BIG OUTCOMES FOR LITTLE ONEROA STREAM - LOGICAL FRAMEWORK APPROACH

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ABSTRACT

The Little Oneroa Stream Project is a community driven or bottom up integrated catchment management planning project utilising the Logical Framework Approach. Two series of workshops were held with professionals, community and council members to establish a collaborative multidisciplinary team, with a unified understanding of the challenges and agreed action plan to meet them. This paper endeavors to show how this bottom up approach incorporates community beliefs, focuses on the real problems, creates a multidisciplinary environment, and best utilises community resources for the planning process to meet the challenges of the catchment in hopes of restoring this once vibrant stream.

The Little Oneroa Stream is located on Waiheke Island and is the most visible stream discharging through one of the most popular beaches on the island and currently poses a health risk to children who play there. The water quality issues have been long standing challenges that have generated much discussion, but little coordinated action. Waiheke Resources Trust (WRT) has picked up the project and implemented a coordinated community approach including coordination with local community, experts and Auckland Council.

The Logical Framework Approach (LFA) is based on establishing four types of core concepts (steps) and their causal relationships for project planning and implementation: Problem Statement/Situation Analysis, Stakeholder Analysis, Objectives Analysis, Project Strategy (Action Plan). Each of these core concepts is described by a narrative, objective verifiable indicators, means of verification and assumptions. The outcomes for the steps are achieved through a parallel iterative process of the four steps.

The LFA workshops enabled a positive atmosphere whilst dealing with contentious issues, by providing a platform for all participants to be heard. Their ideas were taken through a scientific process to reach consensus on the challenges, objectives and outcomes. The next steps for the project are implementation planning, detailed budgeting and identifying and securing funding.

KEYWORDS

Logical Framework Approach, Water Quality, Collaborative Process, Integrated Catchment Management

1 INTRODUCTION

The Little Oneroa Stream lagoon is a popular place for residents and tourists alike. The stream's lagoon is where the stream flows slow down due to natural beach sedimentation processes of Little Oneroa Beach and discharges to the ocean. The beach and lagoon feature a children's playground, picnic tables and barbeques, a dairy, an area to hold outdoor events, restroom facilities and a few small restaurants. The problems with the water quality of the lagoon have been known to residents for more than 30 years and several attempts have been made to address the issue with limited success. The locals

are well aware of the health risk posed by the water quality of the lagoon and know to avoid too much contact with the lagoon water, but as the area is within close proximity to children and attracts more visitors, the health risks increase. The Little Oneroa Stream Project was initiated by Waiheke Resources Trust with the objective to restore the health and water quality of the stream.

The Little Oneroa Stream is not unique. Many streams on Waiheke, New Zealand and worldwide face similar water quality challenges. Integrated catchment management is widely recognized as the best practice approach to managing watersheds to sustainably achieve multiple goals and meet the varying challenges posed by human infrastructure. Integrated catchment management is complex as it requires expertise from multiple disciplines and the buy-in and active participation of the catchment residents.

This paper describes the Logical Framework Approach (LFA) and how it was adapted to successfully take the first steps in planning to address the water quality challenges of the Little Oneroa Stream in the context of integrated catchment management. It is hoped that this project can serve as a model to assist other experts, governing bodies and communities in the collaborative process of LFA to successfully plan for the implementation of integrated catchment management and restore our freshwater ecosystems.

2 CATCHMENT

2.1 DESCRIPTION

The Little Oneroa catchment area is 90.17 hectare (see Figure 1) with approximately 380 sections of residential property. The main stream is approximately 1,890m long with four tributaries contributing another 950m to a total length of 2,840m. The Little Oneroa Stream and its sub-catchment is bound by Ocean View Road, Pacific Parade and Junction Road to the south and Hauraki Road, Queens Drive and Goodwin Road to the north and Cory Road to the east. The land-use is primarily residential in the lower reaches, although there are areas of bush and agriculture near the headwaters. Much of the stream is covered in high quality riparian vegetation, with the exception of headwater reaches of the main tributary, which are in a predominantly agricultural area and have low riparian cover. There is areas of natural cascades in the mid reaches which is a potential barrier to fish passage, however many climbing fish species are present in the upstream reaches. The catchment is primarily characterized by steep gradients surrounding the stream channels and is typical of Waiheke catchments. Little Oneroa Stream has sections of low gradient and has a number of wetlands and ponds. In particular the lower reach has intermittently ponded water depth from accumulated sand at the beach outlet. This sluggish reach has the potential to accumulate organic debris with resultant amenity issues at the popular reserve. This final reach of the stream is of greatest concern as it poses the most significant problems

Figure 1 Little Oneroa Stream Catchment

2.2 CHALLENGES

The physical challenges faced by the Little Oneroa Stream catchment are not unique for a catchment on Waiheke Island or many catchments throughout New Zealand. For this reason the authors feel it is a good representative catchment to demonstrate the effectiveness of the LFA. The challenges as listed below were some of the main challenges or "problems" identified during the problem analysis step.

