**COST-BENEFIT OPTIMISATION FOR ESTIMATION OF A MEAN**

(Modified from Underwood 1997).

Below is a description of a procedure for cost-benefit optimisation of sampling in one water body using b stations and n samples per station. The user need to define a number of quantities using prior knowledge and pilot studies.

Steps 1 – 3 provides the background of how to derive the results and 4-6 are the actual steps necessary to do the optimisation.

Known or estimated quantities:

=variability among sites

=variability among samples

=cost for sampling one site (sampling and sorting not included)

=cost for one sample (travelling and preparations not included)

=defined by budget

1. Expression for total variance and standard error

2. Expression of total cost

3. Expression for minimisation of V\*C (we want low variance and cost!)

4. Find optimal n at minimum

5. Find optimal b

6. Calculate variance and SE of optimal solution

7. Calculate costs necessary to achieve certain target error, SEtarget.