# SEPTAGE MANAGEMENT LEADER'S GUIDEBOOK

PHILIPPINES EDITION

OXFAM

*Any views or opinions presented in this manual are solely those of the authors and do not necessarily represent those of Oxfam. Users of this manual should consult with qualified engineers or other specialists prior to implementing the activities in this manual.*

# Septage Management Leader's Guidebook

# PREFACE

*Neric O. Acosta, Ph. D.*

In 2004, the government of the Philippines passed the Clean Water Act which mandates the establishment of septage management programs at the local government level. The Act clearly states:

> *… Each local government unit shall appropriate the necessary land, including the required rights-of- way / road access to the land for the construction of sewage and/or septage treatment facilities.*

And further, that:

> *Each unit may raise funds through local property taxes and enforcement of a service fee system to subsidize necessary expenses for the operation and maintenance of the sewerage treatment or septage facility servicing their area of jurisdiction.*

*Neric O. Acosta, the Secretary Presidential Adviser for Environmental Protection, current General Manager of the Laguna Lake Development Authority, and principal author of the Clean Water Act of 2004.*

Now, 11 years after the Act was passed, lack of septage management programs is as pressing a need as ever. But there is room for optimism. Many cities and municipalities throughout the Philippines are now discussing methods of improving local sanitation, and septage management is on the radar of many of their mayors. Through the activities of donor and supporting organizations such as Oxfam GB, our capacity is being built through the introduction of international best practices. This helps to create an enabling environment where establishing septage management programs at scale throughout the Philippines becomes possible. This manual is part of that agenda.

The **Septage Management Leader's Guidebook** is not like any guidebook you have seen yet on this topic. It breaks down the process of implementing septage management programs in an easy to read, step-by-step basis. Follow your progress through self-assessments and make sure you cover all of the issues through checklists provided for each task. Finally, refer to the QUICK START GUIDE located at the beginning of each step to see in a "snapshot" the key activities that will be achieved at the conclusion of each step.

We hope you find this manual useful and that it helps you to develop effective and cost recoverable septage management programs in your municipality. The references and web links located throughout this manual will be of substantial help in taking those important strides to make this program sustainable and scalable for many more communities and local governments in the country.

# PREFACE

*Jonathan Parkinson*

*Jonathan Parkinson is an environmental engineer and Senior WASH Programme Development Strategist at Oxfam.*

OXFAM was one of many organizations that took part in the humanitarian response following Typhoon Haiyan, to provide essential water, sanitation and hygiene promotion services. However our work also considered longer term development needs, in particular the improvement of sanitation systems (not just provision of toilets) to reduce environmental health risks associated with water and sanitation related diseases.

As a result, OXFAM in partnership with local government units, UNICEF, and many other organizations, initiated a comprehensive sanitation program incorporating community led total sanitation (CLTS) to eradicate open defecation, sanitation marketing to promote demand for sanitation services and improvements in septage management to address the uncontrolled discharge of untreated fecal sludge into the environment. The program focused on three provinces in the Visayas region - Eastern Samar, Leyte and Northern Cebu (including Bantayan Island) and covered fourteen municipalities.

A key objective was to enable local governments to establish sustainable septage management services to treat sludge from septic tanks and meet their mandates under the Government of the Philippines' Clean Water Act (2004). So far the project has received a great deal of interest from municipalities who appreciate the technical, institutional and financial support being offered to help them fulfill their responsibilities.

This manual forms part of this project and will be a very useful aid for those municipalities who want to take steps to establish effective septage management and a clean environment. It contains various checklists and support tools for decision making in relation to technical choice and financial analysis, and breaks down the challenging process into easily understandable steps allowing for progress to be monitored through a process of self-assessment.

I am pleased to be adding my encouragement and support to municipalities and feel sure that with their energy and commitment, and ongoing assistance from development organizations such as OXFAM, the Government of the Philippines can make strong progress towards their Sustainable Development Goals and *'halve the proportion of untreated wastewater (including septage) being discharged into the environment'* by 2030.

# ACKNOWLEDGMENTS

Oxfam is grateful to all who were involved in the creation of this Septage Management Leader's Guidebook, with special thanks to the Oxfam's Septage Management Team composed of Jeremy Ockelford, Tom Skitt, Nene Narvaez, Carlito Santos, Josie Antonio and Dave Robbins.

First, our deepest appreciation to the Philippine Business for Social Progress (PBSP); our partner in septage management and administrator of Oxfam's Septage Management Revolving Fund.

We would also like to acknowledge the mayors of the Typhoon Yolanda (international name Haiyan) affected municipialities who continue to help us test the methodologies presented herein.

Finally, we are proud to acknowledge the entire Oxfam, GB team working in the Philippines to ensure that every Filipino has a right to realize their potential, and to live free of poverty in a secure and more equitable world.

# AUDIENCE FOR THIS MANUAL

This Leader's Guidebook is intended to build the capacity of those tasked with setting up septage management programs for a city, municipality, or even for a private sector company. It provides checklists, case studies, ideas, and suggestions that you can use to inspire your Technical Working Group into action. Follow the links and references for additional information.

# CONTENTS

# ACRONYMS

| | |
|---|---|
| **ABR** | Anaerobic Baffled Reactor |
| **BSM** | Basic Septage Management |
| **CNC** | Certificate of Non-Coverage |
| **CWA** | Clean Water Act |
| **DENR** | Department of Environment and Natural Resources |
| **DOH** | Philippine Department of Health |
| **ECC** | Environmental Compliance Certificate |
| **ESC** | Environmental Sanitation Clearance |
| **EMB** | Environmental Management Bureau |
| **FGD** | Focus Group Discussion |
| **FS** | Feasibility Study |
| **IEC** | Information and Education Campaigns (aka "promotion" campaigns) |
| **IRA** | Internal Revenue Allotment |
| **MDFO** | Municipal Development Fund Office |
| **MENRO** | Municipal Environmental and Natural Resources Officer |
| **MHO** | Municipal Health officer |
| **NGO** | Non Governmental Organization |
| **NSSMP** | National Sewerage and Septage Management Program |
| **OD** | Open Defecation |
| **ODF** | Open Defecation Free (communities) |
| **RTA** | Rapid Technical Assessment |
| **SB** | Sangguniang Bayan (municipal council) |
| **SI** | Sanitary Inspector |
| **SMP** | Septage Management Program |
| **SMRS** | Septage Management Readiness Score |
| **SpTP** | Septage Treatment Plant |
| **SMDST** | The USAID Septage Management Decision Support Toolkit |
| **TWG** | Technical Working Group |

# DEFINITION OF TERMS

*The following are some of the terms (from the Consortium of Institutes for Decentralized Wastewater Treatment, 2013) used in this manual. The ones not used in the manual are still important, and you will likely encounter them as you proceed:*

**Aerobic Treatment Unit (ATU)**
1. Treatment component that utilizes oxygen to degrade or decompose wastewater, with or without mechanical means; 2. Term traditionally used to describe proprietary devices that use direct introduction of air into wastewater by mechanical means to maintain aerobic conditions within the pretreatment component.

**Anaerobic Digestion**
The degradation of concentrated wastewater solids by anaerobic bacteria. These break down the organic material into inert solids, water, carbon dioxide, and methane, which can provide energy benefits.

**Baffle**
Physical barrier placed in a tank to dissipate energy, direct flow, retain solids and fats, oil and grease FOG, and/or draw water from a specific depth. In a septic tank, an inlet baffle is a pipe, tee, or wall segment at or near the inlet pipe of a tank which is designed to dissipate energy, direct flow below the wastewater surface, isolate scum from the inlet pipe, and allow ventilation. An outlet baffle is a Pipe tee or wall segment at or near the outlet pipe of a tank designed to collect flow from the clear zone, isolate scum from the outlet pipe, and allow ventilation.

**Biosolids**
Dewatered, primarily nutrient-rich organic material generated as a by-product of biological wastewater treatment processes that can be recycled (such as for use as a soil amendment).

**Biochemical Oxygen Demand (BOD)**
Quantitative measure of the amount of oxygen required for the biological oxidation of nitrogenous material (such as ammonia nitrogen and organic nitrogen) in wastewater; typically measured after a 5-day period.

**Chemical Oxygen Demand (COD)**
Amount of the organic matter in wastewater that can be oxidized by a very strong chemical oxidant; typically measured by a standard test using dichromic acid as the oxidant.

**Combined Sewer**
A sewer intended to receive both wastewater and storm- or surface-water

**Coliform Bacteria**
Group of bacteria that constitute most of the intestinal flora of warm-blooded animals (including the genera Klebsiella sp., Enterobacter sp., Citrobacter sp., or Escherichia sp.) and are used as water pollution indicator organisms.

**Composite Sample**
Commingled individual samples collected from the same point at different times; samples may be of equal volume or may be proportional to the flow at time of sampling.

**Desludging**
The process of cleaning or removing the accumulated sludge or septage from a septic tank or wastewater treatment facility.

**Destination**
The place or the facility where the septage/sludge is treated or disposed of, such as the treatment facility, sanitary landfill, or land application site.

**Domestic Sewage**
Wastewater of residential strength, or effluent from a septic tank or other primary treatment device with a BOD5 less than or equal to 170 mg/L; total suspended solids (TSS) less than or equal to 60 mg/L; and fats, oils, and grease less than or equal to 25 mg/L. It may include wastewater from commercial or food service sources, but not industrial wastes.

**Dry Weather Flow**
The flow of wastewater in a combined sewer during dry weather. Such flow consists mainly of wastewater with no storm water included.

**Excreta**
Human waste composed of urine and feces.

**Effluent**
Liquid flowing out of a component or device.

**Facultative**
Having the ability to live under different conditions; for example, with or without free oxygen.

**Grab Sample**
Discrete sample collected at a particular time and location.

**Helminthes**
Parasitic worm-like organisms that feed off living hosts and produce eggs that persist in wastewater effluent and septage sludge unless properly treated.

**Impermeable**
Not permitting the passage of fluid through pores; in practical terms, some small level of hydraulic conductivity may occur, but at so low a level (e.g., 1 x 10-7 cm/s) that it is considered to be negligible.

**Landscape Loading Rate**
The cumulative total of effluent applied to the soil profile at the down gradient end of a dispersal system installed on a slope, expressed as volume per unit length per unit time along the contour.

**Lagoon**
Constructed basin lined with either soils with very low permeability or a synthetic material, surrounded with berms and which contains wastewater which utilizes natural bacteria to break down waste via physical, chemical, and biological processes. Maybe aerobic — shallow allowing dissolved oxygen to permeate throughout the depth; aerated — using mechanical devices to impart dissolved oxygen to the water; facultative — having both oxygen rich and oxygen poor zones; and anaerobic — where dissolved oxygen is devoid throughout the entire water column.

**Methane (CH4)**
A colorless, odorless, and flammable gas present in natural gas and formed by the anaerobic decomposition of organic matter or produced artificially by heating carbon monoxide and hydrogen over a nickel catalyst. See also: anaerobic digestion.

**Pre-treatment**
Any component or combination of components that provides treatment of wastewater prior to conveyance to a final treatment and dispersal component or reuse; often, this treatment is designed to meet primary, secondary, tertiary, and/or disinfection treatment standards.

**Primary Treatment**
Physical treatment processes involving removal of particles, typically by settling and flotation with or without the use of coagulants; (e.g., a grease interceptor or a septic tank provides primary treatment).

**Scum**
Layer of floating material on a liquid surface which may include fats, oil, and grease (fog) or other solid wastes that float.

**Secondary Treatment**
Biological and chemical treatment processes designed to remove organic matter; a typical standard for secondary effluent is BOD and TSS generally to a level of less than or equal to 20 mg/L each on a 30-day average basis.

**Septage**
Liquid and solid residuals (sludge) that accumulate and must ultimately be removed from pretreatment devices, septic tanks, seepage pits, portable toilets, or similar components.

**Service provider**
A public or private entity engaged in site evaluation, system design, construction, inspection, and operation and maintenance. Includes those that collect, transport, and treat septage and fecal sludge.

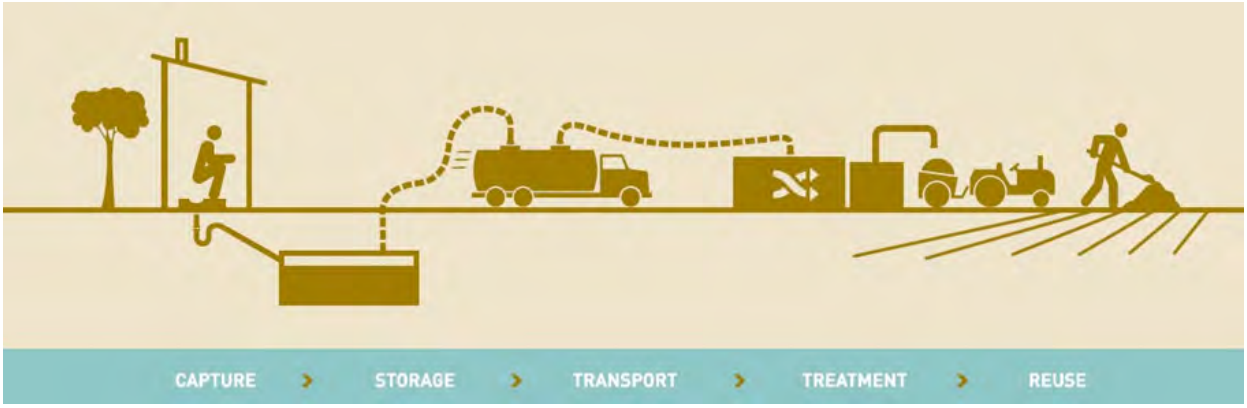
**Sewage**
Untreated wastes consisting of blackwater and graywater from toilets, baths, sinks, lavatories, laundries, and other plumbing fixtures in places of human habitation, employment, or recreation.

**Sewer**
Otherwise known as sewer collection systems, they are systems of piping, lift stations, and other appurtenances that receives and conveys wastewater either by gravity or pressure.

**Sludge**
Precipitated solid matter with a highly mineralized content produced by domestic wastewater treatment processes.

**Value Chain**
The goods and services that are provided to deliver a service. For septage management it includes all of the products and services centered around the capture, collection, transport, treatment and reuse of fecal sludge.

*Sanitation Value Chain*




*The Gates Foundation diagram above depicts the Sanitation Value Chain, a solution that starts with the individual and toilet, followed by storage, transportation and treatment of human waste, and ends, ideally, with safe, usable byproducts such as fertilizer, fuel or clean water. (http://www.abettertoilet.org), 2016.*

# INTRODUCTION

## Self Assessment: The Septage Management Readiness Score

Before you begin planning your new septage management program, it is useful to better understand your current situation or baseline. This Septage Management Readiness Score is designed to do just that! Answer the following questions about your city or municipality as it relates to your septage management program:

| # | Statement | Yes | No |
|---|---|---|---|
| 1 | The mayor is committed to improving sanitation in our community. | | |
| 2 | We have appointed a Technical Working Group to look into developing a Septage Management Program (SMP). | | |
| 3 | We have held a stakeholder meeting to share our sanitation concerns with our community. | | |
| 4 | We are willing to draft a septage management ordinance to set into law the rules and regulations for our SMP. | | |
| 5 | We are willing to establish a tariff system to pay for the scheduled desludging operations and understand this may average between 30 – 45 pesos per family per month (2016 pricing). | | |
| 6 | We will develop a promotions campaign to educate our citizens on best sanitation practices. | | |
| 7 | We have set aside a piece of land for a septage treatment plant. | | |
| 8 | We will conduct a survey or Rapid Technical Assessment to determine the daily amount of septage we have to manage and identify the constraints in collecting it. | | |
| 9 | We will enter into discussions with the water service providers and to determine how we can work together to best accomplish septage management. | | |
| 10 | We will enter into discussions with the private sector to determine if a public – private – partnership is feasible. | | |

To know what your Septage Management Readiness Score is, add up the number of "yes" answers and multiply by 10. How did you do? If your score is 80 points or above, congratulations! You are ready to begin the process of developing a septage management program for your municipality.

If your score is below 80 points, don't despair. Use the guidance in this manual to address the "No" answers and try the self assessment again.

## The Septage Management Decision Support Toolkit

The Septage Management Decision Support Toolkit (SMDST) is a product of the United States Agency for International Development, with technical expertise provided by MWH Global. Use the SMDST in conjunction with this manual to:

- Determine design flow  in terms of cubic meters per day of septage to collect and treat;
- Create an area-wide collection plan;
- Determine capital costs (CAPEX) of trucks, transfer stations, and treatment facilities;
- Determine operating expenses (OPEX) for collection, treatment and biosolids processing; and
- Determine a sustainable tariff to achieve full cost recovery.

For Oxfam projects, the SMDST is available through your technical service provider at the Philippine Business for Social Progress (PBSP).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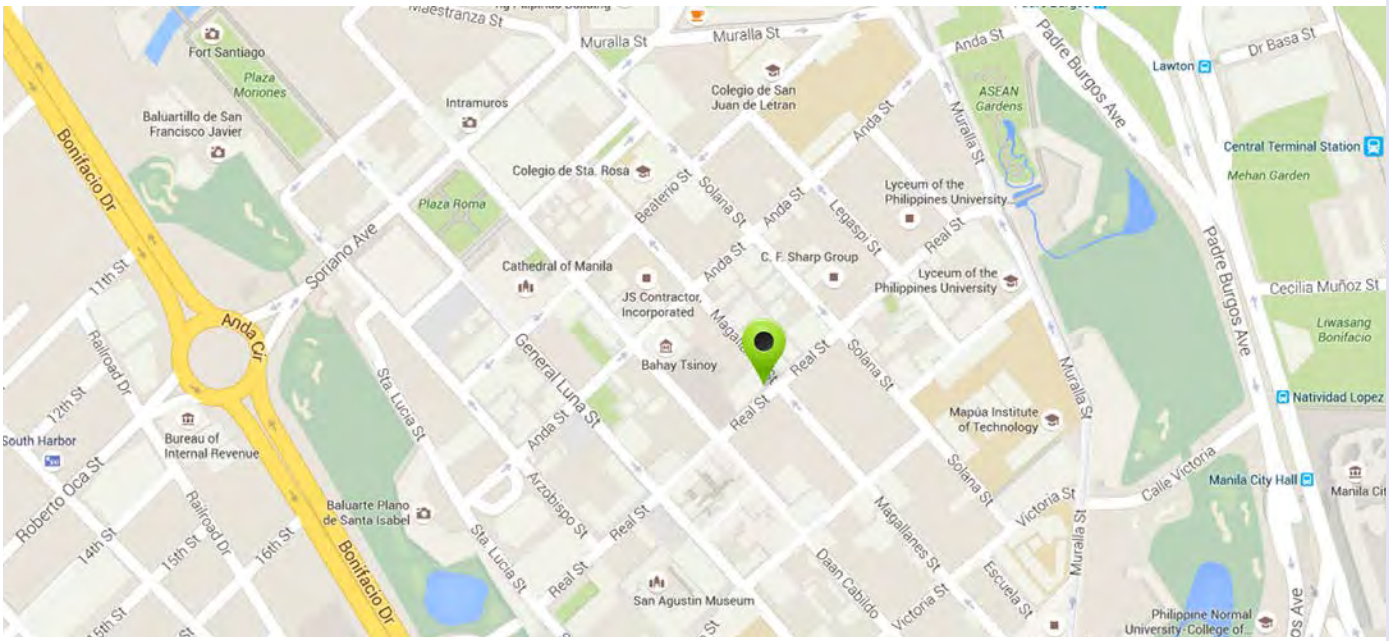


## Background on Septage Management

The linkage between the transmission of diseases such as diarrhea and cholera and human contact with untreated sewage and sludge is undisputed. In the Philippines, 18 people die on average each day due to preventable water borne disease. From an economic standpoint, the cost of poor sanitation in the Philippines has amounted to more than P70 billion annually in losses to revenue due to health impacts, damage to fisheries and missed tourism opportunities.[1]

Septage management or the organized and periodic desludging of septic tanks and cesspools is widely seen as one of the initial steps that municipalities can take to begin to make improvements in sanitation.

Access to basic sanitation is often limited at the local level. Rarely will existing septic tanks and sanitary structures conform to accepted standards. Where sanitary toilets do exist, they are either connected to septic tanks designed with open bottoms, or unimproved pit latrines, neither of which are ever properly desludged. Effluent from these systems often flows into the nearest surface water, or impacts local aquifers. In many municipalities, health authorities have made the connection between these local conditions and the prevalence of waterborne diseases in their communities.

The periodic desludging of septic tanks involves organized programs that achieve the collection, transportation, treatment and processing of fecal sludge. Periodic septic tank desludging is an operation and maintenance (O&M) activity that homeowners can support to reduce septic tank overflows, reduce nuisance conditions, and help minimize the hazards associated to human contact with sewage (Figure 1). The additional benefit of organized desludging programs is for upgrading onsite wastewater treatment systems. The organized approach of door-to-door desludging is the entry point to the regulatory system. Inspectors interact with homeowners, and for deficient systems provide information on how homeowners should upgrade them. A period of time is offered to homeowners to make the repairs, usually by the next desludging event. Over time, upgrading has the potential to make drastic improvements in wastewater management at the community level.

*Figure 1. Municipal workers assist a homeowner in finding and uncovering the tank access for desludging.*

[1]Economic Impacts of Sanitation in the Philippines. Water and Sanitation Program, 2006

## Regulatory Framework for Septage Management

Recognizing the need to improve sanitation conditions through septage management, the Philippines Department of Health (DoH) developed their **Operations Manual on the Rules and Regulations Governing Domestic Sludge and Septage** (figure 2) in 2008. This document sets forth the regulatory framework for local governments and private enterprises governing all aspects of septage management programs, including the collection, transportation, reuse and disposal of sludge and septage. The DoH manual is a "must have" document with a lot of practical information you can use in your program. Download the DOH manual here:

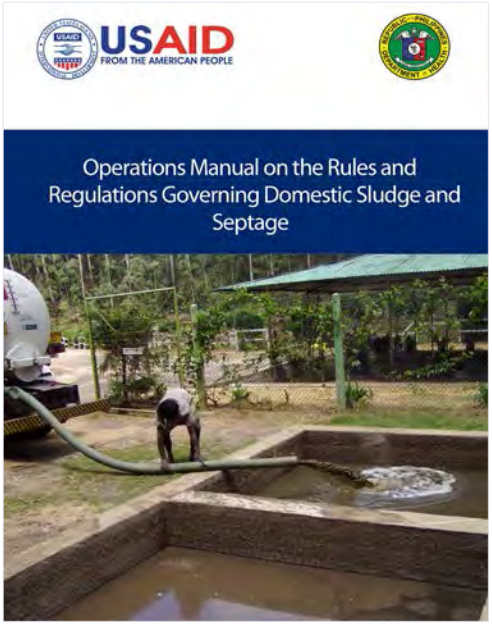
*http://tinyurl.com/sludgemanual*

The Department of Public Works and Highways, (DPWH) is managing the National Sewerage and Septage Management Program (NSSMP) which eventually may provide some assistance to municipalities that want to develop septage management programs. Implementers can access NSSMP resources from the DPWH website at:

**Support for the Nationwide Roll-out of the National Sewerage and Septage Management Program: Program Operations Manual**
*http://www.dpwh.gov.ph/NSSMP/pdf/Program%20Operations%20Manual.pdf*

**NSSMP Application Form**
*http://www.dpwh.gov.ph/pdf/NSSMP%20Application%20Form.docx*

The Department of Health (DoH) and Department of Environment and Natural Resources (DENR) are the regulatory agencies overseeing septage management and will be important contacts moving forward. In addition to national regulations, a number of local governments have developed their own local ordinances on wastewater and septage management. Marikina City, Zamboanga City, San Fernando La Union, Dumaguete, Calamba, Baliwag, Bay and others have undergone this process which reaffirms national policies while localizing the regulatory enforcement procedures, fees, incentives and penalties for non-compliance. These local ordinances can be utilized as models for other cities and municipalities interested in replicating these proactive programs. One such local ordinance, prepared by Dumaguete City is cited widely and is included as an appendix to the DoH manual. It is seen as a model ordinance that cities and municipalities all over the Philippines can adapt for their local conditions and needs.




