Enhancing beneficial re-use of biosolids: A practical guide to community engagement

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ABSTRACT

Currently, in New Zealand, landfilling of biosolids is the preferred option for local authorities due to perceived and real uncertainties around alternative re-use options. There is a strong scientific, economic and environmental case that application to land is the most sustainable option, because biosolids contain large amounts of valuable plant nutrients which can be beneficially re-used. However, the beneficial re-use of biosolids is also potentially the least acceptable to the New Zealand public.

New Zealand has some unique central and local government drivers for consultation and public engagement, but in practice community engagement can be difficult and risky. Management of wastewater solids can be high cost and high risk and strongly determined by technical criteria and constraints. It is therefore important that a transparent and well developed framework for community engagement is used.

LEI have been using a quadruple bottom line (QBL) approach to community engagement for a number of years and have developed a field tested strategy which is presented in this paper. Researchers from the Centre for Integrated Biowaste Research (CIBR) have also been evaluating QBL approaches and testing community engagement with urban and rural communities since 2003. Together, CIBR and LEI have developed a Community Engagement Framework for biowastes. The framework includes practical steps required for community engagement and consultation, project concept design, resource consenting, and system operation and management. This framework can be applied to sustainable waste management and is especially useful for engagement around more contentious wastes such as biosolids. The framework is the document that is recommended for use by the waste sector and will be launched at the conference. This paper outlines LEI's practical approach to community engagement.

INTRODUCTION

Currently, in New Zealand, landfilling of biosolids (treated sewage sludge) is the usual/traditional approach for local authorities due to perceived and real uncertainties around alternative re-use options. There is a strong scientific, economic and environmental case that application to land is the most sustainable option because biosolids contain large amounts of valuable nutrients which can be beneficially re-used.

But whilst the science supports beneficial re-use of biosolids, of the approximately 70,000 dry tonnes of biosolids produced each year, less than half is beneficially re-used (NZWWA, survey 2015). Qualitative interview data collected by researchers from the Centre for Integrated Biowastes Research (CIBR) working in various communities across New Zealand have found a variety of uncertainties exist around possible environmental and human health risks arising from the contaminants present in biosolids (Langer et al., 2012; Ataria et al., 2016). There are also specific cultural concerns for Māori; these include the possible presence of bodily wastes from funeral homes (pers comm Ray Farmer WTAG, Gisborne), as well as concerns about food chain implications and possible impacts on export markets and international perceptions (Ataria et al., 2016). Some of these concerns can be mitigated with specific guidelines and careful practice, but public concern remains an issue for many council's and operators in looking for viable re-use solutions.

Biosolids management has long recognised the importance of "public acceptance" in the success of any beneficial re-use of biosolids, but this has focussed on public "education", rather than public involvement in decision-making. This theory of 'education' is often based on assumptions that more 'technical' information will change people's values and viewpoints (Goven and Langer, 2009). But more education and information is not always effective, and there is increasing recognition in the sector that the 'technical' expert estimations of 'actual risk' do not take into account the "outrage factors" that can contribute to how individuals and communities may see risk. When it comes to biosolids, these outrage factors can be significant, and some common examples include:

- involuntary (out of their control);
- unfamiliar (manure is familiar, biosolids are not);
- memorable (because of odours or other nuisances);
- dreaded (the "yuck" factor of biosolids' origins creates dread);
- not reversible (e.g., persistent pollutants are permanent additions to soils);
- unknowable (greater with biosolids land application compared to animal manures); *and*
- having delayed effects (some effects from biosolids may not be evident immediately and may affect future generations.

Both the Local Government Act (2002) and the Resource Management Act (1991) recommend stakeholder and wider community consultation when making decisions on behalf of the community, or when there is the potential for the rate paying public to be exposed to any liability for costs relating to those decisions. In addition the Treaty of Waitangi (1840) guides partnerships with Iwi for environmental management. The relationship between local government and Iwi is especially important, as both Treaty partner and a key stakeholder, Iwi and rūnanga have a very keen interest in being involved in waste, water and environmental issues.

