UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

PROJECT MANAGEMENT PLAN FOR A SOLID WASTE MANAGEMENT PROJECT IN LLOYDS, ST. THOMAS

CLEODEEN GORDON

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(UCI)

This Final Graduation Project was approved by the University as partial fulfillment of the requirements to opt for the Master in Project Management (MPM) Degree

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Karolina Jiménez Monge
TUTOR

_____

Roger Valverde
REVIEWER No.1

_____

Sara Fonseca
REVIEWER No.2

_____

Cleodeen Gordon
STUDENT

DEDICATION

I dedicate this thesis to the Most High God, for His unwavering faithfulness throughout this entire course of study and to my family members, Claudette, Clayton and Cleon Gordon for their constant support and encouragement.

Commit to the LORD whatever you do, and he will establish your plans. Proverbs 16 vs 3.

ACKNOWLEDGMENTS

I would like to express sincere gratitude to God for the determination He provided from the initiation to the completion of this project. Special acknowledgement is also given to Mrs. Lunce Dowdie- Campbell who introduced me to the Master's Programme and Ms. Karolina Jiménez, who provided excellent tutorship for the final phase of the final graduation project. I must also thank Mrs. Monique Patrice Robb-Cameron who provided linguistic review services and the inspectorate of the Environmental Health Unit at the St. Thomas Health Department who readily provided the information needed to complete the project. Last but not least, I would like to thank my family and friends who continuously provided words of encouragement.

Without the assistance, encouragement and support of these persons, this study would not have been a success.

I thank you all.

ABSTRACT

The objective of this document is to develop an integrated project management plan for a sustainable solid waste management project to alleviate illicit dumping and burning of solid waste in Lloyds, Jamaica. The University of Technology, Jamaica and the St. Thomas Health Department's collaborative Internship program has existed for over 10 years. Despite this fact, the projects done annually by Interns are not guided by a project management plan. This has led to poorly executed projects that are not completed within the designated time or budget. There have also been instances where breakdowns in stakeholder and communication management have led to unnecessary conflicts among the residents and other stakeholders involved in the projects.

The final product of this project will be an integrated project management plan which contains nine subsidiary plans to be used as a framework to guide the sustainable solid waste management project to alleviate illicit dumping and burning of solid waste in Lloyds, St. Thomas.

The methodology used for the development of this project management plan was analytic. The analysis was done using primary sources such as interviews with the Public Health Intern and questionnaire results garnered from the intern's research. Secondary sources such as the Project Management Body of Knowledge Guide, 6th edition, 2017 and relevant websites and previous community studies provided by St. Thomas Health Department were also analysed.

This project management plan is being developed to ensure a high level of planning is done prior to project execution. The practice of poor solid waste management has led to problems such as land and water pollution and vector proliferation. It is therefore imperative that this solid waste management project be successful, so as to improve environmental health conditions in the community. Given the history of projects in the parish where a lack of proper project planning has led to poorly executed projects, this project management plan will provide a guideline with recommended best practice to heighten the probability of project success.

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ABBREVIATIONS AND ACRONYMS

- CHC Community Health Committee
- CPHI Chief Public Health Inspector
- CPI Cost Performance Index
- EH Environmental Health
- FGP Final Graduation Project
- MOHW Ministry of Health & Wellness
- MC Municipal Corporation
- NSWMA National Solid Waste Management Authority
- PHI Public Health Inspector
- PMBOK® Guide Project Management Book of Knowledge
- SERHA South East Regional Health Authority
- SPI Schedule Performance Index
- STHD St. Thomas Health Department
- UCI University for International Cooperation
- UTECH University of Technology
- WBS Work Breakdown Structure

EXECUTIVE SUMMARY

For the past 10 years, the University of Technology (UTECH), Jamaica has made it compulsory for all final year students enrolled in the Bachelor of Science Degree in Environmental (Health Public Health Major) Programme, to successfully implement a community environmental health project. These students are placed in the 14 parishes of Jamaica for a duration of 6 months to implement the projects. During this period, the students are employed to the various parish Health Departments as Public Health Inspector Interns. Each parish has the responsibility of selecting the community in which each student is placed for the implementation of said projects. Students are usually placed in communities that have a history of or emerging significant environmental health problems.

The organization for which the project management plan was developed, the St. Thomas Health Department (STHD), is in the parish of St. Thomas and functions as a Government Office mandated by the South-east Regional Health Authority (SERHA). SERHA is one of the regional health authorities developed by the Ministry of Health in a bid to decentralize the work of the Ministry. From the author's personal experience, the implementation of the annual environmental health projects executed by Public Health Inspector Interns in St. Thomas has proven to be challenging due to a lack of project management planning.

This is the ideal opportunity to introduce an integrated project management plan to guide the most recently proposed project to be done in the community of Lloyds. This will also ensure that all project management knowledge areas will be adequately planned and that a successful high-quality project is executed and that there is no large divergence from the designated project budget and time.

The general objective of this project was to develop an integrated project management plan for a sustainable solid waste management project to alleviate illicit dumping and burning of solid waste in Lloyds, Jamaica. The specific objectives were: to develop a project charter which formally authorizes the project and provides the project manager with the authority to apply organizational resources to project activities, to create a scope management plan that ensures that the project includes all the work required and only the work required for project success, to create a schedule management plan to ensure the timely completion of the project, to develop a cost management plan to ensure that project funds are appropriately controlled, to create a quality management plan to identify quality requirements and document how project deliverables will comply with said requirements, to create a resource management plan to guide the identification and acquisition of both human and physical project resources, to develop a communication management plan to ensure timely creation and dissemination of project information to stakeholders, to develop a risk management plan which will identify, analyze and plan responses to potential risks, to create a procurement management plan to administer contracts to

the most suitable suppliers and to develop a stakeholder management plan to effectively identify, categorize and engage the various project stakeholders.

Analytical research methods were used to achieve the objectives of this Final Graduation Project (FGP). Both primary and secondary sources of information were analyzed. The primary sources utilized were personal interviews with the PHI Intern (project manager) and questionnaire result. The secondary sources were the Project Management Body of Knowledge Guide, 6th edition, 2017, relevant websites and previous community studies provided by the St. Thomas Health Department. The information from these sources were analyzed and used to create the nine subsidiary plans and the overall project management plan for the community project.

Having completed the objectives outlined above, it can be concluded that the principles of the PMI as found in the PMBOK® Guide can be applied to develop an integrated Project Management Plan which can foster change and improve the quality of Project Management administered by Project Manager assigned to the Lloyds Community Health project.The integration management plan will provide a template which speaks to change control, which did not exist within the Health Department before. The scope management plan provides a detailed breakdown and concise definitions of the proposed project work. The schedule management plan will increase the probability of the project manager meeting project schedule goals and completing the project within the given time. The cost management plan will cause a change in the way the project manager plans, monitors, and controls the project budget. The quality management plan provides a quality guide for all project deliverables, rather than specific deliverables as was practiced by previous Project Managers within the Health Department.

The resource management plan will provide a comprehensible guide for the management of both human and physical resources to ensure both types of resources are seen and managed as priorities. The communication management plan will facilitate efficient communication within the project team which will be a diverse group of people. The risk management plan introduces the concept of project risk and provides a template for the documentation of project risk which did not exist in the Health Department before. The procurement management plan will serve as a guide for the creation and award of contracts. Finally, the stakeholder management plan will provide a plan of engagement to prevent stakeholders from becoming disengaged.

It is recommended that the St. Thomas Health Department develops a Project Management Methodology for the execution of future projects. The Department should also provide the means for archiving both hard and soft copies of projects for future reference. It is recommended that UTECH provides project management training for Public Health Inspector Interns and Internship Field Supervisors to ensure the appropriate use of the Project Management Plan.

1 INTRODUCTION

1.1. Background

The Organization for which the Project Management plan will be developed is the St. Thomas Health Department (STHD), which is a government office operated under the Southeast Regional Health Authority (SERHA) of Jamaica. SERHA, which is a statutory body of the Ministry of Health & Wellness, consists of three parishes, St. Catherine, Kingston, and St. Thomas. Located in the parish capital of Morant Bay, the department serves all the communities and localities that fall under the geographic boundaries of St. Thomas. The department is divided into several units that carry out the mandate of providing quality services in the areas of clinical, maternal, adolescent, mental, dental, and environmental health. The project management plan will be done specifically for the Environmental Health Unit within the department. This unit is made up of Public Health Inspectors, Intern Public Health Inspectors and Vector Control Officers.

The Environmental Health Unit has responsibility for enforcing the regulations that govern environmental sanitation, water quality, wastewater management, institutional health, food safety, occupational health, and safety. Like all other parishes in Jamaica, the St. Thomas Health Department has had a long-standing agreement with the school of Public Health and Health Technology at the University of Technology, Jamaica. The agreement allows for the placement of students in their final year of the Bachelor of Science in Environmental Health (Public Health Major) in the parish to work as Intern Public Health Inspectors. To ensure adequate guidance, a tutor from the University is assigned as Academic Supervisor and a Public Health Inspector from the Department is assigned as Field Supervisor.

During the internship period, the interns are expected to carry out research and implement a sustainable project. The projects are done to solve an environmental

health problem in a given community. The areas of concentration are usually liquid waste management, solid waste management or vector control (including rodent and mosquito control). The project involves the collection of socio-demographic and environmental data in a bid to ascertain what environmental health problems are affecting residents. The problems are then scientifically prioritized and the predominant problem with the most significant effects is chosen as the area of concentration for the project. Strategies such as community involvement and health education are then used to solve that problem within a 6-month time span.

1.2. Statement of the problem

Despite the fact that the Internship program has existed in the parish of St. Thomas for over 10 years, the projects done annually are not guided by a project management plan. This has led to poorly executed projects that are not completed within the designated time or budget. There have also been instances where there are breakdowns in stakeholder and communication management leading to unnecessary conflicts among the residents involved in the projects. Therefore, this study seeks to provide a project management plan to act as a framework for the most recently proposed solid waste management intervention project for the small rural community of Lloyds. The plan will provide the basis of all the project work and how the work will be performed.

The quality of life in the community of Lloyds has been significantly affected by the lack of a Solid Waste Management System for over 20 years. The problem stemmed from the infrequency of refuse collection by the National Solid Waste Management Authority (N.S.W.M.A.) trucks designated to the community. The problem is further compounded by a lack of communal waste receptacles. As such, there is nowhere for residents to store refuse if the receptacles in their home/yard become full. This problem has led residents to turn to illicit means of refuse disposal such as backyard burning and dumping.

A community survey done by the Public Health Inspector Intern at the St. Thomas Health Department revealed that 30% of residents have had solid waste accumulated in their yards or engage in illicit dumping. Another 26% of premises inspected had active burning sites. The practices have led to problems such as land and water pollution and vector proliferation. Vector proliferation is of dire concern to the health department due to the risk of diseases such as leptospirosis spread by rodents and chikungunya, zika virus and dengue fever which are spread by mosquitoes. Given the history of projects in the parish where a lack of proper project planning has led to poorly executed projects which fail to meet the requirements of the stakeholders involved. This study was initiated to provide a project management plan so as to ensure a high level of planning is done prior to project execution.

1.3. Purpose

This FGP is the ideal opportunity to introduce an integrated project management plan to guide the proposed project to be done in the community of Lloyds. This will also ensure that all project management knowledge areas will be adequately planned and that a successful, high-quality project is executed and that there is no large divergence from the designated project budget and time.

The residential environment in which any human being dwells has direct effects on the health of that human being. It is therefore important that communities are provided with adequate facilities to ensure a high quality of life for its residents. Among these facilities are an approved water supply, sanitary sewerage systems, an approved solid waste management system and in some situations, an approved vector control programme. These systems work together to create a healthful and aesthetically pleasing environment. However, where communities suffer from a deficiency of one or more of these systems, environmental health problems begin to exist.

As it relates to benefits this project seeks to provide a concise, easily understood project management plan which if used effectively can lead to the following benefits:

- Timely completion of the project
- Appropriate control of project funds
- Adequate management of project resources
- Clear declaration of project quality requirements
- Timely and effective communication among stakeholders
- Identification of ideal Stakeholder engagement strategies
- Identification and adequate management of project risks.

1.4. General objective

To develop an integrated project management plan for a sustainable solid waste management project to alleviate illicit dumping and burning of solid waste in Lloyds, Jamaica.

1.5. Specific objectives

1. To develop an integration management plan to unify and coordinate the processes and project management activities during the project.

2. To create a scope management plan that ensures that the project includes all the work required and only the work required for project success.

3. To create a schedule management plan to ensure the timely completion of the project.

4. To develop a cost management plan to ensure that project funds are appropriately controlled.

5. To create a quality management plan to identify quality requirements and document how project deliverables will comply with said requirements.
6. To create a resource management plan to guide the identification and acquisition of both human and physical project resources.
7. To develop a communication management plan to ensure timely creation and dissemination of project information to stakeholders.
8. To develop a risk management plan which will identify, analyse and plan responses to potential risks.
9. To create a procurement management plan to administer contracts to the most suitable suppliers.
10. To develop a stakeholder management plan to effectively identify, categorize and engage the various project stakeholders.

2 THEORETICAL FRAMEWORK

2.1 Company/Enterprise framework

2.1.1 Company/Enterprise background

The Ministry of Health and Wellness (MOHW) is the pre-eminent Government organization whose mandate is to ensure the provision of quality health services and to promote healthy lifestyles and environmental practices.

The South-East Regional Health Authority (SERHA) is a statutory body of the Ministry of Health & Wellness. SERHA is one of four Regional Health Authorities formed as a part of the Health Sector reform, by passage of the National Health Services Act in 1997.The other three regional Health Authorities established were the North East, Southern, and Western Regional Health authority (Ministry of Health & Wellness, 2019).

Northeast Regional Health Authority comprises Portland, St. Mary and St. Ann. Southern Regional Health Authority comprises Clarendon, Manchester and St. Elizabeth. Finally, Western Regional Health Authority is responsible for the parishes of St James, Westmoreland, Trelawney, and Hanover. South East Regional Health Authority (SERHA) comprises Kingston, St Andrew, St. Thomas and St. Catherine. The population served by SERHA is 47% of the population of Jamaica (Ministry of Health &Wellness, n.d).

The St. Thomas Health Department is located in the parish capital of Morant Bay and is the hub of health services at the parish level. The department is made up of several units including Environmental Health, Health Education, Mental Health, Curative Health, Health Records and Maternity and Child Health. These units cater to persons living in all the communities and localities that fall under the geographic boundaries of St. Thomas.

The Final Graduation Project will be aligned to the Environmental Unit which is the unit responsible for all public health and environmental management including:

- Building and Subdivision plans (approving appropriate sewage systems)
- Environmental Sanitation
- Food safety
- Institutional Health
- Occupational Safety and Health
- Port Health and Quarantine
- Vector control
- Waste Management (includes medical, hazardous and other solid waste for example residential waste)
- Water and Wastewater (regulating existing systems).

2.1.2 Mission and vision statements

The St. Thomas Health Department operates under the mission statement of the Southeast Regional Authority.

Mission

The Mission of the South East Regional Health Authority is to promote and safeguard the health of the Jamaican people in collaboration with individuals, groups/agencies through the provision and monitoring of cost- effective preventative, curative, promotive and rehabilitative services delivered by adequately trained and motivated personnel.

Vision

The South East Regional Health Authority, with the general population, seeks to facilitate a satisfying and healthy life.

The Final Graduation project is aligned to both, the mission of the organization in that it is a project management plan intended to guide a community health project. The project will include strategies such as community participation, collaboration with local business places and political representatives and state agencies. The project falls directly under the mission statement's tenet of cost-effective preventative health care. The project aims to alleviate a solid waste management problem which will prove to be a preventative measure against vector borne diseases such as leptospirosis and dengue fever. The project is also aligned to the SERHA's vision, in that it seeks to work with the community members of Lloyds to empower them and to live a healthy and satisfying life.

2.1.3 Organizational structure

The Environmental Health Unit is headed by a Chief Public Health Inspector (CPHI) who is seconded by two Deputy Chief Public Health Inspectors (DCPHI). The CPHI is provided with a secretary who provided administrative assistance. The unit is divided into four zones based on location namely East (Zone 1), North (Zone 2) South (Zone 3) and West (Zone 4). Each zone is headed by a supervisor also known as a Grade 3 officer. The DCPHIs are in charge of two zones each. Each zone also has a Food Safety Officer (Grade 2 officer) and a Community Health Officer (Grade 1 Officer). The unit also comprises of Officers who oversee the Specialist Areas of Food Safety, Vector Control, Veterinary Public Health and Water & Wastewater. There is one data entry clerk who answers to the Food Safety Specialist Officer. There are currently 2 Intern Public Health Inspectors in the parish. Assigned to the East and West zones. The interns are directly supervised by the Grade 3 officers, After the successful completion of their community project, these interns matriculate to the post of Grade 1 officer, given that there are vacancies in the parish.

The following figure highlights the organizational structure of the Environmental Health Unit at the St. Thomas Health Department.

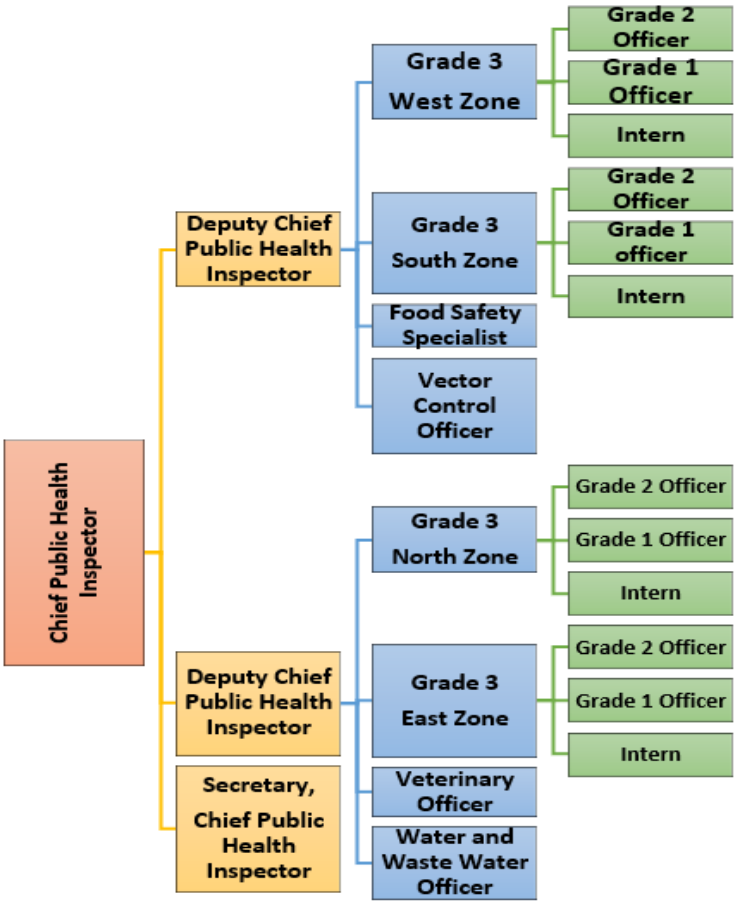


Figure 1 Organizational structure. (Source: Compiled by Author, C. Gordon, 2021)

2.1.4 Products offered

The Environmental Health Unit within the St. Thomas Health Department offers a number of services and products in a bid to protect the health of the St. Thomas population. The Unit operates under the Public Health Regulations of Jamaica and strives to enforce these laws through the provision of the following services (Ministry of Health & Wellness, 2019):

- Health training and certification for food handlers, barbers, hairdressers, cosmetologists, and beauty therapists.
- Inspection and certification of food handling and spirit license establishments.