**A full copy of the Dumaguete City ordinance is provided in the DoH manual (link provided above). Download your copy today!**

*Figure 2. DoH rules for septage management programs.*

## Developing Sustainable Septage Management Programs

The 3 pillars of sustainable septage management programs (figure 3) are:

- Low cost and site appropriate infrastructure for septage collection and treatment;
- Evidence-based promotions campaigns that raise awareness and the willingness to pay for services; and
- Enabling environments that include training and capacity building, access to financing, and a local ordinance on septage management to establish the policies, procedures, fees and fee collection, incentives, and compliance provisions for the program.

The septage management model is implemented at the local level through a bottom-up planning and implementation process. A Technical Working Group (TWG) is guided through the planning steps, which establish the collection and treatment programs, the local ordinance, and the fee system. A promotions campaign garners public involvement and a gradual increase in willingness to pay for services over the long term. In the short term, it shores up local support for the local ordinance and fees.

Oxfam has been innovating in this field through the implementation of a revolving fund that enables the process by providing ready access to capital. (figure 3).

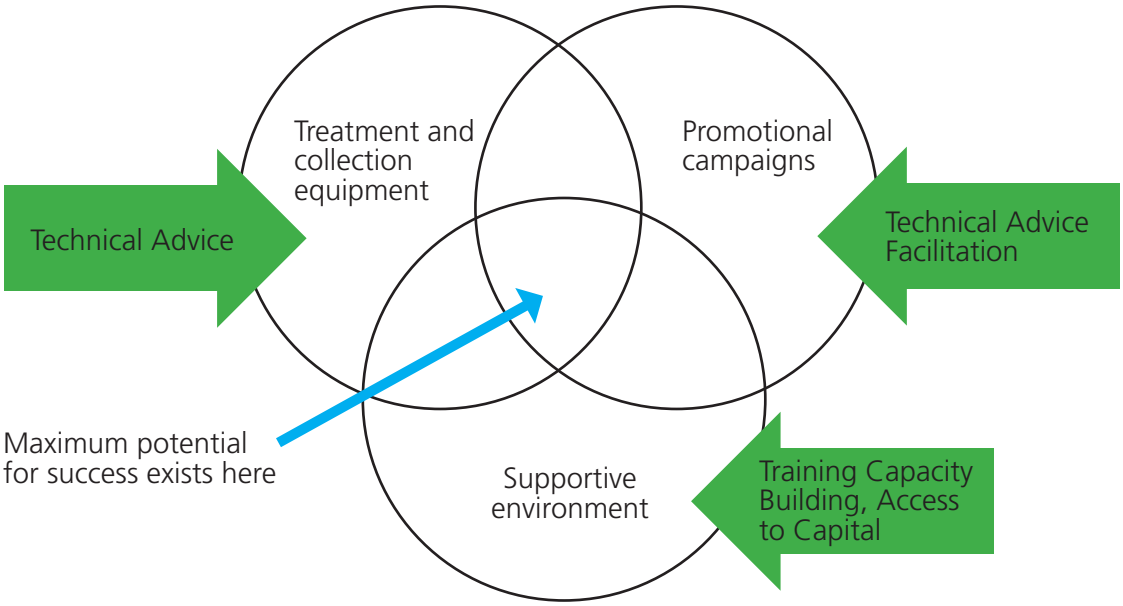



*Figure 3. Septage management development model program being implemented in the typhoon Yolanda recovery zone.*

## Case Study: Using a Revolving Fund for Septage Management

The revolving fund is a simple concept. A sum of cash is put into an account managed by the Fund Manager.[2]

Qualifying LGUs may submit an application once they have achieved the required milestones (land identified, local ordinance and tariff structure passed). The LGU then finances the infrastructure, or contracts out the services through a water provider or private sector contractor (figure 4).

The LGU collects the user fees from households, either as an additional charge on the water bills, or from a surcharge on the real property tax. The LGU then uses those returned funds to repay the loans.

The revolving fund is available at 0% interest over a term of 3 to 5 years. An administration fee is added to the loan to cover costs incurred by the Fund Manager and the costs of technical support provided by PBSP engineers.

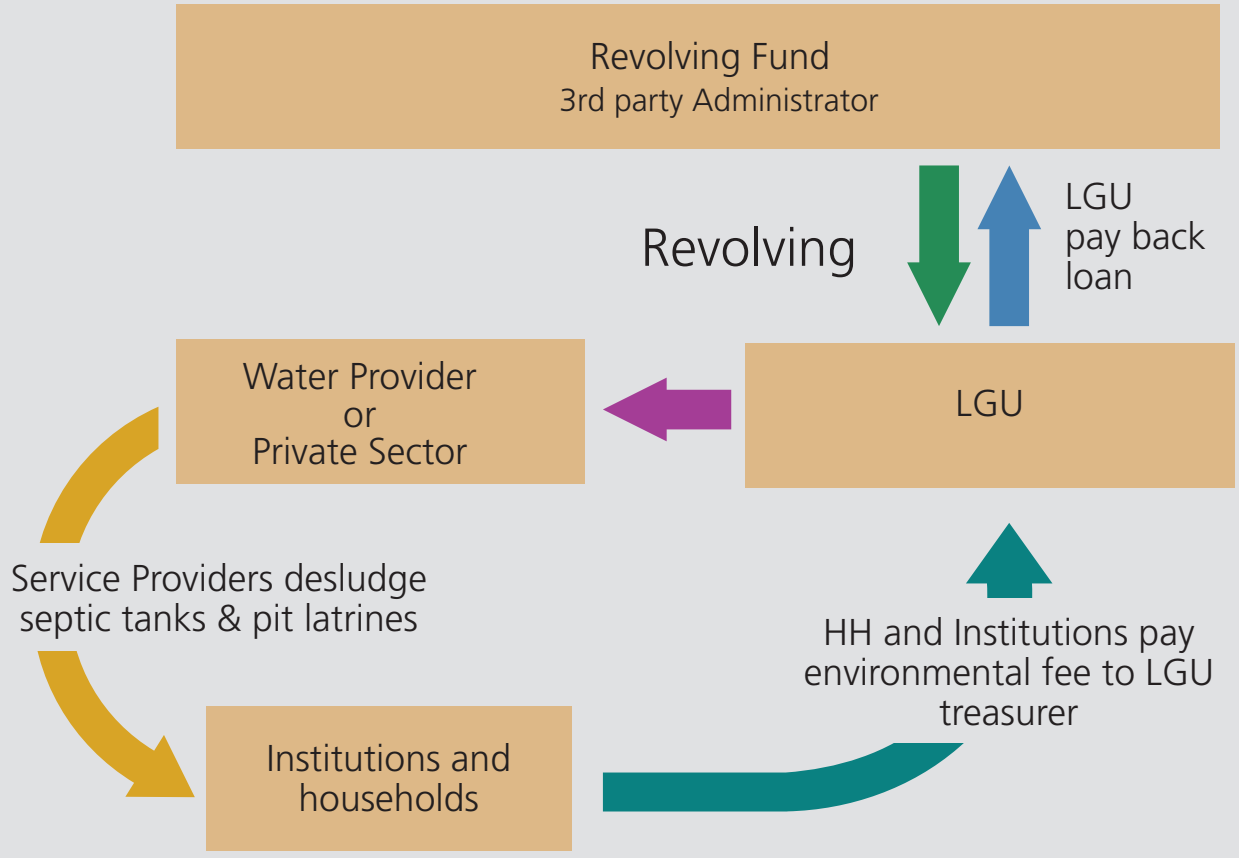



*Figure 4. Revolving fund flow mechanism.*

[2]In this case study, it is the Philippine Business for Social Progress (PBSP) an independent third party NGO that serves as the fund manager.

Water Districts and LGUs may partner for better septage management programs. In Dumaguete City, the local water district and the local government have entered into an agreement to jointly manage the program. The WD is responsible for the collections (trucking) and the LGU is responsible for the treatment. Revenues are split 50% / 50%.

*In photo: Josie Antonio and the Dumaguete City Septage Treatment Plant*

## Water Districts

Water Districts, like municipalities have authority under the Clean Water Act to provide septage management services. Local water districts may wish to undertake septage management programs to i) provide better services for existing water users, or ii) raise revenues to expand water services to uncovered areas. Water Districts may act as standalone agencies or coordinate with LGUs in implementing septage management programs.

Partnerships between local water districts and municipalities can be effective, especially if there is a high percentage of piped water connectivity within the coverage area. Adding septage management tariffs directly to the monthly water bill is a most effective method. The Water District's database of customers provides a convenient method of reaching out to the users directly. Stuffing fact sheets and flyers about septage management programs in the monthly water bill is a low cost and effective method to inform the public.

## About this Manual

This manual presents 16 steps in developing sustainable septage management programs. These steps are broken down into chapters 2, 3 and 4:

- Planning
- Program Design
- Implementation

Following these sections, a short discussion on monitoring and evaluation as well as steps to achieve long term sustainability is provided.

In order to better present these topics in this manual, a QUICK START GUIDE for each step, and tools and checklists are provided for each task. Additionally, external links to additional information is provided.

Finally, please be advised that there is no "one-size-fits-all" method in establishing septage management programs. Each municipality will have its own unique and individual set of constraints and opportunities. The guidelines found in this manual identify many of the steps and procedures for developing sustainable programs, but they should be used with some flexibility to suite the specific local needs in the community.

# THE 16 STEPS FOR DEVELOPING SEPTAGE MANAGEMENT PROGRAMS

There are 3 stages for developing septage management programs:

- Planning;
- Program design; and
- Implementation.

These stages are broken down into the step-by-step process presented in the next 3 pages.

| STEP | Description | Output |
|---|---|---|
| **PLANNING** | | |
| **STEP 1** Conduct the Initial Stakeholder meeting | Share sanitation issues with the officials and community leaders. Achieve a consensus that the need for septage management is real, important and immediate. | Agreement from stakeholders to work to address issues |
| **STEP 2** Establish the TWG | Technical team that will agree to manage the step by step process, while guiding technical decision-making. | TWG members recognized |
| **STEP 3** Prepare work plan and admin budget | Budget estimate for planning, evidence gathering and design phases. Work plan and schedule activities. | • Budget<br>• Work plan |
| **STEP 4** Gather evidence | Rapid technical assessment, focus group discussions, surveys, and / or interviews with key stakeholders. | Data on septic tanks and pit latrines within the coverage area |
| **STEP 5** Determine potential funding sources | Determine where funds will be sourced: donors, user fees, IRA, commercial loans, DPWH, Revolving Fund, private sector. | Financing plan |

*Continued on next page.*

| STEP | Description | Output |
|---|---|---|
| **PROGRAM DESIGN** | | |
| **STEP 6** Determine design flow and collections needs | Use of SMDST to assess infrastructure and trucking costs and develop an area-wide collections plan. | • Design flow<br>• Cost estimates<br>• Area-wide collections plan |
| **STEP 7** Identify suitable land | Parcels should be large, convenient and accessible to truck traffic, but not too close to population centers. | List of potential sites |
| **STEP 8** Asses different technologies | Cost/benefit analysis of collection vehicles and treatment systems that might be used for the project. | Preferred technologies list |
| **STEP 9** Draft the local ordinance | Begin drafting the local ordinance using templates customized for local needs and conditions. | Draft ordinance |
| **STEP 10** Plan the promotions program | Begin the process of developing a promotions campaign using model templates. | Draft promotions campaign |

*Continued on next page.*

| STEP | Description | Output |
|---|---|---|
| **IMPLEMENTATION** | | |
| **STEP 11**<br>Secure permits | Submit permit applications to DENR and DoH.<br>Submit application for DOH Environmental Sanitation Clearance.<br>*(DOH will issue ESC only after ECC or CNC has been issued by DENR/EMB)* | Permits & construction schedule |
| **STEP 12**<br>Launch the promotions campaign | Pretest, launch, monitor and evaluate, and re-launch as needed. | Promotions kick-off event and launching |
| **STEP 13**<br>Finalize and pass the local ordinance | The local government conducts public hearings, finalizes the draft, and approves the new ordinance. | Approved ordinance and fee structure |
| **STEP 14**<br>Finalize Procurement | Award contracts for construction of the facilities and the collections operations. Or conduct these activities in-house by administration. | Collections program ready |
| **STEP 15**<br>Construct and purchase equipment | Purchase equipment, build systems, and begin the collections and treatment programs. | Septage begins to flow |
| **STEP 16**<br>Monitoring and Evaluation | Initiate the M&E plan - a long term effort to keep the program on track. | Adjust program as needed to comply with local ordinance. |

## Gantt Chart illustrating the activities and timeframes for a model program

| STEPS | Activity | MONTH 1 | MONTH 2 | MONTH 3 | MONTH 4 | MONTH 5 | MONTH 6 | MONTH 7 | MONTH 8 | MONTH 9 | MONTH 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Stakeholder meeting | | | | | | | | | | |
| 2 | Establish TWG | | | | | | | | | | |
| 3 | Establish administrative budget | | | | | | | | | | |
| 4 | Evidence gathering | | | | | | | | | | |
| 5 | Funds Sourcing | | | | | | | | | | |
| 6 | Determining design flow | | | | | | | | | | |
| 7 | Identify suitable land parcels | | | | | | | | | | |
| 8 | Technoligy and equipment review | | | | | | | | | | |
| 9 | Write local ordinance | | | | | | | | | | |
| 10 | Promotion program planning | | | | | | | | | | |
| 11 | Permitting for regulatory compliance | | | | | | | | | | |
| 12 | Promotions campaign launched | | | | | | | | | | |
| 13 | Local ordenance passed | | | | | | | | | | |
| 14 | Tendering | | | | | | | | | | |
| 15 | Construction and purchasing | | | | | | | | | | |
| 16 | Initiate M&E Plan | | | | | | | | | | |

Task  Milestone

*Figure 5. Gantt chart for model municipal septage management design and implementation program. Actual steps and timing may vary depending upon local factors.*

# PLANNING

Below are the 5 steps in the planning for septage management programs:

| | | | |
|---|---|---|---|
| STEP 1 | Conduct the Initial Stakeholder meeting | Share sanitation issues with the officials and community leaders. Achieve a consensus that the need for septage management is real, important and immediate | Agreement from stakeholders to work to address issues |
| STEP 2 | Establish the TWG | Technical team that will agree to manage the step by step process, while guiding technical decision-making | TWG members recognized |
| STEP 3 | Prepare work plan and admin budget | Budget estimate for planning, evidence gathering and design phases. Work plan and schedule | Budget<br>Work plan |
| STEP 4 | Gather evidence | Rapid technical assessment, focus group discussions, surveys, and or interviews with key stakeholders. | Data on septic tanks and pit latrines |
| STEP 5 | Determine potential funding sources | Determine where funds will be sourced: donors, user fees, IRA, commercial loans, DPWH, Revolving Fund, private sector. | Financing plan |

STEP

1

PLANNING

# Conduct the Initial Stakeholder Meeting

## QUICK START GUIDE

| | |
|---|---|
| We have conducted preliminary and exploratory talks with LGU mayors/officials prior to the stakeholders meeting. | √ |
| We have identified stakeholders and prepared invitations. | |
| We have set the time and venue for the stakeholders meeting. | |
| We have drafted the problem statement. | |
| We have developed the presentation by the health officer or mayor that defines the problem. | |
| We have ensured that the mayor or other prominent person from the community will make the opening remarks. | |

Stakeholders are people, groups or organizations that have an interest in the outcome of a project or activity. They may include:

- Members of the community at large;
- Environmental clubs at local colleges or universities;
- Educators (academia) from local schools or universities;
- Civil society groups;
- Nongovernmental organizations;
- Government agencies and regulatory officials including the mayor, municipal accountant, Municipal Environmental Officer (MENRO), Municipal Health Officer, engineer or planner; and
- Religious, minority and party leaders.

## Stakeholder Selection Guide

Use this as an initial list of groups that stakeholders can be selected from. TWG members will be selected from this pool. Identify a broad range of stakeholders for inclusion at the meeting. Engaging stakeholders with different positions can identify issues early on that can be addressed as the program develops. Expand as needed to be as inclusive as possible. Select people that represent groups or organizations, or even individuals that are directly or indirectly impacted by the problem or its solution.

| Stakeholder Group | Y/N |
|---|---|
| Mayor's Office | |
| Municipal Environmental Office | |
| Municipal Planning Office | |
| Municipal Engineering Office | |
| Municipal Health Office | |
| SB Liaison Officer | |
| City Accountant | |
| Provincial Attorney's Office | |
| DPWH, DoH, EMB regional offices | |
| Members of the media | |
| NGOs | |
| Academia, including university environmental clubs | |
| Representatives from different socioeconomic groups that are affected by the problem | |

*Figure 6. Key stakeholders of Palo Municipality including the Mayor, key staffers, and community leaders. Oxfam 2015.*

## The Stakeholder Meeting

Careful selection of stakeholders is important. Some of the stakeholders will be tapped for services on the TWG. In planning for the stakeholder meeting, the project proponent (manager or director) will:

Develop the problem statement. Typically a one or two sentence statement is preferred;

- Define the problem, issue or opportunity visually. Photographs, PowerPoint presentations or other means of communicating the issue visually are useful;
- Select a venue adequate for the activity;
- Send invitations to stakeholders and invited guests; and
- Include a local person of authority in the invitations and at the meeting.

## Agenda for Initial Stakeholder Meeting

The stakeholder meeting should last between 60 and 90 minutes.

Here is a sample agenda:

| | Activity | Time |
|---|---|---|
| 1 | Opening comments by mayor, public official or project proponent | 5 – 10 Minutes |
| 2 | Presentation of the problem statement | 2 minutes |
| 3 | Presentation of the issue using PowerPoint presentation or other visuals to better illustrate the issue | 15 Minutes |
| 4 | Comment and discussions period – verify that problem is real and immediate | 30 minutes |
| 5 | Agreement – stakeholders agree to work together to address the issue – Agreement poster signing session and photo taking | 30 minutes |
| 6 | Selection of Technical Working Group (TWG). TWG members sets time and date for TWG meeting | 20 minutes |
| 7 | Closing comments by official or project proponent | 10 minutes |

## NOTES

- Send written invitations to invited stakeholders and then follow up with phone calls to verify attendance. Develop a flyer that includes the title of the event: Stakeholders Meeting to Discuss _(issue)_ , the venue and time of the stakeholders' meeting, the name of the official or influential project proponent and contact information.

- The problem statement or the PowerPoint should be given by the Mayor, Health Officer or project proponent. Most commonly, tying the issue of poor sanitation to local health can be powerful.

- During the 15 minute presentation of the issue, try to show pictures of the issue in action – how the behavior of the people are leading to the concern, how people are affected. Then close by showing some pictures of proper behavior and how it addresses the issue.

- There may be an opportunity to work with neighboring LGUs to develop regional programs. If program organizers think this may be an option, key stakeholders from neighboring LGUs should be invited to participate. A discussion point on the prospects for a regional facility could be added to the ajenda.

- Select TWG members that will do the work and commit to be involved for the entire program. The TWG members should be officially recognized through a notice in the newspaper or town notice board, submitted by the mayor and recognizing them for their community service.

Once the stakeholder meeting is concluded, and if the stakeholders agree to support finding a solution to the issue, the next steps in the process in developing the septage management program can begin.


STEP

2

PLANNING

# Establish a Technical Working Group

## QUICK START GUIDE

| | |
|---|---|
| We have prepared a weekly meeting schedule for the first 3 months. | √ |
| We have chosen a venue that is appropriate for the activity. | |
| We have circulated a roster of TWG members and contact information. | |
| We have ensured that the Mayor has publiclly recognized TWG members for their service. | |

The TWG will be responsible for weekly meetings and drafting recommendations for the mayor and council to consider.

This team will carry out the following tasks:

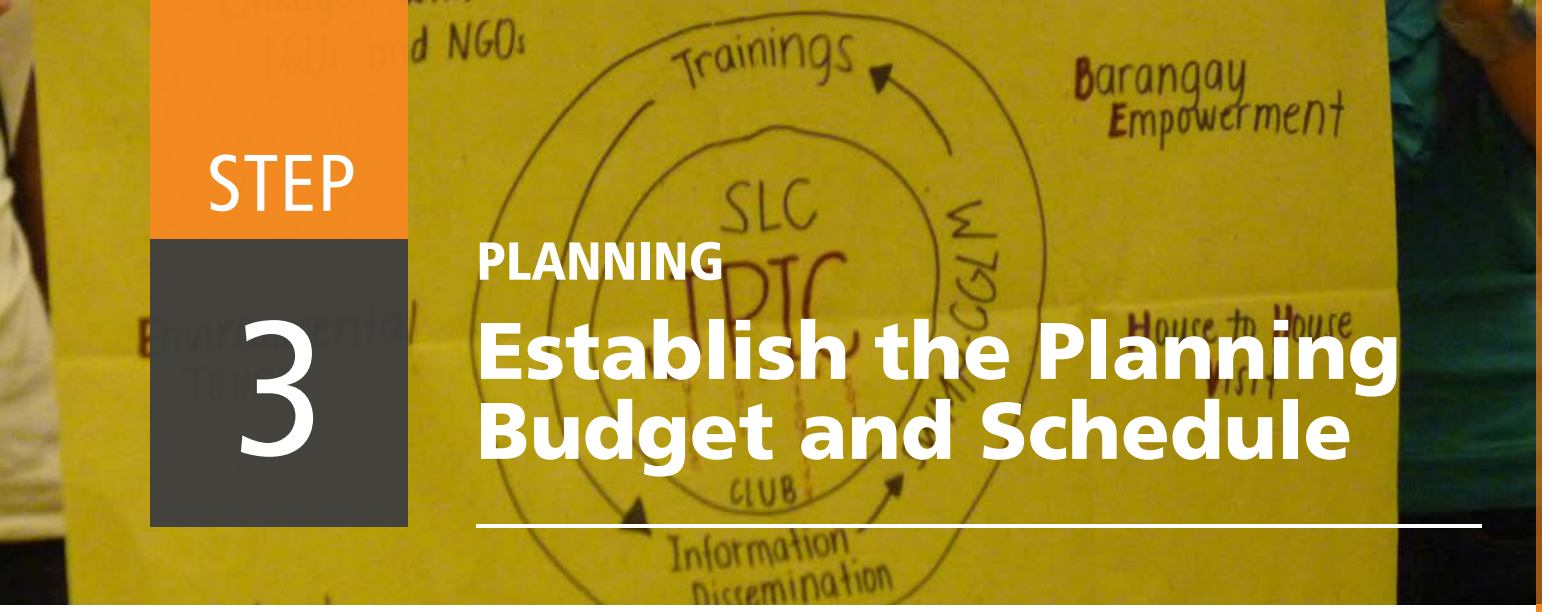
1. Elect a TWG team leader;
2. Gather information through focus group discussions, meetings, interviews and other methodologies that may be appropriate (surveys , environmental walk or direct observation) to define the problem;
3. Plan and manage the budget and resources;
4. Draft the local ordinance;
5. Analyze and select for recommendation the technologies for septage collection and treatment;
6. Decide on how the private sector might be involved in the program; and
7. Develop and launch the promotions campaign.