In practice community engagement can be risky, with decision-makers often feeling that involvement of the community may derail or significantly delay the process of finding a

solution for biosolids management decisions. There is also a fear that involvement of the community may unrealistically raise community expectations, and may expose such diverse and opposing views that a decision is unable to be made. There are often significant existing infrastructure investments, especially relating to waste water treatment systems. This means decisions can be heavily driven by technical criteria and there is a limited range of options that are feasible. The technical constraints often put the council staff, who have the responsibility of asset and waste management, in the position of 'inform and educate'. As a result, the beneficial re-use of biosolids is all too often placed in the 'too-hard basket' and a valuable resource is landfilled.

Further, there is a risk that involving the community in decision-making may raise expectations for greater influence in decision-making than is actually possible. Council decisions that involve significant expenditure are often made by elected representatives, albeit after consideration has been given to consultation outcomes. Consequently it is important that a transparent, robust and well developed strategy for community engagement is used that can be articulated to the decision-makers, and then back to the community.

LEI community engagement work has many areas of commonality with processes developed by CIBR social science researchers. This has led to the development of a joint CIBR/LEI Community Engagement Framework. This joint framework is underpinned by significant research evidence and practical field experience. This paper outlines the practical guides to community engagement tested by LEI over the last 15 years which are recommended in the framework which will be launched at the conference.

LEI COMMUNITY CONSULTATION - HISTORY AND BACKROUND

For well over 15 years senior members of LEI have been undertaking community engagement in their work with wastewater infrastructure projects. This work has used a range of different methods and in more recent years the triple bottom line (TBL) approach to sustainable waste management has been used. The TBL is defined as standing on three pillars: economic, environmental, and social. These three components of the TBL are a way of thinking about projects that focus on impacts in relation to not only economics, but also the environment and the community. The TBL analysis has proven to be relatively simple to grasp, especially the visualisation of the three values as 3 pillars that if not all balanced will lead to an uneven or unbalanced decision. Over the years the LEI staff have started to become involved in projects that are of significant interest to Iwi, either the projects were based in areas with large populations of Māori, or in areas that were important to Māori. It was recognised that the TBL did not take into account the place-based and deeply held intrinsic environmental values of tikanga and mātauranga Māori. Thus a fourth dimension was added to the TBL, that of cultural considerations.

THE QUADRUPLE BOTTOM LINE APPROACH (QBL)

A framework for sustainable development that considers 4 values, being economic, environmental, social and cultural, or the quadruple bottom line (QBL) is also recommended by the International Council for Local Environment Initiatives (ICLEI). A globally adopted definition for sustainable development was set by the Brundtland Commission at the United Nations (1987) as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs." The Brundtland report (1987) recognised that indigenous peoples throughout the world have had an understanding of the

principles of sustainability, and have lived sustainable lifestyles for millennia. This fourth dimension of spiritual or cultural considerations in the New Zealand context is especially relevant.

THE LEI COMMUNITY CONSULTATION STRATEGY – A STEP BY STEP APPROACH

There are many different ways to use the QBL approach and many different methods for community engagement; there is no 'one-size fits all'. LEI have tried and tested a number of community engagement methods over the years starting with the "educate and inform" where engagement is limited to directly affected parties, and moving towards more open dialogue using focus groups and/or stakeholder and community workshops to 'take the community with you' to ensure that an effective, sustainable solution is developed. Approaches that provide multiple opportunities for open discussion, encourage feedback, and provide mechanisms for incorporation of community values and viewpoints into final solutions, assist with greater community buy into the project and a greater sense of community ownership. Decision-making using these approaches are not made solely by council and on costs and environmental outcomes. Solutions are more likely to be fit for purpose and reflect the needs of the community, the affordability of the community as well as satisfying regulatory and environmental requirements.

To effect the above approach, a two-step process is required. The first step is working out what is right (and possibly what is wrong) and the solutions to develop sustainable biosolids management options. The second, is the regulatory approval of the preferred options. The first step is essentially a Local Government Act process of engaging with the community and working out what is best for it, and the second is a Resource Management Act process where the preferred option is approved with consideration of the effects of that option. LEI have incorporated these two steps in the "Solid Stool Concept".