- Inspection and certification of public institutions, beauty establishments, tourist establishments, places of amusement, residential premises and non-residential premises.
- Environmental Health Education.
- Epidemiological surveillance.
- Investigation of complaints regarding public health nuisances as defined by law.
- Inspection of private burial sites.
- Inspection and certification of swimming pools and recreational water bodies.
- Assessment of building and subdivision plans (approving appropriate sewer and wastewater systems).

The project is directly linked to the services of residential premises inspection and environmental health education. These services are used as strategies in combating environmental health problems such as improper waste management.

The project management plan will incorporate the subsidiary plans that will guide aspects such as scope management, stakeholder management and communication management that will be needed to ensure these services are carried out efficiently. With the creation of the plan the intern public health inspector (project manager) will be able to carry out the residential premises inspections within the designated time and communicate with the various stakeholders in order to execute effective health education sessions.

2.2 Project Management concepts

2.2.1 Project

The British Standard for Project Management (BS 6079) defines a project as a unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific

requirements, including constraints of time, cost and resources. The Project Management Body of Knowledge Guide, 6th edition, 2017 provides a more concise definition, stating that “a project is a temporary endeavor undertaken to create a unique product, service or result” (p. 4).

A project is deemed to be successful if it achieves the stated objectives according to their acceptance criteria, within budget and at the agreed timeframe. The uniqueness stems from the concept that projects are not a part of routine operation but rather a specific set of operations designed to accomplish a singular goal (PMI, 2017, p. 4). The temporary nature of projects comes from the fact that projects have a defined beginning and end. The PMBOK® Guide 6th edition highlighted that despite the fact that projects are temporary “their deliverables exist beyond the end of the project. Projects may produce deliverables of a social, economic, material or environmental nature” (PMI, 2017, p.5). For example, this FGP will lead to development of a Project Management Plan which can be used as a model to guide other environmental health projects in the parish of St. Thomas.

2.2.2 Project management

Projects are known to solve problems and to evoke changes in society on many different levels in many different disciplines. Projects must therefore be properly planned and guided. This is where Project management becomes crucial. Project Management is defined by the PMBOK® Guide 6th edition as “the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements” (PMI, 2017, p.10).

Project Management is used in organizations as a tool to achieve certain objectives or to implement certain changes that are needed. The St. Thomas Health Department is no different. The organizations have been using projects for many years to improve environmental health conditions across the parish. Project

management is however lacking. According to the PMI (2017), “using project management processes, tools and techniques put in place a sound foundation for organizations to achieve their goals and objectives” (PMI, 2017, p11).

2.2.3 Project life cycle

Projects may be divided into a number of phases based on size, complexity, time frame and impact. The typical project has five major phases known as initiating, planning, executing, monitoring, and controlling and closing. Collectively, these phases are known as the project life cycle as depicted in figure 2 above.

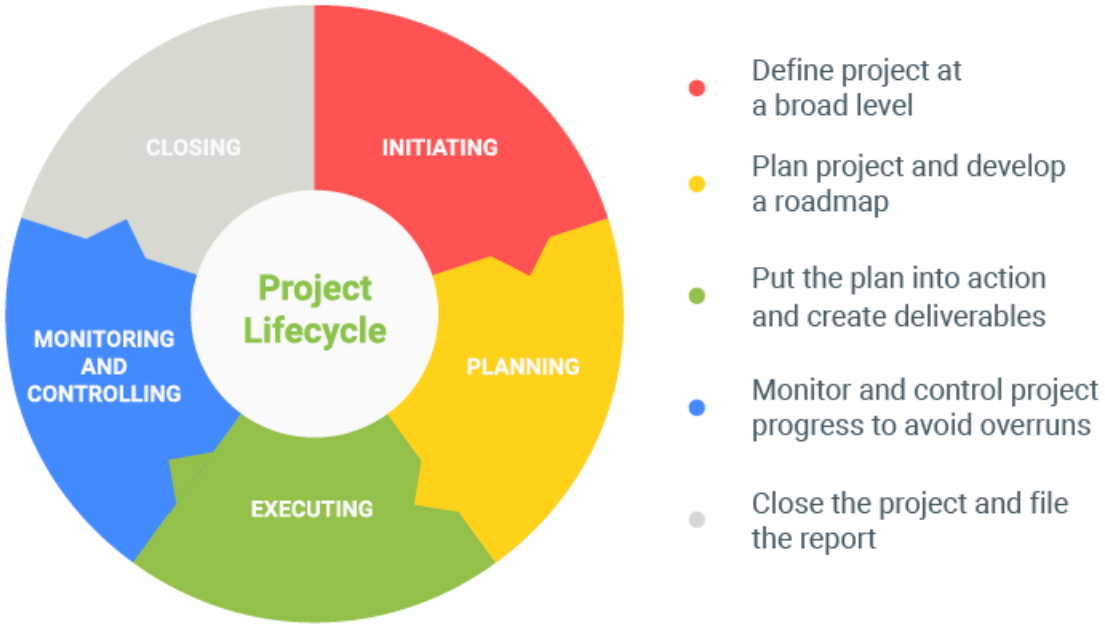


Figure 2 Project Life cycle. (Source: Adopted from GetApp, 2019).

According the PMBOK® Guide a project life cycle is “the series of phases that a project passes through from its start to completion” (PMI, 2017, p18), while Watt (2019) provides a simpler definition which states that the project life cycle is “the path a project takes from the beginning to its end”.

According to the PMPBOK® Guide, a typical project can be mapped according to the generic life cycle of: (i) starting the project, (ii) organizing and preparing, (iii) carrying out the project work and (iv) closing the project (p.548).

The life cycle for the project for which this Final Graduation Project (FGP) seeks to develop a project management plan is similar to the life cycle postulated by the PMI.

The project will be initiated with a socio-demographic and environmental research component where the intern will interact with residents to discover the environmental health issues in the community. Following the collection of this data, prioritization methods are then used to select poor solid waste management as the problem needed to be solved. In the planning phase, this information is taken into consideration and an intervention is proposed along with the resources that will be needed, estimated costs and a project schedule. Implementation will then be done according to schedule. Monitoring and control activities are carried out as early as the initiation phase by the intern's field and academic supervisors. The project is then officially closed with the handing over of the project deliverables in an official closing ceremony.

2.2.4 Project management processes

The PMBOK® Guide states that "the project life cycle is managed by executing a series of project management activities known as project management processes (PMI, 2017 p22).

There are 49 processes which are grouped in 5 categories (initiating, planning, executing, monitoring, and controlling and closing) known as the project management process groups (or process groups) as depicted in Figure 3 above.

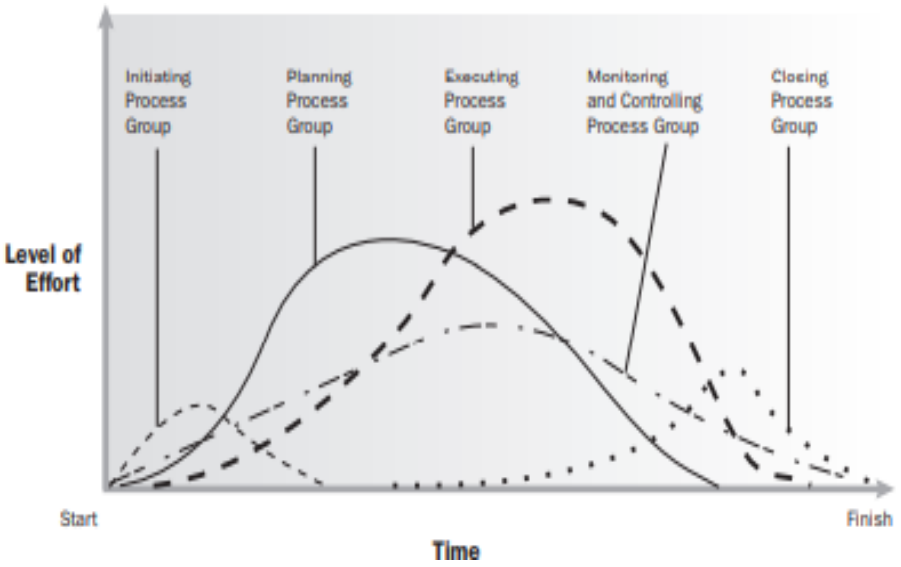


Figure 3 Process group interaction within a project or phase. (Source. PMI, 2017, p.555)

Project management processes are influenced by 2 factors in order to meet project needs, the organizational process assets and the environmental factors. There are multiple ways to manage a project and thus the required process groups and their processes are guides for applying appropriate project management knowledge and skills during the project.

The initiating process, despite being seemingly easily marginalized, is quite important as it provides formal authorization from the project sponsor. This phase also declares the vision for the project and what needs to be accomplished.

Upon obtaining authorization, the next step involves the planning process group. According to the PMBOK® (2017), “these processes are required to establish the scope of the project, refine the objectives and define the course of action required to attain the objectives that the project was undertaken to achieve “(PMI, 2017, p23).

The planning processes are followed by the execution process group where the work is completed according to the project management plan to satisfy the project requirements. Execution is then followed by monitoring and controlling. This process

group is unique in that it occurs throughout the entire life of the project. According to the PMBOK® Guide, the monitoring and controlling processes are “those processes required to track, review and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate corresponding changes” (PMI, 2017, p.23).

The ultimate stage is closing which involves formally closing the project by finalizing all activities and acceptance from customers must be garnered. The FGP provides a project management plan that is a compilation of subsidiary plans created as a result of initiating and planning processes.

2.2.5 Project management knowledge areas

According to the PMBOK® Guide, “a knowledge area is an identified area of project management defined by its knowledge requirements and described in terms of its components processes, practices, inputs, outputs, tools and techniques” (PMI, 2017, p.23). There are ten knowledge areas, all of which will be accounted for during the FGP. The knowledge areas are as follows:

2.2.5.1 Project Integration Management

Project Integration Management includes the processes and activities to identify, combine, unify and coordinate the various processes and project management activities within the Project Management Process Groups (PMI, 2017, p.69). The processes involved in integration management are summarized in figure 4 below.

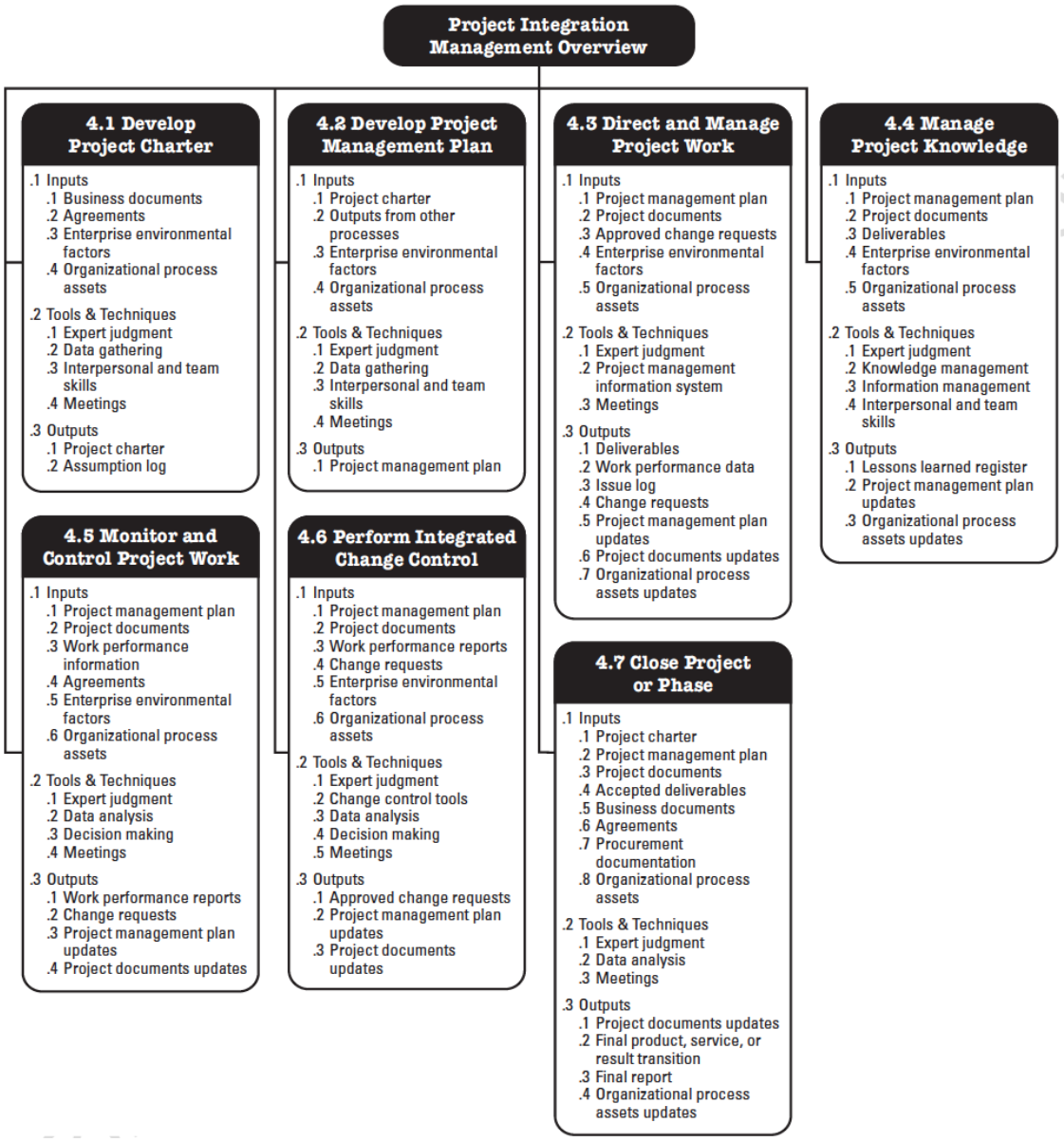


Figure 4 Project Integration Management Overview (Source: PMI, 2017, p.71)

For this FGP, process 4.1 will be used to develop a project charter that will give formal authority for the project management plan to be done. Process 4.2 will be used as a guide throughout the creation of this project management plan.

2.2.5.2 Project Scope Management

Project scope management includes all the processes required to ensure that the project includes all the work required, and only the work required to complete the project successfully (PMI, 2017, p. 129). The Solid Waste Management Project would incorporate all 6 processes involved in project scope management as listed in Figure 5 below.

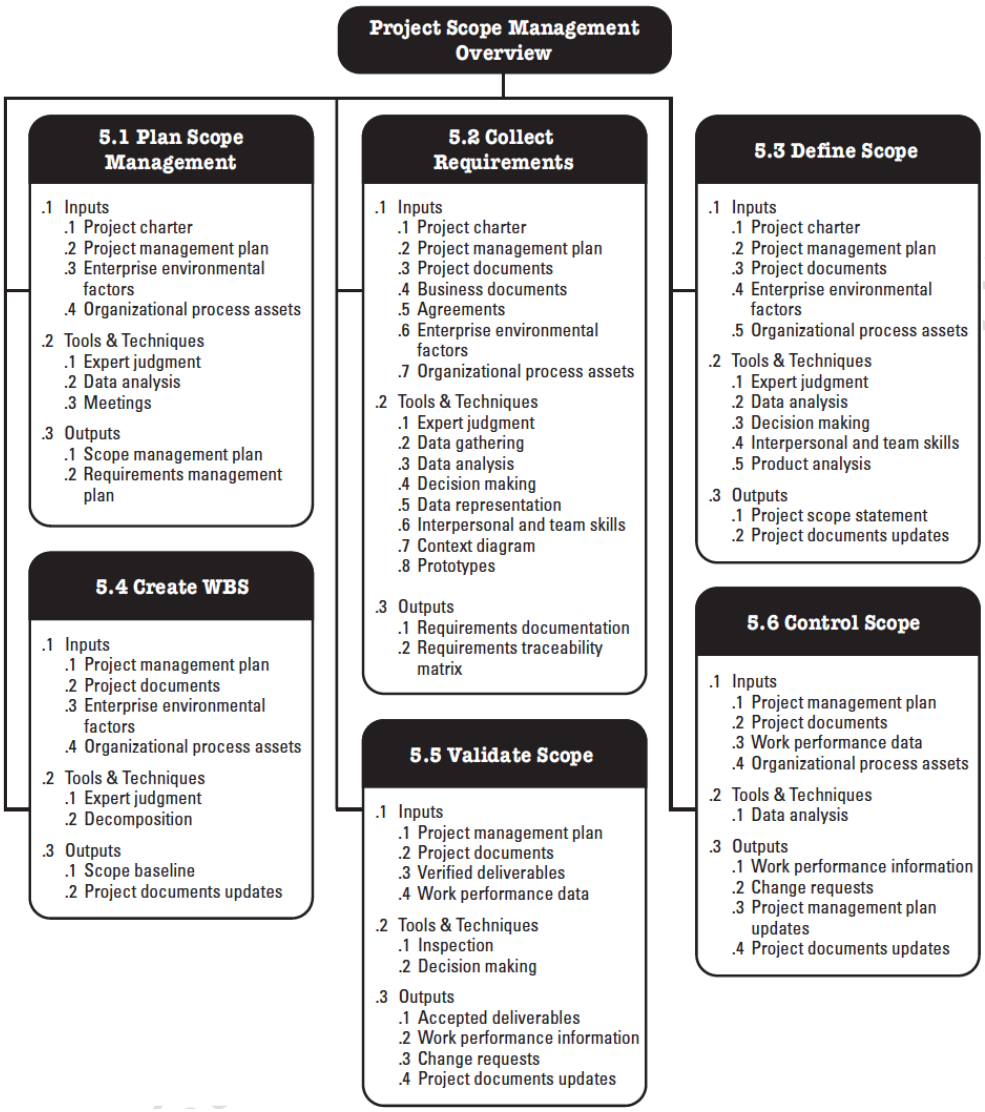


Figure 5 Project Scope Management Overview. (Source: PMI, 2017, p. 129)

2.2.5.3 Project Schedule Management

Project Schedule management includes the processes required to manage the timely completion of the project (PMI, 2017, p.173). There are 6 project schedule management processes that will all be applied to the project. This will ensure that the required project activities will be carried out within the designated time.