2.2.1 NATIONAL POLICY STATEMENT FOR FRESHWATER MANAGEMENT 2014 (NPSFM)

The national policy statement sets out objectives and policies that direct local government to manage water in an integrated and sustainable way, while providing for economic growth within set water quantity and quality limits. The national policy statement is a first step to improve freshwater management at a national level.

The national policy statement sets national bottom lines for two compulsory values – ecosystem health and human health for recreation – and minimum acceptable states for other national values. The national policy statement acknowledges iwi and community values by recognizing the range of iwi and community interests in fresh water, including environmental, social, economic and cultural values.

The Little Oneroa project was not intended to be considered under the NPSFM, but follows similar steps and, if managed well, will be able to be incorporated into the NPSFM framework.

2.2.2 POPULATION AND WASTEWATER DEMAND

Waiheke Island has a permanent resident population of more than 8000 people. The island has significant fluctuations in population throughout the year due to it being a popular tourist destination. Wastewater flow volumes depend upon the nature of the facility being served, the per capita water consumption rates, and the use of any water use reduction fixtures employed. The wastewater volume to be treated is typically determined by multiplying the peak occupancy of a facility by the design flow allowance per person per activity.

CURRENT AND FUTURE POPULATION

Based on the 2013 Census, it is estimated that the permanent population in the Little Oneroa Lagoon catchment is 762 persons. It is worthwhile noting that it is a 7.3% increase on the 1996 Census, which implies that annual wastewater production would have increased by a similar amount. The Hauraki Gulf Island District plan limits the development potential in the catchment, but it is likely that there will be some population increase due to development of 54 vacant lots. It is estimated that these changes in land use could result in an additional 127 persons living in the catchment, an increase of 16.7% over the 2013 population.

It is also noted that the tourist population continues to increase for Waiheke Island. It is unclear as to the direct impact the tourist population will have on the Little Oneroa Stream catchment, but the increase will undoubtedly have both a direct and indirect impact.

SEASONAL FLUCTUATIONS

The increase in population due to tourism during peak summer holiday season has a significant impact on the increased loading of the wastewater infrastructure. An analysis of visitor trends carried out for Auckland City Council in 2010 showed that in January the number of ferry passengers increased by nearly 78% compared to July. While this increase needs to be validated, it provides an indication that onsite wastewater systems will be severely overloaded during the peak summer season. The seasonal fluctuation for Waiheke has at least a two-fold challenge.

The first, as stated above, the additional loading of the individual systems. Especially by users who are not used to live within a water conservative environment and, due to their personal habits and being uninformed, may overload the system design capacity. The second, which may be more problematic, is that many of the homes sit vacant for most of the year and are rented or used as holiday homes during the summer. The septic systems rely upon a good growth of microbes in the system to digest waste. When the system lay dormant for extended periods the microbe population dies back and can take several weeks of use to normalise. The result is that a system for a holiday home, even though it has been designed and installed properly, will not work effectively for the first few weeks, which is often the time of heaviest use.

RISK PROFILE OF ONSITE WASTEWATER SYSTEMS

Auckland Council has carried out a high level risk assessment of 169 onsite wastewater systems, several years ago, in the catchment of the possibility that the systems may impact water quality due to their proximity to the stream. This assessment needs to be

validated by detailed appraisal of the systems, but the results provide an indication of the risk rating, as follows:

- 11% (19 systems) were rated low risk;
- 24% (40systems) were rated medium risk; and
- 65% (110 systems) were rated higher risk.

The systems are mainly septic tanks; the type of systems is as follows:

- 70% (119 systems) are septic tanks;
- 26% (44 systems) are advanced treatment systems;
- 2% (3 systems) are composting toilets and/or greywater;
- 2% (3 systems) are long drops.

The topography and soil type in the catchment also influence the risk profile as they determine the capacity for the soil to provide treatment (e.g. steep sections may produce effluent discharges and clay soils become easily waterlogged).

REGULATIONS FOR ONSITE WASTEWATER SYSTEMS

The existing legislation is limited in its ability to control faecal contamination from onsite wastewater systems and is most effective in dealing with point source pollution, i.e. clearly defined property specific problems. In order to address this short coming Auckland Council manages the adverse effects from onsite wastewater systems through the Legacy Bylaw Provisions and the Auckland Regional Plan: Air Land and Water.

The Auckland Regional Plan: Air Land and Water sets out the environmental performance standards for onsite wastewater systems, including permitted activities.

The Little Oneroa Action Plan contemplates a voluntary community led approach to assure that onsite wastewater systems do not pollute the Little Oneroa lagoon, but it does not take away Auckland Council's authority to enforce regulations. Auckland Council may, at its discretion review the regulations and consider additional measures.