THE SOLID STOOL CONCEPT

The "Solid Stool" is a simplistic way of visualizing the QBL 'pillars' and includes practical steps required for project concept design, resource consenting, system operation and management (Figure 1). The Solid Stool Concept uses a play on words and the legs of the stool represent the four values in the QBL: cultural, social, environmental and financial (Step 1). The absence of considering one value results in the overlying stool seat becoming unstable and lopsided.

Step 1: A key aspect to the Solid Stool Concept is a "Vision" which is developed at the onset of the project by the community and Council. LEI have found that presenting the QBL as a "stool" provides an easy to understand concept and helps gain buy-in from the community on the need for each stool leg (or QBL consideration) to be considered as important. Not to mention of course the humorous aspects of the play on words as a 'seat without a back or arms, typically resting on three or four legs or on a single pedestal" is not the first definition of the word "stool" that springs to mind to those in the wastewater industry!

Step 2: The seat of the stool represents the practical steps that need to be undertaken to complete the project and satisfy regulatory and environmental requirements, these include:

- Gather Information

    - Which enables an understanding of the background of issues, including:
        - Characterisation of the waste stream
        - Identifying limitations (e.g. material, site, environment etc)
    - Investigations:
        - What do we know what don't we know?
- Design
    - Once background work is complete:
        - Develop a range of technical solutions and modifications
        - Identify preferred solution(s)
- Consent
    - Governance/community approval of a preferred solution
    - Obtain the necessary regulatory approval
- Operate and Manage
    - Refine the design
    - Implement
    - Operate and manage