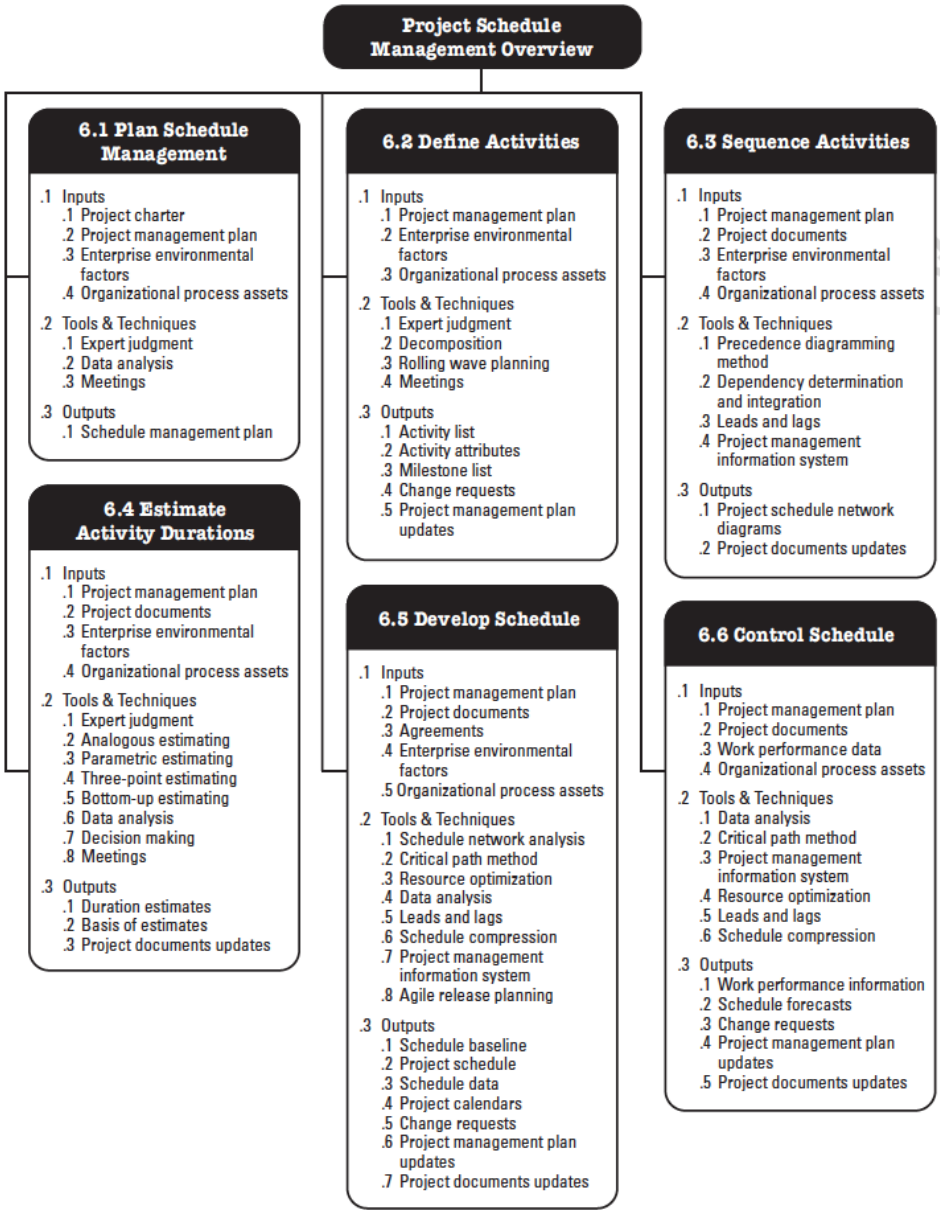


Figure 6 Project Schedule Management Overview. (Source: PMI, 2017, p. 174)

2.2.5.4 Project Cost Management

Project cost management includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget (PMI, 2017, p. 231).

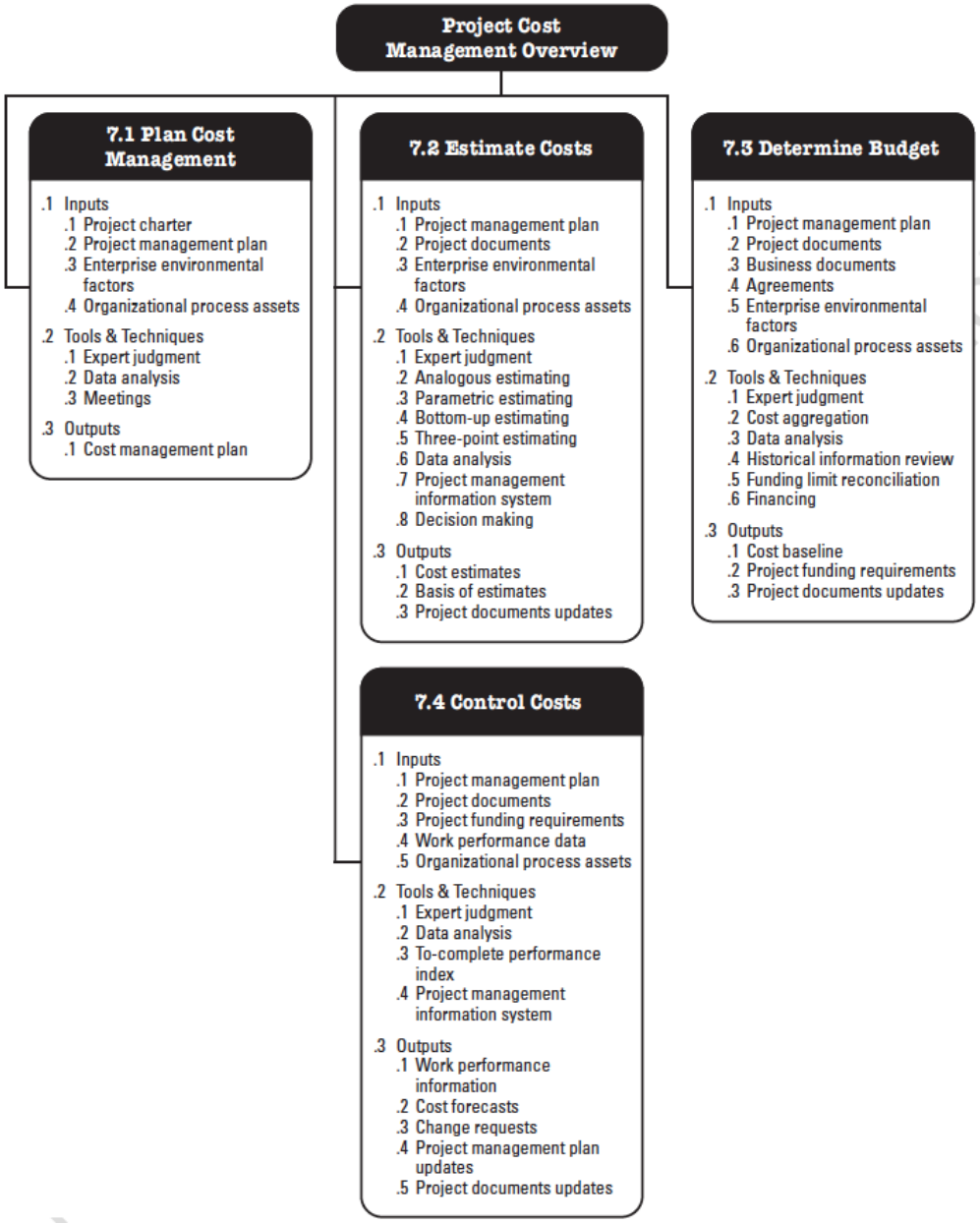


Figure 7 Project Cost Management Overview. (Source: PMI, 2017, p. 232)

This FGP will create a cost management plan that will use the 4 cost management processes as seen above in figure 7 to ensure that there is a plan in place to estimate the cost of materials needed to construct the solid waste receptacles as well as to determine a budget and control costs as bests as possible given the nature of the project.

2.2.5.5 Project Quality Management

Project quality management, according to the PMI "includes the processes for incorporating the organization's quality policy regarding planning, managing and controlling project and product quality requirements in order to meet stakeholder's objectives" (PMI, 2017, p.271). PMI (2017) lists the processes involved in project quality management as:

- 8.1 Plan Quality Management – The process of identifying quality requirements for the project and/or standards for the project and its deliverables and documenting how the project demonstrates compliance with quality requirements and/or standards.
- 8.2 Manage Quality – The process of translating the quality management plan into executable quality activities that incorporate the organization's quality policies into the project.
- 8.3 Control Quality – The process of monitoring and recording the results of executing the quality management activities to assess performance and ensure the project outputs are complete, correct, and meet customer expectations. (p. 271)

Process 8.1 of the project quality management process will be captured in the FGP to ensure that there is a guide for quality assurance. However, processes 8.2 and 8.3 would be the responsibility of the academic supervisor and intern respectively.

2.2.5.6 Project Resource Management

Every project, despite its size, requires the use of resources. It is therefore imperative to plan how these resources will be acquired and managed throughout the project. According to PMI (2017), Project resource management "includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project" (PMI, 2017, p.307). PMI (2017) lists the processes involved in project resource management as:

- 9.1 Plan Resource Management – The process of defining how to estimate, acquire, manage, and utilize physical and team resources.
- 9.2 Estimate Activity Resources – The process of estimating team resources and the type and quantities of material, equipment, and supplies necessary to perform project work.
- 9.3 Acquire Resources – The process of obtaining team members, facilities, equipment, materials, supplies, and other resources necessary to complete project work.
- 9.4 Develop Team – The process of improving competencies, team member interaction, and the overall team environment to enhance project performance.
- 9.5 Manage Team – The process of tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance.
- 9.6 Control Resources – The process of ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring team changes to optimize project performance. (p. 307)

Of the four processes involved in project resource management, this FGP will speak to process 9.1. as detailed above. This process will be adequately captured in a subsidiary project resource management plan

2.2.5.7 Project Communications Management

Project communications management “includes the processes necessary to ensure that the information needs of the project and its stakeholders are met through development of artifacts and implementation of activities designed to achieve information exchange” (PMI, 2017, p.359). PMI (2017) lists the processes involved in project communications management as:

- 10.1 Plan Communications Management – The process of developing an appropriate approach and plan for project communication activities based on the information needs of each stakeholder or group, available organizational assets, and the needs of the project.
- 10.2 Manage Communications – The process of ensuring timely and appropriate collection, creation, distribution, storage, retrieval, management, monitoring, and the ultimate disposition of project information.
- 10.3 Monitor Communications – The process of ensuring the information needs of the project and its stakeholders are met. (p. 359)

Despite the fact that there are 3 processes, this FGP will focus on process 10.1 to create a communication management plan.

2.2.5.8 Project Risk Management

Risks are inevitable in every project; it is therefore essential for the stakeholders involved to adequately analyze and plan for these risks. Project Risk management is defined by the PMBOK® (2017) as “the processes of conducting risk management planning, identification, analysis, response planning, response implementation and monitoring risk on a project” (PMI, 2017, p.395). This FGP will use processes 11.1, 11.2, 11.3 and 11.5 as identified below.

- 11.1 Plan Risk Management – The process of defining how to conduct risk management activities for a project.

- 11.2 Identify Risks – The process of identifying individual project risks as well as sources of overall project risk and documenting their characteristics.
- 11.3 Perform Qualitative Risk Analysis – The process of prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics.
- 11.4 Perform Quantitative Risk Analysis – The process of numerically analysing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives.
- 11.5 Plan Risk Responses – The process of developing options, selecting strategies, and agreeing on actions to address overall project risk exposure, as well as to treat individual project risks.
- 11.6 Implement Risk Responses – The process of implementing agreed-upon risk response plans.
- 11.7 Monitor Risks – The process of monitoring the implementation of agreed-upon risk response plans, tracking identified risks, identifying and analyzing new risks, and evaluating risk process effectiveness throughout the project. (p. 395).

2.2.5.9 Project Procurement Management

According to the Project Management Institute (2017), project procurement management "includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team" (PMI, 2017, p.459). PMI (2017) lists the processes involved in project procurement management as:

- 12.1 Plan Procurement Management – The process of documenting project procurement decisions, specifying the approach, and identifying potential sellers.
- 12.2 Conduct Procurements – The process of obtaining seller responses, selecting a seller, and awarding a contract.

- 12.3 Control Procurements – The process of managing procurement relationships, monitoring contract performance, making changes and corrections as appropriate, and closing out contracts (p. 459).

It is important to note that the project management plan being developed will only use process 12.1.

2.2.5.10 Project Stakeholder Management

Project Stakeholder Management "includes all the processes required to identify the people, groups or organizations that could impact or be impacted by the project, to analyse stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution" (PMI, 2017, p.503). There are 4 project stakeholder processes as outlined below. Only processes 13.1 and 13.2 will be used for the development of this project management plan.

- 13.1 Identify Stakeholders – The process of identifying project stakeholders regularly and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success.
- 13.2 Plan Stakeholder Management – The process of developing approaches to involve project stakeholders based on their needs, expectations, interests, and potential impact on the project.
- 13.3 Manage Stakeholder Engagement – The process of communicating and working with stakeholders to meet their needs and expectations, address issues, and foster appropriate stakeholder engagement involvement.
- 13.4 Monitor Stakeholder Engagement – The process of monitoring project stakeholder relationships and tailoring strategies for engaging stakeholders through the modification of engagement strategies and plans (p. 503).

PMI (2017) lists the key terms that will be used to classify stakeholders are:

- Power: The level of authority allotted to the stakeholder.
- Interest: The level of concern about the project's outcome.
- Influence: The ability to influence the outcomes of the project.
- Impact: The ability to cause changes to the project's planning or execution (p.512).

3 METHODOLOGICAL FRAMEWORK

3.1 Information sources

The Concise Oxford English Dictionary defines the term information as facts An information source is a person, thing, or place from which information comes, arises, or is obtained (Suresh, 2020). Sources of information or evidence are often categorized as primary, secondary, or tertiary material. These classifications are based on the originality of the material and the proximity of the source or origin. This informs the reader as to whether the author is reporting information that is first-hand or is conveying the experiences and opinions of others which is considered second hand (University of Minnesota Crookston, n.d.).

3.1.1 Primary sources

Primary sources provide a first-hand account of an event or time period and are considered to be authoritative. They represent original thinking, reports on discoveries or events, or they can share new information. Often these sources are created at the time the events occurred, but they can also include sources that are created later. They are usually the first formal appearance of original research (University of New South Wales, 2021).

3.1.2 Secondary sources

These sources offer an analysis or restatement of primary sources. They often try to describe or explain primary sources. They tend to be works which summarize, interpret, reorganize, or otherwise provide an added value to a primary source (University of Minnesota Crookston, n.d,). The summary of information sources must be shown in a chart such as chart 1 below.

Chart 1 Information sources (Source: C. Gordon, The Author, June 2021)

Objectives	Information sources	
	Primary	**Secondary**
1. To develop an integration management plan to unify and coordinate the processes and project management activities during the project.	Personal interview with PHI Intern (project manager) and questionnaire results	PMBOK® Guide, 6th edition, 2017, relevant websites and previous community studies provided by St. Thomas Health Department.
2. To create a scope management plan that ensures that the project includes all the work required and only the work required for project success.	Personal interview with PHI Intern (project manager) and questionnaire results	PMBOK® Guide, 6th edition, 2017, relevant websites and previous community studies provided by St. Thomas Health Department.
3. To create a schedule management plan to ensure the timely completion of the project.	Personal interview with PHI Intern (project manager) and questionnaire results	PMBOK® Guide, 6th edition, 2017, relevant websites and previous community studies provided by St. Thomas Health Department.
4. To develop a cost management plan to ensure that project funds are appropriately controlled.	Personal interview with PHI Intern (project manager) and questionnaire results	PMBOK® Guide, 6th edition, 2017, relevant websites and previous community studies provided by St. Thomas Health Department.

Objectives	Information sources	
	Primary	**Secondary**
5. To create a quality management plan to identify quality requirements and document how project deliverables will comply with said requirements.	Personal interview with PHI Intern (project manager) and questionnaire results	PMBOK® Guide, 6th edition, 2017, relevant websites and previous community studies provided by St. Thomas Health Department.
6. To create a resource management plan to guide the identification and acquisition of both human and physical project resources.	Personal interview with PHI Intern (project manager) and questionnaire results	PMBOK® Guide, 6th edition, 2017, relevant websites and previous community studies provided by St. Thomas Health Department.
7. To develop a communication management plan to ensure timely creation and dissemination of project information to stakeholders.	Personal interview with PHI Intern (project manager) and questionnaire results	PMBOK® Guide, 6th edition, 2017, relevant websites and previous community studies provided by St. Thomas Health Department.
8. To develop a risk management plan which will identify, analyse and plan responses to potential risks.	Personal interview with PHI Intern (project manager) and questionnaire results	PMBOK® Guide, 6th edition, 2017, relevant websites and previous community studies provided by St. Thomas Health Department.