The effectiveness of the TWG will be dependent on how well the team can work together effectively. Providing a schedule of well planned and facilitated meetings will help achieve this outcome.

## Selecting Team Members

TWG members should include:

- Municipal Environmental Officer (MENRO)
- Municipal Heath Officer
- Municipal Planning Officer
- Municipal Accountant
- Municipal Engineer
- Sanitary Inspector
- Legal Representative (may come from province)
- SB Liaison Officer (Head of Health or Environmental Committee)
- DOH regional staff
- DPWH regional staff
- EMB regional staff
- NGO, Community organizations, Donors, other interested parties




STEP

3

PLANNING

# Establish the Planning Budget and Schedule

## QUICK START GUIDE

| | |
|---|---|
| We have calculated the expenses for evidence gathering (rapid assessments, surveys, FGDs, interviews). | √ |
| We have developed the cost estimate for the preparation of outreach materials. | |
| We have identified potential study tour sites. | |
| We have prepared a preliminary budget. | |
| We have submitted the budget for review and obtained approval from the Mayor. | |

In this step, the TWG will set the administrative budget for their activities. The budget will include:

- Venue and related expenses for meetings;
- Vehicle for site visits;
- Study tour to nearby municipalities with operational septage management programs;
- Materials and supplies; and
- Contracting if needed for surveys, promotions outputs.

The TWG will need to be funded for the next 9 to 12 months of their activities. They should prepare a budget and seek approval early on. Some items to consider:

### Personnel

Ideally the TWG will be composed of people with the creative and technical skills to accomplish the tasks. Often the team will be composed of volunteers that believe in the program and are willing to give their time and efforts to achieve them. If not, outside contracting may be required.

### Space

Venues for meetings, workshops and focus group discussions. Consider costs for snacks and meals as needed for attendees in accordance with local customs.

### Materials and Equipment

Equipment may include computers, copy machines, cameras, and printers. Materials may include copy paper, poster board, clipboards for surveys and similar items.

### Transportation

Travel expenses for team members to attend meetings and focus group discussions, and travel to the project location for drivethroughs and surveys if they are to be conducted.

### Promotions Campaign Production

This may include printing, publishing, photographs and other related items.

### Promotions Campaign Materials Distribution

Media expenses including postage, personnel for hanging posters or distributing flyers, media air time for radio and TV outreach, venue rental for plays or other dramatic performances.

### Monitoring and Evaluation

Testing, surveying and other related expenses for monitoring indicators.

In many instances, costs can be minimized by linking activities with other projects. Where skills and materials are not available, subcontracting them may be required. The TWG is responsible for creating the budget factoring in all of the anticipated expenses and seeking approvals as needed prior to the commencement of the activities. In addition to the budget, the TWG should create a schedule of activities or work plan that can be shared with the program senior staff.

## Budget Template

Use this checklist as a starting point and add items that may be particular to your program.

| | Expense item | Cost Estimate |
|---|---|---|
| 1 | Venue expense for meetings | |
| 2 | Lunch, snacks for TWG and invited guests during workshops or focus group discussions | |
| 3 | Postage, fax, phone | |
| 4 | Clerical support | |
| 5 | Materials and supplies for developing creative ideas | |
| 6 | Materials and supplies developing text and messages | |
| 7 | Materials, supplies, labor for producing all of the materials for launching the campaign | |
| 8 | Materials and supplies for performing M&E | |
| 9 | Staff time that may need to be billed to the project | |
| 10 | Sub contracted specialists | |
| 11 | Transportation expense for travel to the site for meetings, surveys | |
| 12 | Equipment purchase or rental – photocopiers, cameras, etc. | |
| 13 | Office related expenses or rentals | |
| Other | | |


**Stakeholders in Santa Fe municipality on Bantayan Island attend a public forum on septage management hosted by Mayor Jose Esgana.**

STEP

4

PLANNING

# Gather Evidence

*Enumerators utilize Smartphones for data collection during a rapid technical assessment.*

## QUICK START GUIDE

| | |
|---|---|
| We have conducted interviews and focus group discussions with key informants. | √ |
| We have defined the coverage area and understand the demographics. | |
| We have performed a Rapid Technical Assessment. | |
| Wer have estimated daily septage volume. | |
| We have estimated the tariff needed to sustain the program using the SMDST. | |

Errors or inaccuracies in your assumptions of people's willingness to participate in the program, and numbers, volumes and sizing of existing containment systems will impact upon each of the subsequent steps. You will need a lot of good evidence in order to develop your septage management program. Evidence pertaining to existing conditions of containment systems (number and volume of septic tanks) will be useful in sizing collection and treatment programs. Evidence on people's knowledge, attitudes and practices will help with developing appropriate messages and promotions campaigns. Follow the guidance in this section to select methods of evidence gathering that are most appropriate for your community.

In this step you will:

- Talk to individuals and families;
- Listen to group discussions on people's knowledge, attitudes, and practices related to septage management; and
- Conduct a Rapid Technical Assessment that will determine the number and size of existing containment systems, determine the daily volume of septage to be managed, and identify constraints that may exist in collecting the septage.

## The Information You Need

You need to gain insights into how families will perceive a new septage management program that they will have to support with fees (figure 7). The key in this activity is to determine the motivators. What would motivate a family to pay a monthly fee for septage management services? In some instances it may be:

- Lower cost of desludging that is achieved through an organized program;
- Improved environmental health. People may be convinced that improving septage management would lead to better sanitation and therefore lower incidents of diseases;
- Improved livelihood opportunities. People may already understand that less pollution into the environment may improve livelihood opportunities (fisheries, tourism);
- Creation of new jobs within the septage management program; and
- Pride of community may be a powerful motivator in certain locations.

To determine which motivators might be utilized to make the biggest impact on improving willingness to pay, use this guidance:

- Discover the attitudes that people hold about the issue, problem or opportunity. There will often be a range of feelings that should be quantified to the extent possible, i.e. how many people feel strongly one way or the other;
- Understand the existing situation in relation to septic tanks, pit latrines and current desludging practices. What are the current behaviors and their consequences;
- Understand what better behaviors might be practiced to achieve the desired outcome;
- Determine the methods, processes and procedures that people will need to utilize to perform the desired behaviors and define the limitations people may encounter when trying to practice them; and
- Identify the populations affected by the issue. Determine which segments of society are responsible for creating the problem, and which segments have the most to gain by implementing the solution.

*Figure 7. Nyoman Suartana catches up with a key stakeholder during a Rapid Technical Assessment. Be prepared for interviews. Have a list of prepared questions and a note pad to record the answers.*

Answers to these questions help to create the rationale for the program in general, and the promotion campaign specifically, which will eventually be utilized to increase people's willingness to pay for the services. It begins with understanding the perspective of the people whose behavior needs to be changed. Focus Group Discussion, direct observations and interviews with identified community members are activities that can lead to this understanding.

*Figure 8. Bantayan Island mayors and staff deliberate user fees during a focus group discussion, another method of data gathering.*

*More information on data gathering methods are provided in Appendix 1.*
*The steps in the RTA process and a sample list of RTA questions are provided in Appendix 2.*

**"Workers at toilet factory in Tanauan municipality, Leyte Province. This image illustrates the "value chain" that extends well beyond the desludging activity."**

STEP

5

PLANNING

# Determine Potential Sources of Financing

## QUICK START GUIDE

| | |
|---|---|
| We have estimated the CAPEX and OPEX for our program using the SMDST. | √ |
| We have estimated the monthly tariff and it falls within a range between P30 and P45 per family per month on average. | |
| We have determined how tariffs will be calculated for commercial, institutional and social facilities. | |
| We have determined the amount of money we have (if any) that could be used as a downpayment to finance trucks and infrastructure, realizing it will be paid back through tariffs. | |
| We have explored private sector investments to reduce initial capital outlays. | |
| We have determined the availability of donor or central government funds. | |
| We have determined the feasibility of commercial loans based on guaranteed payback from tariffs. | |
| We have agreed to ring-fence the financing of the program by setting up a separate septage management account and not mingling funds with the municipal general fund. | |

## Here are some traditional challenges in financing septage management programs. Consider how to overcome each:

- Local government's reluctance to invest. This may be based on limited resources for upfront costs, inadequate knowledge on sanitation, limited capacity to manage programs;
- Local government's inability or willingness to borrow. There may be a number of other outstanding loans;
- Customers' willingness and limited ability to pay for services; and
- Customers' dissatisfaction with other municipal services, such as solid waste collection.

## How do we encourage investment in septage management?

- Promotions through evidence-based campaigns that link motivators with properly managing septage;
- Fix the causes of financing failures;
- Affordability: reduce cost estimates by using low cost, efficient technologies or phasing in programs. Provide subsidies for the very poor, and spread costs over many users;
- Begin to account for co-benefits to show added value such as health benefits (reduced water-borne diseases), higher yields for fishermen, benefits to tourism, etc.; and
- Local ordinances and fee schedules to generate a guaranteed and regular revenue stream.

## Mechanisms for financing septage management programs:

- Local government investment
- National government cost share
- Tariffs and user fees
- Donor support
- Commercial loans
- Inter-LGU Partnerships
- Co-benefits (resource recovery, health, tourism, etc.)
- Revolving funds that issue low interest loans to qualified local governments

## Affordability and willingness to pay

- As a general rule, water and sanitation programs may be perceived as affordable as long as the cost does not exceed 5% of their monthly gross income[3];
- Consumers will be willing to pay for services if they believe they address their core values and needs;
- They are better able to pay when upfront costs are charged on more flexible terms, such as installments;
- Sanitation services can be financially viable when they are customer-oriented and perceived as being worth paying for; and
- The bigger issue is not the *"customers willingness to pay"*, BUT the *"LGUs' willingness to charge"*.

[3] *It is generally believed that 5.0% is the ceiling for the ratio of water and sanitation tariffs to total household expenditures. This ratio declines as per capita GDP increases.*

*Ogawa,Takehiko, 2004: Estimation of Willingness-to-Pay (WTP) for Water and Sanitation Services through Contingent Valuation Method (CVM). A Case Study in Iquitos City, The Republic of Peru*

### The Baliwag septage treatment facility in Bulacan

The Baliwag Water District required a source of funds to implement their SMP. Rather than rely on donor assistance, the BWD simply secured a 60M Peso ($1.5M USD) loan from the Philippine National Bank, with a 10-year repayment period and 7% interest. With these funds, the BWD could purchase trucks and engage the contractor to design and build their facility. Tariffs are used to make the loan payments and cover the costs of operations.

## Additional Recommendations

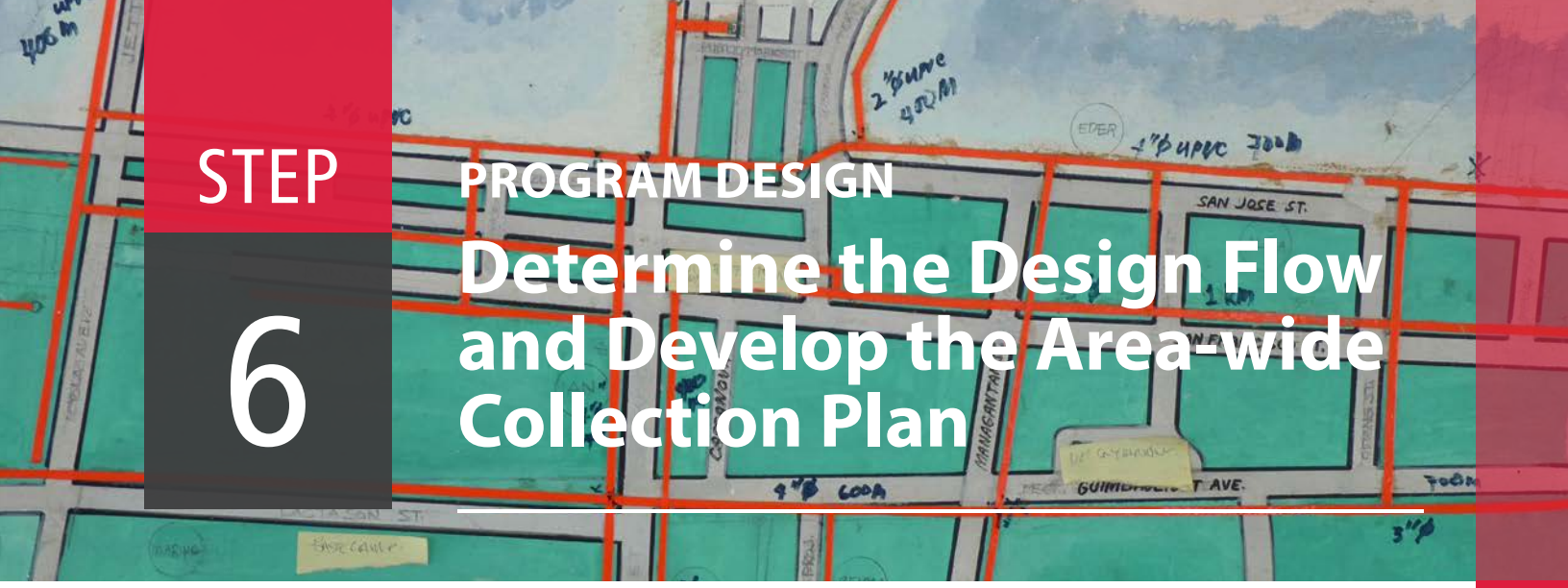
Implementers should develop a written financing plan to identify the potential sources of funds considering the following:

- **Ring-fence the finances.** Establish a separate septage management account. Do not mingle septage finances with the municipality's general fund;
- **Develop a written Financing Plan.** Utilize the data from the SMDST and carefully assess the different funding opportunities referenced above;
- **Encourage contractors and equipment companies to provide favorable terms of credit.** Desludging vehicles are often purchased with a relatively small down payment and terms for the balance (interest rate and payback period). This works very well with septage management programs as the revenue coming in from tariffs should be sufficient to make the monthly payments while covering the costs of operations. Favorable terms should be negotiated with contractors for the construction of treatment facilities, and the truck vendors. Negotiating short-term financing with contractors and equipment providers will enable the municipality to minimize upfront cash outlays. Public Private Partnerships, such as mentioned in this paragraph look very attractive to the private sector when the revenue (tariffs collected) is guaranteed in law through the local ordinance.

# PROGRAM DESIGN

This covers steps 6 – 10 which are used to develop the design of your septage management program:

| | | | |
|---|---|---|---|
| STEP 6 | Determine design flow and develop the area-wide collections plan | Use the SMDST to determine design flow and prepare the area-wide collections plan. | • Design flow<br>• Cost estimates and financials<br>• Area-wide collections plan |
| STEP 7 | Identify suitable land parcels for the treatment system | Parcels should be large, convenient and accessible to truck traffic, but not too close to population centers. | List of potential sites |
| STEP 8 | Assess the different technologies | Cost/benefit analysis of technologies for both collections and treatment. | Preferred technologies and equipment list |
| STEP 9 | Draft the local ordinance | Begin drafting the local ordinance using templates. | Draft ordinance |
| STEP 10 | Plan the promotions program | Begin the process of developing a promotions campaign using model templates. | Draft promotions plan |




STEP

6

PROGRAM DESIGN

# Determine the Design Flow and Develop the Area-wide Collection Plan

## QUICK START GUIDE

| | |
|---|---|
| From the RTA, we have entered the following data into the SMDST | √ |
| - Number of residential containment tanks and their average size | |
| - Number of commercial containment tanks and their average size | |
| - Number of institutional containments tanks and their average size | |
| - Number of social containment tanks and their average size | |
| We have entered additional data on population density, time and distance from the population centers and the treatment plant location. We have also entered data on constrains of tank access, truck access, and anticipated levels of participation. | |
| We have determined the average daily flow and obtained other outputs from the SMDST. | |
| We have developed the area-wide collections plan. | |

From the survey data, the number and size of the containment tanks of residential, commercial, institutional (hospitals, offices), and social (schools, public markets) buildings are entered into the SMDST. In addition, an estimate of the percentage of desludgable systems, and the percentage of people that will likely participate in the program is entered. The SMDST uses the data to determine daily design flow, OPEX and CAPEX of the collection program, and a host of other outputs (figure 9).

The SMDST will provide data on the daily flow as well as the septage characteristics based on published data. You can refine the outputs by performing a sampling and analysis program and using real data from our community instead of assumed data.

| Parameter | Resdiential | Commercial | Institutional | Social | Total |
|---|---|---|---|---|---|
| Flow Per Day (m3/day) | 27.74 | 4.28 | 6.36 | 0.29 | 38.67 |
| Flow Per Year (m3/year) | 8,100.00 | 1,250.00 | 1,856.67 | 85.00 | 11,291.67 |
| Total Solid (mg/L) | 31,555.56 | 25,000.00 | 25,000.00 | 25,000.00 | 29,702.58 |
| BOD (mg/L) | 2,100.00 | 2,000.00 | 2,000.00 | 2,000.00 | 2,071.73 |
| TKN (mg/L) | 993.33 | 1,000.00 | 1,000.00 | 1,000.00 | 995.22 |
| Fecal Coliform (MPN/100ml) | 131,111.11 | 100,000.00 | 100,000.00 | 100,000.00 | 122,317.34 |
| Helminth Factor (MPN/L) | 6,666.67 | 5,000.00 | 5,000.00 | 5,000.00 | 6,195.57 |

*Figure 9. The SMDST calculates the average daily flow and the septage characteristics, which will be used to determine the size of the treatment facilities.*

## Notes:

- Adjusting the desludging cycle (how often the containment tanks should be desludged) can have a big impact upon the design flow. Remember that the desludging frequency is an average that will be applied to the entire community. Some houses with more occupants and smaller tanks may need more frequent desludging.
- Varying the number of operational days per week and hours per day will change the design flow. The design flow is an important number that will be used to size the treatment system, determine the number of trucks and operators.
- Phasing the development of the system. If the community / population will grow slowly or the implementer anticipates that it may take a number of years to reach the design flow, consider phasing the development of the system. This helps avoid paying for unused capacity, and minimizes the upfront expenses for the development of the program.

## Area-wide Collections Plan

Municipalities in the Philippines are subdivided into barangays with their own local government system headed by the barangay captain. When developing the area-wide collections plan, you will:

- Consider the constraints in accessing the homes and tanks in each barangay. Limitations may include seasonal flooding, weight restrictions on bridges, steep unpaved or narrow roads, and heavy traffic;
- Consider the order of desludging. Which barangays will get the service first?;
- Then, prepare a 5-year desludging schedule based on the outputs from the SMDST. The SMDST will tell you how many homes can be desludged in a day considering the size of truck, distances and efficiency factors entered into the SMDST; and
- Use the population density in each barangay along with information on accessibility and desludging time to see if transfer stations would be useful, and if so, which type.

## Strategy: Start off with the easiest barangays first; those that have:

- A high percentage of water system connections;
- A barangay captain that is enthusiastic and willing to work with the program; and
- The fewest constraints and easiest to access (wide streets, most homes accessible by vacuum truck, most homes have septic tanks).


### Public Private Partnership – Envirokonsult Equipment & Services Inc. and Manila Water

Manila Water is the concessionaire responsible for septage management in the East Zone of Metro Manila. They own and maintain a fleet of trucks which are operated by Envirokonsult Equipment & Services Inc., a private sector contractor. Envirokonsult Equipment & Services Inc. therefore is responsible for staffing, training, and quality control.

*Manila Water septage fleet, operated by drivers and desludgers provided by Envirokonsult Equipment & Services Inc.*

## Public vs. Private Sector

It is highly recommended for the municipality to explore a public private partnership with desludging contractors. Here are some considerations:

- Private sector desludgers know how to perform their business;
- Private sector contractors will be responsible for their own staff, training, and productivity;
- Contracts can be arranged where municipalities either buy and maintain the trucks, or the private sector does and bills for the service.

Municipalities with an established motor pool and with experience with trucking operations, as with municipal solid waste services should consider doing their own in-house desludging. The actual desludging skills can be taught in a two week on-the-job training with an established utility nearby.

The collection program requires cooperation from:

- The barangay captain, who will enforce traffic control during days of desludging;
- The sanitary inspector, who will perform pre- and post-inspections on each tank desludged and be the primary point of contact with the occupant;
- The municipality communications officer, who will deploy sound trucks and conduct campaigns to increase the participation in the program.

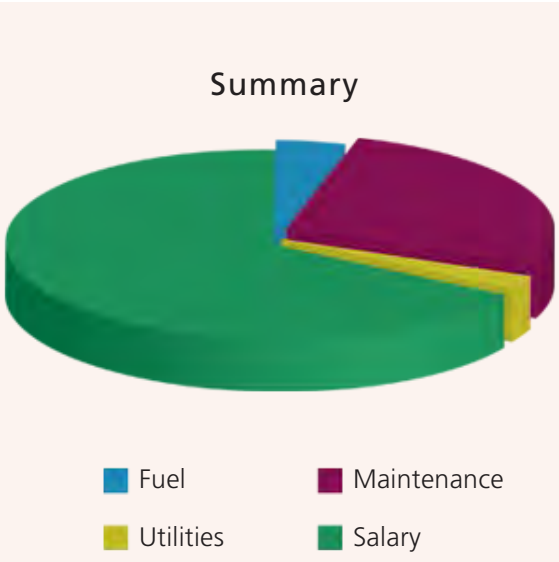
Consider the questions in this checklist when developing your collections program:

| | |
|---|---|
| We have prepared and disseminated a formal schedule of desluding activities. | √ |
| We have ensured that the the sanitary inspector has been trained and is ready to perform inspections. | |
| We have prepared a database with entries from each house or occupied building. | |
| We have ensured that desludging operators have been trained through a minimum two-week job sharing program. | |
| We have ensured that the motor pool is prepared to service trucks with spare parts and maintain desludging accessories. | |
| We have ensured that an outreach campaign has been prepared by the municipal communications office. It may include (i) sound truck, (ii) door hangers, (iii) direct mailings through water bill, and (iv) posters or other methods. | |

Use the SMDST to guide you through the area-wide collection planning process. Enter the data into the SMDST through the user interface. This asks questions pertaining to the conditions in the coverage area including:

- Container volumes;
- Time and distances study; and
- Trucking operations and efficiencies.