SPECIFIC ENGINEERING CHALLENGES FOR ONSITE WASTEWATER SYSTEMS ON WAIHEKE ISLAND

Whenever designing an onsite wastewater treatment system, that is intended to discharge to ground (absorption systems), several factors must be evaluated. These are the depth of permeable soil over high groundwater, bedrock or other limiting layer, soil factors, land slope, flooding hazard and the amount of suitable area available.

Soil and site factors are critical on Waiheke Island. Soil factors include percolation rates which may be considered a soil limiting layer such as distance to groundwater, bedrock or a soil with percolation rates less than 2.5 cm per hour or greater than 90 cm per hour. The main consideration for site factors are available space, slope and distance to water course. Traditional engineering of absorption system limits an acceptable natural slope to less than 8% for installation. It is unusual to find flat slopes on Waiheke with the exception of areas typically found close to a natural water course. The soils on Waiheke also have slow percolation rates which would greatly increase the size of an absorption system or be unsuitable. It would be more beneficial to consider evapotranspiration bed systems or specifically constructed wetlands for wastewater treatment of onsite wastewater disposal for many sites on Waiheke.

3 PROCESS

3.1 LOGICAL FRAMEWORK APPROACH

The Logical Framework Approach has been used for nearly fifty years with great success for assessing large and complex projects. It was originally developed in the late 1960's to improve project planning and evaluation for the US Agency of International Development (Reference?). It has been adopted by many development agencies throughout the world and is considered to be a highly adaptive process.

The approach is an iterative process that includes four crucial interlocking steps (or concepts).

- Problem Statement/Situation Analysis
- Stakeholder Analysis
- Objectives Analysis
- Project Strategy

These steps are typically performed in parallel which provide the opportunity to iterate each step as the process progresses. The output or product of the process is a Logical Framework Matrix (LFM) and an action plan for the project. It is important to note that the LFA is a thinking tool which seeks to establish and organise causal relationships between the existing situation, problem analysis, stakeholders and objectives, in this way solutions can be understood as to their effect on the whole of the system.

The LFA has been adapted for use in the Little Oneroa Stream Project to address the water quality issues of the stream in the context of integrated catchment management. As stated in the Little Oneroa Action Plan:

"The Little Oneroa Lagoon Action Plan is based on the Logical Framework Approach (LFA), a methodology for quality-based understanding of planning, based on a participatory and transparent planning process, aimed towards the needs of partners and target groups, in which the key elements of a project are agreed on step by step, in teams, with those concerned, and recorded transparently.

The final output is the Logical Framework Matrix which details the purpose (overall goal), specific objectives, outputs and activities, by

- *Analysing an existing situation, including the identification of stakeholders' needs and the definition of related objectives;*
- *Establishing a causal link between inputs, activities, results, purpose and overall objective (vertical logic);*
- *Defining the assumptions on which the project logic builds;*
- *Identifying the potential risks for achieving objectives and purpose;*
- *Establishing a system for monitoring and evaluating project performance; and*
- *Providing a communication and learning process among the stakeholders, i.e. beneficiaries, planners, decision-makers and implementers." (Little Oneroa Stream Action Plan)*

3.1.1 WORKSHOP SUMMARY

The LFM and Action Plan were developed through seven facilitated workshops held from 8 to 29 October 2015, organised and promoted by the Waiheke Resources Trust (WRT), altogether a total of 107 participants attended the workshops. There were two series of workshops, one series of four workshops held on Thursdays and one series of three

workshops held on Saturdays, to cater for different audiences. Prior to the workshops WRT carried out a door knocking campaign within the catchment in July 2015 and also surveyed the residents to find out their views on managing Little Oneroa Stream. The Thursday workshop series were attended by a multidisciplinary team of experts from Auckland Council, Auckland Transport and experts from the local community as well as interested community members. Tony Miguel led the workshops and coalesced the data at each step of the process. He also authored the Action Plan, LFM and preliminary implementation plan commissioned by the Waiheke Resources Trust and funded by Auckland Council. The Saturday workshop series were attended mainly by interested community members bringing in their local knowledge.

3.2 PROBLEM STATEMENT (SITUATION ANALYSIS)

The process began with the situation analysis, identification of problems and their source and definition of the problem statement. The first workshop opened with a greeting to the workshop, overview of the LFA and introduction of everyone attending the workshop. The situation analysis was presented by Auckland Council staff.

The following is a summary of the situation analysis presentation:

"Project Little Oneroa is an initiative of the Waiheke Resources Trust to lead a community initiative to clean up the Little Oneroa Stream, funded initially by seed funding from the company Clean Stream Waiheke Ltd and grant funding from Council's Environmental Initiatives Fund and the a contribution from the Waiheke Local Board.