Objectives	Information sources	
	Primary	**Secondary**
9. To create a procurement management plan to administer contracts to the most suitable suppliers.	Personal interview with PHI Intern (project manager) and questionnaire results	PMBOK® Guide, 6th edition, 2017, relevant websites and previous community studies provided by St. Thomas Health Department.
10. To develop a stakeholder management plan to effectively identify, categorize and engage the various project stakeholders.	Personal interview with PHI Intern (project manager) and questionnaire results	PMBOK® Guide, 6th edition, 2017, relevant websites and previous community studies provided by St. Thomas Health Department.

3.2 Research methods

Research methods are defined by Bajpai (2011) as, “the systematic and scientific procedure of data collection, compilation, analysis, interpretation, and implication pertaining to any business problem”. Research methods are systematic in that, there is a definite set of procedures and steps that will be followed, (Mahmood, 2011). Several types of research methods exist such as survey research (questionnaires, interviews), observational research, content analysis, case study, and the analysis of documents and historical records. The research method used in this FGP is documentary analysis.

3.2.1 Analytical method

“Analytical research, as a style of qualitative inquiry, draws from the disciplines of philosophy, history, and biography. This research method varies from ethnography

in that it is non-interactive document research. Analytical research describes and interprets the past or recent past from selected sources. The sources may be documents preserved in collections, and/or participants' oral testimonies" (McMillian & Schumacher, 1997 p. 464). The summary of research methods for each specific objective is indicated in chart 2 below.

Chart 2 Research methods (Source C. Gordon, The Author, June 2021)

Objectives	Analytical Research Method
1. To develop an integration management plan to unify and coordinate the processes and project management activities during the project.	The analytical research method will be used to analyze information found in the sources identified in Chart 1, objective 1 above to aid in decision making when developing the project charter.
2. To create a scope management plan that ensures that the project includes all the work required and only the work required for project success.	The analytical research method will be used to analyze information found in the sources identified in Chart 1, objective 2 above to aid in decision making when creating the scope management plan.
3. To create a schedule management plan to ensure the timely completion of the project.	The analytical research method will be used to analyze information found in the sources identified in Chart 1, objective 3 above to aid in decision making when creating the schedule management plan.

Objectives	Analytical Research Method
4. To develop a cost management plan to ensure that project funds are appropriately controlled.	The analytical research method will be used to analyze information found in the sources identified in Chart 1, objective 4 above to aid in decision making when developing the cost management plan.
5. To create a quality management plan to identify quality requirements and document how project deliverables will comply with said requirements.	The analytical research method will be used to analyze information found in the sources identified in Chart 1, objective 5 above to aid in decision making when creating the quality management plan.
6. To create a resource management plan to guide the identification and acquisition of both human and physical project resources.	The analytical research method will be used to analyze information found in the sources identified in Chart 1, objective 6 above to aid in decision making when creating the resource management plan.
7. To develop a communication management plan to ensure timely creation and dissemination of project information to stakeholders.	The analytical research method will be used to analyze information found in the sources identified in Chart 1, objective 7 above to aid in decision making when developing the communication management plan.

Objectives	Analytical Research Method
8. To develop a risk management plan which will identify, analyse and plan responses to potential risks.	The analytical research method will be used to analyze information found in the sources identified in Chart 1, objective 8 above to aid in decision making when developing the risk management plan.
9. To create a procurement management plan to administer contracts to the most suitable suppliers.	The analytical research method will be used to analyze information found in the sources identified in Chart 1, objective 9 above to aid in decision making when developing the procurement management plan.
10. To develop a stakeholder management plan to effectively identify, categorize and engage the various project stakeholders.	The analytical research method will be used to analyze information found in the sources identified in Chart 1, objective 10 above to aid in decision making when developing the stakeholder management plan.

3.3 Tools

According to the PMBOK® Guide, a tool is “something tangible such as a template or software program used in performing an activity to produce a product or result” (PMI, 2017, p.725). The tools that will be used in the Final Graduation Project are as follows:

- Project charter template – used as a guide for the development of the project charter.

- Project Management plan template – a guide to development of the project management plan and all subsidiary plans.
- Requirements traceability matrix template – will provide a visual representation of product requirements and the deliveries that satisfy them.
- Work Breakdown Structure (WBS) generator – a breakdown of the total scope of work to be carried out by the project team.
- Requirements Management Plan template – provides a description of the project requirements will be analyzed, documented and managed
- Scope management Plan template- will provide a guide to the development of the scope management plan.
- Schedule Management plan template- to guide the development of the schedule management plan.
- Scheduling tool- Used to create the project schedule
- Activity list template – used to create a documented tabulation of schedule activities.
- Cost Management Plan template- develops the cost management plan to control project income and expenditure.
- Project budget template – Provided by the University of Technology, to be used to track financial transactions over the course of the project.
- Cost baseline template- summarizes the development of the cost baseline.
- Quality management plan template- an outline from which the quality management plan will be developed.
- Quality management tools such as check sheets.
- Resource Management Plan template - an outline from which the resource management plan will be developed.
- Resource calendar- A calendar that clearly states when skilled and unskilled workers in the community will be available for project work
- Responsibility Assignment Matrix – Identifies team members and assigns them responsibilities.

- Communications Management Plan template – an outline from which the communications management plan will be developed.
- Communication matrix – Documentation of communication plans between project team and stakeholders.
- Risk Management Plan template - an outline from which the risk management plan will be developed.
- Risk register template – an outline from which the project risk register will be developed.
- Procurement Management Plan template - an outline from which the procurement management plan will be developed.
- Stakeholder Management Plan template - an outline from which the stakeholder management plan will be developed.
- Stakeholder Analysis Chart – Documentation of the qualitative and quantitative information to determine whose interest should be considered during the project.
- Stakeholder engagement assessment matrix – Shows how each stakeholder should be engaged with based on their involvement in the project.

The summary of tools is shown in chart 3 below.

Chart 3 Tools (Source: C. Gordon, The Author, June 2021)

Objectives	Tools
1. To develop an integration management plan to unify and coordinate the processes and project management activities during the project.	▪ Project charter template ▪ Project Management plan template

Objectives	Tools
2. To create a scope management plan that ensures that the project includes all the work required and only the work required for project success.	▪ Requirement's traceability matrix template ▪ Requirements management plan template ▪ Scope management plan template ▪ WBS generator
3. To create a schedule management plan to ensure the timely completion of the project.	▪ Schedule management plan template ▪ Microsoft project 2019
4. To develop a cost management plan to ensure that project funds are appropriately controlled.	▪ Cost management plan template ▪ Budget template from the University of Technology ▪ Cost baseline template
5. To create a quality management plan to identify quality requirements and document how project deliverables will comply with said requirements.	▪ Quality management plan template ▪ Checklist template
6. To create a resource management plan to guide the identification and acquisition of both human and physical project resources.	▪ Resource Management Plan template ▪ Resource calendar ▪ Responsibility Assignment Matrix

Objectives	Tools
7. To develop a communication management plan to ensure timely creation and dissemination of project information to stakeholders.	▪ Communications Management Plan template ▪ Communication matrix
8. To develop a risk management plan which will identify, analyse and plan responses to potential risks.	▪ Risk Management Plan template ▪ Risk register template
9. To create a procurement management plan to administer contracts to the most suitable suppliers.	▪ Procurement Management Plan template
10. To develop a stakeholder management plan to effectively identify, categorize and engage the various project stakeholders.	▪ Stakeholder Management Plan template, ▪ Stakeholder Analysis Chart, ▪ Stakeholder engagement assessment matrix

3.4 Assumptions and constraints

According to the PMBOK® Guide an assumption is a “factor in the planning process that is considered to be true, real or certain, without proof or demonstration” (PMI, 2017, p.699). A constraint is “a limiting factor that affects the execution of a project, program, portfolio or process” (PMI, 2017, p.701).

Chart 4 shows the assumptions and constraints considered on the Final Graduation Project for each specific objective.

Chart 4 Assumptions and constraints (Source: C. Gordon, The Author, June 2021)

Objectives	Assumptions	Constraints
1. To develop an integration management plan to unify and coordinate the processes and project management activities during the project.	▪ The project charter will be developed before all other subsidiary plans.	▪ Time- Only 6 days were allotted for the development of the project charter.
2. To create a scope management plan that ensures that the project includes all the work required and only the work required for project success.	▪ The author has received all the information need ed to create the scope management plan.	▪ The project work must include strategies stipulated and verified by the University.
3. To create a schedule management plan to ensure the timely completion of the project.	▪ The time allotted for the development of the project management plan and the community project will be sufficient.	▪ The time allotted for community intervention will not exceed 4 months.

Objectives	Assumptions	Constraints
4. To develop a cost management plan to ensure that project funds are appropriately controlled.	▪ The budget created will accurately depict the financial transactions during the community project.	▪ The community intervention must not exceed $100,000 Jamaican dollars.
5. To create a quality management plan to identify quality requirements and document how project deliverables will comply with said requirements.	▪ The quality management plan will highlight all the quality requirements of the project.	▪ The quality requirements must be able to be met within the $100,000 budget.
6. To create a resource management plan to guide the identification and acquisition of both human and physical project resources.	▪ Skilled and unskilled workers needed for the project can be found in the community.	▪ The availability of skilled workers may be limited as the workers may be on other projects.
7. To develop a communication management plan to ensure timely creation and dissemination of project information to stakeholders.	▪ All stakeholders will receive timely and accurate information.	▪ Poor cell phone service in the study area.

Objectives	Assumptions	Constraints
8. To develop a risk management plan which will identify, analyse and plan responses to potential risks.	▪ Sufficient information has been provided to identify the majority of project risks.	▪ All project risks must be identified within the planning stage of the project.
9. To create a procurement management plan to administer contracts to the most suitable suppliers.	▪ All goods and services necessary for the project can be procured at local businesses.	▪ Goods and services must be procured within the allotted 6 months and $100,000 budget.
10. To develop a stakeholder management plan to effectively identify, categorize and engage the various project stakeholders.	▪ The stakeholder management plan will provide information on how to engage all stakeholders.	▪ The information provided about stakeholders is limited to the information provided by the intern public health inspector.

3.5 Deliverables

A deliverable according to the PMBOK® Guide a deliverable is “any unique and verifiable product, result or capability to perform a service that is required to be produced to complete a process, phase or project” (PMI, 2017, p.704). The main deliverable to be garnered from this FGP is an integrated project management plan

which contains nine subsidiary plans to be used as a framework to guide the sustainable solid waste management project to alleviate illicit dumping and burning of solid waste in Lloyds, St. Thomas.

Chart 5 shows the expected deliverables for each specific objective.

Chart 5 Deliverables (Source: C. Gordon, The Author, June 2021)

Objectives	Deliverables
1. To develop an integration management plan to unify and coordinate the processes and project management activities during the project.	▪ Project charter
2. To create a scope management plan that ensures that the project includes all the work required and only the work required for project success.	▪ Scope management plan ▪ Requirements management plan ▪ Requirements, traceability matrix
3. To create a schedule management plan to ensure the timely completion of the project.	▪ Schedule management plan ▪ Activity list ▪ Schedule network diagram ▪ Project schedule

Objectives	Deliverables
4. To develop a cost management plan to ensure that project funds are appropriately controlled.	▪ Cost management plan. ▪ Cost baseline and budget
5. To create a quality management plan to identify quality requirements and document how project deliverables will comply with said requirements.	▪ Quality management plan
6. To create a resource management plan to guide the identification and acquisition of both human and physical project resources.	▪ Resource management plan
7. To develop a communication management plan to ensure timely creation and dissemination of project information to stakeholders.	▪ Communication management plan ▪ Communication matrix
8. To develop a risk management plan which will identify, analyse and plan responses to potential risks.	▪ Risk management plan ▪ Risk register
9. To create a procurement management plan to administer contracts to the most suitable suppliers.	▪ Procurement management plan
10. To develop a stakeholder management plan to effectively identify, categorize and engage the various project stakeholders.	▪ Stakeholder management ▪ Stakeholder analysis chart

4 RESULTS

4.1 Integration Management Plan

The Project Integration Management Plan consists of the Project Charter and the Project Management Plan.

4.1.1 Project Charter

In order to develop objective number 1 for the Lloyds Solid Waste Management Community Project, a project charter was created. According to the PMBOK® Guide, the project charter formally authorized the existence of a project and provided the project manager with the authority to apply organizational resources to project activities (PMI, 2017, p.75). It consists of pertinent information such as the project purpose, objectives, assumptions and constraints, deliverables, budget, milestones, relevant historical information, and stakeholder information.

In order to develop the Project Charter, interviews with the project manager (Intern Public Health Inspector) and the Project Management Book of Knowledge Guide were used as sources. Chart 6 shows the Project Charter for the Lloyds Solid Waste Management Community Project.

Chart 6 Project Charter (Source: C. Gordon, The Author, August 2021)

PROJECT CHARTER	
Project Name:	
Project Management Plan for a Solid Waste Management Project in Lloyds, St. Thomas.	
Project Start Date:	**Project Finish date:**
February 14, 2022	August 22, 2022
Project Objectives:	

General Objective

To plan and implement a sustainable solid waste management program in the community of Lloyds in St. Thomas, Jamaica, in order to eliminate the solid waste management problem in said community.

Specific Objectives:

1. To eliminate two illicit dumpsites in the community to alleviate the proliferation of vectors and beautify the community.
2. To increase the number of individual solid waste receptacles in order to increase the solid waste storage capacity of the community .
3. To construct two communal solid waste receptacles at strategic points in the community in order to increase the solid waste storage capacity and provide increased collection points for the NSWMA truck.
4. To improve garbage collection frequency in order to alleviate the problem of overflowing solid waste receptacles.
5. To educate the population on proper solid waste management and the impacts of not practicing said to ensure that the intervention is sustainable
6. To hand over the solid waste receptacles to the community in order to close the project.
7. To apply the practices postulated by the Project Management Institute in the PMBOK® Guide to the management of the project.

Project purpose or justification

A solid waste management system that serves a residential area should facilitate the appropriate storage, collection, and disposal of refuse. Unfortunately, there have been issues in all three of these processes in the community of Lloyds for over twenty years. The problem stemmed from the infrequency of refuse collection by the National Solid Waste Management Authority (N.S.W.M.A.) trucks

designated to the community. The problem is further compounded by a lack of communal waste receptacles. As such, there is nowhere for residents to store refuse in the event that the receptacles in their home/yard become full. As a result of the deficiencies in collection and storage, residents have resorted to the inappropriate disposal practices of burning and dumping.

A community survey done by the Public Health Inspector Intern at the St. Thomas Health Department revealed that 30% of residents have had solid waste accumulated in their yards or have engaged in illicit dumping. Another 26% of premises inspected had active burning sites. A project management plan will therefore be developed to guide a sustainable intervention project to alleviate these problems. This project management plan will assist the public health intern in conducting a project that empowers community members to work towards improving the environmental health status of their community thereby creating an environment conducive to their health and wellness.

Description of Product or Service to be generated by the Project – Project final deliverables:

The following are the expected deliverables of the project:

1. Elimination of two illicit dumpsites.
2. 25 new individual solid waste receptacles.
3. 2 communal solid waste receptacles.
4. Weekly collection of solid waste by the National Solid Waste Management Authority (NSWMA).
5. Three health education sessions on the importance of proper solid waste management, the consequences of burning and dumping garbage and recycling, reusing, and reducing.
6. Handing over ceremony.
7. Project Management Plan.

Assumptions:

The project assumptions are listed below. If an assumption is invalidated at a later date, then the activities and estimates in the project plan will be adjusted accordingly.

- Project sponsors will be committed throughout the life of the project.
- Key project members will be available for the duration of the project.
- Project team members have the knowledge, technical skills and experience required and will perform optimally to ensure project objectives are achieved.
- Project schedule dates are accurate; vendors/contractors will deliver construction materials on time.
- NSWMA will commit to frequent and more widespread collection of solid waste.
- Health education sessions will be effective and community members will understand the importance of the community initiative and will be motivated to be fully engaged in the initiative.
- Vendor/contractors will be paid without delay.
- Government lands will be available to place communal solid waste receptacles.
- The Municipal corporation will approve new garbage collection points.

Constraints:

- Scope:
  - Availability of NSWMA trucks to cover expected routes for solid waste collection.
  - Commitment of the community members.
  - Availability of land space for approved garbage collection points.
- Schedule:
  - 6-month time frame for project completion.

- Cost:
  - Project is limited to funds generated from fundraising activities and sponsorship.
- Quality:
  - Suitability of land space for approval as garbage collection points.
- Resources:
  - Competing project proposals from neighboring communities.

Preliminary Risks:

The following are deemed as the uncertain things that can jeopardize the project's success:

- If there are unfavorable weather conditions, there will be delays in the removal of the dump sites and the construction and placement of the receptacles resulting in an overall increase in the project time.
- If there is poor communication among stakeholders, then there will be conflicts arising which lead to project work not being done or being done poorly.
- If stakeholders are not properly identified or engaged throughout the duration of the project, there will be delays in project execution due to the emergence of marginalized project stakeholders or stakeholders becoming disengaged.
- If skilled community workers are unavailable due to other projects, external workmen will have to be hired, this will lead to an increase in the project budget.
- If the cost estimates done are inaccurate, will lead to a project budget overrun.

Budget:

The project's budget is estimated at $275,000 JMD.

Item	Cost (JMD)
Elimination of dumpsite	$15,000
Individual Receptacles	$35,000
Communal Receptacles	$165,000
Collection Frequency	$0
Health Education	$15,000
Project closure	$20, 000
Project Management	$0
Contingency Reserve	25,000
Total	**$275,000**

Milestones and dates:

Milestone	Start date	End date
Community Survey	February 14, 2022	March 25, 2022
Community Sensitization	February 14, 2022	April 1, 2022
Community Meeting	April 15, 2022	April 15, 2022
Stakeholders Identification & Engagement/ Intersectoral Collaboration	April 15, 2022	April 29, 2022
Project Proposal	May 2, 2022	May 2, 2022
Removal of dump sites	May 9, 2022	May 23, 2022
Construction of communal receptacles	May 23, 2022	May 30, 2022
Placement of individual receptacles	May 23, 2022	May 30, 2022
Health Education	May 30, 2022	June 25, 2022
Project Close	June 25, 2022	July 29, 2022

Relevant historical information:

The community of Lloyds is a small farming community in the rural Jamaican parish of St. Thomas. For approximately five years the community has been without a resident Grade one Public Health Inspector (PHI). The presence of the PHI has only been felt through the investigation of environmental health complaints.