The outputs are estimates of OPEX and CAPEX as well as the number of transfer stations required. Static transfer stations are required for areas where there is limited truck access and call for service desludging is practiced. With this information, identify enough parcels of land within the affected locations inside the coverage area to locate the transfer stations. Then use the guidance in the technology selection guide to choose equipment best for your program.




Key Cost Parameters

| | |
|---|---|
| Fuel | Vacuum Truck |
| | Motorcicle |
| | Transfer Truck |
| | Total Fuel |
| Maintenance | Collection Vehicles |
| | Equipment & Furnishings |
| | Building & Site Improvements |
| | Total Maintenance |
| Utilities | Utilities |
| | Total Utilities |
| Salary | Collection Labor |
| | Office Labor |
| | Total Salary |
| Estimated Costs | Preliminary |
| | Contingency |
| | Total Annual Opex Costs |

*Figure 10. SMDST output showing collection system OPEX and CAPEX.*

STEP

7

PROGRAM DESIGN

# Identify Suitable Land Parcels for the Treatment System

## QUICK START GUIDE

| | |
|---|---|
| We have conducted a shortlisting process identifying all potential sites. | √ |
| We have conducted an internal evaluation and a short list of alternatives based on a comprehensive list of criteria. | |
| We have narrowed down the list of potential sites to two or three that appear to be most suitable. | |
| We have ensured that the Mayor and Sangguniang Bayan (SB) have deliberated and approved the short list of potential sites. | |
| After considering all factors, a site has been selected that meets the approval of the Mayor and SB. | |

The TWG will guide the site selection process. The criteria for selecting the sites include:

| | |
|---|---|
| Proximity of the parcel to the population served. | |
| Cost of the parcel in terms of purchase price, or lost future revenue for alternative uses. | |
| Size of the parcel. Is it big enough for the treatment technology anticipated? | |
| Utility access. Are power and water available to the site? | |
| Climate resilience and flooding risk for the site. | |
| Topography, soils, and proximity to domestic water supply sources. | |
| Approval of local community. | |
| Sufficient space for future expansion. | |
| Planned in conjunction with solid waste management facilities. | |

The TWG should utilize a ranking system where each criterion is graded on a scale of 1 – 5 and the shortlist based on aggregate scores.

## Not in My Back Yard

The "Not in My Back Yard" (NIMBY) syndrome is opposition by residents to a project because it is too close to them, even though they feel the project is needed. Reasons for this opposition to septage management programs may be based on legitimate concerns, which may include increased truck traffic, odors, noise or other nuisances, the potential for decreased property values, and more[4].

Often, rationale for community opposition may be less factual and more emotional, an example being the widely held but false belief that pathogens from septage management facilities are airborne and can make people sick simply by proximity. While educating people on the factual aspects of septage management can help, it is not the complete answer to addressing NIMBY concerns. For that, a specific strategy should be implemented early on in the process with the goal of changing NIMBY to PIMBY, or "Please (but it) In My Back Yard".

A three-step strategy is proposed that should be implemented for all septage management programs to address the siting issue:

1

**Planning** – a comprehensive approach that integrates the technical aspects of a project with addressing the potential impacts that the project may have on surrounding communities.

2

**Education and promotions** – using evidence based promotions campaigns targeting impacted communities to focus on the local benefits while addressing what might truly motivate individual community members to act in support the project.

3

**Providing real benefits for affected communities** – such as local employment, improved roads and access, economic development, revenue sharing or other incentives for communities to want to host the site.

The overarching goal of these activities is to achieve buy-in from the overwhelming majority of citizens in the affected community. Understanding the issues of affected communities and building solutions and even incentives into the overall project design can help sway the opponents. These may include short term construction jobs for qualified individuals living near the proposed facility, upgraded roads, limits on facility operating hours, or controls for odors and other potential nuisances.

Addressing the issue upfront through effective and inclusive planning, education and stakeholder involvement can often make the difference between a successful project and one that never gets off the ground.

[4]Goodbye NIMBY, Hello PIMBY — Richard Hartung
*http://www.themalaysianinsider.com/sideviews/article/goodbye-nimby-hello-pimby-richard-hartung/*

STEP

8

PROGRAM DESIGN

# Technology Options – Treatment and Collections

## TREATMENT FACILITY

### QUICK START GUIDE - Treatment Technology selection

| | |
|---|---|
| We have selected and evaluated a preferred treatment site. We understand the site constraints. | √ |
| We have determined the daily volume and characteristics of the septage to be collected and treated. | |
| We have used the TOOLKIT (SMDST) to review costs for passive, hybrid and mechanized systems and have selected a preferred technology. | |
| We have prepared draft designs at the pre-feasibility study level. | |
| We have begun discussing with local contractors to verify their capabilities and interests. | |
| We have consulted with stakeholders and decision makers on the treatment technology selection. | |

This step is broken down into two sub-tasks:

- Selecting the treatment technologies; and
- Selecting the collection equipment and fleet.

## Types of Treatment Technologies

There are many types of septage treatment plants. The type the community chooses will be determined by:

- Capital cost to construct (CAPEX) and the amount of money that can be raised;
- Operational and maintenance costs (OPEX) including power consumption;
- The land area required;
- The ease of operation; and
- Performance.

The following technology / cost matrix (figure 11) can be utilized for initial planning:

| MODEL OF TREATMENT | TYPE OF TREATMENT | FACILITY COST / AREA REQUIREMENTS | | | | REMARKS |
|---|---|---|---|---|---|---|
| | | Capacities per day | | | | |
| | | 5m³ | 10m³ | 15m³ | 30m³ | |
| Dumaguete, Negros Oriental | Anaerobic -> Facultative -> Maturation -> Reed Bed | P3M 3,000 m² | P5.5M 6,000 m² | P7.5M 9,000 m² | P13M 10,000 m² | • Large space requirement<br>• Low cost<br>• Minimal electricity required<br>• No chemicals |
| San Fernando, La Union | Anaerobic Baffled Reactor -> Upflow Anaerobic -> Sludge Blanket -> Facultative -> Maturation | P3M 3,000 m² | P5.5M 6,000 m² | P7.5M 9,000 m² | P13M 10,000 m² | • Large space requirement<br>• Low cost<br>• Minimal electricity required<br>• No chemicals |
| Baliuag, Bulacan | Mechanized System and Chemical Treatment | P20M 400 m² | P20M 500 m² | P22M 600 m² | P35M 750 m² | • Minimal space requirement<br>• Expensive investment, operation and maintenance |
| Lime Stabilization for Yolanda-Affected Areas | Lime Stabilization -> Drying Bed -> Anaerobic Baffled Reactor -> Facultative Ponds | P2M 600 m² | P3M 1,000 m² | P5M 1,200 m² | P8M 1,500 m² | • Medium cost due to chemical and minimal electrical usage |

*Figure 11. Indicative costs for septage treatment facilities.*

The data presented for each technology is indicative based on averages from existing facilities located throughout the Philippines. The next step is to refine this data by preparing preliminary design and costing based on local conditions. Such information can be obtained from:

- Staff engineers if they have specific training;
- Consultations with DOH and DPWH staff;
- Contract engineers; or
- Through an open bidding process.

Example (figure 12): Two municipalities in Central Philippines are going through this process. They have shortlisted 3 options: (i) lime stabilization as being used in Tacloban City, (ii) sewage lagoons as being used in Dumaguete, and (iii) a passive technology by BORDA which has been successfully used in Aceh, Indonesia.

| Parameter | Lime Stabilization (Tacloban Model) | Lagoons (Dumaguete Model) | BORDA System (Aceh, Indonesia Model) |
|---|---|---|---|
| Capital Cost (CAPEX) | P 3,220,000 Civil, Electromech 1.25M<br>**Total P 4.47 M** | P 6,480,000 Civil, Electromech, 800,000<br>**Total P 7.28 M** | **Total: P 4.5 M** |
| Land area (sq. meters) | 2500-3000 sq m. including future expansion | 3745 sq m. including future expansion | 2,000-2,500 sq.m. |
| Electrical consumption | P 550 / day | P 550 / day | n.a. |
| Number of operators | 3 – 4 | 4 – 6 | 3 – 4 |
| Skill level of operators (low, medium, high) | Moderate | Moderate | Low |
| Operations cost per year (OPEX) including cost of consumables (lime, chlorine) | P 30 per day for Chlorine<br>P 1350 – P 1500 / day for Lime<br>Salaries for hauling, composting, disposal of biosolids. | P 30 per day for Chlorine<br>P 1350-P1500 / day for Lime<br>Salaries for hauling, composting, disposal of biosolids. | Most of the cost is for salaries, hauling / composting / disposal of biosolids |
| Components: list each component in the treatment train | Screening, grit removal, lime mixing, aeration, neutralization, waste stabilization, planted gravel system, chlorination | Screening, grit removal, lime mixing, aeration, neutralization, ABR, extended aeration, planted gravel system, chlorination | Receiving area/screening, Bio-digester, sedimentation tank, stabilization reactors, mixing tank, dewatering bed, ABR, PGF, Constructed wetland |

*Figure 12. Example - shortlist of options among various technologies*

In addition to this matrix, preliminary engineering designs were completed to help identify the required units and flow pattern, which will be used to explain to the decision-makers how each technology works. The preliminary designs also help to size each of the components to better understand the overall area required. Such designs are at the "pre-feasibility study" (pre-FS) level of detail. In the case of Bantayan Municipality, their selection was a lagoon system (figure 13), patterned after Dumaguete City's septage treatment plant.

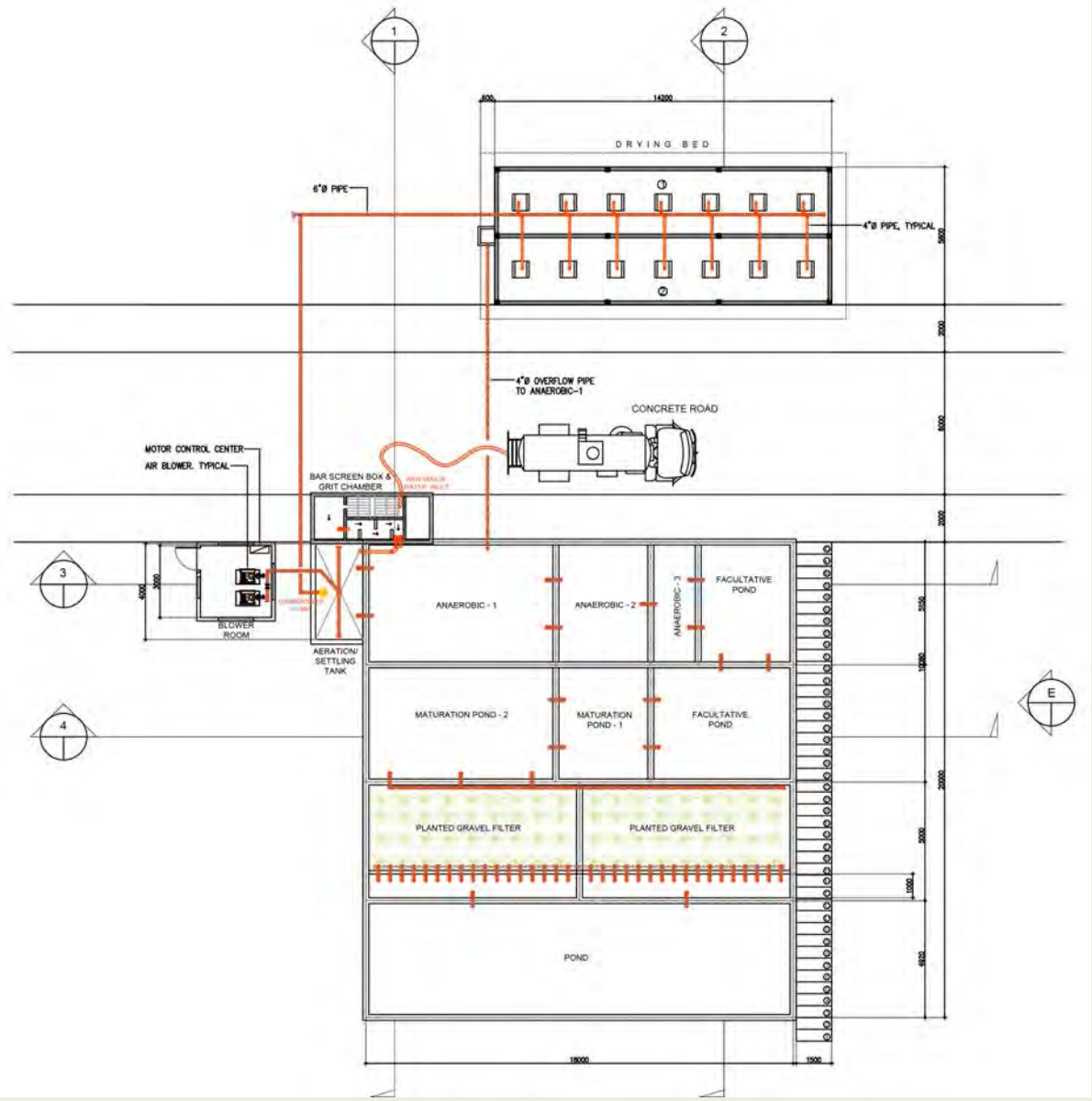



*Figure 13. Flow diagram for the lagoon system of Bantayan Municipality.*

In another instance, the TWG recommended passive technologies as most appropriate for their local needs. Mechanized options can be similarly considered should these appear to be feasible and practical given local conditions.

Private sector organizations were invited to submit proposals which generated this information. At their request, flow process and unit costing information was also provided. The cost breakdown of the preferred technology option is provided below for this 15 cubic meter per day system. There are many resources that local governments can use to obtain more information about septage treatment technologies. (see Appendix 8)

| Post | Module Details | Sub-Total (PhP) | Total (PhP) |
|---|---|---|---|
| I | Direct Cost Estimate | | 4,500,000.00 |
| 1 | Receiving point and pre-treatment | 450,000 | |
| 2 | Biogas Digester | 1,150,000 | |
| 3 | Sedimentation Tank | 250,000 | |
| 4 | Stabilization Reactors | 1,250,000 | |
| 5 | Anaerobic Baffled Reactor | | |
| 6 | Sludge with Lime mixing pit | 300,000 | |
| 7 | Sludge Drying bed filtration | 300,000 | |
| 8 | Constructed Wetlands | 200,000 | |
| 9 | Planted Gravel Filter | 600,00 | |
| 10 | Introduction of UV or Chlorination (in needed) | - | - |
| II | Contingency | - | - |
| III | Mobilization and Demobilization | - | - |
| IV | Investment of Truck | - | - |
| V | Land | - | - |
| VI | Project Management and Administration | - | - |
| | GRAND TOTAL | | 4,500,000.00 |

*Figure 14. Cost estimate for a 15 cubic meter system (BNS Borda, 2015).*

## QUICK START GUIDE - Septage Collection Technology

| | |
|---|---|
| We have determined the desludging model we will use – either scheduled desludging (door to door service every 3 – 5 years), or or the demand based "call for service" model | √ |
| We have conducted our RTA and understand the access limitations | |
| We have conducted our Time and Distance study and used the SMDST to provide outputs | |
| We have determined if we will use transfer stations, and if so, mobile or stationary | |
| We have determined our fleet composition and any special tools required for the service | |
| We have reviewed the CAPEX and OPEX estimates from the SMDST | |

The septage collection equipment including the number and size of trucks, motorcycle tankers, and hand operated desludging equipment will be mostly determined by:

- Estimated daily volume of septage to collect;
- Time and distance study for collection and transport activities;
- If there is any large truck ban or heavy traffic in the municipality; and
- Percentage of homes not accessible by a vacuum truck.

For communities where any significant portion of the homes and businesses are not accessible by a vacuum truck, other equipment such as motorcycle tankers, hand carts, hand operated augers, and others may be required. The following images (figures 15-18) show the different types of collection and transport technologies.

Figure 15. The eVac is powered by a 1.5kw electric motor. It uses a small vacuum pump to create a vacuum of up to 0.9 bars in the 47 liter vacuum tank. Using the plug and gulp method, the eVac can deal with higher density sludges. Wet sludge can be emptied at a rate of up to 10 litres per second, and thicker sludge at around 50 litres per minute. The 82mm diameter pipe can access the pit through the pedestal if necessary.

Figure 16. Septage auger. Powered by a small gasoline operated motor, the auger shoots the septage into the barrels, which are then loaded onto a pickup truck or hand cart and transported to the collection site or transfer station. This is an ideal setup for homes inaccessible by the vacuum truck.

Figure 17. Vacutug, another option for narrow streets. Vacutugs are available in a variety of sizes. 0.5 to 1.6 cubic meters are most common.


Figure 18. Traditional vacuum trucks. The tanks shown here have a 2.5 cubic meters capacity. Vacuum trucks are available in sizes in sizes from less than 1 cubic meter to up to 10 cubic meters of capacity.

Always verify weight restrictions on area roads and bridges before ordering. Compare those restrictions with the gross vehicle weight of the vehicle fully loaded.

# Transfer Stations

Transfer stations are intermediary drop off locations often used where treatment facilities are located too far away from population centers to make direct disposal feasible. In other locations, traffic concerns or local truck bans during daylight hours may make transfer stations feasible. In addition, municipalities where a significant percentage of homes cannot be accessed by tanker trucks should utilize transfer stations.

Consider transfer stations if:

- There are more than 5% of the homes inaccessible by a vacuum truck;
- The treatment plant is too far away from the community serviced making the transport of individual loads impractical; and
- If there is a truck ban or if heavy traffic during daylight hours will impede the delivery of septage to the plant.

Two types of transfer stations are presented here: mobile and fixed.

## Mobile Transfer Stations

Mobile transfer stations are nothing more than larger tanker trucks that are deployed along with small vacuum trucks and motorcycle or hand carts. The smaller vehicles discharge to the larger tanker, which then carries the collected waste to the treatment plant. These work well in scheduled desludging business models.

## Fixed Transfer Stations

Fixed transfer stations are dedicated facilities installed at central locations throughout the municipality that serve as drop off locations for collected septage (figure 19). They may include a receiving station with screens, a tank for holding the collected waste, trash storage containers, and wash down facilities. These may be more appropriate for call-for-service business model.

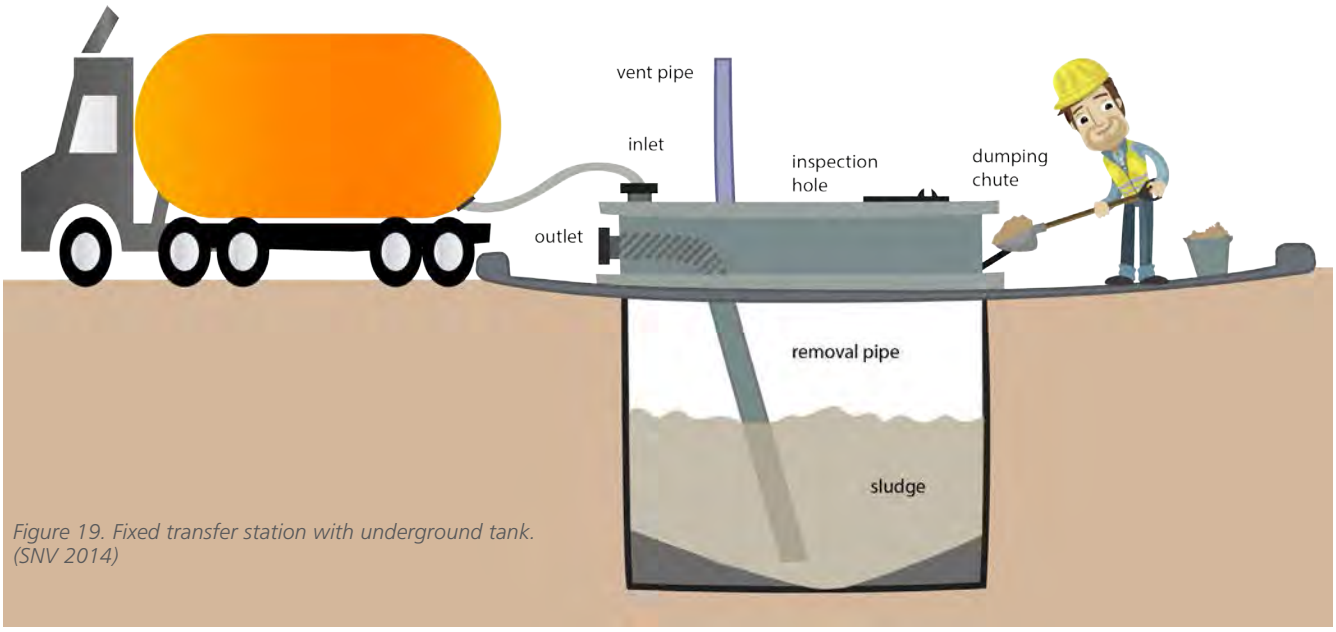



*Figure 19. Fixed transfer station with underground tank. (SNV 2014)*

Transfer stations may be staffed or unstaffed, or emptied daily or weekly depending upon design flow. Other considerations for transfer stations include:

- Local populations may be opposed to installing transfer stations in their neighborhoods. Transfer stations can be sources of nuisances from odors, truck traffic, others;
- Consider adding bar screens at the transfer station. This will require a staff person and solid waste bins that can be periodically emptied at the landfill;
- Consider adding tank washing facilities to concentrate waste at the collection site and not out in the community;
- Utilize a manifest system so that all loads are tracked from origin to discharge site.

