SUMMARY COMMENTS AND STATUS OF HORIZONTAL DS 7. STABILITY

RECOMMENDATIONS FROM THE STEERING COMMITTEE

The discussion on this item showed a certain degree of confusion about the concept of "stability". In the end it was agreed that the policy needs to be covered are three-fold: stability (in the sense of maturity) for products such as compost; stability in the sense of reduced odour emissions for putrescible waste such as sewage sludge; stability in the sense of potential biodegradability for measuring the environmental impacts (gas and leachate production potential) of residues of mechanic/biological treatment that are landfilled. This could mean the adoption of different standards depending on the available knowledge of these biological processes.
The Steering Committee was not satisfied with the quality of this desk study, as it lacked in a broad view of the problem and did not allow an informed choice of method(s) to be standardised. It was agreed that **further work on this item was needed and that a revised desk study should be provided by May 2004**.
Mr Bev Cooper, Work Package Leader, wished to receive from the Steering Committee members **a list of experts' names** that could be contacted in order to help gathering the necessary information for re-drafting the desk study.

SUMMARY OF COMMENTS

HORIZONTAL DESK STUDY 7. STABILITY (BIODEGRADEBILITY)

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Report and recommendations following receipt of comments

This area of work had a different stating point from the majority of other packages in that there were no international standards for sludge's or treated biowaste to amalgamate. An ISO standard exists for biodegradable packaging as does one for the determination of soil microbial mass. Many methods and techniques existed, some accepted as national methods but to my knowledge none were National Standards. On this basis the Project Leaders researched the available techniques/methods and presented what they believed to be the best possible method.

Stability

During aerobic biodegradation the carbon atoms are oxidised to form carbon dioxide with the evolution of heat. From this simple equation it can be seen that the analytical chemist can determine what is happening in a number of ways:

- Determine oxygen uptake
- Determine carbon dioxide evolution
- Determine heat evolved
- Determine carbon loss

Methods exist for the first three bullet points and are to a large extent national. Only one technique is based on ISO methods namely the carbon dioxide release method.

All the other methods of test carry out some form of sample segregation some take small sample size whilst others actually homogenise the sample with water and therefore change the nature of the sample completely.

Of the other existing methods namely Dewar, SOUR, Sapromat, Oxytop, Solvita the last three are proprietary commercial instruments and as such where an acceptable alternative generic method exists should not become standards.

In developing the carbon dioxide method I took into account the objectives that the proposed method:

- Did not alter the structure of the initial sample
- Was capable of testing a wide range of particle sized materials
- Could be undertaken without the need for expensive equipment
- Could be automated and be able to determine large numbers of samples
- Would be enable the measurement other gasses evolved e.g. ammonia with the appropriate sensors
- Could be used to test large sample sizes to ensure homogeneity of the test sample

Several areas of research need to be undertaken to confirm:

- Moisture content of the sample during the test
- Temperature at which the test is undertaken
- Duration of the test.
- Addition of nutrients

As can be expected there is considerable resistance from the users of the other methods to change. I believe that the proposed method is the most versatile of any of the current methods available, it can be used at all stages of decomposition, measuring the rate of decomposition. To measure potential degradation it may be necessary to add nutrients to stimulate the microbial activity and also develop mathematical equations to calculate the potential degradation from the rates being measured. Addition techniques may also be

required to give an overall picture. Residual and potential activity will very much depend on the environment in which the material is placed. i.e. land fill in either an anaerobic or aerobic situations, spread on land as a mulch or incorporated into soil. In each situation the moisture content and microbial activity will be different and will have a significant effect on any long-term biodegradation of the material.

Some experts appear to favour particular methods very strongly to the exclusion of all others. Since the objective is for a single method it is therefore obvious that some will be disappointed when their favoured method is not the one adopted. However if the selected method meets the criteria I outlined above, is scientifically rigorous and has good performance characteristics I believe it will be a practical solution that is fit for purposes.

It has to be recognised that in the final outcome, agreement may not be possible and that a single standard method cannot be developed.

PROPOSAL

That the points raised within the desk study namely and comments received, moisture content, temperature at which the test and the use of electronic sensors be undertaken and the duration of the test be evaluated and the method then subjected to inter-laboratory testing.