This is compounded by the fact that the National Solid Waste Management Authority (NSWMA) trucks which are responsible for solid waste collection, have not been visiting the community on a regular basis. Residents have turned to illicit means of solid waste disposal and as a result, the community is faced with numerous environmental health problems leading to an unhealthy community. This has led the St. Thomas Health Department to choose Lloyds for the placement of an Intern Public Health Inspector and the execution of a Solid Waste Management Project.

Stakeholders:

The following are the project stakeholders.

Project Team	St. Thomas Heath Department
PHI Intern (Project Managers)	National Solid Waste Management Authority
Residents	Intern Supervisor (Academics)
St. Thomas Municipal Corporation	Intern Supervisor (Field)
Member of Parliament, North East, St. Thomas	Community Business Operators
Councilor, Lloyds Division	Suppliers
St. Thomas Health Department	

Approval:

Project Manager: Shantae Golding-Anderson	Signature:

Authorized by:	Signature:

4.1.2 Project Management Plan

The second process in the Project Integration Management knowledge area is the development of the project Management plan. For the purposes of this project, the plan is inclusive of subsidiary plans that speak to each Project Management Knowledge area.

The Project Management Plan also considers the processes of change control, lessons learned and project closure which are described below.

a. Change Control

Throughout the project, changes to the scope may become necessary. These changes will be implemented using an integrated change control process as described below:

- Any member of the Community Health Committee (Project Team) can request a change, but this must be done by completing a change request form. The change request form template created for this project provides a concise document within which the change description, reason for change, possible impact of change and the proposed action can be adequately described. The document also carries the status of the change request and the signature of the person who reviews the document. The template used for the change control request form can be found in appendix 4
- The proposed changes are discussed at the monthly committee meetings.
- If the change is considered necessary, the project manager is responsible for presenting the change to the Chief Public Health Inspector who is considered the sponsor for the project.
- Once the change is approved both the project sponsor and manager must sign the change request form.

- Whether or not the change is approved, the project manager must inform the project team.
- All change requests, approval and disapproval are recorded in a change log.

b. Lessons Learned

A lessons learned register is a compilation of the important lessons learnt during the project. According to the PMI, the lessons learned register can include the category and description of the situation. It may also include the impact, recommendations and proposed actions associated with the situation (PMI, 2017).

For this project, the lessons learned will be documented in the following manner:

- Lessons learned will be discussed and recorded at the completion of each project phase. The records will include challenges, problems, realized risks and opportunities. The impact, recommendations and proposed actions will also be recorded.
- The necessary actions will be taken to maximize identified opportunities and minimize identified risks.
- The document will be stored at the Health Department where all members of future project teams can have access to the information.

The lessons learned register template created for the purposes of this project includes sections to detail the event, the date raised, the proposed recommendations and the actions taken. The person responsible for the event is also listed along with the corresponding WBS Identification number and the status of the lesson learned. The template used for the lessons learned register can be found in appendix 5.

c. Project Closure

The PMI asserts that “close project is the process of finalizing all activities for the project” (PMI,2017, p.121). Due to the nature of the Lloyds Community Solid Waste

Management Project, the following processes will have to be completed in order for the project to be officially closed.

- The field supervisor from the Health Department and Academic supervisor from the University of Technology, Jamaica must do a joint inspection of the project area to ensure that the communal receptacles have been constructed, the dump sites have been removed and that the individual receptacles have been placed. The supervisors will also review the lesson plans and educational materials used for the health education sessions.
- The field supervisor will interview citizens with regards to the increase in solid waste collection by the NSWMA.
- The field supervisor has signed off on the community status register to ensure an increase in the number of homes that are now compliant with the Solid Waste Management Laws.
- All outstanding payments have been made to the local businesses that provide resources during the project.
- The project document is submitted to the Academic Supervisor and a receipt is given to the project manager.

A handing over ceremony is done by the Health Department to officially hand over the receptacles to the community health committee.

4.2 Scope Management Plan

According to the Project Management Institute, project scope management includes “the processes required to ensure that the project includes all the work required and only the work required to complete the project successfully” (PMI,2017, p.129). In order to clearly define the scope of this project, a scope management plan was created. The plan included a scope definition, the Work Breakdown Structure (WBS),

WBS Dictionary, and the scope control measures that acted as a guide for the project.

4.2.1 Collect Requirements

Collect requirements is the “process of determining, documenting, and managing stakeholder needs and requirements to meet objectives” (PMI, 2017, p.135). The Community Health Committee which acts as the project team is actively involved in this process.

During committee meetings, tools, and techniques such as brainstorming, and interviews will be used to decipher project requirements. Expert judgement from the Project Manager’s field supervisor will also be a key tool. Field supervisors have a wealth of experience in similar projects and will be relied on heavily for information regarding requirements. The team will work to manage the identified requirements throughout the project.

The requirements documentation matrix below describes the project requirements based on the needs of the community, the technical and functional requirements, the level of priority and the person responsible for raising the requirement.

Chart 7 Requirements Documentation (Source: C. Gordon, The Author, August 2021)

Community Needs	Functional Requirements	Technical Requirements	Priority	Raised by
Beautification of open lots.	Community members needed to remove refuse.	NSWMA collection vehicles needed for refuse collection.	High	Project Sponsor
Increased individual solid waste storage capacity.	Public Health Inspector Intern determine the ideal points of placement.	Receptacles must be 55-gallon capacity, metal, 22.5 inches inside diameter, 33.5 inches internal height with detachable covers and pierced bottoms.	High	Project Sponsor
Increased communal solid waste storage capacity.	Skilled community members such as masons, welders, and labourers.	Receptacles must be of a large enough size to support the population of the sub-section of the community it will serve. Floors must be sloped to allow adequate drainage and a soak away pit must be attached to ensure sanitary disposal of wastewater.	High	Project sponsor
Weekly collection of solid waste by NSWMA.	NSWMA Collection personnel including Public Relations Officer and General Manager.	NSWMA collection vehicles needed for refuse collection.	High	Project Sponsor

Community Needs	Functional Requirements	Technical Requirements	Priority	Raised by
Increased knowledge on Environmental Health problems.	Representatives from St. Thomas Health Department, NSWMA, Municipal Corporation.	Health education topics must cover proper solid waste management, the consequences of burning and dumping garbage, solid waste management practices such as recycling, reusing and reducing.	High	Project Manager
Responsibility and ownership of project deliverables.	Community Health Committee and project manager needed to plan event and extend invitation to stakeholders.	Event must be held at a time where all stakeholders are able to attend.	High	Project sponsor

4.2.2 Requirements Traceability Matrix

The Requirement Traceability Matrix “links product requirements to deliverables and helps to ensure each requirement in the requirements documentation is tested. The matrix provides an overview of the tests required to verify the requirements” (PMI, 2017, p.280). The deliverables of this project are verified by the Academic Supervisor from the University of Technology, Jamaica and the field supervisor from the St. Thomas Health Department. The requirements traceability matrix

will act as a guide by which each supervisor can evaluate the deliverables. The requirements matrix below describes the requirements, the corresponding objective and WBS ID as well as the proposed mode of verification to be used.

Chart 8 Requirements Traceability Matrix (Source C. Gordon, The Author, September 2021)

Community Needs	Functional Requirements	Technical Requirements	Priority	Project Objectives	WBS ID	Verification
Beautification of open lots.	Community members needed to remove refuse.	NSWMA collection vehicles needed for refuse collection.	High	To eliminate two illicit dumpsites in the community to alleviate the proliferation of vectors and beautify the community.	1.1	Site visit and evaluation by field and academic supervisor.
Increased individual solid waste storage capacity.	Public Health Inspector intern determine the ideal points of placement.	Receptacles must be 55-gallon capacity, metal, 22.5 inches inside diameter, 33.5 inches internal height with detachable covers and pierced bottoms.	High	To increase the number of individual solid waste receptacles in order to increase the solid waste storage capacity of the community .	1.2	Evaluation by field and academic supervisor.

Community Needs	Functional Requirements	Technical Requirements	Priority	Project Objectives	WBS ID	Verification
Increased communal solid waste storage capacity.	Skilled community members such as masons, welders and labourers.	Receptacles must be of a large enough size to support the population of the sub section of the community it will serve. Floors must be sloped to allow adequate drainage and a soak away pit must be attached to ensure sanitary disposal of wastewater.	High	To construct two communal solid waste receptacles at strategic points in the community in order to increase the solid waste storage capacity and provide increased collection points for the NSWMA truck.	1.3	Site visits and evaluation by field and academic supervisor.

Community Needs	Functional Requirements	Technical Requirements	Priority	Project Objectives	WBS ID	Verification
Weekly collection of solid waste by NSWMA.	NSWMA Collection personnel including Public Relations Officer and GM.	NSWMA collection vehicles needed for refuse collection.	High	To improve garbage collection frequency in order to alleviate the problem of overflowing solid waste receptacles.	1.4	Evaluation by field and academic supervisor done through interviews with residents.
Increased knowledge on Environmental Health problems.	Representatives from St. Thomas Health Department, NSWMA, Municipal Corporation.	Health education topics must cover proper solid waste management, the consequences of burning and dumping garbage, solid waste management practices such as recycling, reusing and reducing.	High	To educate the population on proper solid waste management and the impacts of not practicing said to ensure that the intervention is sustainable	1.5	Evaluation of lesson plans by field and academic supervisor. Interviews with residents.

Community Needs	Functional Requirements	Technical Requirements	Priority	Project Objectives	WBS ID	Verification
Responsibility and ownership of project deliverables.	Community Health Committee and project manager needed to plan event and extend invitation to stakeholders.	Event must be held at a time where all stakeholders are able to attend.	High	To conduct a handing over ceremony to officially close the project.	1.6	Evaluation by field and academic supervisor done through interviews with residents
Proper administration of project knowledge, in order to increase the possibility of project success.	Project Management consultant to create a project management plan.	Plan must be completed before the start of the project in February 2022 and submitted to the St. Thomas Health Department for use.	High	To apply the practices postulated by the Project Management Institute in the PMBOK® Guide to the management of the project.	1.7	Evaluation by field and academic supervisor done through interviews with residents. Evaluation of project deliverables by supervisors.

4.2.3 Scope Definition

The scope of the project is defined by the University of Technology, Jamaica. In the final semester of the Environmental Health program, the project managers are given a project manual which clearly outlines the scope of the project. This definition was created through the joint effort of the University of Technology, Jamaica, and the various parish Public Health Department.

The project scope encompasses increasing the solid waste storage capacity of the community by increasing the number of individual solid waste receptacles by twenty-five and constructing two communal receptacles at strategic points within the community. The scope also includes the removal of two illicit dump sites which exist in the community and a health education campaign covering topics relevant to proper solid waste management.

4.2.4 Project Scope Statement

The project scope statement is the description of the project scope, major deliverables, and exclusions. The project scope statement "documents the entire scope, including project and product scope" (PMI, 2017, p.154). In order to create the scope statement for this project, the project manager was consulted.

The project scope statement for the Lloyds Community Health Project summarizes and highlights the important aspects of the project scope including the scope description, project deliverables, the acceptance criteria for those deliverables as well as project constraints and assumptions. The scope statement is presented in Chart 9 shown below.

Chart 9 Project Scope Statement (Source C. Gordon, The Author, September 2021)

Project Name:	Project Management Plan for a Solid Waste Management Project in Lloyds, St. Thomas.

Project Sponsor:	St. Thomas Health Department	Project Manager:	Shantae Golding-Anderson
Scope Description	The project scope encompasses increasing the solid waste storage capacity of the community by increasing the number of individual solid waste receptacles by twenty-five and constructing two communal receptacles at strategic points within the community. The scope also includes the removal of two illicit dump sites which exist in the community and a health education campaign covering topics relevant to proper solid waste management.		
Project Deliverables	1. Elimination of two illicit dumpsites. 2. 25 new individual solid waste receptacles. 3. 2 communal solid waste receptacles. 4. Weekly collection of solid waste by the National Solid Waste Management Authority (NSWMA). 5. Three health education sessions on the importance of proper solid waste management, the consequences of burning and dumping garbage and recycling, reusing, and reducing. 6. Handing over ceremony 7. Project Management Plan		
Acceptance criteria:	● Complete elimination of two illicit dumpsites. All solid waste must be removed from the properties, packaged, and disposed of by the NSWMA truck. ● 25 covered, securable metal solid waste receptacles. ● concrete, gated communal skips, located in areas where access by residents and collection personnel is possible.		

	● Creation of a set weekly collection schedule by the NSWMA. ● Three Health education sessions in which at least 25 community members are reached. ● Handing over ceremony which does not exceed a budget of $20,000 JMD and involves all project stakeholders.
Constraints:	▪ Scope: - Availability of NSWMA trucks to cover expected routes for solid waste collection. - Commitment of the community members. - Availability of land space for approved garbage collection points. ▪ Schedule: - 6-month time frame for project completion. ▪ Cost: - Project is limited to funds generated from fundraising activities and sponsorship. ▪ Quality: - Suitability of land space for approval as garbage collection points. ▪ Resources: - Competing project proposals from neighboring communities.
Assumptions:	▪ Project sponsors will be committed throughout the life of the project. ▪ Key project members will be available for the duration of the project.

	▪ Project team members have the knowledge, technical skills and experience required and will perform optimally to ensure project objectives are achieved. ▪ Project schedule dates are accurate; vendors/contractors will deliver construction materials on time. ▪ NSWMA will commit to frequent and more widespread collection of solid waste. ▪ Health education sessions will be effective and community members will understand the importance of the community initiative and will be motivated to be fully engaged in the initiative. ▪ Vendor/contractors will be paid without delay. ▪ Government lands will be available to place communal solid waste receptacles. ▪ The Municipal corporation will approve new garbage collection points.

4.2.5 Work Breakdown Structure (WBS)

The work breakdown structure is designed to show how project deliverables are broken down into work packages and provide a way of showing high level areas of responsibility (PMI, 2017, p316). The WBS for this project was created after consultation with the project manager and a review of the project scope definition and project scope statement.

The work presented is based on the specific objectives of the project. The WBS is presented in Figure 8.

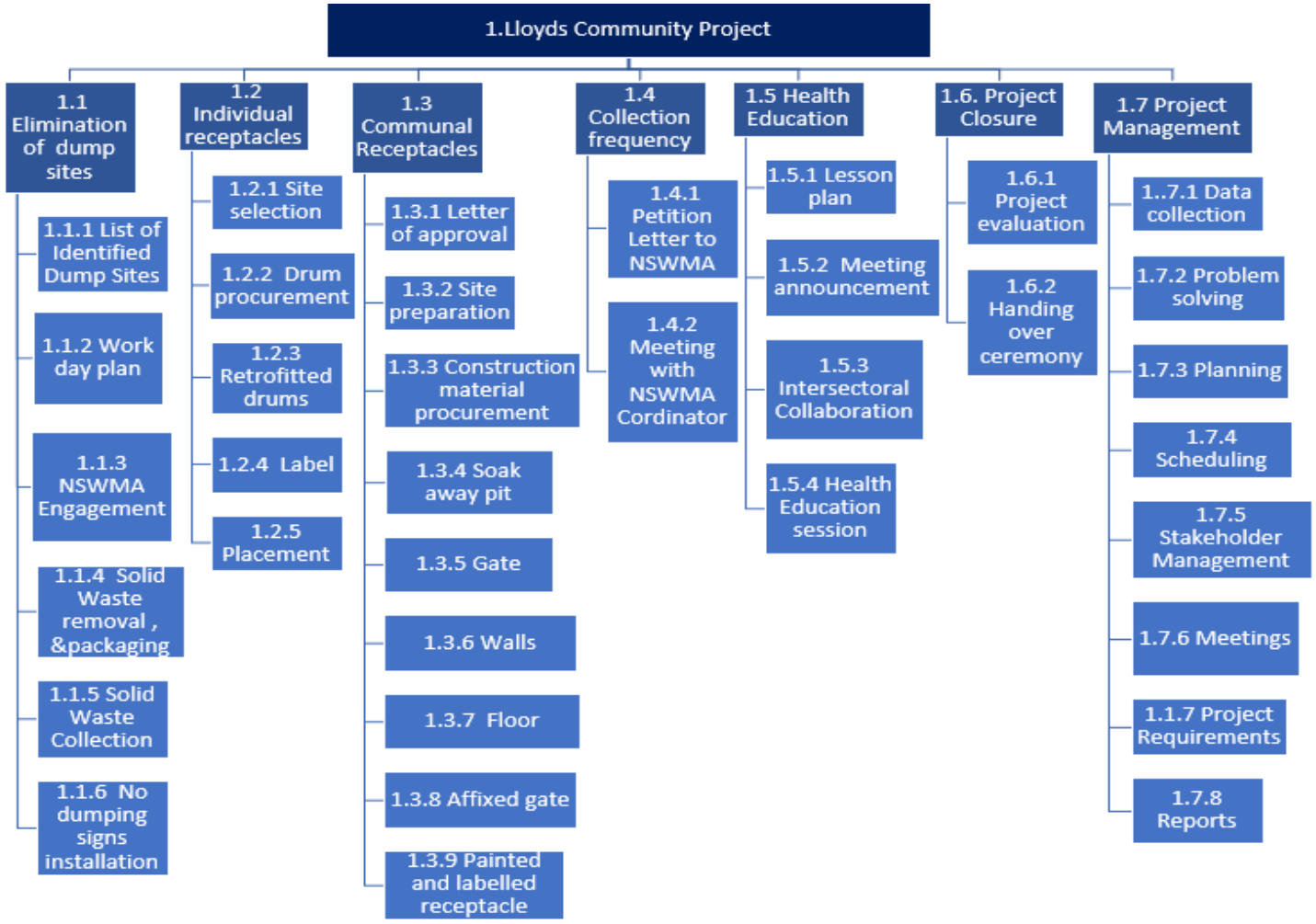


Figure 8 Work Breakdown Structure (Source, C. Gordon, The Author, September 2021)

4.2.6 WBS Dictionary

The WBS Dictionary is a document that provides detailed deliverable, activity, and scheduling information about each component in the WBS (PMI, 2017 P.162). The WBS Dictionary was created based on the information provided for the WBS by the project manager. It gives details of the project activities and the work that is expected to be done. The resources needed for the work are also stated in the WBS dictionary. The WBS dictionary is presented in Chart 10.