Little Oneroa stream meets the coast at Little Oneroa beach, a popular beach on Waiheke's northern coast, enjoyed by many for its scenic beauty, accessibility and amenities. The Little Oneroa stream is impounded by sand at its mouth and does not flow to the sea, forming a small lagoon for short times of the year, usually after long dry times at the end of summer. The first heavy rain after this period clears it then again. It is a natural process, which is common for small streams draining into the Hauraki Gulf. The lagoon is right beside a popular children's playground where children are naturally drawn to paddle and play in the warm shallow water.

The Little Oneroa lagoon has a long history of serious faecal contamination which poses a public health risk. Monitoring of Little Oneroa Lagoon from 2005 to 2009 found the median e- coli level was four times higher than the Ministry for the Environment (MfE) and Ministry of Health (MHF) guidelines for safe swimming. This resulted in the lagoon having a permanent warning sign erected to discourage recreational use. Water testing carried out in 2010 at several sites in the stream catchment showed that 17% of stream samples exceeded the MfE/MoH guidelines.

An Auckland City Council source tracking study in 2007/2008 detected human faecal sources in the lagoon as well as bird and dog sources. The human source is likely to be from failing on-site wastewater (septic) systems. A Council project in 2008/09 identifying and enforcing wastewater system failures in the Little Oneroa catchment failed to result in any sustained improvements in stream water quality. Removal of the ducks from the downstream and lagoon areas in 2010 appeared to have made positive improvements to water quality at the lagoon monitoring site in the short-term but this improvement was not sustained.

Water testing was carried out under the Auckland Council 'Safeswim' programme in the Little Oneroa lagoon plus a site 100m upstream, over a 4 week period in Feb-March 2015. The results show that E-coli levels were regularly many times higher than the national limits for freshwater. Pollution levels are also likely to be related to weather, tidal conditions and the amount of sand blocking the lagoon's flow to the sea. Safeswim data indicates that the contamination of the lagoon does not affect beach water quality at

Little Oneroa beach for most of the time but that it may be affected by heavy rainfall events." (Little Oneroa Stream Action Plan)

During and after the presentation many questions were asked and answers proffered from various workshop attendees. The general tenor of the workshop quickly became a collaboration of experts and residents alike.

Three groups were formed and following instruction they set about creating lists to define all of the problems, both perceived and real, within the catchment. Each group chose a presenter and the lists were presented in summary to the other groups. During each presentation discussion problems were filtered out that were more perceived than real and to add or elaborate on problems that were overlooked or understated. The lists were then formed into the first draft of the initial problem statement.

The groups were again instructed to meet and expand their lists by determining the sources of the problems. A similar process was followed, selecting a presenter and discussing each result to filter and elaborate on each source. The problem statement was revisited and refined.

This process was repeated several times in order to continue to refine the problems, sources and define a problem statement that the entire workshop could agree on, in fact it took the majority of the first two workshops to come to an agreement.

Eventually the problem statement was finalised and became the problem statement for the project.

