of an on-site sewage disposal system. We ask for your careful consideration when working in areas that have been mapped in the soil survey as having developed from Wisconsin glacial till. When describing a soil profile, it is in the best interest for all concerned if a conservative interpretation is given when a BC horizon is encountered.

If you have further questions, or desire additional assistance, please let me know.

JAThomas/

cc: Residential Sewage Disposal Program staff  
Plan Review Program staff  
Local Health Departments  
USDA-NRCS