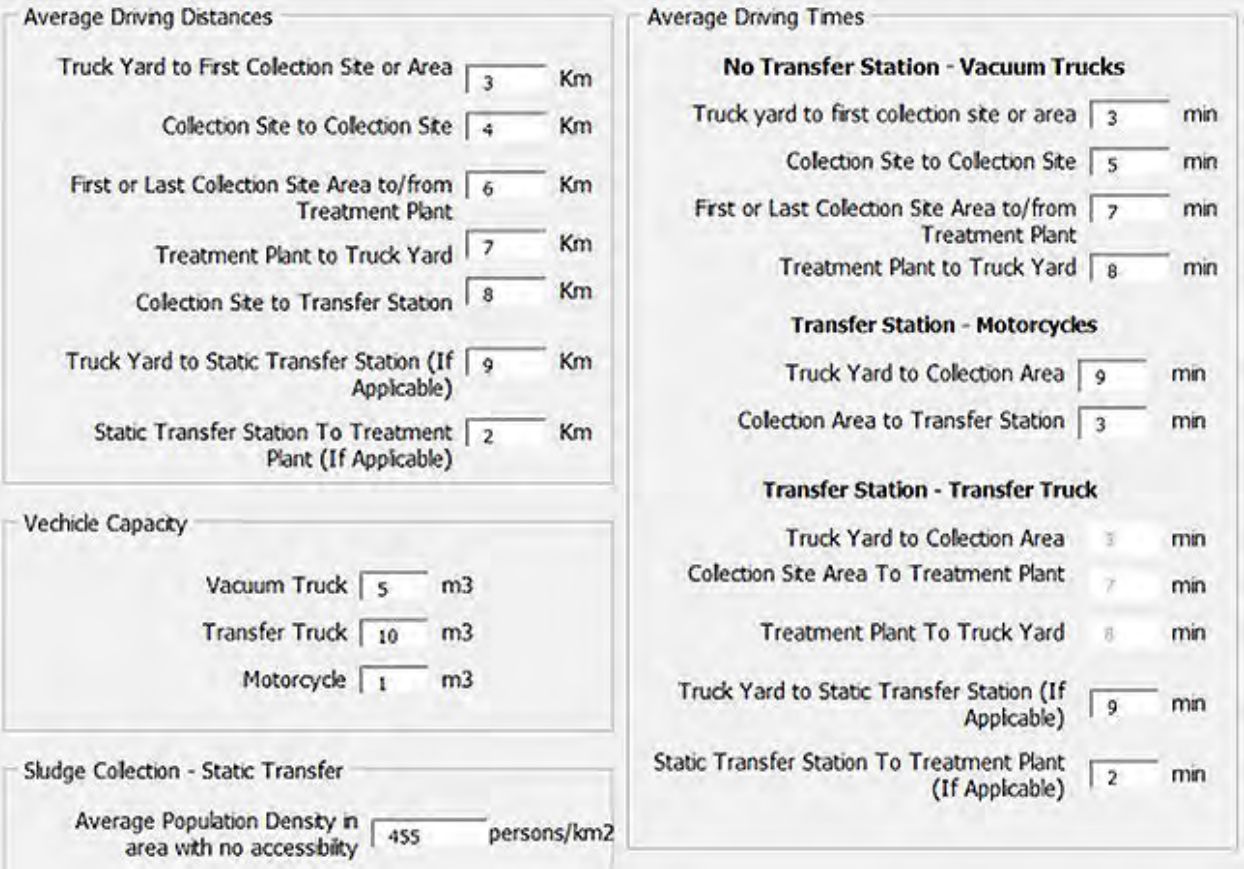



*Figure 20. Screenshot from SMDST. Use the SMDST Time and Distance study inputs page to determine fleet composition, transfer stations, CAPEX and OPEX.*

STEP

9

PROGRAM DESIGN

# Draft the Local Ordinance

## TREATMENT FACILITY

## QUICK START GUIDE
Treatment Technology selection

| | |
|---|---|
| We have prepared a schedule of work sessions and readings. | √ |
| SB (municipal council) liaison and municipal legal representatives are involved in the process. | |
| Text is drafted and circulated internally for suggested edits. | |
| We have reviewed the draft for consistency with model local ordinances (from DoH manual). | |
| We have scheduled the first reading and presentation in open SB session. | |
| We have conducted the second reading to finalize the text and user fee program. | |
| We have conducted the third reading for approval by SB and the Mayor. | |

The local ordinance sets the policies, procedures, rules and regulations pertaining to septage management. Important sections of the local ordinance include:

- Formulation of a Septage Management Committee;
- Definitions of terms used throughout the document;
- Rational for the program, often described through a series of "where as" statements;
- Rules pertaining to the collection, treatment and discharge of fecal sludge;
- Rules related to installing new or upgrading existing on-site treatment facilities;
- Rules for reusing or recycling the byproducts of the sludge treatment process;
- Fee schedule;
- Penalties for non compliance; and
- Rules on fund utilization and composition of management body.

## Additional Provisions that Might Appear in the Local Ordinance

- The local government shall dedicate a full time sanitary inspector for the program. The SI will be responsible for:
  - Facility inspections,
  - Preparing recommendations for upgrading, and
  - Issuing enforcement actions;
- The local government shall fund an ongoing promotions program to educate their citizens about the program; and
- Developing incentives to encourage people to participate in the program. This might include discounts for those that avail of the service when the truck is in the neighborhood.

## Pro-poor Tariff System

A pro-poor tariff system allows for a minimum charge, typically for those that use the least amount of water. Regular fees are on a sliding scale based on water consumption or some other metric. Other features may include a micro-finance that families can tap for low interest loans to buy toilets or upgrade their facilities.

*The Department of Health's (DOH) Operations Manual on the Rules and Regulations Governing Domestic Sludge and Septage states:*

*The LGU should develop a septage management plan with supporting ordinances to promote regular desludging within the covered area, thereby ensuring the protection of the environment and citizens' health. A sample septage management ordinance based on the actual ordinance from Dumaguete City is presented in full in the DOH manual, and re-printed here in Appendix 7.*

STEP

10

PROGRAM DESIGN

# Draft the Promotions Plan

## QUICK START GUIDE

| | |
|---|---|
| We have developed a clear statement of the goals of the public awareness campaign. | √ |
| We have identified the key behaviors that need to be changed to achieve these goals. | |
| We have created the message based on evidence gathered earlier to determine key motivators. | |
| We have identified the outreach media (print, posters, door-to-door, others) most appropriate to reach the target population. | |
| We have drafted the promotions plan. | |
| We have started the creation stage of the program outreach materials. | |

The promotions plan identifies the steps for:

- Creating the message;
- Producing the materials;
- Launching the outreach activities;
- Monitoring and Evaluation (M&E); and
- Adjusting the message and outreach based on the M&E.

These steps help the TWG develop a strategic approach to preparing the campaign outputs and selecting appropriate media for dissemination. In this stage, the team takes the information obtained during the planning phase and begins to develop the key communications outputs and a plan for disseminating the messages to the target audience.

## Establishing a Communication Objective

The objective should clearly state the desired outcome of the program. Some objectives may include:

- How many containment tanks will be emptied?;
- What is the frequency of desludging?;
- Are reuse products being given away or sold?; and
- The cost of the program in terms of user fees.

## Forming Key Messages

The key message is the very essence of what the program is trying to communicate to the audience. The key message should correspond to the communication objective and be closely aligned with the stated goals of the program. In forming a key message it is important that the TWG:

- Keep it simple - one key message only;
- Consider the audience's acceptance of the message;
- Align the message with the identified motivators of the target audience;
- Focus on the positive message of carrying out the new practices instead of the negative aspects of the existing behaviors;
- Keep it practical in terms of the costs and benefits of the program; and
- Ensure that you can deliver on the promises made in the promotions campaign.

Refer to USAID's 10 Step Promotions Campaign Toolkit, downloadable for free at *www.waterlinks.org.* Much of the information in this section has been derived from that toolkit.

### For rural sanitation programs in the Philippines, 4 communications channels are most common:

- Interpersonal communications which include one on one discussions such as in door to door campaigns conducted by barangay health workers;
- Intra-personal communications which include small group discussions such as yard meetings or community gatherings;
- Printed media communications including posters, flyers, brochures or notices for display on public information boards;
- Activity based communications which may include school plays with themes pertaining to sanitation, or special events that promote improved sanitation, such as hand washing programs at schools. Pilot projects or demonstration activities that show how others are practicing new behaviors are especially useful.

## Choosing the Communication Approach

In selecting the right communication approach, it is essential to clearly recognize the targeted audience and their preferred method of obtaining information. Ideally, the best approach incorporates multimedia outreach. Posters, flyers, school plays, and direct communication are all effective. This strategy is an important component of the communications plan.

Mass media, such as newspaper, radio and television are more appropriate for larger audiences and general messages compared to the targeted messages required of local sanitation outreach programs.

Social media however, unlike mass communications may play an important role in local sanitation issues. Mobile phone based applications and messages can be low cost and highly effective.

*For more information on communication approaches, see Appendix 3.*

## Crafting the Message

Messages should be short and creative. Look at the examples below for ideas. Follow this guidance when crafting the message:

| | | |
|---|---|---|
| 1 | Have you identified the important motivators and incentives that may be used to encourage people to participate in the program? | Y/N |
| 2 | Have you identified the "ideal behaviors" associated with desludging the containment tank, proper operations, and upgrading the system over time? | |
| 3 | Perform a word association exercise – the team works together with the aid of a scribe to list all of the key words that are used to describe the bad and good behaviors, the consequences and benefits. Then begin associating words into phrases that describe the problem and solution. This exercise can help the team develop slogans or phrases that can be used in posters, or expounded upon for brochures. | |
| 4 | Fill in the gaps with visuals. Provide pictures of the ideal behaviors and benefits that come from them. While it is important to understand the poor behaviors and their consequences, to the extent possible, your campaign should focus on the positive. Do your images tell the story you are trying to convey? | |
| 5 | For posters, keep it simple. The less text on the poster, the better. | |
| 6 | Text should be bold and easy to read. The style of the text and images should not take away from the message. | |
| 7 | For brochures and fact sheets, make sure to include contact information for people that have questions or want to get involved. Contacts must be answered promptly. | |
| 8 | Think of the message as a "promise". "If you do this behavior, this will be the result". Is the promise in your campaign true, verifiable, and measurable? | |

## Checklist for Promotions Materials – Photos and Text

The TWG should follow this checklist for creating promotions materials

| | | |
|---|---|---|
| 1 | Are photos or graphics relevant to the target population? | Y/N |
| 2 | Do photos or graphics adequately show people performing the preferred behavior? | |
| 3 | Do the visuals tell the story you want to tell? | |
| 4 | Do the photos complement the text? | |
| 5 | Is the message simple and easy to understand by the target audience? | |
| 6 | Is the message memorable? Will it get people talking? | |
| 7 | Hint: check to see if photos tell the story by themselves, even without the text. If so, you are on the right track. | |
| 8 | Does the message describe the benefits of the preferred behavior? | |

## Pre-testing

For larger campaigns it may be beneficial to pretest with a subset of the target audience. This helps to verify that the message is getting through before spending for the full campaign. Here is a pre-testing checklist:

| Task | Value |
|---|---|
| Expose the respondent to the promotions materials as they would be exposed during the full program roll out. For campaigns involving posters, flyers, or brochures, have respondents read the materials? For plays or radio spots, have them watch or listen. | |
| In individual or group setting, present a list of prepared questions about the materials and the behavior to elicit responses that will inform you about the degree that the message has been transmitted and the likelihood it will result in changed behavior. Below are some questions you may ask to obtain this information (customize to your specific campaign). Answers should be on a range from 1 – 5 where 1 is strongly disagree and 5 is strongly agree. | |
| • Are you aware that this is an issue? | 1-5 |
| • Is this an issue of concern to you? | 1-5 |
| • Did you relate to the people depicted in the materials? | 1-5 |
| • How does the preferred behavior described in the materials differ from your behavior? | 1-5 |
| • Do you believe that the depicted behavior is appropriate for you and your community? | 1-5 |
| • Do you believe if everyone practiced this preferred behavior, that it will make a positive impact in your community? | 1-5 |
| • What do you think the motivating factor is that the promotional material is representing? | Respondent writes down the motivator |
| • Is this motivating factor relevant to you in your community? | 1-5 |
| • This is a strong motivator for me | 1-5 |
| • I would be likely to change my behavior now that I am more informed about the problem | 1-5 |

## Sample Promotion Campaign Outputs

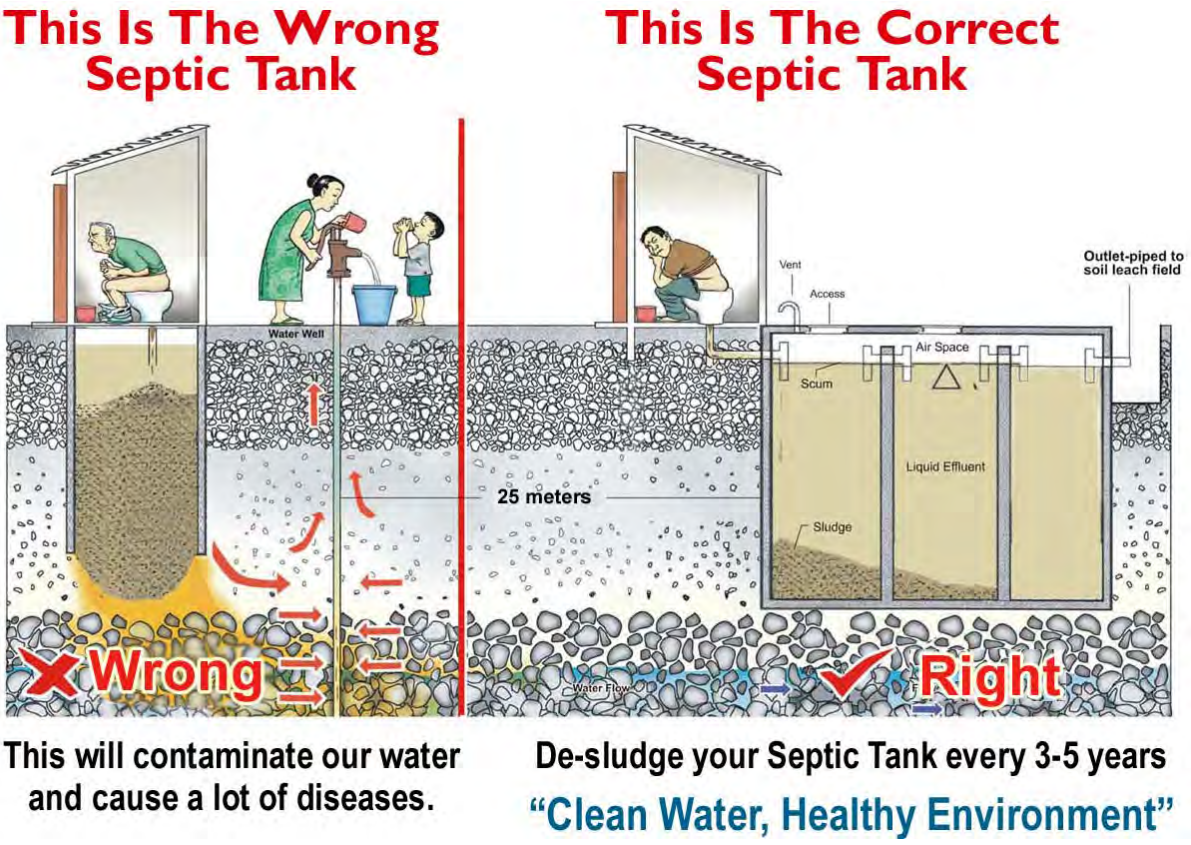
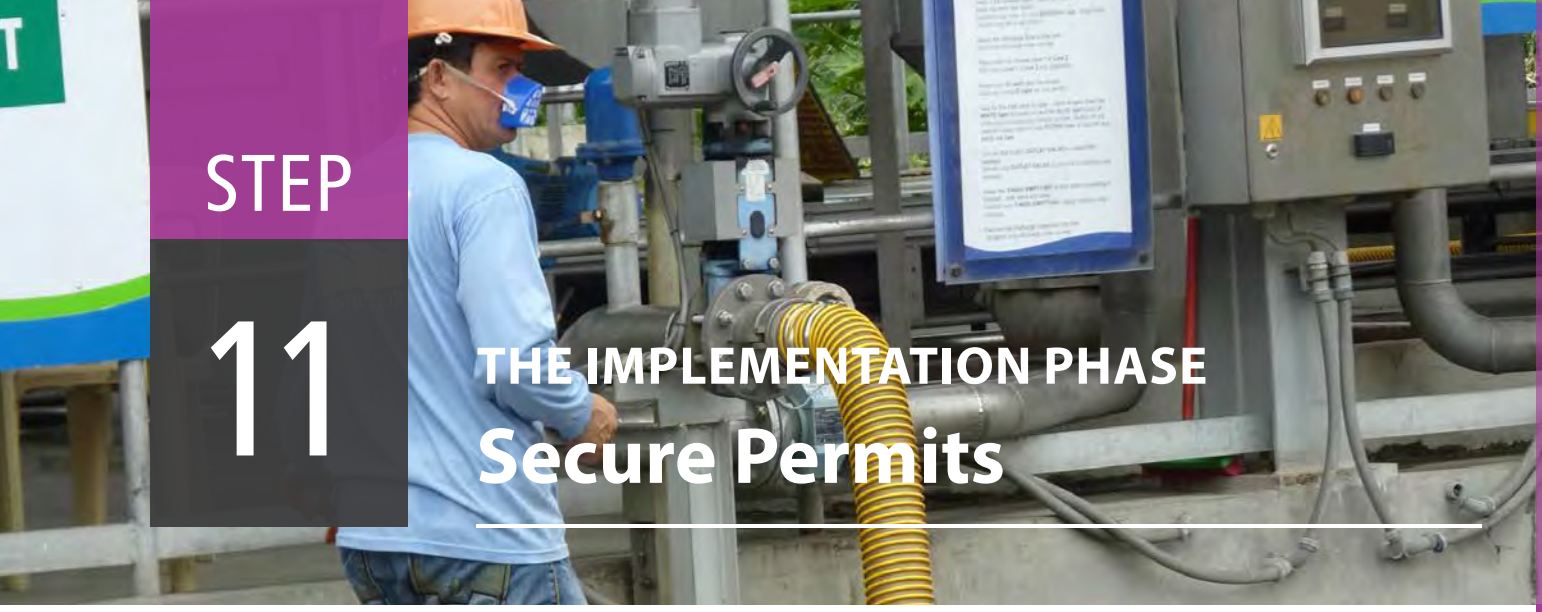



*Figure 21. The "right" and "wrong" septic tank. Courtesy of the USAID Philippine Sanitation Alliance Project.*


*Figure 22. "Clean your septic tank or swallow the consequences". Outreach campaign in Muntinlupa City, Philippines. Courtesy of the USAID Philippine Sanitation Alliance project*

# THE IMPLEMENTATION PHASE

| | | | |
|---|---|---|---|
| STEP 11 | Secure permits | Submit application for DENR/EMB ECC or CNC and Discharge Permit.<br>Submit application for DOH Environmental Sanitation Clearance.<br>*(DOH will issue ESC only after ECC or CNC has been issued by DENR/EMB)* | Permits & construction schedule |
| STEP 12 | Launch the promotions campaign | Pretest, launch, monitor and evaluate, and re-launch as needed. | Promotions kick-off event and launching |
| STEP13 | Finalize and pass the local ordinance | The approval process for officially passing the draft ordinance into law. | Approved ordinance and fee structure |
| STEP 14 | Tender to construct, buy equipment, or purchase services | Determine if program will be managed "by administration" or contracting with the private sector. | Bids are obtained and contracts executed |
| STEP 15 | Construct | Build the facilities and purchase the equipment. | Septage begins to flow |
| STEP 16 | Monitor and Evaluate the Implementation – organizational structure moving forward | Begin long term monitoring of indicators and targets. | Quarterly reports, institutional arrangements plan moving forward |



STEP

11

THE IMPLEMENTATION PHASE

# Secure Permits

## QUICK START GUIDE

| | |
|---|---|
| We have invited DoH, DPWH and EMB regional officials to participate in TWG and stakeholder meetings. | √ |
| We have created facility designs at the feasibility study level of detail. | |
| We have obtained an Environmental Sanitation Clearance (ESC) form from DoH. | |
| We have applied for an Environmental Compliance Certificate (ECC) or Certificate of Non-Coverage (CNC) at DENR/EMB. | |
| We have conducted courtesy consultations with the DWPH staff. | |
| We have obtained permits. | |
| We have reviewed and understood monitoring requirements. | |

There are three regulatory agencies directly involved in securing permits and clearances for septage management programs and facilities:

- **The Department of Health (DOH)** is primarily responsible for creating and enforcing standards for drinking water, septage and sludge disposal. DOH has a role in reviewing and issuing Environmental Compliance Certificates (ECC) for both stationary (treatment) and mobile (collection and transportation) septage services.
- **The Environment Management Bureau, within the Department of Environment and Natural Resources (DENR)** is the lead agency for water and wastewater regulation policy, enforcement, and institutional coordination. They will issue a ECC or Certificate of Non-Coverage (CNC).
- **The Department of Public Works and Highways (DPWH)** is one of the three departments in the government carrying out major infrastructure projects. They may offer some technical or financial assistance for your project.

## Environmental Sanitation Clearance from DoH

You must secure an Environmental Sanitation Clearance (ESC) from the Center for Health Development of the Department of Health. This requirement applies to all new and existing septage management activities, expansion, or modification of permitted facilities. It includes the treatment and disposal sites as well as all collections operations. The DoH Center for Health Development is the office with jurisdiction.

More information can be found in the DoH Operations Manual on the Rules and Regulations Governing Domestic Sludge and Septage (2008) accessible here:

*http://tinyurl.com/sludgemanual*

## Discharge Permit or Certificate of Non-Coverage

The Environmental Management Bureau (EMB) of the Department of Environment and Natural Resources (DENR) requires a discharge permit for larger facilities. Here is a link to the discharge permit application form:

*http://emb.gov.ph/permitting/DischargePermitForm.pdf.*

It is recommended to establish personal communication early on with the EMB representative.

**NOTE**

If you are within the jurisdiction of the Laguna Lake Development Authority, get the discharge permit from them.

## Department of Public Works and Highways (DPWH)

DPWH manages the National Sewerage and Septage Management Program (NSSMP). They offer technical assistance and possibly matching funds for projects. Access their program and application forms at:

*http://www.dpwh.gov.ph/NSSMP/*

Coordination with the regional DPWH office will be worthwhile.


STEP

12

THE IMPLEMENTATION PHASE

# Launch the Promotions Campaign

## QUICK START GUIDE

| | |
|---|---|
| We have planned a kick off meeting or event to launch the campaign. | |
| We have organized a press conference to publicize the event. | |
| We have ensured that enough materials are available for dissemination. | |
| We have disseminated the materials as per the plan: preselected locations for poster hanging, flyer hand outs, school plays or others. | |
| We have verified that the materials have been effectively disseminated. We are conducting periodic checks to verify the outputs continue to be available and visible. | |
| We have started the monitoring and evaluation process for the promotions campaign. | |

Once the materials have been pretested and are ready for dissemination, the campaign can be launched and the message and materials disseminated to the target audience. Often, campaigns are conducted in association with promotional "kick off" events such as "fun runs", community gatherings, or public holiday celebrations (figure 23).

After the outreach materials have been distributed, in the short term, it is important to follow up to verify that the outreach methodologies expressed in the communications plan are being properly performed. For poster campaigns, verify that the posters are placed in pre-designated locations and check back to verify they haven't been taken down. For door to door outreach, verify that the planned number of contacts are being made, and identify any problems or issues that can be addressed early on.