The final problem statement is

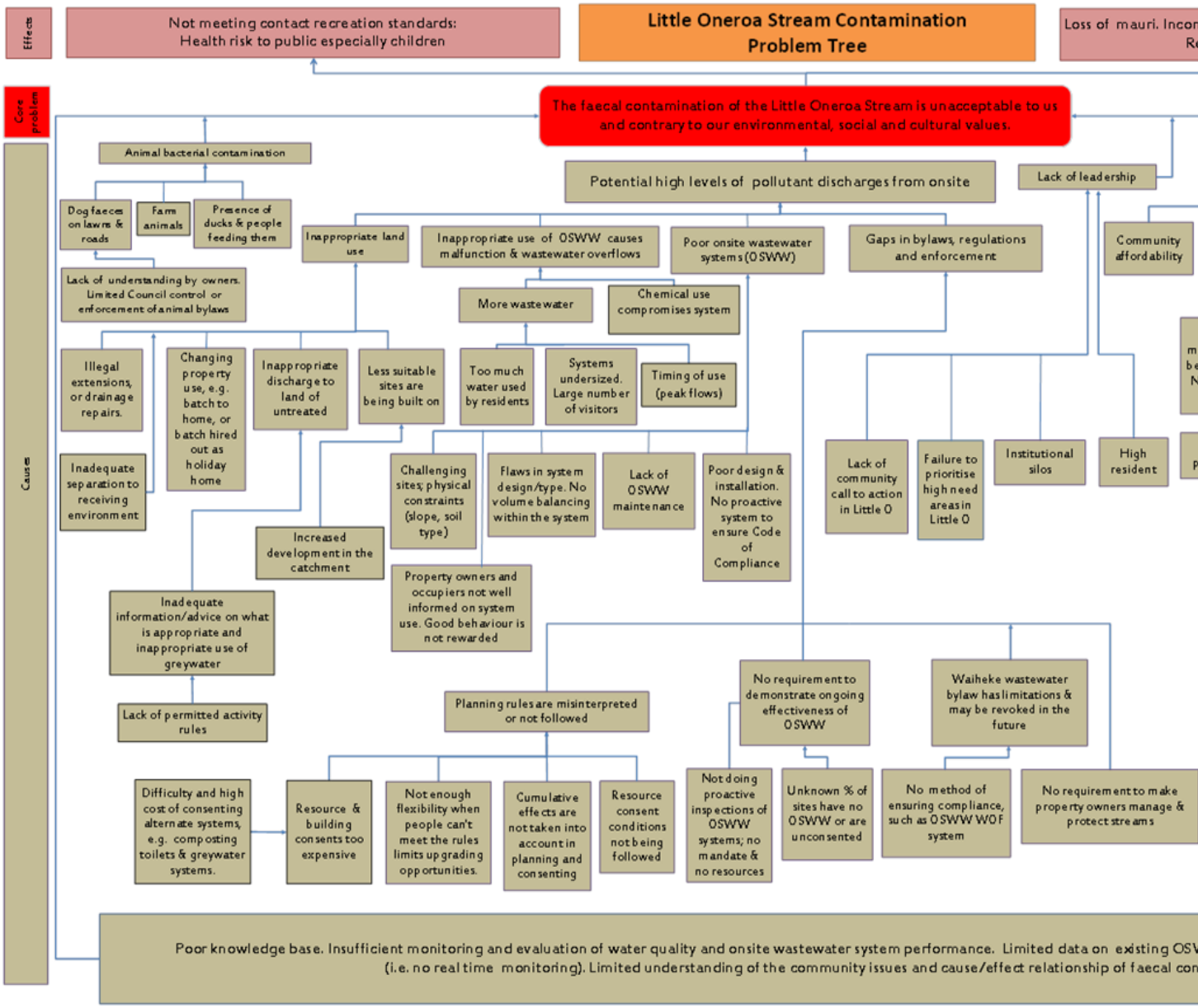
"The faecal contamination of the Little Oneroa Stream is unacceptable to us and contrary to our environmental, social and cultural values."

The evolution of the problem statement demonstrated how the iterative refinement process honed the actual problems which in turn provided a clear purpose for the project. This enabled the objective analysis and action plan to be focused and effective.

It is important to note that defining the problems, sources and problem statement in this way may appear to be inefficient, but it creates many efficiencies throughout the planning process. First it is a cathartic process for residents, many who are long standing, to be heard by a group that is knowledgeable and working on a solution. It dispels perceived problems utilising knowledge, data and experience. Dispelling these perceptions is also iterative, usually requiring revisiting a perceived problem several times, especially for people who have held a particular perception for a long time. It is important to be patient, yet factual, to avoid being dismissive of any individuals input and bolstering the collaborative workshop environment. Lastly the process brings together local experts and governing experts from a multidisciplinary background and creates an interchange of knowledge that often doesn't happen until much further into the planning/design process or sometimes not at all. The result achieved initial community buy-in, focused purpose and created a multidisciplinary team that have a common understanding and agree on the same set of problems, sources and purpose.

The figure below is the finalised problem tree that resulted from the first two workshops and was integrally used for the objective and shareholder analysis.

Figure 2 Problem Tree



3.3 OBJECTIVE ANALYSIS

The objective analysis and shareholder analysis were performed in parallel through-out the workshop sessions three and four. The objective analysis became the bridge between the problem statement and the specific actions that are organized in the LFM and action plan. The first step was to use the problem statement and rewrite it as a purpose statement.

The purpose statement, in contrast to the problem statement and because of the effort defining the problem statement, was written and agreed quickly.

"To restore the Little Oneroa Stream so that it is safe for human contact and recreation and meets our environmental, social and cultural values."

The workshop was again split into three groups and instructed to identify specific activities for the project using the list of problems identified in the first step and present them to the other two groups. The groups listed dozens of activities for the project and through collaboration were able to refine the lists and add activities that were overlooked.

The groups were then instructed to list the outputs expected from the project in a table with the following headings:

- Outputs - Expected Results
- Objectively verifiable indicators of achievement
- Sources and Means of verification
- Assumptions

The groups were then asked to group the activities that would support each output. Through several iterations the activities were categorised into the six specific outputs they would support. The finalised Outputs table and the specific activities supporting each Output are detailed in tables below.