Chart 10 WBS Dictionary (Source C. Gordon, The Author, September 2021)

Level	WBS Code	WBS Name	Description/Definition	Budget (JMD)	Resources
1	1.1	Elimination of dump sites	Removal of solid waste from land spaces previously used for the illicit dumping of garbage.	15,000.00	
2	1.1.1	List of Identified dump sites	Identifying and listing the dump sites for elimination based on location and extent of garbage accumulation.	0.00	Project manager, project team, and community leaders.
2	1.1.2	Workday plan	Mobilizing community members, schedule feasible dates to carry out work	0.00	Project manager, and project team.
2	1.1.3	NSWMA Engagement	Communication with the Public Relations Officer of the NSWMA to make arrangements for collection at the end of workdays.	0.00	Project manager, project team and NSWMA Personnel.
2	1.1.4	Solid waste removal and packaging.	Removal of solid waste from land and placing waste into bags for ease of collection.	10,000.00	PM, project team, community members, cleaning equipment, cleaning equipment, biodegradable garbage bags, food, and drinks.

Level	WBS Code	WBS Name	Description/Definition	Budget (JMD)	Resources
2	1.1.5	Solid Waste collection.	Collection of the packaged solid waste by the NSWMA collection truck.		NSWMA personnel, Collection truck.
2	1.1.6	No dumping signs Installation	Prepare and post no dumping signs in areas that were previously used as dumpsites.	5,000.00	Project manager, project team, community members.
1	1.2	Individual receptacles	Increasing the solid waste storage capacity of the community by providing and placing metal drums throughout the community.	35,000.00	
2	1.2.1	Site selection	Choosing the most feasible sites to place the individual receptacles where they may be accessed by both community members and collection personnel.	0.00	Project manager, project team, community members
2	1.2.2	Drum procurement	Obtain drums to be used as refuse receptacles through purchasing or donations from nearby factories.	20,000.00	Project manager, project team

Level	WBS Code	WBS Name	Description/Definition	Budget (JMD)	Resources
2	1.2.3	Retrofitted drums	Addition of handles to drum covers, piercing of drum base to prevent settling of water.	10,000.00	Project manager, project team, community members
2	1.2.4	Label	Branding drums with the community health committee name and logo.	5,000.00	Project manager, project team, community members
2	1.2.5	Placement	Placing drums in selected sites.	0.00	Project manager, project team, community members
1	1.3	Communal receptacles	Increasing the solid waste storage capacity of the community by constructing two communal receptacles.	165,000.00	
2	1.3.1	Letter of approval	Writing a letter seeking permission from the municipal corporation to erect receptacles on lands slated for community development. Receiving written approval from the authority before construction begins.	0.00	Secretary of health committee, project manager, project team, Municipal Corporation Secretary Manager

Level	WBS Code	WBS Name	Description/Definition	Budget (JMD)	Resources
2	1.3.2	Site preparation	Clearing land to be used for receptacles.	3,000.00	Project manager, project team, community members, weed Wacker
	1.3.3	Construction material procurement	Purchasing or otherwise obtaining materials needed to construct receptacles	80,000.00	Project manager, project team, community members, local factory, and hardware personnel.
2	1.3.4	Soak away pits	Construction of a Soak away pit to ensure drainage of water when receptacle is washed.	40,000.00	PM, project team, community members, Wastewater Specialist Public Health Inspector
2	1.3.5	Gate	Welding of metal gates that will be placed at the front of receptacles.	10,000.00	Project manager, project team, community members, welder, steel, expanded mesh
2	1.3.6	Walls	Construction and rendering of concrete walls.	10,000.00	Project manager, project team, skilled community members, concrete, gravel, water, and sand.
2.	1.3.7	Floor	Construction of concrete floors, smooth finished, sloped.	10,000.00	Project manager, project team, skilled community members, concrete, gravel, water, sand

Level	WBS Code	WBS Name	Description/Definition	Budget (JMD)	Resources
2	1.3.8	Affixed gate	Attaching metal gate to constructed concrete receptacle.	0.00	Project manager, project team, community members, welder
2	1.3.9	Painted and labelled receptacle.	Painting internal and external walls and affixing Community Health Committee name and logo to outer wall.	12,000.00	Project manager, project team, community members, oil paint, spray paint
1	1.4	Collection frequency	Advocating for the residents of the community to get increased frequency of solid waste collection by the NSWMA.	0.00	
2	1.4.1	Petition letter to NSWMA	Submission of letter to NSWMA requesting weekly collection of solid waste and outlining new collection points.	0.00	Community health committee secretary, community members
2	1.4.1	Meeting with NSWMA	Meeting with NSWMA Collection Coordinator, General Manager and Public relations officer to confirm increased collection frequency.	0.00	Project manager, project team, personnel from NSWMA

Level	WBS Code	WBS Name	Description/Definition	Budget (JMD)	Resources
1	1.5	Health Education	Empowering community members through Environmental Health Education.	15,000.00	
2	1.5.1	Lesson plan	Planning health education sessions based on relevant topics	0.00	Project manager, project team, field supervisor, academic supervisor
2	1.5.2	Meeting announcement	Communicate with community members to make them aware of meeting dates and topics.	0.00	Project team, Health Department vehicle and personnel for town cry
2	1.5.3	Intersectoral collaboration	Building a network among the NSWMA, Health Department and Municipal Corporation for project purposes.	0.0.	PM, project team, Community Health Committee, NSWMA personnel, Health Department personnel, Municipal Corporation personnel
2	1.5.4	Health Education Session	Conducting Health education sessions on Environmental Health topics aligned to the objectives of the project.	15,000.00	Project manager, project team, Community Health Committee, NSWMA personnel, Health Department personnel, Municipal Corporation personnel.

Level	WBS Code	WBS Name	Description/Definition	Budget (JMD)	Resources
1	1.6	Project closure	Official ceremony during which project deliverables are officially handed over to the community and community members, who are encouraged to ensure the sustainability of deliverables.	20,000.00	
2	1.6.1	Project evaluation	Evaluation of project deliverables by Academic supervisor and field supervisor.	0.00	Project manager, field supervisor, academic supervisor
2	1.6.2	Handing over ceremony	Official ceremony where project deliverables are officially handed over to the community and community members are encouraged to ensure its sustainability.	20,000.00	
1	1.7	Project Management	Application of project management knowledge to the successful execution of the project.	0.00	

Level	WBS Code	WBS Name	Description/Definition	Budget (JMD)	Resources
2	1.7.1	Data Collection	Interviews with residents and inspection of residential premises.	0.00	Project manager, field supervisor, Yallahs Public Health Inspectors.
2	1.7.2	Problem solving	Deciphering the root cause of the solid waste management problem and developing the plan to solve it.	0.00	Project manager, project team, project sponsor.
2	1.7.3	Planning	Planning and updating project activities.	0.00	Project manager, project team.
2	1.7.4	Scheduling	Planning and managing project activities timeline.	0.00	Project manager, project team.
2	1.7.5	Stakeholder Management	Identifying and engaging key project stakeholders	0.00	Project manager, project team.
2	1.7.6	Meetings	Conducting meetings with project stakeholders.	0.00	Project manager, project team
2	1.7.7	Project Requirements	Define project requirements and solid waste receptacles	0.00	Project manager, project team.
2	1.7.8	Reporting	Preparing progress reports to be submitted to field and academic supervisors.	0.00	Project manager, project team.

4.2.7 Roles and responsibilities

The governance structure of this project is based on the instructions of the University of Technology, Jamaica's Internship manual. The roles and responsibilities are defined below in chart 11.

Chart 11 Roles and Responsibilities (Source C. Gordon, The Author, September 2021)

Project Role	Responsibilities
Project Sponsor Chief Public Health Inspector, St. Thomas Health Department	Provision of monetary support and resources for the project.
Project Manager Public Health Intern	Application of project management best practices to the successful execution of the project.
Steering Committee Deputy Chief Public Health Inspectors	Provision of valid advice so as to ensure timely and successful creation of project deliverables and
Project Team Lloyds Community Health Committee	Planning and execution of project work. Mobilization of community members to participate in project work.
Community Members	Participation in health education sessions, project work
Other Stakeholders NSWMA Municipal Corporation Local businesses	Provision of human and physical resources to aid in project work.

4.2.8 Scope Verification

Due to the nature of this project, scope verification is the responsibility of the Academic Supervisor from the University of Technology, Jamaica and the Field Supervisor from the St. Thomas Health Department. The scope baseline is clearly defined in the internship manual. Throughout the project, the supervisors do routine inspections of the project community to evaluate whether or not the necessary work and only the necessary work is being done. The Field Supervisor will also assess the Project Manager's field notes on a weekly basis as a form of verification.

4.2.9 Scope Control

The control of the scope will be the responsibility of the project manager and the project team. The project team will ensure that the project work done is guided by the WBS dictionary. The project manager will act as a guide to the project team in ensuring that the intended scope is adhered to. All change requests for the scope will be submitted to the project manager using the change request for. The project manager holds the authority to either approve or deny the changes. In situations where the project manager feels it is necessary, the changes will be proposed to the project sponsor who will then make the final decision. Once approved, all project documents concerning the project scope will be updated.

4.3 Schedule Management Plan

The schedule management plan will detail how the schedule will be created, controlled, reviewed and managed. The project schedule will provide a guide for the timing in which the project activities are carried out.

Changes to the schedule may become necessary as the project progresses, these changes will be governed by the schedule management plan to ensure that no unnecessary or detrimental changes are made.

Project schedule management is crucial to this project as the Public Health Inspector Intern must complete the project within a 6-month time frame in order to graduate and be hired to the Health Department. The project team will therefore need guidance on how to create a realistic schedule.

The schedule management plan will detail the Schedule Management Approach, roles and responsibilities and schedule change control.

4.3.1 Schedule Management Approach

The project schedule management plan will be done using information provided from an interview with the internship academic supervisor, internship field supervisor and the project manager.

A review of previous internship projects will be done to ascertain the types of activities that would be needed to meet the objectives of the project. This information will be used to complete the define activities process. The work packages that were determined in the WBS as stated in the Project Scope Management Plan will be used as inputs to this process. The work packages will then be broken down into activities. At a meeting of the project team, the activities will be listed, reviewed and documented. This is followed by the sequence activities process where the relationships and dependencies between the activities will be determined. Following this documentation, the estimated duration of these activities will be likewise discussed, reviewed and documented. Will then be deciphered based on the work periods that would be needed to complete the individual activities based on the project resources. The project schedule will then be made using Microsoft Project Professional 2019 ®.

4.3.2 Define Activities

Define activities is the process of identifying and documenting the specific actions to be performed to produce the project deliverables (PMI,2017, p.183).

The define activities process was done relying heavily on the expert judgement of the internship field and academic supervisors as well as Public Health Inspectors who have done similar projects in the parish of St. Thomas. The activity list includes all the activities that would be needed to successfully accomplish the project. A description is given for each activity, so as to ensure the work that needs to be done is clearly understood by the project team. The list also details the resources need for each activity and shows the dependencies on some activities on the completion of others. These dependencies are listed in the predecessor column. The activity list is shown in chart 12 below.

Chart 12 Activity List (Source: C. Gordon, The Author, September 2021)

Deliverable	WBS Code	Work Package Name	Description/Definition	Activity Name	Resource names
Elimination of dump sites	1.1.1	List of Identified dump sites	Choosing and recording the dump sites for elimination based on location and extent of garbage accumulation.	1. Conduct Survey community 2. Choose sites 3. Record choice	Project manager, project team, community leaders

Deliverable	WBS Code	Work Package Name	Description/Definition	Activity Name	Resource names
	1.1.2	Work-day plan	Mobilizing community members, schedule feasible dates to carry out work	1. Inform community members 2. Schedule work-days	Project manager, project team
	1.1.3	NSWMA Engagement	Communication with the Public Relations Officer of the NSWMA to make arrangements for collection at the end of workdays.	1. Meet with Public Relations Officer from NSWMA. 2. Get commitment for collection.	Project manager, project team, NSWMA Personnel
	1.1.4	Solid waste removal and packaging.	Removal of solid waste from land and placing waste into bags for ease of collection.	1. Remove solid waste 2. Package solid waste	Project manager, project team, community members, cleaning equipment, cleaning equipment, biodegradable garbage bags, food, and drinks
	1.1.5	Solid Waste collection	Collection of the packaged solid waste by the NSWMA collection truck.	1. Organize collection 2. Observe collection	NSWMA personnel, Collection truck

Deliverable	WBS Code	Work Package Name	Description/Definition	Activity Name	Resource names
	1.1.6	No dumping signs installation	Prepare and post no dumping signs in areas that were previously used as dumpsites.	1. Create signs 2. Post signs	Project manager, project team, community members
Individual receptacles	1.2.1	Site selection	Choosing the most feasible sites to place the individual receptacles where they may be accessed by both community members and collection personnel.	1. Choose sites 2. Inform residents of sites	Project manager, project team, community members
	1.2.2	Drum procurement	Obtain drums through purchasing or donations from nearby factories.	1. Procure drums 2. Transport drums to community	Project manager, project team
	1.2.3	Retrofitted drums.	Addition of handles, piercing of drum base	1. Add handles to cover 2. Pierce base	Project manager, project team, community members
	1.2.4	Label	Branding drums with the community health committee name and logo.	1. Create label and logo 2. Affix label	Project manager, project team, community members

Deliverable	WBS Code	Work Package Name	Description/Definition	Activity Name	Resource names
	1.2.5	Placement	Placing drums in selected sites.	1. Place drums in designated areas 2. Secure drums	Project manager, project team, community members
Construct communal receptacles	1.3.1	Letter of approval	Writing a letter seeking permission from the municipal corporation to erect receptacles on lands slated for community development. Receiving written approval from the authority before construction begins.	1. Write letter 2. Deliver letter to Municipal Corporation	Secretary of health committee, project manager, project team, Municipal Corporation Secretary Manager
	1.3.2	Site preparation	Clearing land to be used for receptacles.	1. Remove vegetation 2. Mark designated spot for receptacle	Project manager, project team, community members, weed Wacker.

Deliverable	WBS Code	Work Package Name	Description/Definition	Activity Name	Resource names
	1.3.3	Construction material procurement	Purchasing or otherwise obtaining materials needed to construct receptacles	1. Procure material 2. Transport material to community	Project manager, project team, community members, local factory and hardware personnel,
	1.3.4	Soak away pits	Creation of a Soak away pit to ensure drainage of water when the receptacle is washed.	1. Dig pit 2. Pack with stones 3. Install plumbing 4. Seal cover	Project manager, project team, community members, Wastewater Specialist Public Health Inspector
	1.3.5	Gate	Welding of metal gates that will be placed at the front of receptacles.	1. Procure materials 2. Weld gate	PM, project team, community members, welder, steel, expanded mesh.
	1.3.6	Walls	Construction and rendering of concrete walls. Concrete walls	1. Dig foundation 2. Steelwork 3. Lay blocks 4. Render walls	PM, project team, skilled community members, concrete, gravel, water, and sand.

Deliverable	WBS Code	Work Package Name	Description/Definition	Activity Name	Resource names
	1.3.7	Floor	Concrete floors, smooth finished, sloped	1. Formwork 2. Place reinforcement 3. Pour concrete 4. Cure concrete	PM, project team, skilled community members, concrete, gravel, water, sand
	1.3.8	Affixed gate	Attaching metal gate to constructed receptacle	1. Measure and mark points of attachment 2. Implement metal anchors 3. Weld gate to anchors	Project manager, project team, community members, welder
	1.3.9	Paint and label	Painting internal and external walls and affixing Community Health Committee name and logo.	1. Paint internal walls 2. Paint external walls 3. Affix Label and logo to outer wall	Project manager, project team, community members, oil paint, spray paint.
Collection frequency	1.4.1	Petition letter to NSWMA	Submission of letter to NSWMA requesting weekly collection of solid waste and outlining new collection points.	1. Write letter 2. Submit letter to NSWMA	Community health committee secretary, community members

Deliverable	WBS Code	Work Package Name	Description/Definition	Activity Name	Resource names
	1.4.2	Meeting with NSWMA	Meeting with NSWMA Collection Coordinator, GM and Public relations officer to confirm increased collection frequency.	1. Meet with Collection coordinator 2. Discuss collection schedule	Project manager, project team, personnel from NSWMA
Health Education	1.5.1	Lesson plan	Planning health education sessions based on relevant topics	1. Research relevant topics 2. Write lesson plans	PM, project team, field supervisor, academic supervisor
	1.5.2	Meeting announcement	Communicate with community members to make them aware of meeting dates and topics.	1. Laisse with Health department to get town cry 2. Create posters 3. Send information via social media	Project team, Health Department vehicle and personnel for town cry

Deliverable	WBS Code	Work Package Name	Description/Definition	Activity Name	Resource names
	1.5.3	Intersectoral collaboration	NSWMA, Health Department, Municipal Corporation	1. Meet with stakeholders 2. Exchange contact information 3. Plan joint health education sessions	PM, project team, Community Health Committee, NSWMA personnel, Health Department personnel, Municipal Corporation personnel
	1.5.4	Health Education Session	Conduct Health education sessions on Environmental Health Problems, observations and possible solutions.	1. Schedule health education sessions 2. Evaluate sessions	Project manager, project team, Community Health Committee, NSWMA personnel, Health Department personnel, Municipal Corporation personnel

Deliverable	WBS Code	Work Package Name	Description/Definition	Activity Name	Resource names
Project closure	1.6.1	Project evaluation	Evaluation of project deliverables by Academic supervisor and field supervisor.	1. Meet with Academic supervisor 2. Meet with Internship Supervisor 3. Schedule Evaluation	Project manager, field supervisor, academic supervisor
	1.6.2	Handing over ceremony	Official ceremony where project deliverables are officially handed over to the community and community members are encouraged to ensure the sustainability of deliverables.	1. Plan handing over ceremony 2. Invite stakeholders	
Project Management	1.7.1	Data Collection	Interviews with residents and inspection of residential premises.	1. Conduct premises Inspections 2. Conduct interviews 3. Record data	Project manager, field supervisor, Yallahs Public Health Inspectors

Deliverable	WBS Code	Work Package Name	Description/Definition	Activity Name	Resource names
	1.7.2	Problem solving	Deciphering the root cause of the solid waste management problem and developing the plan to solve it.	1. Conduct data analysis 2. Prioritize problems	Project manager, project team, project sponsor
	1.7.3	Planning	Planning and updating project activities.	1. Plan stakeholder meetings 2. Plan work days	Project manager, project team
	1.7.4	Scheduling	Planning and managing project activities timeline.	1. Create project schedule 2. Manage project schedule	Project manager, project team
	1.7.5	Stakeholder Management	Identifying and engaging key project stakeholders	1. Identify stakeholders 2. Plan stakeholder engagement	Project manager, project team
	1.7.6	Meetings	Conducting meetings with project stakeholders.	1. Convene meetings 2. Schedule meetings	Project manager, project team.