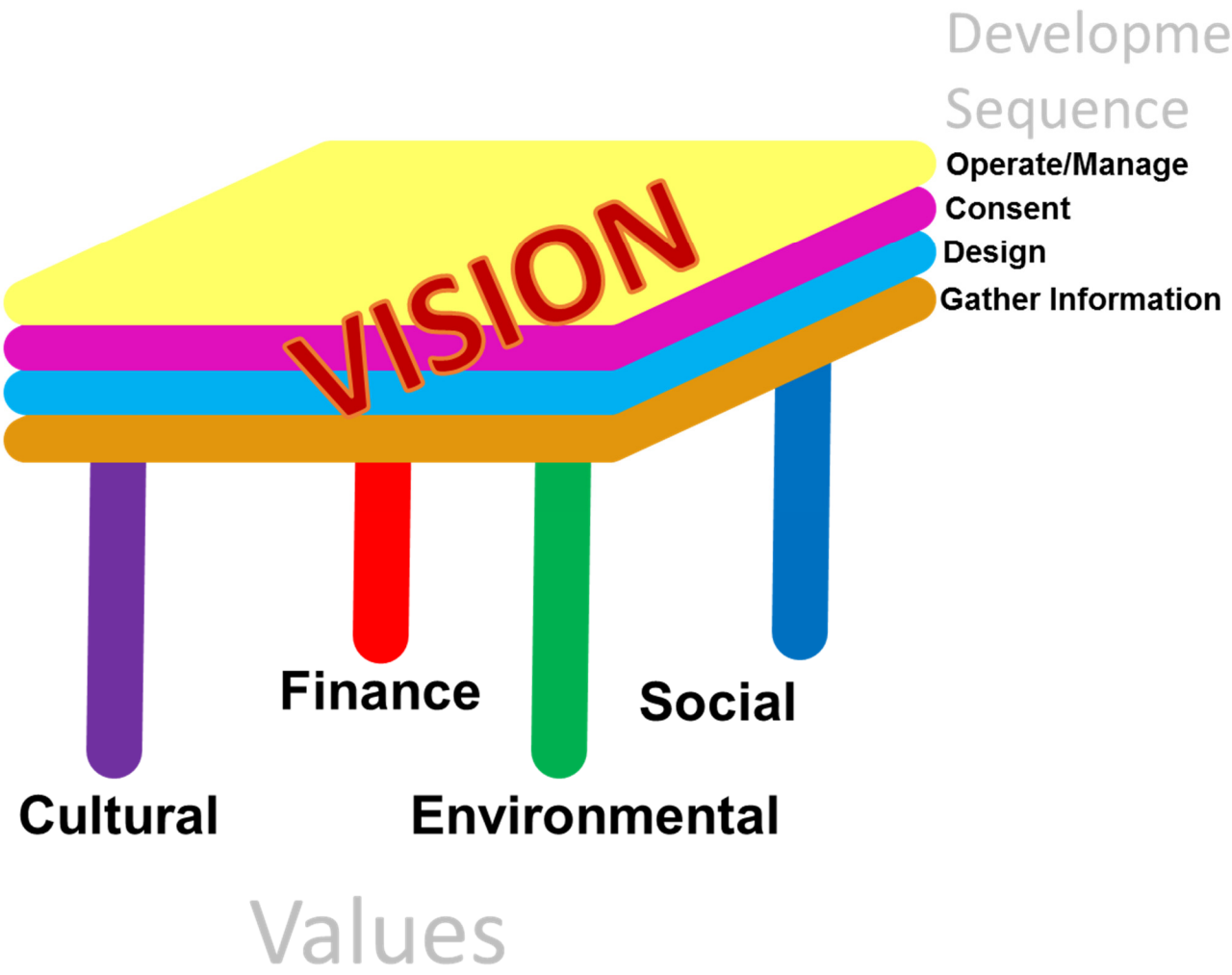

Fig 1. The solid stool concept.

THE PROCESS

The sections below describe the process or strategy for community consultation for small-medium projects.

The objectives of the consultation and communication strategy are as follows:

- Consultation on the project will fully meet the requirements of the Local Government Act 2002;
- Consultation on the project will represent best practice under the Resource Management Act;
- Stakeholders and the wider community will have been provided the opportunity to fully participate in the decision-making process and in determination of the possible options;
- Stakeholders and the wider community will have been provided the opportunity to provide informed feedback on the options being considered;
- Council will have been provided with accurate and timely information on stakeholder views and perspectives on the options being considered;
- The Consenting Authority will have been provided with accurate information on the views and preferences of stakeholders on selected options; and
- Timely and accurate communications on the project will have been provided to the interested public.

STATUTORY REQUIREMENTS AND GOOD PRACTICE

Local Government Act 2002

Local authorities have a general requirement under Part 6 of this Act to undertake consultation in relation to decisions made on behalf of the client community. Therefore the consultation will typically need to be with all of the rate paying public, or at least those members of the rate paying public with the potential to be exposed to any liability for costs relating to the proposed biosolids management plan.

Resource Management Act 1991

For most biosolids management plans there will be a requirement for a resource consent. There is no direct statutory requirement for consultation by the applicants with any other party. However, once the project has proceeded to the stage where preferred options have been decided and consent applications have been lodged, it is best practice to engage with persons considered by the consenting authorities to be affected parties (i.e. stakeholders.) It is best practice for consultation with affected parties to start well before lodgement of consent applications.

Treaty of Waitangi (1840)

The Treaty of Waitangi (1840) guides partnerships with Iwi for environmental management; and the increasing number of Treaty of Waitangi Settlement Acts often prescribe the nature

of relationships between local government and mana whenua entities and how the environment is to be managed.