The six specific output categories are:

- Manage bacterial contamination from animals
- Reduce levels of pollutant discharges from onsite wastewater systems
- Effective Leadership
- Secure Funding
- Protect and Restore the Stream ecological values
- Management of the lagoon

Table 1 Little Oneroa Action Plan Specific Outputs

Outputs- Expected results	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
1. Bacterial contamination from animals is managed 2. Reduced levels of pollutant discharges from onsite wastewater systems 3. Effective leadership 4. Funding is secured to deliver the Action Plan 5. Streams are protected and their values are restored 6. The Lagoon is managed to reduce public health risks	1. Actions to reduce impact of animals on water quality 2. Information on the performance of onsite wastewater systems. 3. Annual performance report. 4. Amount of funding secured. 5. Length of streams restored. 6. Number of lagoon closures.	1. Records of actions and results 2. Results of voluntary inspections of OSWW 3. Annual performance report of Action Plan implementation. 4. Annual funding report. 5.1 GIS and other records of stream restoration. 5.2 Catchment Management Plan developed and implemented. 6. Lagoon management plan developed	• Adequate funding and resourcing. • Proactive community participation and outreach. • Animal management methods are effective. • Property owners are willing to participate. • Cost effective testing of OSWW. • Stakeholder agreement on inspections & regulatory framework. • Options for treatment of the lagoons are feasible • Auckland Transport and Stormwater are willing to participate in the design and implementation of improvements identified in the catchment management plan. • Adequate council

			resources for inspection and compliance management. • WRT will be confirmed as the long term programme manager.

Table 2 Activities for Output 1. Manage bacterial contamination from animals

No.	Activities
1.1	Contact owners in upper catchment and encourage stock exclusion
1.2	Put up signs why not to feed the ducks (& other messages on the sign)
1.3	Control duck numbers, investigate options to deter/scare ducks
1.4	Beach Ambassadors to educate beach users on not feeding the ducks, keeping kids out of stream and p
1.5	Education of dog owners to provide advice on the effect of dog droppings and measures to avoid contam

Table 3 Activities for Output 2. Reduce levels of pollutant discharges from onsite wastewater systems

No.	Activities
2.1	Marketing: promote good news stories, and appeal to the community to help by ensuring they look after their OSWW and participate in voluntary inspections on a confidential basis.
2.2	Investigate potential for community/council delivery of free health checks of whole OSWW (including discharge)
2.3	Advocate for reduced consent fees for septic tank upgrades (note that this is an Annual Plan or Long Term Plan issue)
2.4	Advocate for loan system under rates for septic tank upgrades (note that this is an Annual Plan or Long Term Plan issue)
2.5	Implement voluntary OSWW programme (subject to a review of the outcomes of Actions 2.1 to 2.4)
2.6	Work with real estate agents to include OSWW checks as a condition in sale and purchase agreements
2.7	Work with letting agencies to include conditions in Tenancy Agreements to ensure good OSWW management (such as setting maximum occupancy and water metering of tank water use)
2.8	Promote education of engineers, building officers, and service providers on short circuiting between wastewater and stormwater and good OSWW practice
2.9	Advocate with Auckland Council that the Waiheke Wastewater Bylaw review includes consultation with the community on including compulsory checks or a WOF for OSWW
2.10	Advocate for the introduction of Permitted Activity (more liberal and simpler) rules for composting toilets and greywater systems, with supporting guidelines to make it cheaper and easier to get consents; in conjunction with the review of TP58

Table 4 Activities for Output 3. Leadership

No.	Activities
3.1	Establish a Little Oneroa Liaison Group, key tasks: • Developing a data and knowledge repository • Coordination, project management, funds and budget management of the Action Plan • Recruitment of volunteers and securing resources • Providing a political continuity plan • Advocacy to secure funding and making applications to funders
3.2	Establish a well-known brand by building on the existing initiatives
3.3	Identify a project champion and sponsor
3.4	Identify and engage with potential champions: political (Local Board, Auckland Council and Central Gove

Table 5 Activities for Output 4. Secure funding

No.	Activities
4.1	Fund raising events
4.2	Contribution and support from community groups (may be in kind)
4.3	Seek support from business and commerce; e.g. Fullers, banks, tourism operators, local businesses, AT
4.4	Funding applications to public good organisations
4.5	Support from private benefactors or philanthropic organisations
4.6	Secure funding by advocating for inclusion of the Action Plan in the Waiheke Local Board Plan 2017
4.7	Advocate for the Action Plan to be included in the Auckland Council Annual Plan and Long Term Plan
4.8	Work with Auckland Council to investigate a region-wide targeted rate for onsite wastewater manageme

