THE NATURAL STEP™ SUSTAINABILITY FRAMEWORK

What is a sustainability assessment?

Sustainability is often referred to as the triple bottom line and includes economic, social and environmental dimensions. In most engineering options evaluations, the economic and environmental dimensions are well considered. Social aspects of a project are considered to a lesser extent and, in many cases, only after community objection. The key issue of inter-generational equity is rarely considered.

The main differences between a sustainability review of options and a conventional options analysis are greater emphasis on social aspects, potential long term impacts and consideration of social equity issues. The emphasis of the sustainability analysis is therefore on the long term and equity aspects of the options.

Sustainability framework

When addressing sustainability it is necessary to have a framework. There are many frameworks around and each suits a specific purpose. These include environmental foot-printing, life-cycle analysis and similar approaches. PSD uses the strategic sustainability Natural Step™ (TNS) framework for sustainability assessment. TNS framework is made up of four system conditions. For anything to be sustainable it must meet the four system conditions and these form the basis of further specific questions which can be used to assess the options in this study. The four system conditions of TNS are:

In a sustainable society, nature is not subject to systematically increasing:

1. concentrations of substances extracted from the Earth's crust,
2. concentrations of substances produced by society,
3. degradation by physical means
4. people are not subject to conditions that systematically undermine their capacity to meet their needs.

Each option considered in TNS assessment is assessed on how well it meets the system conditions using the statements:

✓✓ = meets the criteria well

✓ = meets the criteria

× = meets the criteria with limitations

×× = does not meet the criteria

Practical application

The sustainability assessment is carried out by applying the system conditions to the options under consideration. An example from a project is given in the table below. In this instance the assessment was for treatment (the process) and application to land (the end use) of biosolids, and sustainability was assessed for both these aspects.

Example sustainability assessment

	Current practice	Option A	Option B
System condition 1			
The process does not cause harmful increase in the environment of naturally occurring substances	✗	✓✓	✓✓
The end use does not cause harmful increase in the environment of naturally occurring substances	✓	✓	✓✓
System condition 2			
The process does not cause harmful increase in the environment of man made substances	✓✓	✓✓	✓✓
The end use does not cause harmful increase in the environment of man made substances	✓	✓	✓✓
System condition 3			
The option does not degrade the environment in any significant way	✓✓	✓✓	✓✓
System condition 4			
The option does not create potential long term adverse impacts	✗	✓	✓✓
The option does not rely on non-renewable resources	✓	✗✗	✗✗

✓✓ = meets the criteria well
✓ = meets the criteria
✗ = meets the criteria with limitations
✗✗ = does not meet the criteria

The overall outcome of this particular sustainability review was that all options were generally consistent with the system conditions for sustainability, with a few areas which needed investigation.