# Summary

Longitudinal blending piles of dry bulk material are used to homogenize a variable input. Gerstel (1979) made an analytical theory of the homogenization effect of these stockpiles. In this research a computer model in Delphi has been developed to simulate this homogenization effect in blending piles.

For blending piles basically two methods of stacking can be used: Chevron and Windrow. Only the Chevron method is modeled. This method uses a stacker which is moving at constant speed back and forth in the longitudinal direction of the pile. Usually there is a standard limit at the end of the pile. The windrow has a complex pattern of motion, has many different ley-outs and is therefore difficult to model.

Basically there are two methods for reclaiming the material: Bench reclaiming and the method of sections. This model will simulate the method of sections. In this method the material is collected in oblique slices with the same angle as the angle of repose.

The model uses the element and stockpile dimensions as input. The system has got two active processes, two queues and stockpile elements. The first active process is the stacker which creates the elements and gives them a property and position. The reclaimer calculates the volume of each element within the reclaimed slice and calculates the average property per slice. For the volume calculation a separate function is used to decrease calculation time. The cone-ends calculation methods turned out to be complex and not accurate. This resulted in a deviation of the total volume calculation of 4%.

The validation showed that the volume calculation of the part in between the cone-end the model works correctly. As predicted the model does not work accurate for the cone-ends. The homogenization function with simple input variables is also working as expected.

There are six experiments and 230 simulation runs performed. As expected the experiments prove the homogenization of the pile is more efficient with more layers. However the theory of Gerstel is not proved, because there are many differences in approach. The main difference is the range in which the models give a good approximation. The model of Gerstel is a good approximation if there are an infinite number of layers while this model is limited to a finite number of layers due to the calculation time. Furthermore a blending pile is homogenizing more with increasing height and increasing vertical sections. There is neither a relation found between the pile length nor the reclaimed number of slices and the homogenization effect.