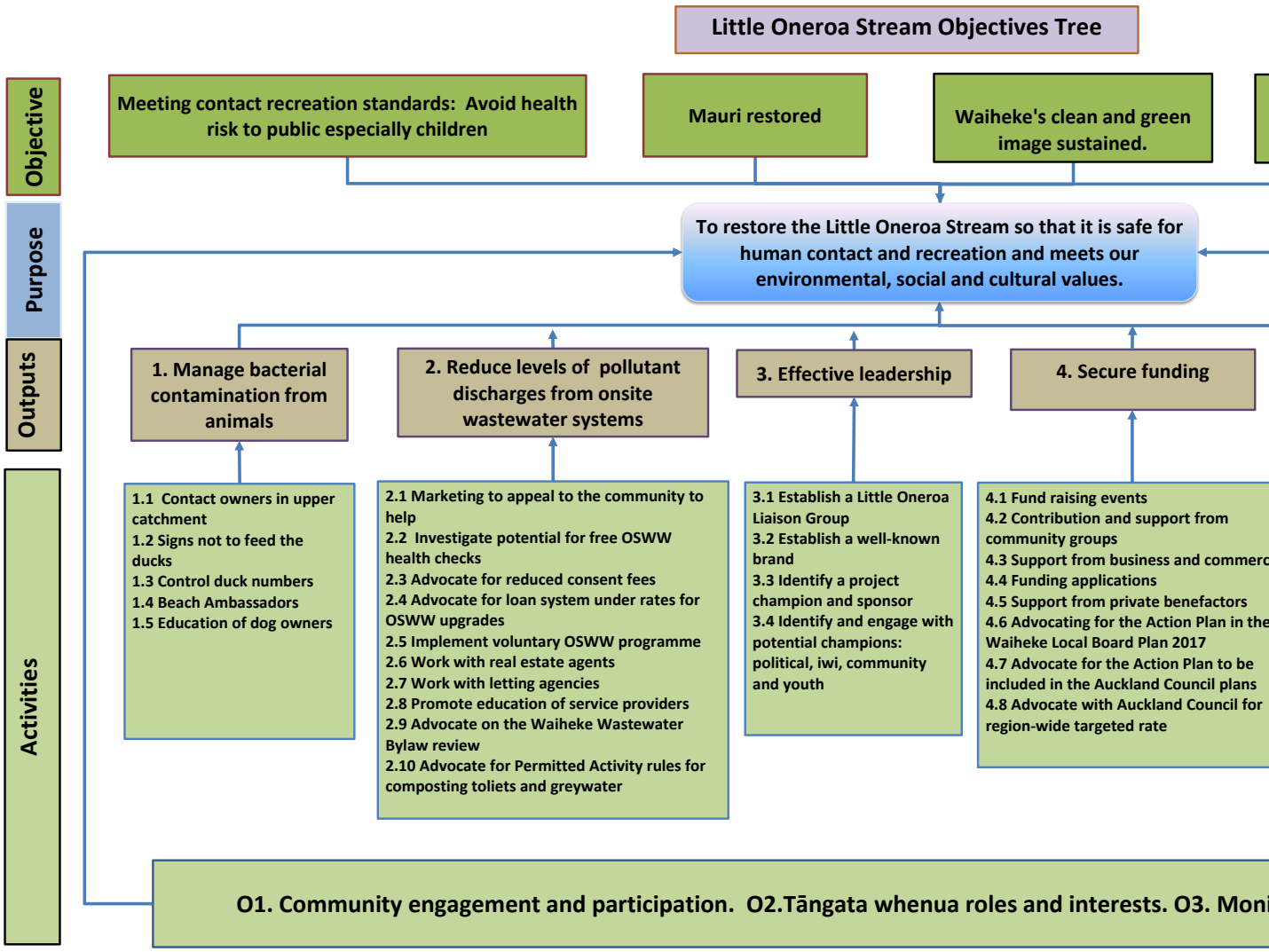
Table 6 Activities for Output 5. Protect and restore stream ecological values

No.	Activities
5.1	Education and involvement • Expert workshops, e.g. riparian planting and wetland restoration • Data sharing • Promote through social media • Establish an interactive website • Provide water education at the playground • Develop models for kids
5.2	Develop and implement a catchment management plan including options assessment, a restoration plan
5.3	Implement pilot projects to demonstrate good practice • Work with Auckland Council Stormwater and Auckland Transport to lead by example • Work with property owners
5.4	Promote and implement Water Sensitive Design techniques, e.g. green roof, permeable paving, biofilter • Management of overland flowpaths • Management of road stormwater

Table 7 Activities for Output 6. Management of the Lagoon

No.	Activities and ***sub-activities***
6.1	Install signage with messages to not feed the ducks, pick up after your dog and no swimming (already t
6.2	Provide educational workshops with interactive learning
6.3	Develop an agreed implementation plan
6.3.1	Carry out an assessment of all lagoon management options
6.3.2	Consult on the options and determine feasibility
6.3.3	Develop an implementation plan for the preferred options or options

Figure 3 Objectives Tree



Utilising the six specific outputs and category specific activities in concert with the project purpose statement the group collaboratively defined the four main objectives for the project. Again the objectives analysis step utilised the bottom up approach to analysis wherein the specific activities have informed the outputs which have in turn informed the objectives.

3.4 STAKEHOLDER ANALYSIS

The stakeholder analysis was completed in parallel with the activities and outputs analysis and before the objectives analysis. This is crucial to understand as the stakeholder, activities and outputs analysis were used in an iterative process to assist in the refinement of each analysis.