*Figure 23. WASH Caravan kicks off septage management program in Marikina City, 2007 (left), and WASH Day Campaign in Dumaguete City, 2005 (right). Courtesy of the USAID Philippine Sanitation Alliance project*

Launching the promotions campaign involves preparation of the promotion campaign materials and deploying them in an organized fashion. It is usually preceded by a launching event or campaign kickoff. Press conference or special meetings can be organized to accomplish the kick off. During the kick off, the promotions materials are presented to the general audience for the first time.

Use the check list below to verify the major steps are followed:

| Number | Activity | Y/N |
|---|---|---|
| 1 | Verify the timing of the launching is in accordance with the plan. | |
| 2 | Identify the venue for the kick off meeting or press conference and send out invitations and directions. | |
| 3 | Present the materials at the kick off meeting along with the problem statement. | |
| 4 | Discuss next steps and how the team will monitor progress. | |
| 5 | Deploy the promotions materials. | |
| 6 | Follow up to verify that the materials have been effectively deployed, and re-deploy as needed. | |

## Monitoring and Evaluation of the Campaign

Monitoring is a continuous assessment that aims at providing all stakeholders with early detailed information on the progress or delay of the ongoing assessed activity. An evaluation is a systematic and objective examination concerning the relevance, effectiveness, efficiency and impact of activities in the light of specified objectives.

For the promotions campaigns, the TWG verifies that the promotions materials have been disseminated as per the communications plan. Then, a new round of focus group discussions, interviews and surveys are conducted with the results compared to the baseline results from the initial evidence gathering to determine if attitudes are changing. This may be simple or complex to measure.

Determining if actual behavior change is sustainable is a much longer process. It requires careful monitoring of indicators. Some examples of indicators:

- BOD concentrations in receiving waters for programs that are intended to reduce discharge of failing septic tanks;
- Number of containment tanks desludged (is the number increasing year to year?); and
- Percentage of tariffs billed that are actually collected.

Careful selection of indicators is required to ensure they are relevant to the behavior change sought, and are easy to measure. A more complete discussion of this topic is in Step 16.

To achieve long term sustainability of sanitation improvement programs, ongoing and continuous community engagement and promotions campaigns are required as well as the associated monitoring, evaluation, refinement and relaunching as necessary.

## Monitoring and Evaluation Checklist for Promotions Campaigns

Short-term monitoring and evaluation is used to verify that the promotions campaign has been properly launched and is achieving the desired results. If not, ways of modifying the campaign may be suggested as needed. This is typically achieved through the monitoring of indicators, and observing if behaviors are changing as per the expectations.

| **Indicators of program success** | **Quantification** |
|---|---|
| Number of fact sheets or brochures given out | |
| Number of posters deployed | |
| Number of attendees at plays or parades | |
| Number of people commenting on the campaign | |
| Number of web page hits | |
| **Indicators of behavior change** | **Quantification** |
| Number of people observed performing improved behaviors | |
| Quantified environment or social change observed as a result of changed behaviors | |
| Fees collected if new behavior is associated with a fee | |
| Other project specific indicators | |

STEP

13

THE IMPLEMENTATION PHASE

# Pass the Local Ordinance

## QUICK START GUIDE

| | |
|---|---|
| Approval begins at the Sangguniang Bayan (SB) with a two-thirds majority. | √ |
| Once SB approval is obtained, we ensure that it is sent to the Mayor for signing. | |
| The mayor may sign or veto. If vetoed, it goes back to SB for further consideration, adjustment, or a veto override attempt. If signed by mayor, it is forward to the municipal attorney's office for final review. | |
| The attorney's office may send back the ordinance to the SB if it finds that it has over reached its authority. If no action, the ordinance becomes law after a 30-day waiting period. | |
| We maximize opportunities for public comment in each of the readings. | |

Local governments are afforded the opportunities to pass local ordinances to improve the health and safety of its citizens. In previous steps, the local ordinance was drafted and refined through meetings by the TWG and reading the proposed ordinance in open session at the SB. After the 3rd reading, the SB approves and sends to the mayor for approval. If the local ordinance fails to gain approval, there will be an opportunity by the TWG to address any issues of contention and try again.

*Refer to Appendix 6 for the full text of requirements specified in the Local Government Code.*


SJZ 659
1977
DISTANCE

STEP

14

THE IMPLEMENTATION PHASE

# Tender to Construct, Buy Equipment, or Purchase Services

## QUICK START GUIDE

| | |
|---|---|
| All procurement of goods and services shall be through competitive bidding in accordance with the Local Government Code and RA 9184. | √ |
| We have posted a "Request for Proposals" in the paper in accordance with the Local Government Code and RA 9184 requirements. | |
| We have hosted a pre-bid meeting where invited contractors can review the plans and specifications. | |
| We have selected the preferred contractor based on pre-determined criteria. Lowest cost may not always be the only selection criteria. | |
| We have posted awards as per LGC and RA 9184 requirements. | |
| We have engaged successful bidders through pre-construction meetings to verify that all aspects of the program are well understood, and that the schedule for achieving milestones is agreed upon. | |

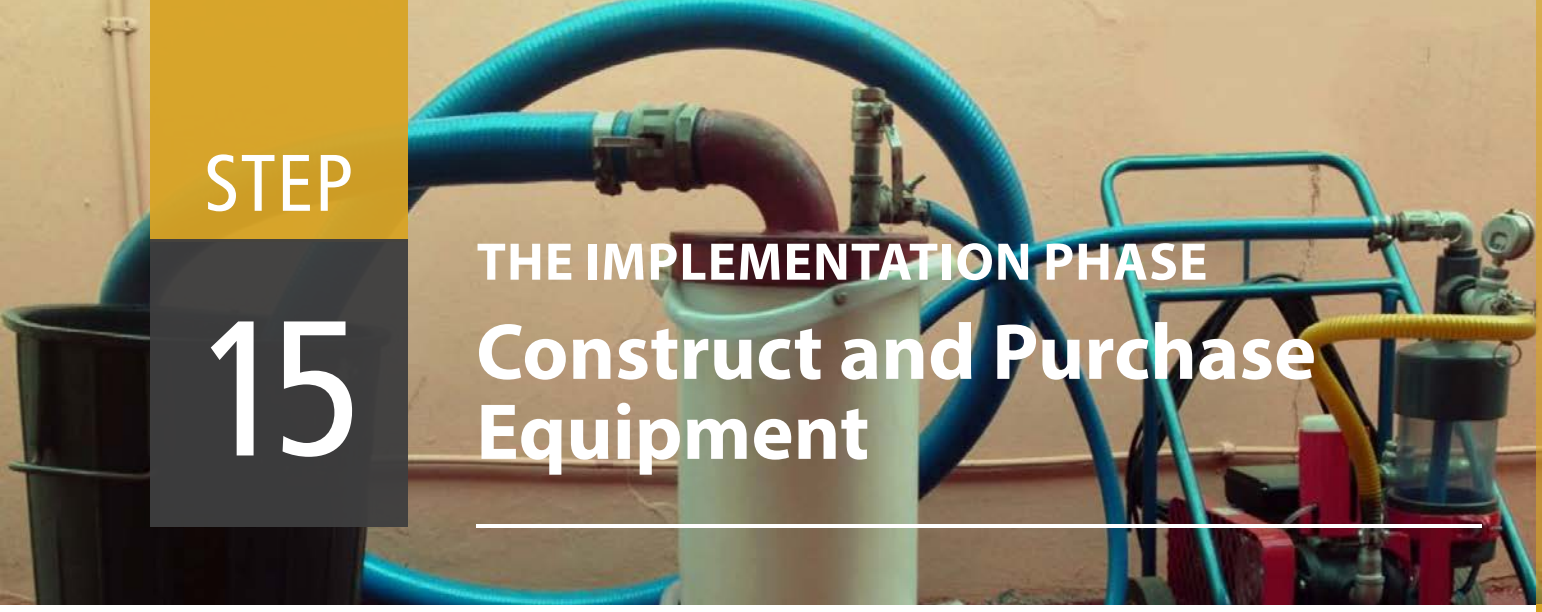
The Local Government Code and Republic Act 9184 (An Act Providing for the Modernization, Standardization and Regulation of the Procurement Activities of the Government and for Other Purposes) describes the procedures that govern the procurement, care, utilization, custody, and disposal of supplies and services. The general rule in procurement is that - except as otherwise provided in the code, acquisition of supplies and services by local government units shall be through competitive public bidding.

- Publishing the tender advertisement in the local news paper;
- Hosting a pre-bid conference; and
- Selecting the contractor or purveyor of the goods and services based on predetermined criteria.

*See Appendix 5 for the section of the Local Government Code pertaining to procurement / tendering.*

## Tendering Checklist

| | |
|---|---|
| Engineered designs shall be prepared by a licensed civil or sanitary engineer in good standing. | √ |
| Parts, materials and equipment purchased for this program shall comply with ASTM and NSF International standards where applicable. | |
| Parts, materials and equipment shall be warranted by the contractor for a period of not less than 1 year. | |
| Septage treatment facilities shall conform to all DENR discharge standards. Contractor shall maintain an effluent guarantee for no less than 1 year. | |
| Contractor shall be licensed and bonded. | |
| Contractor shall provide three references from similar projects. | |
| Contractor shall provide a detailed proposed construction schedule. | |
| Contractor shall submit a health and safety plan prior to construction. | |
| Contractor shall utilize Best Management Practices for erosion and non-point source pollution control. | |



STEP

15

THE IMPLEMENTATION PHASE

# Construct and Purchase Equipment

## QUICK START GUIDE

| | |
|---|---|
| We have hosted a pre-construction meeting with contractors. | √ |
| We have developed a master construction schedule and identified milestones. | |
| We have conducted construction inspections at:<br>• Preconstruction site inspection<br>• Completion of construction staking<br>• Installation of tanks and basins<br>• Plumbing inspection<br>• Final inspection | |
| We have obtained two sets of "as-built" or record drawings duly signed by the engineer in charge, along with warrantees, O&M plan. | |
| We have checked the start-up facilities; tanks and pipelines have been tested for leaks; all equipment has been tested. | |
| Turnover to the client. We have maintained all warranty and effluent guarantee periods until turnover is complete. | |

## Construction Monitoring and Inspection

The pre-construction inspection: Host it on-site and discuss each aspect of the construction schedule with the contractor:

- Obtain copies of the approved construction drawings;
- Obtain a construction schedule with milestones noted. These include
  - o Construction staking complete
  - o Digging basins and setting of tanks
  - o Final plumbing
  - o Project completion
- Observe the construction staking and verify that it conforms with the site plan and approved drawings;
- Discuss with the contractor site health and safety and obtain a copy of the health and safety plan;
- Discuss ingress, egress, worker parking, hours of operation, local ordinances and permits;
- Discuss run off control and prepare a Non-point Source Pollution Mitigation plan.

The contractor will be responsible for posting copies of the ECC or CNC and DoH Clearance at the construction site. They are also required to provide adequate notification of construction milestones in order to facilitate inspections.

## Commissioning

During commissioning, the system is tested first with water to verify tanks and basins are water tight, then with actual septage as the program starts up. Wastewater treatment systems require time to start up. Commissioning may last between 3 to 6 months before the system is operating at peak efficiency. This is often based on the volume of waste received. The construction contract should identify the commissioning period. Make sure you:

- Obtain signed copies of record or "as-built" drawings;
- Obtain operation and maintenance manual from contractor; and
- Obtain warrantees from equipment manufacturers.

## Training of Operators

This is the ideal time to ramp up training of the treatment plant operators and collection drivers. These are not skills that will develop immediately. The following can help:

- A 2 week training period with nearby operational program. This is where your staff will travel to a nearby city or municipality with an existing program and learn the job skills required of them. Be sure to budget for expenses and make arrangements with the host facility well in advance.
- Apprenticeship and job sharing programs. These are longer term arrangements between skilled people and organizations and those employees that need to learn. They can be within an organization or with host and recipient relationships between organizations.
- Twinning arrangements. These are formal agreements between host and recipient organizations to share best practices. The process has been happening for several years for water service providers. Utilize the same concepts for septage.

  See *www.waterlinks.org* or more information.

## Turnover

Once commissioned, the plant is turned over to the customer (municipality, WD, private enterprise). In some instances, the customer will continue to engage the contractor for operations and maintenance. Be sure to:

- Verify you have copies of "as-built" drawings, warrantees and O&M plan;
- Obtain a final sampling analysis report that the facility meets or exceeds DENR discharge compliance standards; and
- Obtain keys to the gate.

Now that the facility is turned over, it is your responsibility to ensure on-going compliance, either through in-house staff, or through a contract with a third party contractor.

**Recommendation.** Maintain contact with other cities and municipalities that are engaging in septage management. Meet frequently to discuss best practices, lessons learned, and to set up twinning, mentoring and job sharing arrangements.

## Key Provisions of the Collection Program

- All truck-mounted tanks shall be inspected by the driver prior to transport on public roads to ensure that septage will not leak, spill, or run out of the tank.
- All vehicles used to transport the septage shall be equipped at all times with spill control or absorbent materials and disinfecting agents, such as lime or chlorine bleach.
- No discharge of septage or sludge shall be allowed in manholes, drainage areas, canals, creeks, rivers or other receiving bodies of water or land. Septage must be disposed of in an approved location or facility.
- Record keeping and manifesting requirements must be complied with.

Records of all desludging and compliance activities should be maintained in a central database. Entries will include the date of last desludging, volume removed, any issues with the on-site system, and any compliance schedules or orders. The sanitary Inspector will be responsible for all recordkeeping and the integrity of the database.

*Refer to Appendix 4 for the Manifest Form.*


*Figure 24. Drivers shall be trained in "rules of the road" and procedures for spill reduction and emergency procedures.*

*Figure 25. All records about your program become public documents. Keep them honest and transparent.*


CAUTION
ON-GOING
DESLUDGING
Baliwag Water District
Septage Treatment Plant

STEP

16

THE IMPLEMENTATION PHASE

# Monitor Operations and Moving Forward

## QUICK START GUIDE

| | |
|---|---|
| We have identified the short, medium and long term indicators for monitoring our program. | √ |
| We have considered in advance the remedial actions we will use to address issues. | |
| We have determined targets for the indicators. | |
| We have considered public notification procedures or annual report-card for transparency. | |
| We have developed a written monitoring plan and schedule of monitoring activities. | |
| We have prepared monthly reports for the Mayor looking at short-term indicators and longer-term trends. | |

Once you implement, there will be a lot of people looking at your program. If your program is donor funded, they will certainly have an interest in your progress. Regulators including EMB and DoH will be checking up to make sure you are in compliance with your permit requirements. Nearby municipalities will be looking to see if this is something they should try and replicate in their communities. Finally, your constituents and critics will all be looking to make sure that the promises made are delivered upon and that they are getting service for their money. If so, their willingness to pay will increase over the long term. If not, their willingness to participate in future sanitation projects will be affected.

In other words, there is a lot at stake to keep things on track and as designed. There is one excellent tool available to help in this regard, and that is the monitoring and evaluation plan. When successfully implemented, monitoring and evaluation (M&E) can help correct issues before they become problems. The plan will indicate:

- Short term indicators – daily to monthly;
- Medium term indicators – 6 to 18 months; and
- Long term indicators – 2 to 5 years.

## Moving Forward

The long term sustainability of the program will rely upon many factors including:

- Effective integration of the value chain;
- Achieving cost recovery targets;
- Creating sanitation management organizations that are sustainable after the project support has ended; and
- Conducting on-going promotions campaigns.

## Effective Integration of the Value Chain

There are many possible entry points for service providers and equipment manufacturers throughout the desludging program. These include:

- Consultants, contractors and equipment sales during the implementation phase;
- Service contractors for making plumbing repairs to containment tanks found deficient;
- Designers and engineers for installing new compliant systems or upgrading existing ones;
- Contractors and installers for new or upgraded facilities;
- Independent inspectors who may be contracted with by the Municipality;
- Independent desludging firms who will provide services to homeowners independent of the municipality (but will use the treatment facilities as the disposal site);
- Independent desludging firms who will contract with the municipality to perform routine desludging services;
- Trainers, capacity builders, technical service providers contracted through PBSP to provide technical support; and
- Others.

| Term | Indicator | Frequency | Implication |
|---|---|---|---|
| Short | Odors around the plant | Daily | Issues with solid waste handling, organic overloading. Investigate and correct. |
| Short | Hygiene and worker safety | Daily | Monitor worker health and safety, as well as sanitary practices of all staff daily. Review incident reports as incidents occur. |
| Medium | Odor of dried sludge | Monthly | Dried sludge has earthy odor. Other orders may indicate treatment breakdown or insufficient drying. |
| Medium | Quarterly discharge monitoring | Quarterly | Violations may indicate treatment plant overloading or toxic chemicals in the collected septage. If found, closer monitoring will be required. |
| Medium | Collection volume and number of trips | Monthly | Sharp drop off may indicate equipment failures or personnel issues. Investigate. |
| Medium | Revenue | Monthly | Drop off may indicate willingness to pay is dropping. Investigate to obtain evidence, and invigorate your promotions campaign based on the findings. Verify tariffs have been added to the water bill or other collections mechanisms are functioning as estimated in the plan. Investigate shortages and adjust plan as needed. Then re-check tariffs to make sure they are correct. |
| Medium | OPEX | Monthly | Try to understand trends by comparing month to month. Investigate any category where costs exceed plan, and adjust as needed. |
| Medium | Profit – Revenue minus expenses | Monthly | Keep track of this number to verify it is in accordance with plan projections. |
| Medium | Planning assumptions | Monthly | Verify assumptions such as septic tank sizing with real data from operations. Adjust planning model as needed based on real data. |
| Medium | Desludging plan | Monthly | Verify implementation is in accordance with area-wide desludging plan. Investigate reasons if not. |
| Medium | Desludging trucks and equipment performance and maintenance | Monthly | If having issues here, implement a formal asset management program:<br><br>*http://water.epa.gov/infrastructure/sustain/asset_management.cfm* |
| Long | Number of customers in coverage area | Year to year trend | Compare with business model to indicate if your projections are on track. Adjust as needed. |

As communities upgrade their sanitation over time, a cadre of trained and professional service providers will be needed to affect the change. Building the capacity of each sector over time through ongoing training, twinning, mentoring and apprenticeship programs will help ensure that the SMP does not bog down due to a lack of skill in the workforce.

## Achieving Cost Recovery Targets

The business plan developed during the implementation phase of your SMP provided costs and revenue estimates based on average tariffs, percentage of people likely to pay, and efficiency of the proposed collection mechanism. Once the program begins, careful attention to the program costs and revenue generated will be critical. Your SMP should be run like a public service utility with similar monthly reporting requirements.

Attention to the balance sheet, cash flow forecast, income and expenses statements and other financial management tools will be critical. Conduct month-to-month comparisons and act quickly when trends indicate variance from the business plan.

Revenue shortfalls may be an indication of a need for a fresh promotions campaign or increased incentives to encourage people to avail of the service when the truck is in the neighborhood. Such incentives should be built into the fee schedule and local ordinance.

Surcharges for missed appointments or discounts can be strong motivators.

## Sanitation Management and Organization

Septage management programs require ongoing activities to sustain adequate levels of service. These include:

- Ongoing promotions campaigns including sound truck and door hangers (specially designed fliers that fit over the doorknob) deployed in advance of the desludging operation. Keep it fresh and interesting;
- Ongoing inspection and compliance program. Make sure inspections are being carried out and all desludging records and compliance actions are entered into the database;
- Capacity building of regulatory staff for review and approval of plans for new construction or upgrading existing on-site systems;
- Mechanisms for ongoing training and capacity building of program staff (mentorships, job sharing, twinning); and
- A proactive fleet maintenance, or asset-management program.

## Avoid the Backslide – The Call-for-Service Dilemma

What may start out as a scheduled desludging program can quickly revert to the call-for-service model. Scheduled desluding is based on the concept that when the truck is in the neighborhood, most families will avail of the service. If this doesn't happen, scheduled desluging quickly becomes inefficient, and the call-for-service becomes more efficient.

This is what happened in Dumaguete City. After a couple of years of scheduled desludging, participation rates fell to an all time low of 30%. Municipalities can avoid this by keeping promotions campaigns fresh and interesting, while building incentives into the program that encourage people to avail of the scheduled service. As of this writing, Dumaguete City is back on track and conducting scheduled desludging.

*(Dumaguete City septage trucks waiting for the call. Call-for-service is much less efficient than scheduled desludging).*

# APPENDIX 1
# Data Gathering Methods

| | |
|---|---|
| **Interview** | |
| A means of exploring what people think about an issue without the formality of a questionnaire. The interviewer probes and draws out issues of interest in a naturalistic setting. For good results the interviewer needs: clear objectives, a good discussion guide setting out areas to probe, and the ability to listen carefully | Useful for the development of any community education or promotional program. |
| **Focus Group Discussion** | |
| An excellent way of understanding each aspect of a subject, especially about why people do or think what they do. They gather together people with similar backgrounds for a detailed discussion about a subject. The key components of effective FGDs are: clear objectives, a well thought-out discussion guide, a moderator who makes participants feel comfortable, a determination to find out what people really know and think. | All programs can benefit from this technique. |
| **Survey** | |
| Surveys (or questionnaires) are used to gather quantitative and qualitative data. Surveys help the TWG collect information to describe, compare, or explain attitudes and behaviors of targeted populations. This tool can provide a wealth of information about a sample population's preferences and behaviors pertaining to what they currently know and their attitudes on sanitation, wastewater and septage management. This information will inform the promotions strategy. Surveys are also useful for gathering feedback to assess how well a program is working. Surveys can be conducted via the web, email, phone, or in person. | Larger outreach programs at provincial or national level. |
| **Observation** | |
| Environmental walks or drive throughs are most useful. Ask to sit with mothers, farmers and community members and watch what goes on. Join in with the community life to the extent possible. Take notes and photos as well as contact information. Renewing contacts with the same people after the campaign has been launched can be especially valuable.<br><br>*CAUTION: for particularly sensitive issues, community members may act aggressively towards interviewers. Appropriate caution should be exercised. If aggressive people are encountered, walk away and end the effort.* | All outreach programs. Seeing firsthand the nature of the issue is most valuable. |
| **Environmental Walk** | |
| Choose sites that are representative of your target area, and having made the customary contacts with leaders, administrators, etc, ask a group of local people to show you round your chosen villages/ neighborhoods. Chat with mothers and fathers about their children, what their problems are, how they manage to keep their households and their children clean. Ask about problems with sewage, latrines, stagnant water, how they manage their babies and children, the age children learn to defecate alone and where, who helps with the children. | Local programs at the village, town or county level. |

## How to Conduct Interviews and FGDs

### Interviews

Talk to individuals and stakeholders to obtain information by asking questions. You can gather information from various sources, including first of all the people who are directly impacted by the issue, other relevant stakeholders, as well as community leaders or other influential individuals.