GOOD PRACTICE FOR CONSULTATION

It is generally considered to be good practice to follow the provisions of a statement of principles of consultation developed from Environment Court decisions. These principles are as follows:

- **Early.** Consult as soon as possible when there is still the flexibility to make changes to address issues raised by interested and affected persons.
- **Transparent.** Be open about what the project wants to achieve, what scope there is within the project to change certain aspects of the proposal, and why there might be elements that may not be able to change.
- **Open Mind.** Keep views open to the responses people make and the benefits that might arise from consultation.
- **Two-Way Process.** Consultation is intended as an exchange of information and requires both the project team and those consulted to put forward their points of view and to listen to and consider other perspectives.
- **Not a Means to an End.** While consultation is not an open-ended, never-ending process, it should not be seen merely as an item on a list of things to do that should be crossed off as soon as possible.
- **On-Going.** It may be that consultation, or at least communication, will continue after the consent application has been lodged, or even after a decision has been made.
- **Agreement Not Necessary.** Consultation does not mean that all parties have to agree to a proposal, although it is expected that all parties will make a genuine effort. While agreement may not be reached on all issues, points of difference will become clearer or more specific.

GOOD PRACTICE FOR COMMUNICATION

Effective communication is about ensuring that information is provided in a way that is clear and concise and reaches its target audience. Effective communication should follow these principles:

- **Relevant.** There is a lot of information out there. It is important to make sure that all information provided is necessary and relevant.
- **Clear and Concise.** Everyone is busy and there is competition for most people's attention. Information needs to get key messages across clearly and efficiently.
- **Targeted.** Information needs to be targeted to its intended audience.
- **Accessible.** Innovative methods of information dissemination should be considered. In addition to more traditional methods such as newspaper and radio advertising, other methods may be appropriate, such as a project website and email updates.
- **Appropriately timed.** Communication to the wider public should be timed so that people who are generally at work can attend public presentations and meetings.

PARTIES FOR CONSULTATION AND COMMUNICATION

This section outlines the typical agencies and individuals needing to be consulted and/or communicated with, and the range of issues to be addressed by each.

Council and Councillors

It is appropriate for Councillors, as governors of the public authority responsible for the project, to be kept appropriately informed of progress with the project to enable them to make the necessary decisions and give the appropriate directions.

Council Management

In most instances executive management of Council may have only arm's length involvement in the project but it is appropriate that management be kept informed of project progress and issues as there may be circumstances in which executive management decides to give direction in respect to the project.

District Ratepayers

District Councils are obliged by statute to consult with their ratepayers before entering into commitments of public money. While most ratepayers can be expected to have little or no interest in RMA processes and outcomes, the financial commitment of their Council to significant projects is of direct interest to everyone with the potential to be exposed to any liability for the costs relating to those projects.

District ratepayers should be consulted in general terms on the following matters:

- Project Drivers. What is the problem? Why does anything have to be done?
- Options. What choices does the community and Council have to fix the problem?
- Cost Implications. What are the costs of the available options, including doing nothing?
- Equity. Who pays how much, and why?

In order to consult with the district ratepayers on the project, the following steps are required:

- Information in general terms on the four bullet-point matters above will need to be made available to the district community;
- The opportunity will need to be provided for any members of the district community who may be interested to attend conveniently timed and located meetings to participate in discussion on the project and to help shape possible options;
- Council will need to be able to demonstrate that the views of the ratepayers have been taken into account in arriving at the decision on how to proceed.

Consent Authorities

Good two-way communication with the relevant consenting authority will assist the early achievement of agreement on the design of the proposed project.

Statutory Consultation Parties

Iwi: Maori tribal authorities within whose rohe the proposed project resides should be consulted. Consultation will be to provide Iwi with information on the proposed project to enable the project team to receive information and advice from Iwi on cultural, social and environmental preferences. While in theory the Resource Management Act does not require consultation for a resource consent application with anyone, in practice there are requirements of the Act that cannot be met without such consultation. Good two-way communication with involved Iwi and Hapu can be expected to assist the achievement of agreement on the proposed activity.

Department of Conservation: Depending on the end solution, DOC may need to be consulted. DOC may be particularly interested in any projects that may impact habitats along riversides.

Fish & Game: F & G have an interest in any discharges to freshwater.

Interest Groups: These are organisations without a specific statutory mandate for involvement in resource consenting business, but which nevertheless have an interest in the effects of consented activities. Such groups considered to be likely to have an interest could include:

- District Health Boards;
- Local environmental groups; and
- Local businesses.