The groups were given instructions to identify stakeholders and estimate the following for each stakeholder:

- Interests
- Effect of the Little Oneroa Stream Project on their interests
- Importance of the stakeholder for successful implementation
- Degree of influence of the Stakeholder

As stated in the previous section the stakeholder analysis was also used to inform and establish the objectives for the project. Additionally the stakeholder analysis was critical for the development of the preliminary implementation plan as it identified the resources that are most important to carry forward the action plan.

Table 8 is an example of the output from the stakeholder analysis.

Table 8 Stakeholder Analysis

Stakeholder Group: Beneficiaries	**Interests**	**Effect of the Little Oneroa project on their interests**
Local community of today (property owners in the catchment, social , psychological and medical)	Safety. Aesthetics. Community pride. Mauri. Health. Personal integrity, land value, being able to have a safe and sanitary property. Considering wastewater as a resource.	Increased value, increased health, pride, connected socially
Local community of the future	Healthy environment.	Do not want to inherit a problem. Important that any work is continued by them.
Auckland Council and Council Controlled Organisations (CCO)	Safe and sanitary. Clean environment. Enhanced reputation. Less long term costs and optimising regulatory efforts.	Precedence, expenditure, achieving "world's most liveable city" goal. Avoiding reputational loss. Facilitation. Providing funding, data and information.
Iwi	Respect, customary responsibility, spiritual health, natural balance, kaitiakitanga (guardianship)	High
Neighbours of the stream	Ensuring a safe, healthy and attractive stream with no offensive odours.	Positive or negative
Waiheke Resources Trust	Implementing a successful project	Positive
Toddlers	Freedom	Legacy
Holiday homeowners and tourism operators.	Pride in their business. Increase in business. Cost and financing.	Can help promote awareness on how to use septic systems.
Flora and fauna	Happy and healthy	Indicators of remediation
Families	Safe beach/stream, health, modelling right behaviour	A way of being involved, connectedness, less sickness
Local businesses	Image, reputation, more visitors to optimise revenue	Boosting economy, boosting profile for more business
Environment and ecosystems	Balance, health, prosperity. Good water quality.	High
Tourists	Pristine, clean, safe and healthy	Need to ensure that they are aware of septic systems and proper functioning.
Recreationalist	Safety, abundance, enjoyment, connection	High
Onsite wastewater systems providers	More business. Opportunity for innovation.	Skilled professionals will ensure better systems.

4 CONCLUSION

4.1 ACTION PLAN OUTCOME REVIEW

The LFA process was successful for the establishing the Little Oneroa Stream Project Action Plan. It has clearly stated purpose and objectives, well defined challenges that need to be solved and a solid understanding of the stakeholders that are required to successfully achieve its objectives. The outputs of the project are achievable and verifiably measureable.

It is important that this was accomplished by bringing together the community, governance and experts that formed a team to collaboratively tackle the problem. None of these groups in isolation would have been able to achieve the same result for focused planning. The buy-in from the community for this project has happened from the onset. Enabling the community residents a time and place to air their grievances and thoughts was cathartic and allowed the process to move forward unencumbered by "perceived problems" that were not based on scientific evidence, but anecdote.

The multidisciplinary team of experts that were involved in the workshops included onsite wastewater treatment design and operators, fresh water ecologists, water quality specialists, catchment planning specialist, wastewater specialist and water resource engineers. These members of the workshop brought expertise and innovation by working together and understanding one another's professional perspectives. These expert members of the workshop were evenly spread throughout the three groups and that helped keep the groups focused.

The LFA process provided a structural platform for vertical thinking that established the challenges and worked from the bottom up to the objectives and outputs. The clear understanding of the project in this manner has also enabled effective lateral thinking that is resulting in innovation for this project and beyond. Researching new filtration technologies, design of new treatment systems, more focused structuring of catchment plans and furthering water sensitive infrastructure are a few of the pilot projects that are being undertaken by various members of the workshop.

It is recommended that future integrated catchment management projects consider the LFA process for project planning. Especially when the catchment includes a highly visible shared public resource and amenity such as a stream, beach or other riparian area.

4.2 THE NEXT STEP - IMPLEMENTATION PLAN

The implementation plan is the next step of the project. There was not sufficient time at the workshops to develop a detailed implementation plan with detailed budgets. The outline of an implementation plan was put forward as an Appendix of the Action Plan and focused on two activities thought to be the most critical for the project, Integrated Catchment Management Planning and Community Engagement and Education. These two activities were viewed as the most essential first steps to achieving the projects objectives. The Waiheke Resources Trust and Little Oneroa Stream Project are continuing the community engagement and education and establish the implementation plan for the catchment planning process. There is still much work to be done as this is just the first step to restore this catchment to health and achieve sustainable integrated catchment management including detailed budgeting as well as identifying and securing the funding for the required works.

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