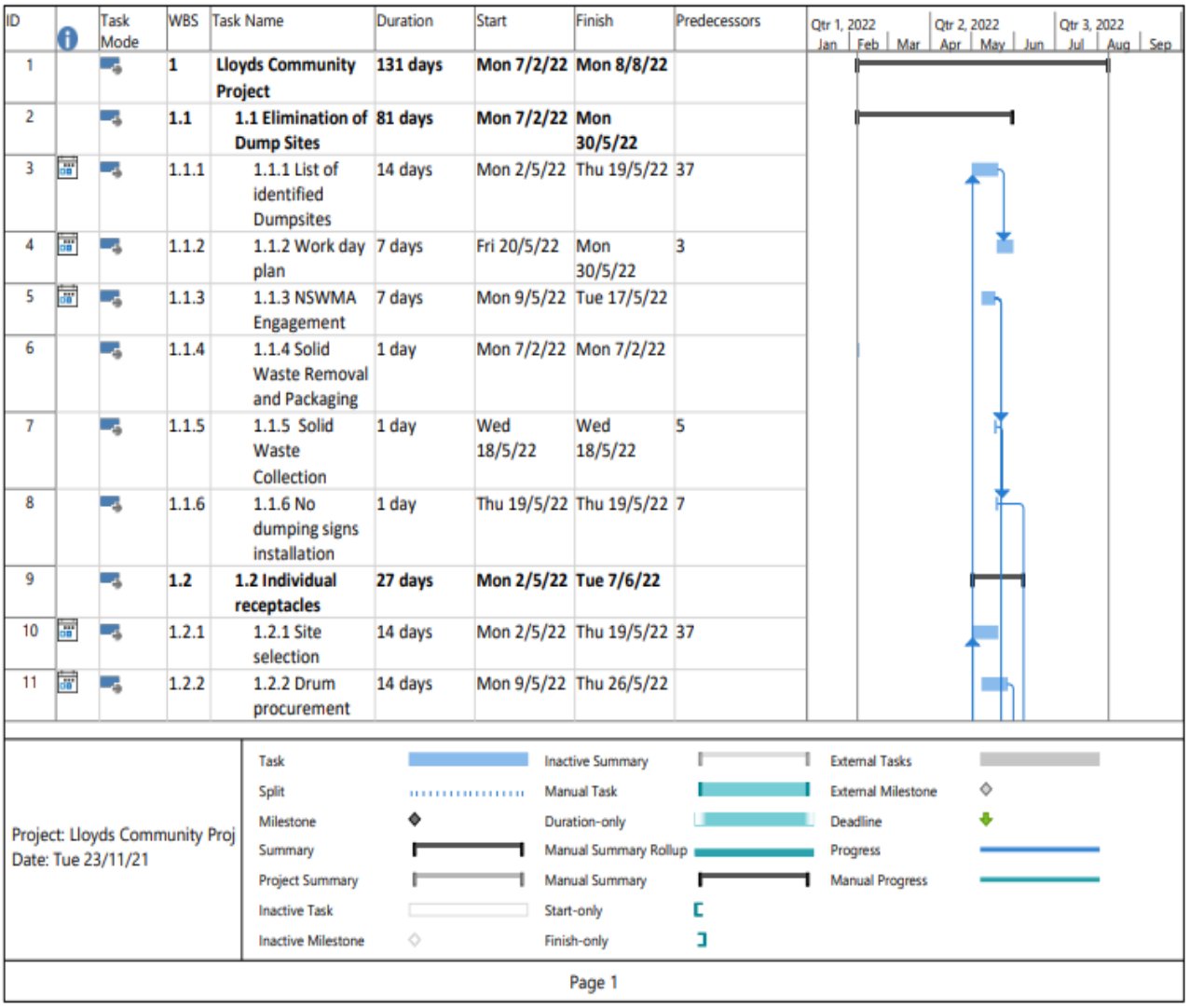
Deliverable	WBS Code	Work Package Name	Description/Definition	Activity Name	Resource names
	1.7.7	Project Requirements	Define project requirements for solid waste collection points and solid waste receptacles	1. Define requirements 2. Document requirements	Project manager, project team
	1.7.8	Reporting	Preparing progress reports to be submitted to field and academic supervisors.	1. Prepare weekly report 2. Plan report evaluation	Project manager, project team,

4.3.3 Sequence Activities

Following the define activities process, the sequence activities process follows, this process involves identifying and recording the relationships between project activities. For the Lloyds Community Health Project, the Microsoft Project Professional 2019 ® was used to sequence the activities, find relationships and to create a network diagram.

4.3.4 Estimate Activity Durations

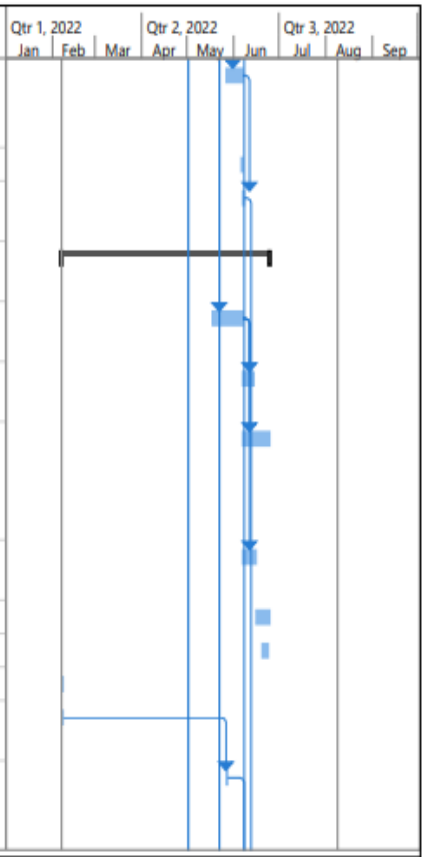
Estimate activity durations is defined by the PMI (2017) as the process of estimating the number of work periods needed to complete individual activities with estimated resources (PMI,2017, p.195). Due to the nature of the Lloyds Community Health project, expert judgement was used to estimate the durations of the listed activities. The internship academic and field supervisors, who have experience in working on Community Health Projects annually, were consulted for this process. After this information was collected, it was added to Microsoft Project Professional 2019 ® which was then used to create the project schedule. The project schedule is presented in figure 9 below.



ID	Task Mode	WBS	Task Name	Duration	Start	Finish	Predecessors
1		1	**Lloyds Community Project**	**131 days**	**Mon 7/2/22**	**Mon 8/8/22**	
2		1.1	**1.1 Elimination of Dump Sites**	**81 days**	**Mon 7/2/22**	**Mon 30/5/22**	
3		1.1.1	1.1.1 List of identified Dumpsites	14 days	Mon 2/5/22	Thu 19/5/22	37
4		1.1.2	1.1.2 Work day plan	7 days	Fri 20/5/22	Mon 30/5/22	3
5		1.1.3	1.1.3 NSWMA Engagement	7 days	Mon 9/5/22	Tue 17/5/22	
6		1.1.4	1.1.4 Solid Waste Removal and Packaging	1 day	Mon 7/2/22	Mon 7/2/22	
7		1.1.5	1.1.5 Solid Waste Collection	1 day	Wed 18/5/22	Wed 18/5/22	5
8		1.1.6	1.1.6 No dumping signs installation	1 day	Thu 19/5/22	Thu 19/5/22	7
9		1.2	**1.2 Individual receptacles**	**27 days**	**Mon 2/5/22**	**Tue 7/6/22**	
10		1.2.1	1.2.1 Site selection	14 days	Mon 2/5/22	Thu 19/5/22	37
11		1.2.2	1.2.2 Drum procurement	14 days	Mon 9/5/22	Thu 26/5/22	

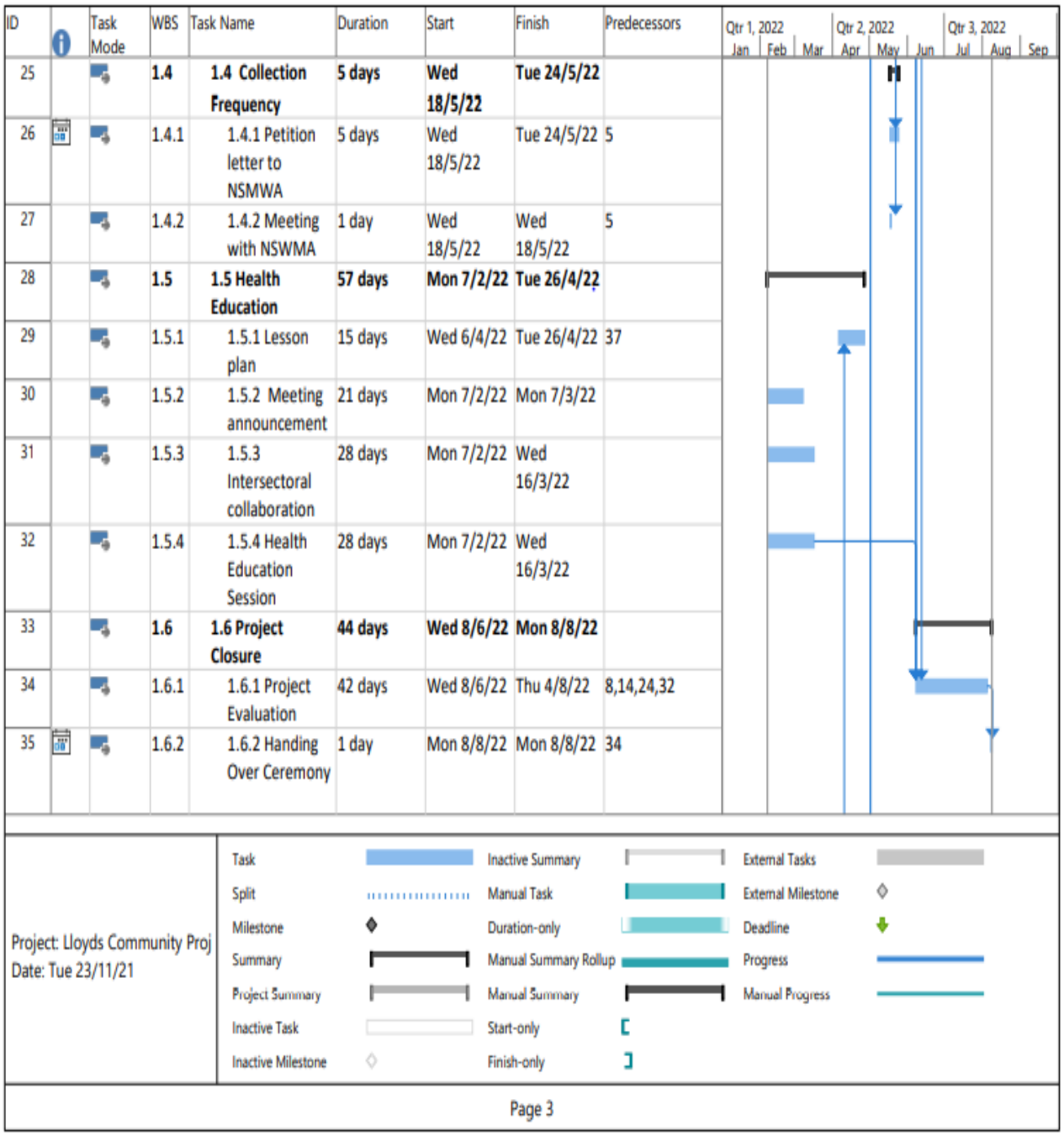
Figure 9 Lloyds Community Health Project Gantt Chart (Source: C. Gordon, The Author, September 2021)

ID	Task Mode	WBS	Task Name	Duration	Start	Finish	Predecessors
12		1.2.3	1.2.3 Retrofitted drums	7 days	Fri 27/5/22	Mon 6/6/22	11
13		1.2.4	1.2.4 Label	1 day	Mon 6/6/22	Mon 6/6/22	
14		1.2.5	1.2.5 Placement	1 day	Tue 7/6/22	Tue 7/6/22	12
15		**1.3**	**1.3 Communal receptacles**	**100 days**	**Mon 7/2/22**	**Fri 24/6/22**	
16		1.3.1	1.3.1 Letter of Approval	14 days	Wed 18/5/22	Mon 6/6/22	5
17		1.3.2	1.3.2 Site Preparation	5 days	Tue 7/6/22	Mon 13/6/22	16
18		1.3.3	1.3.3 Construction material procurement	14 days	Tue 7/6/22	Fri 24/6/22	16
19		1.3.4	1.3.4 Soak-away pit	7 days	Tue 7/6/22	Wed 15/6/22	16
20		1.3.5	1.3.5 Gate	7 days	Thu 16/6/22	Fri 24/6/22	
21		1.3.6	1.3.6 Walls	4 days	Mon 20/6/22	Thu 23/6/22	
22		1.3.7	1.3.7 Floor	1 day	Mon 7/2/22	Mon 7/2/22	
23		1.3.8	1.3.8 Affixed gate	1 day	Mon 7/2/22	Mon 7/2/22	
24		1.3.9	1.3.9 Painted and labelled receptacle	1 day	Fri 27/5/22	Fri 27/5/22	23



Project: Lloyds Community Proj
Date: Tue 23/11/21

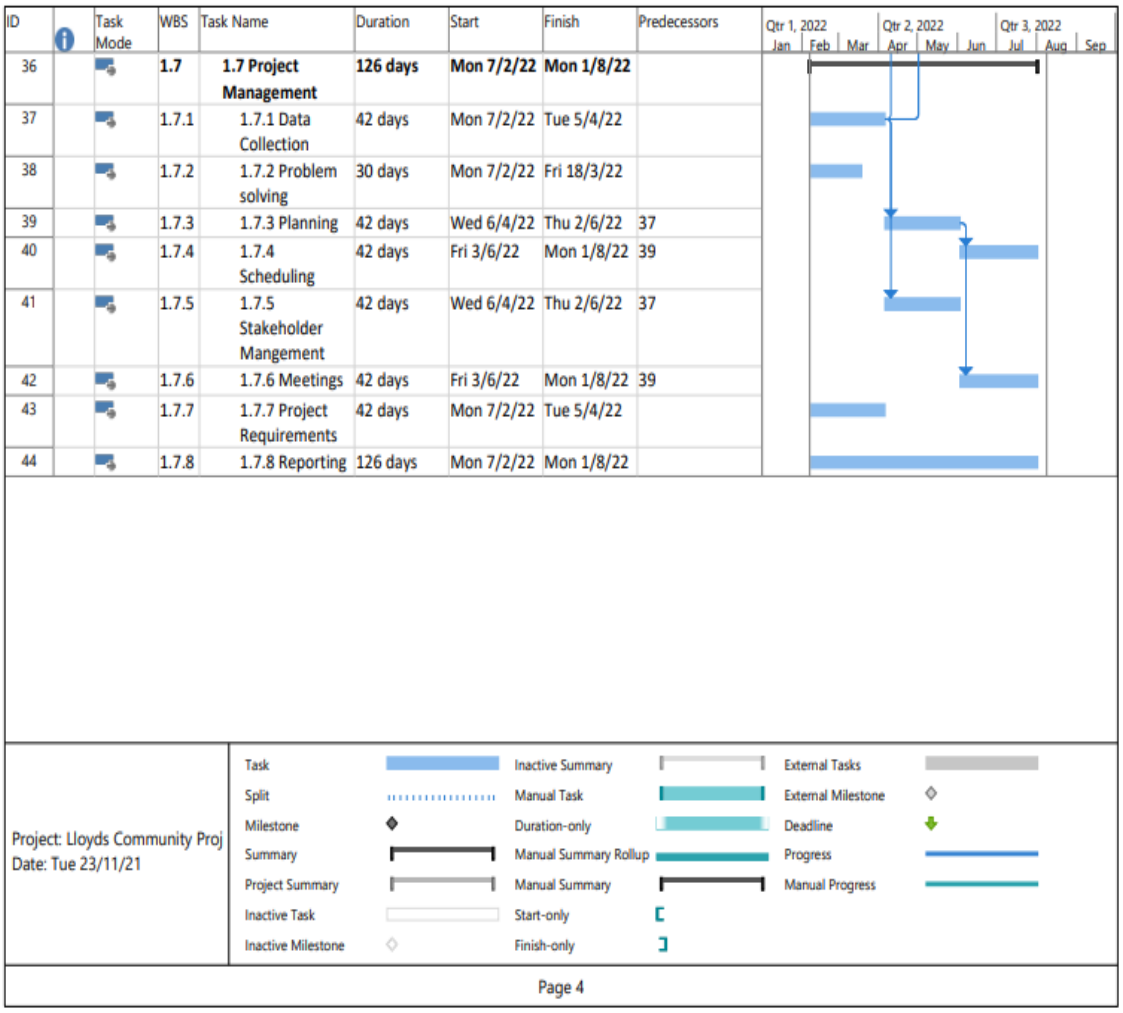
Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress



ID	Task Mode	WBS	Task Name	Duration	Start	Finish	Predecessors
25		1.4	**1.4 Collection Frequency**	**5 days**	**Wed 18/5/22**	**Tue 24/5/22**	
26		1.4.1	1.4.1 Petition letter to NSMWA	5 days	Wed 18/5/22	Tue 24/5/22	5
27		1.4.2	1.4.2 Meeting with NSWMA	1 day	Wed 18/5/22	Wed 18/5/22	5
28		1.5	**1.5 Health Education**	**57 days**	**Mon 7/2/22**	**Tue 26/4/22**	
29		1.5.1	1.5.1 Lesson plan	15 days	Wed 6/4/22	Tue 26/4/22	37
30		1.5.2	1.5.2 Meeting announcement	21 days	Mon 7/2/22	Mon 7/3/22	
31		1.5.3	1.5.3 Intersectoral collaboration	28 days	Mon 7/2/22	Wed 16/3/22	
32		1.5.4	1.5.4 Health Education Session	28 days	Mon 7/2/22	Wed 16/3/22	
33		1.6	**1.6 Project Closure**	**44 days**	**Wed 8/6/22**	**Mon 8/8/22**	
34		1.6.1	1.6.1 Project Evaluation	42 days	Wed 8/6/22	Thu 4/8/22	8,14,24,32
35		1.6.2	1.6.2 Handing Over Ceremony	1 day	Mon 8/8/22	Mon 8/8/22	34

Project: Lloyds Community Proj
Date: Tue 23/11/21

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress



ID	Task Mode	WBS	Task Name	Duration	Start	Finish	Predecessors
36		**1.7**	**1.7 Project Management**	**126 days**	**Mon 7/2/22**	**Mon 1/8/22**	
37		1.7.1	1.7.1 Data Collection	42 days	Mon 7/2/22	Tue 5/4/22	
38		1.7.2	1.7.2 Problem solving	30 days	Mon 7/2/22	Fri 18/3/22	
39		1.7.3	1.7.3 Planning	42 days	Wed 6/4/22	Thu 2/6/22	37
40		1.7.4	1.7.4 Scheduling	42 days	Fri 3/6/22	Mon 1/8/22	39
41		1.7.5	1.7.5 Stakeholder Mangement	42 days	Wed 6/4/22	Thu 2/6/22	37
42		1.7.6	1.7.6 Meetings	42 days	Fri 3/6/22	Mon 1/8/22	39
43		1.7.7	1.7.7 Project Requirements	42 days	Mon 7/2/22	Tue 5/4/22	
44		1.7.8	1.7.8 Reporting	126 days	Mon 7/2/22	Mon 1/8/22	

Figure 10 Lloyds Community Health Project Gantt Chart (Source: C. Gordon, The Author, September 2021)

4.3.5 Project Schedule Changes

According to the PMI (2017), control schedule is the process which i the status of the project in order to update the involves monitoring project schedule and ensure the management of changes to the scope baseline (PMI, 2017, p.222). Due to the strict restrictions in time, changes in the project schedule must be very strictly monitored. This is where the control schedule process is employed.