Interviews have some shortcomings including:

- Time-intensive due to the one-on-one nature of the technique;
- Effectiveness of interview relies on interviewer's ability to establish a rapport with the interviewee;
- Findings may not be representative; thus may not be typical for overall population.

### Focus Group Discussion

A focus group discussion (FGD) is a group interview or open forum technique to bring a diverse group of participants together to discuss their opinions and insights on a particular issue. This technique is a good option to understand participants' habits and preferences in waste management. FGDs provide opportunities for the team to receive candid feedback from participants through group dialogue. At the same time, it allows the team to perform follow-up questioning through face-to-face interaction with the participants.

Limitations of FGD include the following:

- Participants can be influenced by each other;
- Interpreting results may be difficult and hard to quantify; and
- Can provide limited information that may not be representative of the target population.

Despite these limitations, FGDs are powerful tools for helping to understand key issues, and developing promotions campaigns. They can be useful in initially identifying problems and issues, discussing current practices and desired behaviors, and even for soliciting information about campaign materials. The TWG should consider hosting a series of FGDs with various sectors of society impacted by the issue to understand different perspectives from the different socio-economic strata of their society.

## Focus Group Discussion (FGD) Leaders' Guide

The FGD provides a great opportunity to quickly gather data about people's perceptions on social and technical issues and what to do about them. When conducted correctly, FGDs can provide the level of evidence required for effective campaign development, without the need of expensive and time consuming surveys. FGDs work best when:

- The moderator moves the discussion along and directs the conversation to obtain the most information possible;
- The moderator encourages that all opinions be put forth, even if they differ from the consensus;
- The moderator allows all participants to speak;
- The participants are truly representative of the demographics and feel free to participate openly and honestly; and
- The moderator is selected from the local population when possible.

The moderator may follow this guidance for conducting effective FGD:

| Task # | Task | Y/N |
|---|---|---|
| 1 | Prepare between 10 and 15 focus group questions designed to help understand people's perceptions, knowledge, attitudes, practices, needs, wants and desires related to the issue, and the key motivators that might entice people to change their behaviors. | |
| 2 | Select a venue that will offer a private and quiet space for the participants, the moderator and the observers. | |
| 3 | Select 8 – 12 people to participate in each of the focus group discussions. They should be selected carefully to adequately represent the socioeconomic groups identified. | |
| 4 | Provide a written invitation to select participants with the theme of the discussion, the venue directions and map, time for the meeting and any other information required. Include a message by the mayor, elected official, or prominent person from the community. Follow up with a phone call a day or so before to verify attendance, and request that participants be punctual. | |
| 5 | Host multiple FGDs with different mixes of participants to obtain different perspectives on the issues. | |
| 6 | Allow between 5 and 20 minutes per question for discussions depending upon the quality of the information obtained. | |
| 7 | Encourage open ended questions, and a free flowing discussion. The moderator should try to engage each participant. Call on individuals that are not participating as much, and encourage all opinions to be shared. | |
| 8 | Try to involve a mix of women and men as participants and take note of gender issues and gender biases. | |
| 9 | Engage at least 2 but preferably 3 observers that will sit in the background and take notes. Observers will not participate in the discussions. | |

## Other Methods of Evidence Gathering

**Surveys/Questionnaires** are methods of collecting information from large populations. This technique allows the TWG to capture a large amount of feedback or data in a short amount of time. However, there are limitations for utilizing surveys for data collection for proposed septage management programs. These limitations include:

- It can be challenging to write good survey questions;
- It takes a skilled team to conduct the survey without introducing bias;
- It may be difficult to achieve random sampling;
- Long surveys will result in decreased participation;
- It can be expensive to perform correctly; and
- Interpreting results may be difficult.

Because of these reasons, surveys are not recommended for small to medium sized septage management programs that would be typical of average sized municipalities. For larger projects, if surveys are to be conducted, it is recommended that a reputable professional organization with documented experience in conducting this type of research be engaged to perform them.

**Direct Observation / Environmental Walk** is a method of discovering more about the actual behavior of individuals relative to a particular issue. The primary purpose of this technique is identifying populations that are involved in the activities and the practices and behaviors that contribute to the issue. When combined with picture-taking, observation can be a powerful tool in learning about current behaviors about current behaviors and their consequences. Observations of desired behaviors are just as powerful, which can provide the TWG with a richer understanding of how community members could better manage wastewater and septage.

**Observations** are a good choice of evidence gathering anytime. It enables team member(s) to be more aware of activities routinely occurring in the community and to gain direct experience with the community with regard to its waste management practices. Through direct observation, the TWG is able to gather evidence of actual instead of reported behaviors. One way to conduct direct observations is through an environmental walk.

Aside from the benefits, conducting observations also has limitations, such as:

- Validity and reliability of the data may be affected if the people being observed know they are being observed; and
- It is difficult to assess preferences and opinions from observation alone.

## Direct Observation of the Desludging Process

In most municipalities, there are existing private sector desludgers (Malabanan in the Philippines) that will desludge a septic tank for a fee. These desludgers are a wealth of information on the nature and sizing of typical systems in the community, their desludging practices and lessons learned.

Observing the actual desludging process will provide information on accessibility issues, and other constraints that program designers will need to be aware of. It should be noted that ideally, existing desludging companies will continue to provide and possibly scale up services as contractors for the municipality.

### Environmental Walk – A Direct Observation Technique

An environmental walk is a technique to learn about community practices through direct observation and interviews. TWG team members ask a group of local people or officials to show them around some chosen barangays/ neighborhoods.

During the walk, members chat with mothers and fathers about their household waste practices, what their perceptions of the issues are, how they manage to keep their households and their environment clean. Ask about problems with sewage, latrines, stagnant water, how they manage their solid waste and wastewater, human waste and manure. Ask permission to take pictures. Rural villagers are most often exceptionally friendly, so avoid (politely) offers of food and drink, and keep to the mission at hand. And be sure to look behind buildings where many of the problems can be seen.

## Rapid Technical Assessment

Rapid Technical Assessments (RTA) are survey methods that focus on the containment tanks of on-site wastewater systems and what it will require to desludge them. Therefore it looks at:

- Size of the tank;
- Location of the tank on the lot;
- Accessibility of the tank;
- Accessibility of the contents of the tank; and
- Truck parking and issues related to the access to the property by the truck.

The data from the RTA is then used to estimate the daily amount of septage that will require collection, and assess the constraints that will dictate the size and nature of the collection fleet. It is also used to predict the level of compliance, or the percentage of the families that will participate in the program. The beauty of the RTA is that you don't have to survey every house in the coverage area to obtain this data. Often, a sample size of 200 – 300 houses will be enough to obtain the required data at a 95% confidence level. Use the Septage Management Decision Support Toolkit (SMDST) to help determine your sample size.

# APPENDIX 2
# The RTA Process

There are five (5) steps in a Rapid Technical Assessment (RTA) for residential houses:

Step 1: Identify zones within the coverage area;

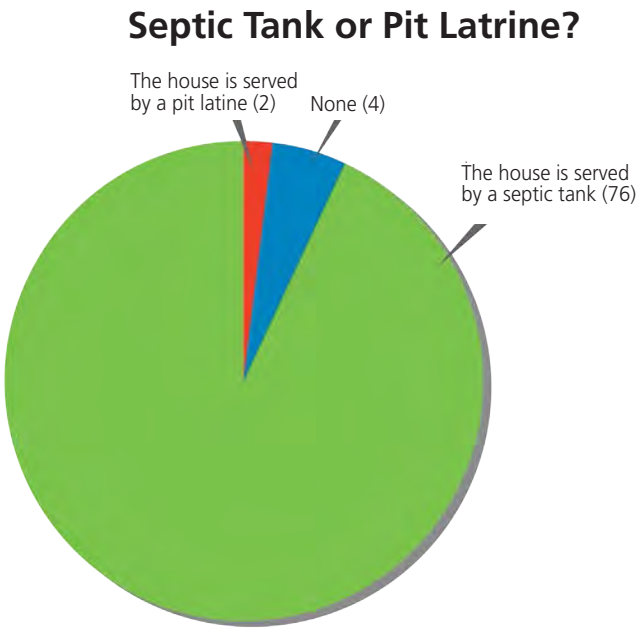
Step 2: Train the team members on the technical issues of site evaluations, and the questionnaire as well as any survey instruments such as hand held devices and data entry programs;

Step 3: Deploy the teams to the sites. Enumerators should work together in neighborhoods to the extent possible, but surveys should be done individually;

Step 4: Obtain the data once the survey is completed; and

Step 5: Enter data into the SMDST to determine average daily flow, sizing of the collection fleet, and program financial modeling which is described in detail in Chapter 3 - Program Design.

*Note: It is often useful to identify the private desludgers working in the community, the fees they charge and their disposal sites and practices. At this point, these individuals know more about desludging in your area than anyone. They can be assets during the training of enumerators as described in Step 2 above, and may serve eventual roles as contractors for municipal desludging services once the program begins.*




*Outputs from Rapid Technical Assessment. The question was "Is the building served by a septic tank, pit latrine or none?"*

**RTA Indicative Questions** (Adjust as needed for your community)

1. Total number of people living in the house or compound?
   - o Enter number of people

2. Do you have a toilet?
   - o Yes
   - o No

3. If yes, you have a toilet, how many toilets serve the house or compound:
   - o 1
   - o 2
   - o 3
   - o 4
   - o More than 4

4. If no, there is no toilet, would you be willing to install one?
   - o Yes, definitely
   - o Maybe, depending upon price
   - o No

5. Do you share your toilet with other households?
   - o Yes
   - o No

6. If yes, you share your toilet with others, how many additional people use your toilet?
   - o Enter number of additional people that use your toilet.

7. The toilets in the house are:
   - o Automatic flush
   - o Pour flush
   - o Drop through
   - o Direct discharge

8. Onsite system type. Does the home have a
   - o Septic tank
   - o Cesspool
   - o Other – a type of wastewater system other than septic tank or cesspool
   - o None

9. If yes, there are septic tanks or cesspools serving this property, how many are there?
   - o Enter number

10. Where does the effluent go?
   - o Ponds on the ground surface
   - o Directed to the ditch or drainage
   - o To a soak away or leach field
   - o To a sewer system

11. Excluding those with proper soak pits, are you willing to install a proper soak pit?
   - o Yes, definitely
   - o Maybe, need more information
   - o No

12. For those with cesspools or no on-site system, would you be willing to install a proper septic system?
   - o Yes, definitely
   - o Maybe, but need more information
   - o No

13. If there is no system on site, the occupants
   - o Share with neighbors
   - o Use a public toilet
   - o Practice open defecation

14. Volume of the containment tank:
   - o Enter number in cubic meters.

15. Containment tank location:
   - o The containment tank is installed underneath the main building
   - o The containment tank Is installed underneath an out building
   - o The containment tank is installed in the yard

16. If the containment tank is installed underneath a building,
    - o The tank is installed under a finished floor
    - o The tank is installed under an unfinished floor

17. Access ports for the containment tank
    - o There are access ports (minimum of 25 cm in diameter)
    - o There are access ports (but less than 25 cm in diameter)
    - o There are no access ports

18. If no access ports, are you willing to install a proper access port?
    - o Yes, definitely
    - o Maybe, but need more information
    - o No

19. Accessibility by vacuum trucks:
    - o The roads to the house are accessible by a standard truck
    - o The roads to the house are too narrow to accommodate a standard truck

20. Truck parking:
    - o There is designated parking for the septage vehicle
    - o The vehicle can park, but there will be some road obstruction
    - o The vehicle can park, but it will block the road completely
    - o There is no parking for the vehicle

21. Horizontal distance (in meters) from the truck parking to the containment tank:
    - o Enter number in meters

22. Vertical distance from truck parking to containment tank:
    - o The truck parking is above the elevation of the containment tank
    - o The truck parking is below the elevation of the containment tank
    - o The truck parking is generally level with the elevation of the containment tank

23. If truck parking is lower in elevation than containment tank access port, what is the elevation gain in meters?
    - o Enter number of meters of vertical elevation gain

24. Venting. Is there a vent pipe visible from the septic tank or cesspool?
    - o Yes
    - o No

25. To pump the tank, does the operator have to drag the hose through the house?
    - o Yes
    - o No

26. Greywater:
    - o Flows directly to the drainage or ditch
    - o Ponds on the property
    - o Is plumbed to the containment tank
    - o Is plumbed to a dedicated soak away

27. Distance between septic tank, cesspool or soak system from wells used for domestic purposes:
    - o Enter distance in meters

28. Has the system ever been desludged?
    - o No never
    - o Yes, less than 1 year ago
    - o Yes, between 1 and 3 years ago
    - o Yes, more than 3 years ago

29. If yes, who did the desluding?
    - o City government
    - o Private contractor
    - o We did it ourselves

30. If yes, how much did it cost?
    - o Enter number in IDR

31. Water supply:
    - o Piped water from water district or city
    - o Private well located on site
    - o Communal well or stand pipe located off site with piped water to house
    - o Communal well or stand pipe located off site with buckets for water delivery
    - o Private vendor

32. Home ownership:
    - o Respondent owns the home
    - o Respondent rents the home
    - o Other

33. Cost of water (monthly average):

34. Cost of electricity (monthly average):

Additional information that can be collected by the RTA team at the end of each day (for the particular zone of the city where they are working)

a. Is truck yard and treatment plant located at the same place?
    a. Yes
    b. No

b. If truck yard and treatment plant are at the same location:
    a. What is the driving time between the truck yard and collection area (in minutes)?
    b. What is the distance between the truck yard and collection area (in km)?

c. If truck yard is not at the same location as the treatment plant,
    a. What is the driving time between the collection area and the treatment plant (minutes)?
    b. What is the distance from the collection area and the treatment plant (km)?

d. Are there restrictions for trucks in driving to the area?
    a. Yes (either a truck ban during certain hours or heavy traffic)
    b. No

# APPENDIX 3
# Main Media Channels for a Sanitation Promotions Campaign

The following is a summary of main media channels applicable to local sanitation promotions campaigns:

| Limited reach | Characteristic |
|---|---|
| Pamphlets/ Brochures | Information transmission, best where cognition, rather than emotion is a desired outcome. Downloadable. |
| Fact/ information sheets | Quick, convenient information. Provides the "how to" for desired behaviors. |
| Newsletters | Continuity. Personalized. Labor-intensive and requires detailed commitment and needs assessment before commencing. Easily widely distributed by handing out, mailing, or email. |
| Posters | Common at village level. Information boards in public squares have high visibility and show sanction by local government. |
| T-shirts | Emotive. Personal. Useful for cementing attitudes and commitment to program/ idea. |
| Stickers | Short messages to identify/ motivate the user. Cheap, persuasive. |
| Theater | School plays and community theater. An appealing way to receive messages. Low cost, fun. |
| Yard meetings | Informal ways for friends and neighbors to get together to discuss new ideas in non threatening settings. |
| **Mass Reach** | **Characteristic** |
| Television | Awareness, arousal, modeling and images creation role. May be increasingly useful in information dissemination, and training as awareness and interest in sanitation increases. Mainstreaming readily available. Expensive and for larger campaigns only. |
| Radio | Informative, interactive (talkback). Cost-effective and useful in creating awareness, providing information. Local talk radio may be applicable and low cost method of reaching certain audiences. |
| Newspapers | Print and digital. Long and short copy information. Material dependent on type of newspaper and day of week. |
| Magazines | Print and digital. Wide readership and influence. Useful and in supportive role and to inform and provide proof. |
| Internet | Can serve a wide role from personal information transmission to group session to blogging. |
| Mobile phones, video, jingle, social media | Deliver timely, short information. May be highly effective in reaching large audiences with short messages |

Careful planning of the communications methods during the budgeting process will be required.

# APPENDIX 4
# Manifest Form for Desludging Activities

## MANIFEST FORM

**SLUDGE/SEPTAGE ORIGIN**

Name (Household/Unit Owner): _____

Address: _____

_____

Date and Time of Collection: _____

**SOURCE AND VOLUME OF SLUDGE/SEPTAGE**

| Source | Check one | Volume (cubic meters) |
|---|---|---|
| Residential | | |
| Commercial/Industrial | | |
| Institutional | | |
| Wastewater Treatment Plant | | |

Commercial/industrial waste must be sampled and tested before it is off-loaded at the treatment facility to ensure that the material won't contaminate the treatment process. Contamination can be caused by grease oil, metals, and chemicals.

Description of Commercial/Industrial waste: _____

_____

_____

**EXCAVATOR/TRANSPORTER**

| | |
|---|---|
| Operator/Company | |
| Address | |
| Type of Vehicle | |
| Plate No./Body No. | |
| Name of Driver | |
| Signature | |
| Driver's License No. | |
| Name of Other Personnel | |

Attested by Barangay Captain or Authorized Representative: _____

Name and Signature

# APPENDIX 5
# Local Government Code on Tendering

**Tendering Program Requirements**

Section 355. Scope. - This Title shall govern the procurement, care, utilization, custody, and disposal of supplies, as defined herein, by local government units and the other aspects of supply management at the local levels.

Section 356. General Rule in Procurement or Disposal. - Except as otherwise provided herein, acquisition of supplies by local government units shall be through competitive public bidding. Supplies which have become unserviceable or no longer needed shall be sold, whenever applicable, at public auction, subject to applicable rules and regulations.

Section 357. Definition of Terms. - When used in this Title, the term

(a) "Lowest Complying and Responsible Bid" refers to the proposal of one who offers the lowest price, meets all the technical specifications and requirements of the supplies desired and, as a dealer in the line of supplies involved, maintains a regular establishment, and has complied consistently with previous commitments;

(b) "Suitable Substitute" refers to that kind of article which would serve substantially the same purpose or produce substantially the same results as the brand, type, or make of article originally desired or requisitioned;

(c) "Supplies" includes everything, except real property, which may be needed in the transaction of public business or in the pursuit of any undertaking, project, or activity, whether in the nature of equipment, furniture, stationary materials for construction or personal property of any sort, including non-personal or contractual services such as the repair and maintenance of equipment and furniture, as well as trucking, hauling, janitorial, security, and related services; and

(d) "Terms and Conditions" refer to other requirements not affecting the technical specifications and requirements of the required supplies desired such as bonding, terms of delivery and payment, and related preferences.

Section 358. Requirement of Requisition. - Any order for supplies shall be filled by the provincial or city general services officer or the municipal or barangay treasurer concerned, as the case may be, for any office or department of a local government unit only upon written requisition as hereinafter provided.

Section 359. Officers Having Authority to Draw Requisitions. - Requisitions shall be prepared by the head of office or department needing the supplies, who shall certify as to their necessity for official use and specify the project or activity where the supplies are to be used.

Section 360. Certification by the Local Budget Officer, Accountant, and Treasurer. - Every requisition must be accompanied by a certificate signed by the local budget officer, the local accountant, and the local treasurer showing that an appropriation therefore exists, the estimated amount of such expenditure has been obligated, and the funds are available for the purpose, respectively.

Section 361. Approval of Requisitions. - Approval of the requisition by the head of office or department concerned who has administrative control of the appropriation against which the proposed expenditure is chargeable is deemed sufficient, except in case of requisition for supplies to be carried in stock which shall be approved by the local chief executive concerned: Provided, That such supplies are listed or included in the annual procurement plan and the maximum quantity thereof does not exceed the estimated consumption corresponding to a programmed three-month period: Provided, further, That nothing herein contained shall be held as authorizing the purchase of furniture and equipment for stock purposes.

Section 362. Call for Bids. - When procurement is to be made by local government units, the provincial or city general services officer or the municipal or barangay treasurer shall call bids for open public competition. The call for bids shall show the complete specifications and technical descriptions of the required supplies and shall embody all terms and conditions of participation and award, terms of delivery and payment, and all other covenants affecting the transaction. In all calls for bids, the right to waive any defect in the tender as well as the right to accept the bid most advantageous to the government shall be reserved. In no case, however, shall failure to meet the specifications or technical requirements of the supplies desired be awarded.

Section 363. Publication of Call for Bids. - The call for bids shall be given the widest publicity possible, sending, by mail or otherwise, any known prospective participant in the locality, of copies of the call and by posting copies of the same in at least three (3) publicly accessible and conspicuous places in the provincial capital or city, municipal, or barangay hall, as the case may be.

The notice of the bidding may likewise be published in a newspaper of general circulation in the territorial jurisdiction of the local government unit concerned when the provincial or city general services officer or the municipal or barangay treasurer, as the case may be, deems it necessary in order to obtain the lowest responsible and complying bid.

The opening of bids shall only be made in the presence of the provincial or city auditor or his duly authorized representative who shall initial and secure copies of the bids and certify the abstract of the bidding.

Section 364. The Committee on Awards. - There shall be in every province, city or municipality a committee on awards to decide the winning bids and questions of awards on procurement and disposal of property.

The Committee on Awards shall be composed of the local chief executive as chairman, the local treasurer, the local accountant, the local budget officer, the local general services officer, and the head of office or department for whose use the supplies are being procured, as members. In case a head of office or department would sit in a dual capacity, a member of the sanggunian elected from among its members shall sit as a member. The committee on awards at the barangay level shall be the sangguniang barangay. No national official shall sit as a member of the committee on awards.

The results of the bidding shall be made public by conspicuously posting the same in the provincial capital or city, municipal, or barangay hall.

Section 365. Rule on Awards. - Awards in the procurement of supplies shall be given to the lowest complying and responsible bid which meets all the terms and conditions of the contract or undertaking.

# APPENDIX 6
# Local Government Code on Passing Local Ordinances

SEC. 54. Approval of Ordinances

(a) Every ordinance enacted by the sangguniang panlalawigan, sangguniang panlungsod, or sangguniang bayan shall be presented to the provincial governor or city or municipal mayor, as the case may be. If the local chief executive concerned approves the same, he shall affix his signature on each and every page thereof; otherwise, he shall veto it and return the same with his objections to the sanggunian, which may proceed to reconsider the same. The sanggunian concerned may override the veto of the local chief executive by two-thirds (2/3) vote of all its members, thereby making the ordinance or resolution effective for all legal intents and purposes.

(b) The veto shall be communicated by the local chief executive concerned to the sanggunian within fifteen (15) days in the case of a province, and ten (10) days in the case of a city or a municipality; otherwise, the ordinance shall be deemed approved as if he had signed it.

(c) ordinances enacted by the sangguniang barangay shall, upon approval by the majority of all its members, be signed by the punong barangay.

SEC. 56. Review of Component City and Municipal Ordinances or Resolutions by the Sangguniang Panlalawigan

(a) Within three (3) days after approval, the secretary to the sanggunian panlungsod or sangguniang bayan shall forward to the sangguniang panlalawigan for review, copies of approved ordinances and the resolutions approving the local development plans and public investment programs formulated by the local development councils.

(b) Within thirty (30) days after receipt of copies of such ordinances and resolutions, the sangguniang panlalawigan shall examine the documents or transmit them to the provincial attorney, or if there be none, to the provincial prosecutor for prompt examination. The provincial attorney or provincial prosecutor shall, within a period of ten (10) days from receipt of the documents, inform the sangguniang panlalawigan in writing of his comments or recommendations, which may be considered by the sangguniang panlalawigan in making its decision.