Neighbours: The owners and occupiers of properties adjoining the site for any proposed project and any land discharge site may be expected to have an interest in what is proposed. It is appropriate that they are directly involved in the decision-making process.

CONSULTATION AND COMMUNICATION METHODOLOGY

It is important to have a mechanism to involve the community in decision-making that will assist with identifying options that the community are happy with and support. This can be achieved in a range of ways some of which are outlined in Table 1 below.

Table 1: Consultation and Communication Methods

Method	Description
Stakeholder and community dialogue/workshops	General discussion with key stakeholders and the wider community.
Personal meetings	Targeted discussion with individual key stakeholders.
Telephone calls	Targeted discussion with individual stakeholders.
E-mails	Quick and convenient communication with individuals or groups.
Letters	Formal written correspondence on Council letterhead.
Newspaper articles and advertisements	General information for the wider public.
Internet; Website	Generic information post for both consultation and communication.

Stakeholder and community dialogue/workshops

The workshop process consists of the statutory parties, including Regional Council, Department of Conservation and the District Health Board, as well as interest groups, community groups and local iwi coming together to identify issues of local significance, as well as diverse community concerns and interests. You typically require at least 3-4 workshops to allow time to present the background information and the potential options, provide the opportunity for feedback and to further investigate the ideas or questions put forward; this will signal a commitment to include community inputs and provide a transparent process for feedback.

Each workshop has several steps and 1½ hours is the minimum time required. It is important to be flexible, it may not be possible to get through all the steps, and tasks may need to be modified as the workshop progresses.

Workshop 1:

- Understanding the journey – what is the vision/what do you want to achieve from this community dialogue/workshops?
- Understanding the background - what are the technical facts, waste characteristics, geology, hydrology, monitoring results, etc.?
- Understanding the options - what are the range of options available, how much will they cost? (E.g. low/medium/high cost).
- What are the impacts of these options?
- Canvas from the group if there are other options.
- Introduce the concept of quadruple bottom line criteria and the need for balancing differing and often competing viewpoints.

Workshop 2:

- Discuss the quadruple bottom line criteria, using a brief 'workshop' process to raise questions/issues which allows for community members to identify the key 'community' values that a 'technical' solution will need to align with.
- As appropriate elicit relevant knowledge from the community.
- Feedback and community evaluation of options and arrive at a preferred selection of options using a voting process to allow everyone express their opinion.

This phase of consultation and workshops 1 and 2 represent **Step 1** of the LEI process and are not to be confused with consultation with the community and affected parties under the RMA (Step 2); its purpose is to establish with both interest groups and the "silent majority" of the community an understanding of their expectations and preferences, and provides an opportunity for the community to identify the best solution for them without being caught up on the specifics of effects based consultation which typically occurs during a resource consenting process**.** The outcome of this stage is typically a community nominated preference to a way forward. This is likely to be accompanied by and informed with a series of technical reports which will address specific questions that are raised by the group.

Workshop 3:

- In workshop 3 the preferred option(s) is presented to the group for discussion, along with technical information, justification and costs.

CONCEPTUAL DESIGN

Based on the various scenarios, and as informed by consultation, appropriate conceptual designs for a biosolids management plan are typically prepared, including the rationale for selecting this design and the anticipated operational, regulatory and environmental requirements (Step 2).

A further community meeting may be required at this stage to refine the Conceptual Design. Based on the preferred option, there will be a need to identify the issues to be addressed in meeting planning and consenting (Step 2). At this stage of the process newspaper/website articles may be appropriate communication methods.

OUTCOMES

The outcomes of consultation activities need to include, where appropriate, recognition of the following aspects:

- Recognise that the timeframes for consultation and consent applications, while generous, are still finite and do not allow for endless rounds of meetings or extended periods of consideration.
- Recognise that only the Council and its elected members (Councillors and Mayor) ultimately have the decision-making responsibility, and they need to make the best decisions on behalf of their entire community.
- Recognise that financial implications may limit the nature and extent of any solutions.
- Maintain a quadruple bottom line approach (environmental, cultural, social/recreational, and financial criteria) for ranking potential solutions and modifications.
- Ensure that all agreed solutions are technically viable and achieve quantifiable benefits.
- Ensure that all modifications and mitigation measures are clearly linked to identified concerns.
- Implement design and mitigation measures that are integrated effectively and will not cause conflicts with other measures or cause issues that previously did not exist.
- Aim to create a biosolids management system that minimises inconvenience, and maximises benefit, for the involved and affected community.