(c) If the sangguniang panlalawigan finds that such an ordinance or resolution is beyond the power conferred upon the sangguniang panlungsod or sangguniang bayan concerned, it shall declare such ordinance or resolution invalid in whole or in part. The sangguniang panlalawigan shall enter its action in the minutes and shall advise the corresponding city or municipal authorities of the action it has taken.

(d) If no action has been taken by the sangguniang panlalawigan within thirty (30) days after submission of such an ordinance or resolution, the same shall be presumed consistent with law and therefore valid.

SEC. 59. Effectivity of Ordinances or Resolutions

(a) Unless otherwise stated in the ordinance or the resolution approving the local development plan and public investment program, the same shall take effect after ten (10) days from the date a copy thereof is posted in a bulletin board at the entrance of the provincial capitol or city, municipal, or barangay hall, as the case may be, and in at least two (2) other conspicuous places in the local government unit concerned.

(b) The secretary to the sanggunian concerned shall cause the posting of an ordinance or resolution in the bulletin board at the entrance of the provincial capitol and the city, municipal, or barangay hall in at least two (2) conspicuous places in the local government unit concerned not later than five (5) days after approval thereof.

The text of the ordinance or resolution shall be disseminated and posted in Filipino or English and in the language or dialect understood by the majority of the people in the local government unit concerned, and the secretary to the sanggunian shall record such fact in a book kept for the purpose, stating the dates of approval and posting.

(c) The gist of all ordinances with penal sanctions shall be published in a newspaper of general circulation within the province where the local legislative body concerned belongs. In the absence of any newspaper of general circulation within the province, posting of such ordinances shall be made in all municipalities and cities of the province where the sanggunian of origin is situated.

# APPENDIX 7
# Septage Ordinance of Dumaguete City

**REPUBLIC OF THE PHILIPPINES**
*City of Dumaguete*
**OFFICE OF THE CITY COUNCIL**

**EXCERPT FROM THE MINUTES OF THE REGULAR SESSION OF THE CITY COUNCIL HELD AT THE SESSION HALL ON APRIL 6, 2006**

PRESENT:

| | |
|---|---|
| HON. WILLIAM E. ABLONG, Presiding Officer | CITY VICE-MAYOR |
| HON. ROTELIO U. LUMJOD | CITY COUNCILOR |
| HON. MANUEL T. SAGARBARRIA | CITY COUNCILOR |
| HON. NOEL C. DE JESUS | CITY COUNCILOR |
| HON. FRANKLIN O. ESMEÑA | CITY COUNCILOR |
| HON. URBANO E. DIGA, JR. | CITY COUNCILOR |
| HON. SALETO J. ERAMES | CITY COUNCILOR |
| HON. ESPIRIDION V. CATAN | CITY COUNCILOR |
| HON. MANUEL C. PATRIMONIO | CITY COUNCILOR |
| HON. HARRISON K. GONZALES, Liga President | CITY COUNCILOR |
| HON. KARISSA FAYE R. TOLENTINO, SK Chairman | CITY COUNCILOR |

ABSENT:

| | |
|---|---|
| HON. SAMUEL D. DICEN | CITY COUNCILOR |

**RESOLUTION NO. 141**
**Series of 2006**

WHEREAS, mandated by the new Clean Water Act of 2004 (R.A. 9275) and other existing laws and ordinances related directly or indirectly to wastewater and septage management, the City of Dumaguete, as a non-highly urbanized city, is establishing a septage management system;

WHEREAS, untreated wastewater affects health by spreading diseases, making water unfit for human consumption and other uses, contaminating groundwater, threatening biodiversity, and reducing the quality of life of the citizens;

WHEREAS, most of the residences, businesses and institutions in Dumaguete City use septic tanks for wastewater treatment and disposal;

WHEREAS, most of the septic tanks in the city are not properly designed, constructed or regularly desludged;

WHEREAS, groundwater is the city's water source;

WHEREAS, the construction and operation of a sewerage network and treatment system is beyond the financial capacity of the city government at this time;

WHEREAS, the City is committed to the improvement, maintenance and conservation of the ecosystem and the protection of public health;

WHEREAS, Section 7 of the Clean Water Act (RA 9275) provides, among others, that each LGU may raise funds to subsidize necessary expenses for the operation and maintenance of sewage treatment or septage facilities servicing their area of jurisdiction through local property taxes and enforcement of a service fee system;

WHEREFORE, on motion of Councilor Manuel C. Patrimonio, duly seconded by Councilor Harrison K. Gonzales, the City Council in session assembled.

RESOLVED, AS IT IS HEREBY RESOLVED, to enact the following ordinance:

**ORDINANCE NO. 18**
**Series of 2006**

**AN ORDINANCE ESTABLISHING A SEPTAGE MANAGEMENT SYSTEM IN THE CITY OF DUMAGUETE.**

Be it ordained by the City Council of Dumaguete that:

**ARTICLE I**
**Title of the Ordinance**

**AN ORDINANCE ESTABLISHING A SEPTAGE MANAGEMENT SYSTEM IN THE CITY OF DUMAGUETE.**

**ARTICLE II**
*Scope*

**Section 1.** This ordinance shall apply to all buildings and structures whether public or private, residential or commercial, proposed/planned or existing. However, properties or businesses that have onsite wastewater treatment facilities approved by the City Environment and Natural Resources Officer (CENRO) shall be exempted from this ordinance.

**Section 2.** Pretreatment for Commercial Facilities. Septage from a commercial or other non- residential facility is acceptable if the septic tank only receives wastewater typical of a household (i.e., from toilets and sinks). If the wastewater contains substances of a commercial nature such as oil or fuel residue, metals, or high volumes of fats and grease, an appropriate pretreatment program, approved by the CENRO, must be in place.

**ARTICLE III**
**Authority**

**Section 3.** This ordinance is enacted to supplement the provisions and specifications of existing laws and ordinances related to septage management and complement existing laws on clean water and building and plumbing regulations.

**ARTICLE IV**
**Definitions**

**Section 4.** The words and phrases used in this Ordinance shall mean as follows:

**Anaerobic ponds** – are deep stabilization ponds used to treat high-strength organic wastewater that also contains high concentration of solids. Anaerobic treatment does not require the presence and use of oxygen and encourages the growth of bacteria, which breaks down the waste material, releasing methane and carbon dioxide.

**Baffle** – a device (as a wall or screen) to deflect, check or regulate the flow of sewage and septage. It promotes preliminary and primary treatment of the incoming sewage by allowing the physical separation of solid and liquid components in the sewage.

**CENRO** – City Environment and Natural Resources Office.

**Chamber** – an enclosed space, cavity or compartment of a septic tank.

**Communal Excreta Disposal System** – an excreta disposal system serving a group of dwelling units.

**Desludging** – the process of removing the accumulated sludge or septage from the septic tank.

**Digestion** – a microbiological process that converts the chemically complex organic sludge to methane, carbon dioxide, and inoffensive humus-like material.

**Disposal Field or Leaching Bed** – a soil-based effluent disposal system composed of pipes and shallow trenches leading from the outlet of the septic tank, consisting of open jointed or perforated pipes so distributed that effluent from a septic tank is oxidized and absorbed by the soil. The surrounding bedding material of the network of pipes should be of high enough permeability to effect treatment by seepage.

**Domestic Sewage** – sewage containing human excrement and liquid household waste. Also called sanitary sewage.

**Effluent** – a general term denoting any wastewater, partially or completely treated, or in its natural state, flowing out of a drainage canal, septic tank, building, manufacturing plant, industrial plant, treatment plant, etc.

**Facultative Ponds** – shallow rectangular ponds that stabilize wastes using a combination of anaerobic, aerobic, and facultative (aerobic-anaerobic) processes.

**Freeboard or Airspace of a Septic Tan**k – the distance as measured from the maximum liquid level line to the underside of the septic tank slab or cover.

**Individual Excreta Disposal System** – an excreta disposal system serving a dwelling unit.

**Maturation ponds** – low-rate stabilization ponds that are designed to provide for secondary effluent polishing and seasonal nitrification.

**"P" traps** – traps used on plumbing fixtures, such as toilets and drains, to prevent sewage gases from entering the plumbing system or the atmosphere.

**Scum** – a slimy or filmy covering on the surface of the liquid in the septic tank.

**Seepage pit** – a loosely lined excavation in the ground that receives the discharge of a septic tank and designed to permit the effluent from the septic tank to seep through pit bottom and sides.

**Septage** – thickened and partially treated sewage that is removed from a septic tank.

**Septic tank** – a watertight receptacle, which receives the discharge of a sanitary plumbing system or part thereof, and is designed and constructed to accomplish the sedimentation and digestion of the organic matter in the sewage within the period of detention/retention and to allow the liquid to discharge to a leaching field, sewer lines, a combined sewerage network or directly to a secondary wastewater treatment facility in accordance with the standards set forth by the Revised National Plumbing Code of the Philippines.

**Sewage** – any wastewater containing human, animal or vegetable waste matter in suspension or solution including human excreta and urine and may possibly contain liquids consisting of chemicals in solution.

**Sewer** – an artificial pipe or conduit for carrying sewage and wastewater.

**Sewerage** – a comprehensive term, including all construction for collecting, transporting, and pumping of sewage. Usually refers to a buried system of underground pipes.

**Sewage works** – a comprehensive term for pumping, treating and final disposal of effluent via a centralized treatment plant.

**Sludge** – precipitated solid matter with a highly mineralized content produced by water and sewage treatment processes.

**Stabilization pond** – An artificial pond designed to treat wastewater in general using solely naturally occurring biological treatment processes, and without the need for an electro- mechanical energy input.

**Subsurface Absorption Bed or Drain field** – also called leaching bed, leaching field, or soak- away. An underground system of pipes embedded in a suitably porous soil medium leading from the outlet of the septic tank, consisting of open jointed or perforated pipes so distributed that the effluent from a septic tank is oxidized and absorbed by the soil. Must be located far from environmentally critical waterways or groundwater wells.

**ARTICLE V**
**Septage Management System**

**Section 5**. **Excreta Disposal System.** All houses/buildings shall have an approved excreta disposal system for treatment of domestic sewage.

**Section 6. Desludging and Transfer of Septage to the Septage Treatment Facility.** Liquid and/or solid materials removed from septic tanks shall be transported by a septage hauler/pumper to the Septage Treatment Facility in Barangays Camanjac and Candau-ay of this City following Department of Health regulations on desludging and transport of sludge. No septage hauler/pumper can unload or dispose of septage in other places, including bodies of water, agricultural fields, and the drainage system within the city until the implementing rules and regulations for proper land application have been issued by the authorized government agencies.

**Section 7**. Septage Treatment Facility. The septage treatment facility shall use stabilization ponds or lagoons, composed of anaerobic, facultative, and maturation or aerobic ponds. All stabilization ponds shall be lined with high density polyethylene (HDPE) geomembrane on top of highly compacted soil. Jointing of adjacent sections of geomembrane sections shall be in accordance with manufacturers' jointing guidelines. Effluent from the last aerobic pond shall flow into a constructed wetland to ensure that the quality of the final effluent shall meet DENR standard for the receiving water body. Periodically, the solid material that accumulates in the receiving tank and ponds shall be removed and deposited in sludge drying beds. Dried sludge shall be recovered as compost material, soil conditioner or landfill material. An operations and maintenance plan shall be developed, which shall include a vector control strategy to insure that no disease-causing elements shall thrive in the treatment facility and a maintenance schedule for clearing excess vegetation growth.

The operations and maintenance plan shall also include provisions for reducing system upset, including immediate actions to prevent the occurrence of foul smells and release of partially treated effluent from the system.

**ARTICLE VI**
*General Design and Construction Requirements of Septic Tanks*

**Section 8. General Requirements.**

**Section 8.1.** *Buildings or Structures Proposed for Construction*

a. No building plan for residential dwelling units or commercial and institutional structures shall be approved unless the design of the sanitary plumbing and septic tank conforms to the specifications set herein and other pertinent regulations; alternative wastewater treatment systems shall be duly approved and endorsed by the CENRO. Further, per DENR regulations, all malls, restaurants, hotels, apartelles and other residential buildings, subdivisions, hospitals and similar establishments are required to utilize sewage treatment facilities as a condition to the granting of Environmental Clearance Certificates (ECCs) and permits to operate.

b. It shall be the duty of the owner, administrator or contractor to inform the concerned agency that the newly constructed septic tank, sewage treatment facility or alternative treatment system, with prior plan approval, is ready for inspection. The new system shall not be covered or used until inspected and approved by the City Engineer's Office.

**Section 8.2.** *Existing Buildings or Structures*

a. Owners of existing septic tanks that are not accessible for desludging are required to repair or upgrade their tank so it can be desludged. If repairs are not possible, such owners are encouraged to build a new septic tank that will comply with the provisions set herein.

b. The cost of repair and upgrading of septic tanks shall be borne by the owners.

c. Communal or shared septic tanks can be used alternatively whenever feasible, particularly for existing clustered structures that are highly dense and characterized by lack of or inadequate land space. The design and the manifest of ownership and joint maintenance shall go through an approval process as determined by the City Government.

**Section 9. Specifications.** Septic tanks shall be designed and constructed in compliance with the mandate set forth in the National Building Code, including use of unconventional or new material for building parts, and as prescribed by the National Plumbing Code and the Code on Sanitation, including proper sizing and layout, and the criteria set forth below.

a. It shall be designed to produce an effluent consistent with approved engineering and environmental standards.

b. It shall be built of solid durable materials and shall be watertight. Materials shall conform to applicable Philippine material standards.

c. It shall not be constructed under any building and not within twenty–five (25) meters from any existing source of water supply.

d. It shall be divided into three compartments; the volume of the first compartment shall be between one-half to two-thirds of the total tank volume.

e. Where more than one tank is used to accommodate the required liquid volume in a given minimum retention time of 2 days, the tanks shall be conjoined. The first tank shall be equal to or larger than any subsequent tank in the series.

f. Baffles or similar devices shall be installed at each inlet and outlet of the tank and at each compartment. Materials shall conform to approved applicable standards. It must be integrally cast with the tank, affixed with a permanent waterproofing material, or attached at the top and bottom with connectors that are not subject to corrosion or decay. Sanitary tees used on baffles shall have a minimum diameter of 100 mm (4 inches).

g.The baffles between compartments shall extend at least 200 mm above the

maximum liquid surface or all the way to the underside of the top cover.

h. The centerline of the inlet pipe shall be at least 50 mm above the centerline of the outlet pipe. Both inlet and outlet pipes shall be similar in diameter with each other and shall have a minimum diameter of 100 mm.

i. Adequate venting shall be provided in each compartment with the use of ventilating pipes not less than 50 mm in diameter. For buildings where plumbing fixtures have appropriate "p" traps, venting should occur through the plumbing stack in the building, not from the septic tank. For buildings where toilets and sinks are not protected with "p" traps, traps should be installed, or vent directly from the septic tank.

j. Access to the septic tank: There shall be at least one maintenance hole for each compartment, with a minimum side dimension of 500 mm. All maintenance holes shall extend through the tank cover and shall extend to finished grade. Manhole covers shall be designed with durable and fully coated or non-corrosive handles for easy lifting. Septic tank access covers should be secured from unauthorized entry, either through safety screws, locks or a tank lid that weighs 15 kg or more.

k. Outlet from the septic tank:
The design, construction, and location of structures receiving effluent from septic tanks shall conform to the National Plumbing Code of the Philippines. Effluent treatment is further required but will be covered by a separate ordinance and other infrastructure projects.

l. For clustered structures or houses that are highly dense and characterized by lack of or inadequate land space, there shall be designed a communal septic tank consistent with approved engineering and environmental standards.

**ARTICLE VII**
**Administration and Enforcement**

**Section 10.** The administration and enforcement of this ordinance for new buildings is hereby vested in the Building Official of the City Government of Dumaguete.

**Section 11.** There shall be created a City Septage Management Authority (CSMA) composed of representatives from the City Environment and Natural Resources Office, City Health Office, General Services, City Treasurer's Office, Dumaguete City Water District, City Legal Office, City Engineer's Office and a non-government organization who shall be appointed by the City Chief Executive from the NGO members of the City Development Council. Other persons may be invited to provide technical advice to the CSMA.

a. The CSMA shall conduct a survey of all properties and premises in coordination with barangay officials to determine if a septic tank is present, and if it is accessible for desludging.

b. If a septic tank is not present or it is inaccessible for desludging, the CSMA shall serve notices of non-conformance to the provisions of this ordinance to the owners/ administrators, or occupants.

c. The CSMA or its authorized representatives shall be permitted to enter all properties for the purpose of inspection, observation, measurement, sampling and testing. A prior notice shall be given property-owners to facilitate inspection and provide assistance to the CSMA representatives.

d. For those property owners, administrators or occupants served with notices of non-conformance, a compliance period shall be set by the property owners, administrators or occupants and the CSMA. The compliance period shall be based on the proper installation of an acceptable septic tank of which design is specified in this ordinance

e. The CSMA shall issue a certificate of compliance to the property owners who are deemed to have met the minimum requirements for septic tanks.

f. For new developments, the occupancy permit issued by the building officials shall serve as certificate of compliance until the CSMA conducts another round of inspection.

g. The CSMA shall conduct a periodic survey of properties every 3 years or as determined by the CSMA to verify changes in septic tank accessibility or changes in tank capacity requirements. This shall be done in coordination with the barangay officials.

h. The CSMA shall plan and implement an information and education program on wastewater management and the city's septage management system.

**Section 12. Monitoring and Evaluation.** Close monitoring of all activities in the treatment facility shall be conducted by the CSMA in conjunction with the operations and maintenance plan that will be contained in the operational guidelines. Adverse effects of the project shall be mitigated and considered top priority in prevention and maintenance operations. Any environmental change/hazard attributed to the project implementation shall be immediately addressed.

**Section 13. Desludging**. Septic tanks require desludging on an average of every 3 to 5 years. Septic tanks shall be desludged when the sludge volume is 1/3rd of the total volume of the septic tank.

a. The CSMA shall keep a record of all owners/administrators of buildings and structures who have desludged their septic tanks, those that are inaccessible, those that do not have septic tanks, and those that do not have water-sealed toilets, and other data that may be deemed necessary by the CSMA.

b. The CSMA shall implement and adhere to the rules and regulations set forth by the Department of Health in handling, transporting, treatment and disposal of septage.

c. The CSMA shall strictly implement an accreditation system and operational guidelines for private desludging service providers that would like to operate in the city, including but not limited to securing an environmental sanitation clearance (ESC) which is discussed more thoroughly in the rules and regulations set forth by the Department of Health in handling, transporting, treatment and disposal of septage.

**Section 14.** Funding. The City Government shall allocate necessary funds to support capital expenditures and operating and maintenance expenses of the septage management system.

**Section 15. User fee.** All building or structure owners shall pay an amount for the desludging of their septic tanks and treatment of the septage equivalent to the following:

**User Fees.** A user fee of Two Pesos (P2.00) per cubic meter of water consumed shall be charged and added to the Dumaguete City Water District (DCWD) monthly water bill. The fee may be adjusted periodically following public consultations.

**Section 15.1.** Users of un-metered water and users with no history of billable water flow or water consumption shall have their user fee estimated by the Water District by averaging the billable flow of other households with the same number of members and toilets. Commercial establishments that have their own water source shall be required to install a production meter. The quantity of water produced shall be the basis for computing the cost of desludging the septic tank.

**Section 15.2.** Users who have their own onsite wastewater treatment system certified by the CENRO as functioning and compliant shall be exempt from paying the required user fee.

**Section 15.3.** *Trust Fund.* Monies collected from users' fee or the desludging and treatment fees shall be held in Trust by the City Treasurer's Office. Said Trust Fund shall only be disbursed upon proper authorization by the CSMA, subject to the usual accounting and auditing regulations.

**Section 16. Violations and Penalties.**

**Section 16.1.** *Issuance of Non-Conformity.* The CSMA shall issue a notice of non-conformity to property owners, administrators or occupants who do not have a septic tank, whose septic tank is not designed properly, or is inaccessible for desludging unless they have an alternative system approved by the CENRO.

**Section 16.2.** Penalties. The violator, or owner of a non-complying establishment or household, who fails to comply with the provisions of this Ordinance within one (1) year as provided by the Local Government Code, must pay the fines per violation set herein in lieu of prosecution:

a. For private residential buildings ..... **P1,000.00**

b. For hotels, apartments, banks, offices, shops, lodging houses, malls, restaurants, and other commercial establishments ..... **P2,000.00**

c. For hospitals, funeral parlors and similar operation ..... **P3,000.00**

or by imprisonment of not less than one (1) day nor more than one (1) year, or both fine and imprisonment at the discretion of the court. Failure to comply with the provisions herein shall result in the cancellation of business permits for commercial establishments.

**ARTICLE VIII**
**Final Provision**

**Section 17.** All provisions of existing laws and ordinances are hereby supplemented and added to come up with a system that will work for the city.

**Section 18.** This Ordinance shall take effect upon its approval.

UNANIMOUSLY APPROVED.
o o o O o o o

I hereby certify to the correctness of the above quoted resolution with an ordinance.

RAMON A. VILLAROSA
*City Secretary*

ATTESTED:

***WILLIAM E. ABLONG***
*City Vice-Mayor*
Presiding Officer

APPROVED:

**AGUSTIN R. PERDICES**
*City Mayor*

# APPENDIX 8
# Online Resources

Here are some free resources that can be easily downloaded from the internet:

The best one is the **Faecal Sludge Management (FSM) Book,** a free manual by Dr. Linda Strande. This "must have" book can be downloaded for free here:
*http://www.eawag.ch/en/department/sandec/publikationen/faecal-sludge-management-fsm-book/*

**Operations Manual on the Rules and Regulations Governing Domestic Sludge and Septage**
*http://tinyurl.com/sludgemanual*

**Support for the Nationwide Roll-out of the National Sewerage and Septage Management Program: Program Operations Manual**
*http://www.dpwh.gov.ph/NSSMP/pdf/Program%20Operations%20Manual.pdf*

**NSSMP Application Form**
*http://www.dpwh.gov.ph/pdf/NSSMP%20Application%20Form.docx*

**Implementer's Guide to Lime Stabilization for Septage Management in the Philippines**
*http://pdfwater.org/wp-content/uploads/2015/02/LimeStabilization-Sept02-lowres-optimized.pdf*

**Sustainable Sanitation Alliance (SuSanA) Knowledge Resource**
The Sustainable Sanitation Alliance has an open source library that is home to more than 1,700 publications revolving around the topic of sustainable sanitation.

**SuSanA Website**
*http://www.susana.org/*

**SuSanA Library**
*http://www.susana.org/en/resources/library*

**SuSanA Case Studies**
*http://www.susana.org/en/resources/case-studies*

**SuSanA Training Materials**
*http://www.susana.org/en/resources/training-materials*