NZ SPECIFIC RESERACH

Since 2003 CIBR researchers have worked with community groups and key regulatory and industry stakeholders to explore social and cultural aspects of biosolids reuse framed within case studies in Christchurch, Little River, Porirua, Kaikōura, and Mokai, as well as undertaking Tiaki Para: a study of Ngāi Tahu values and issues regarding waste. Outcomes of the CIBR research suggests that any viable solution must be a mix of ‘technical’ and ‘community’ knowledge in order for all concerns to be identified, understood and addressed. The research

has found that use of a quadruple bottom line (QBL) type approach allows for a comprehensive development of the "technical + people aspects = acceptable solutions". The methodologies for community engagement have also been well researched by CIBR and an approach using 'face-to-face' community meetings or workshops is recommended.

Thus the use of an approach to community engagement that uses the QBL and considers social/cultural/economic/environmental considerations via 'face-to-face' community meetings or workshops is supported as best practice by both New Zealand specific research (CIBR) and practical field experience (LEI).

A JOINT CIBR/LEI COMMUNITY ENGAGEMENT FRAMEWORK

There are significant commonalities between the CIBR and LEI approaches to using the QBL in community engagement for wastewater infrastructure projects.

CIBR and LEI have worked together to develop a community engagement framework that brings together a number of different factors that support 'good practice', including utilising the quadruple bottom line (QBL) in decision-making and processes required to satisfy regulatory and environmental requirements of the preferred options. The framework is underpinned by robust scientific research and practical field application. The purpose of the freely available framework is to: encourage regulatory authorities to adopt a consistent approach to community consultation; and create an awareness within the community of the benefits of sustainable biowaste re-use; and to provide a process that provides a pathway from project conception to regulatory approval and operation.

The framework provides an opportunity to guide and assist Council's, producers, dischargers and regulators (regional councils) through the entire process of biosolids management, taking it from the 'to hard' basket to a community supported sustainable beneficial re-use solution.

The framework is available from the CIBR and LEI websites and a hard copy will be available at the LTC conference.

CONCLUSION

New Zealand landfills significantly more biosolids than other developed countries (e.g. Australia, EU, USA) and has unique social, cultural, economic and environmental factors to consider. Both social and cultural acceptability is fundamental to achieving enhanced beneficial re-use of biowastes such as biosolids. Community engagement around biosolids can be difficult and risky; but equally it is difficult and risky not to do this work. A transparent, robust and well developed strategy can provide a good outcome and develop shared understanding between different stakeholders, strengthen council and community relationships, and build greater trust and confidence in the decision-making process.

CIBR/LEI Community Engagement framework brings together leading edge research tools with practical real world experience to produce an easy to follow step by step process to community engagement that works. This enabling approach to consultation with stakeholders is showing improved buy-in to the projects by their respective communities, rather than a confrontational approach. Enabling communities to take ownership gives them the power to decide what they can afford and the trade-offs they are prepared to accept; which in term will lead to an increased beneficial re-use of biosolids.

The LEI practical approach to the framework is a 2-step process that guides Councils to find an 'acceptable solution' that is a mix of both 'community' (Step 1) and 'technical' (step 2) criteria. The "Solid Stool Concept" is a tool that allows easy visualisation of the need to balance economic, social, cultural and environmental desires of the community (the legs) and limitations of the council (the seat).

The joint CIBR/LEI Community Engagement Framework is the document that is recommended for use and will be launched at the conference.

For more information on the CIBR/LEI community engagement framework please contact: jacqui@lei.co.nz and/or Virgina.baker@esr.cri.nz.

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