If there is need for changes in the schedule during the project, the project team under the guidance of the project manager will carefully analyze the potential changes. Factors such as the impact of the potential change on other activities, possible variance and effect on scope, schedule and resource management must be scrutinized before the project manager makes the final decision on the change. If the change is deemed necessary, then a change request must be submitted. The designated change request form can be found in Appendix 4. The project manager will then make the necessary changes to the project schedule.

4.3.6 Roles and Responsibilities

The project manager will assume responsibility for the production of the project schedule and the presentation of the schedule to the project stakeholders. Once the schedule is deemed fit by the project stakeholders, the project manager and project team will be in charge of ensuring that the schedule is adhered to as much as possible. Another responsibility of the project team will be participation in schedule updates. Whenever necessary, the team must communicate schedule changes to the project manager. Other stakeholders such as the project sponsor and steering committee must maintain and awareness of the project schedule status and approve or reject change requests as needed.

4.4 Cost Management Plan

The PMI describes plan cost management as the process of defining how project costs will be estimated, budgeted, managed, monitored and controlled (PMI,2017 p.235). The project cost management plan is essential to the successful execution of the project. To decipher the most realistic approach to project cost management, based on previous projects management by the Health Department and University of Technology, Jamaica. Internship academic and field supervisors were consulted and provided information needed for the compilation of a concise, easy to follow cost management plan.

4.4.1 Measuring Project Costs

The project's cost performance will be measured using Earned Value Management. These performance measures will include the likes of schedule and cost variance, Schedule Performance Index (SPI) and Cost Performance Index (CPI). The following chart created by the author will be used to monitor the SPI and CPI thresholds of the project.

Chart 13 Cost Performance Measure (Source: C. Gordon, The Author, October 2021)

Performance Measure	Yellow	Red
Schedule performance index	Between 0.9 and 0.7 or between 1.1 and 1.2	Less than 0.7 or greater than 1.2
Cost Performance Index	Between 0.9 and 0.7 or between 1.1 and 1.2	Less than 0.7 or greater than 1.2

According to the PMI, an SPI value less than 1.0 indicates less work was completed than was planned. An SPI value greater than 1.0 indicates that more work was done than planned. A CPI value of less than 1.0 indicates a cost overrun for work completed. A CPI value greater than 1.0 indicates a cost overrun of performance to

date (PMI,2017 p.263). The project manager will be responsible for calculating these measures and ensuring that any variance is noted and remedied appropriately.

4.4.2 Reporting Format

Cost management reports will be included in a monthly progress report that will be submitted to the Internship Field Supervisor. The report will include the earned value metrics discussed in the cost management approach section. The report will also include cost variances and corrective actions.

4.4.3 Cost Variance Response Process

The Earned Value Metrics will be assessed monthly, giving the project manager a mathematical and scientific prediction of the rate at which, the project is progressing in relation to the budget and schedule. A zero or a positive value, in the case of both SPI and CPI, is always favourable. In the instance where these favourable indices are not achieved, a cost variance corrective action becomes necessary. The control thresholds for the project will be a CPI and SPI of more than 1.2 or less than 0.9 respectively. If any of these thresholds are met, the project manager will be responsible for presenting the project sponsor with several corrective actions. This must be done within 3 days of identifying the cost variance. Once the project sponsor decides on a corrective action, the project manager then has another 3 business days to present the project sponsor with a formal Cost Variance Corrective Action Plan. This plan will include details of the actions that will be needed to bring the project back within budget. The project sponsor must authorize the plan of action before the corrective measure is implemented.

4.4.4 Cost Change Control Process

According to the PMI (2017), control cost is the process of monitoring the status of the project to update the project costs and managing changes to the cost baseline (PMI, 2017, p.622). Due to limitations in project funds, changes in the project schedule must be very strictly monitored. This is where the control cost process is

employed. The cost control process will follow the established change order process. If there is need for changes in the cost during the project, the project team under the guidance of the project manager will carefully analyze the potential changes. Factors such as the impact of the potential change on other activities, possible variance and effect on schedule management must be scrutinized before the project manager makes the final decision on the change. If the change is deemed necessary, then a change request must be submitted. The designated change request form can be found in Appendix 4. The project manager will then implement the necessary changes.

4.4.5 Project Budget

The projected costs for the project are categorized and presented in the table below:

Chart 14 Project Budget (C. Gordon, Author, October 2021)

Item	Cost (JMD)
Elimination of dumpsite	$15,000
Individual Receptacles	$35,000
Communal Receptacles	$165,000
Collection Frequency	$0
Health Education	$15,000
Project closure	$20, 000
Project Management	$0
Contingency Reserve	25,000
Total	**$275,000**

Prior to the development of the project schedule, the cost for each activity was estimated. The tools and techniques used in the process were, expert judgement, analogous estimating and parametric estimating. Internship academic and field supervisors were consulted to determine the most effective means of estimating to be used for the project. The estimated projected expenditure for each month, based

on the project activities that are slated to occur and the contingency reserve was captured in a graphical representation known as a S-curve. That S-curve is presented in figure 10 below.

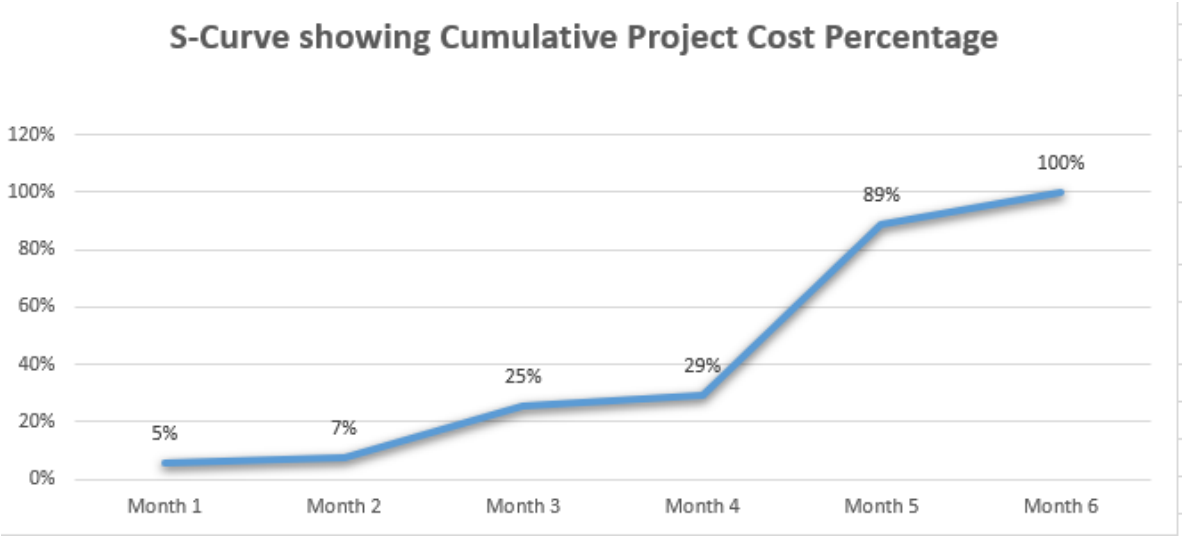


Figure 11 S-Curve Showing Cumulative Project Cost Percentage (Source: C. Gordon, The Author, November 2021)

The cost of each work package was determined by assessing the cost attached to each previously determined task. A review of previous projects was done, and analogous estimating was then used to compare the costs of the task with the costs of the same or similar tasks in the previous projects. This information was then added to a spreadsheet using Microsoft Excel 2019 ®. Included in the cost estimates, was a contingency reserve calculated at 10% based on recommendations from the internship field supervisor. The activity cost estimates are presented in the WBS dictionary found in the Scope Management Plan. After consultation with the field internship supervisor, the cost baseline as shown below was developed.

Chart 15 Project Cost Baseline (Source: C. Gordon, The Author, October 2021)

WBS	Task Name	Duration	Activity Cost Estimate (JMD)
1.1.1	1.1.1 List of Identified dump sites	14 days	0.00
1.1.2	1.1.2 Work Day plan	7 days	0.00

WBS	Task Name	Duration	Activity Cost Estimate (JMD)
1.1.3	1.1.3 NSWMA Engagement	7 days	0.00
1.1.4	1.1.4 Solid Waste Removal and Packaging	1 day	10,000.00
1.1.5	1.1.5 Solid Waste Collection	1 day	0.00
1.1.6	1.1.6 no-dumping signs Installation	1 day	5,000.00
1.2.1	1.2.1 Site selection	14 days	0.00
1.2.2	1.2.2 Drum procurement	14 days	20,000.000
1.2.3	1.2.3 Retrofitted drums	7 days	10,000.00
1.2.4	1.2.4 Label	1 day	5,000.00
1.2.5	1.2.5 Placement	1 day	0.00
1.3.1	1.3.1 Letter of Approval	14 days	0.00
1.3.2	1.3.2 Site Preparation	5 days	3,000.00
1.3.3	1.3.3 Construction material procurement	14 days	80,000.00
1.3.4	1.3.4 Soak-away pits	7 days	40,000.00
1.3.5	1.3.5 Gate	7 days	10,000.00
1.3.6	1.3.6 Walls	4 days	10,000.00
1.3.7	1.3.7 Floor	1 day	10,000.00
1.3.8	1.3.8 Affixed gate	1 day	0.00
1.3.9	1.3.9 Paint and label	1 day	12,000.00
1.4.1	1.4.1 Petition letter to NSMWA	5 days	0.00
1.4.2	1.4.2 Meeting with NSWMA	1 day	0.00
1.5.1	1.5.1 Lesson plan	15 days	0.00
1.5.2	1.5.2 Meeting announcement	21 days	0.00
1.5.3	1.5.3 Intersectoral collaboration	28 days	0.00

WBS	Task Name	Duration	Activity Cost Estimate (JMD)
1.5.4	1.5.4 Health Education Session	28 days	15,000.00
1.6.1	1.6.1 Project Evaluation	42 days	0.00
1.6.2	1.6.2 Handing Over Ceremony	1 day	20,000.00
1.7.1	1.7.1 Data Collection	42 days	0.00
1.7.2	1.7.2 Problem solving	30 days	0.00
1.7.3	1.7.3 Planning	42 days	0.00
1.7.4	1.7.4 Scheduling	42 days	0.00
1.7.5	1.7.5 Stakeholder Management	42 days	0.00
1.7.6	1.7.6 Meetings	42 days	0.00
1.7.7	1.7.7 Project Requirements	42 days	0.00
1.7.8	1.7.8 Reporting	126 days	0.00
	Budget		250,000.00
	Contingency Reserve at 10%		25,000.00
	Total		275,000.00

According to the principles of the PMI, it is in the best interest of the project to decide on a contingency reserve. The Project Management Institute defines a contingency reserve as the budget within the cost baseline that is allocated for identified risks (PMI, 2017 p.245). The contingency reserve is to be used by the project manager, with consultations from the project team and project sponsor. The following table outlines the use of the contingency reserve.

Chart 16 Management of Contingency Reserve (Source: C. Gordon, The Author, October 2021)

WBS	Task Name	Use of Contingency Reserve
1.1.1	1.1.1 List of Identified dump sites	

WBS	Task Name	Use of Contingency Reserve
1.1.2	1.1.2 Work Day plan	
1.1.3	1.1.3 NSWMA Engagement	
1.1.4	1.1.4 Solid Waste Removal and Packaging	
1.1.5	1.1.5 Solid Waste Collection	
1.1.6	1.1.6 no-dumping signs	
1.2.1	1.2.1 Site selection	
1.2.2	1.2.2 Drums	50% of the contingency reserve can be applied here as this is a critical part of the project. And the price of storage drums varies throughout the year.
1.2.3	1.2.3 Retrofitted drums	
1.2.4	1.2.4 Label	
1.2.5	1.2.5 Placement	
1.3.1	1.3.1 Letter of Approval	
1.3.2	1.3.2 Site Preparation	
1.3.3	1.3.3 Construction material	25% of the contingency reserve can be applied here as this is a critical activity and the price of construction material varies throughout the year.
1.3.4	1.3.4 Soak-away pits	
1.3.5	1.3.5 Gate	
1.3.6	1.3.6 Walls	
1.3.7	1.3.7 Floor	
1.3.8	1.3.8 Affixed gate	

WBS	Task Name	Use of Contingency Reserve
1.3.9	1.3.9 Paint and label	
1.4.1	1.4.1 Petition letter to NSMWA	
1.4.2	1.4.2 Meeting with NSWMA	
1.5.1	1.5.1 Lesson plan	
1.5.2	1.5.2 Meeting announcement	
1.5.3	1.5.3 Intersectoral collaboration	
1.5.4	1.5.4 Health Education Session	25% of the contingency reserve can be applied here as the number of attendants of the sessions may vary and more refreshment will have to be provided.
1.6.1	1.6.1 Project Evaluation	
1.6.2	1.6.2 Handing Over Ceremony	
1.7.1	1.7.1 Data Collection	
1.7.2	1.7.2 Problem solving	
1.7.3	1.7.3 Planning	
1.7.4	1.7.4 Scheduling	
1.7.5	1.7.5 Stakeholder Management	
1.7.6	1.7.6 Meetings	
1.7.7	1.7.7 Project Requirements	
1.7.8	1.7.8 Reporting	

4.5 Quality Management Plan

The Quality Management Plan for the Lloyds Community Health Project will define the activities, processes and procedures for ensuring the high quality of the project's deliverables. The purpose of this plan is to guide the project manager, project team and all stakeholders directly involved in the creation of the deliverables. The plan

was made using information gathered from interviews with the internship field supervisor and academic supervisor.

4.5.1 Quality Management Approach

The Quality management approach for the Lloyds Community Health Project is aimed at ensuring the project deliverables meet the prescribed requirements. This includes planning for project and product quality given the scope of the project. The approach includes researching and having a clear understanding of the regulations and standards that govern the project. These include National regulations and the policies outlined by the University of Technology, Jamaica and the St. Thomas Health Department. Project deliverables must meet these standards as well as provide a high level of stakeholder satisfaction. The environmental health needs and requirements of the community will also be considered in project quality management.

4.5.2 Quality Objectives

The quality objectives of the Lloyds Community Health Project are detailed in the table below. For each deliverable, the acceptable quality criteria have been outlined, along with the means by which these requirements will be measured, managed and controlled.

Chart 17 Quality Objectives (Source: C. Gordon, The Author, October 2021)

Deliverable	Requirement	Acceptable criteria	Stakeholder	Metric	Manage Quality Activity	Control Quality Activity
Elimination of two illicit dumpsites.	Time- bound	A minimum of one day should be used to complete the removal and sanitary disposal of all solid waste found at the two dumpsites.	Project Manager Project Team Community Members	Time – 24 hours	Implementation of sub teams (made up of community members) and a work schedule for the day. Sub teams will be monitored by project team members.	Internship Field supervisor will conduct a site inspection on the day of the clean up to ensure dump sites are removed.

Deliverable	Requirement	Acceptable criteria	Stakeholder	Metric	Manage Quality Activity	Control Quality Activity
25 New individual solid waste receptacles.	Cost effective Appropriate size Durable Secure	$30,000 300lb capacity 22.5 inches inside diameter 33.5 inches internal height Made of metal Protected with close fitting cover	Project Manager Suppliers	Cost – no more than $30,000	Acceptable criteria will be clearly outlined in contracts to be signed by suppliers.	Upon delivery, the project quality manager will inspect all receptacles to ensure acceptable criteria are met.
2 Communal solid waste receptacles.	Cost effective Appropriate size Accessible	6ft x 6ft Sloped, smooth floors Ramped entrance Smooth cleanable concrete walls Privacy door	Project manager Suppliers	Cost – no more than $120,000	Acceptable criteria will be clearly outlined in contracts to be signed by suppliers.	Upon delivery, the project quality manager will inspect all building material to ensure acceptable criteria are met.

Deliverable	Requirement	Acceptable criteria	Stakeholder	Metric	Manage Quality Activity	Control Quality Activity
	Regulatory compliant	Constructed and located in keeping with the Town and Country Planning Act (1999) and the Public Health Nuisance Regulations (1998).				Internship academic supervisor will carry out an inspection of the receptacles Approval letter to be reviewed by field supervisor prior to construction.
Weekly collection of solid waste by the NSWMA.	Time-bound Relevant content	Refuse collected by the NSMWA truck once weekly, on a set day between the hours of 9am-5pm.	Project Manager Project Team Community Members NSWMA	Time- Once weekly	Written commitment and printed collection schedule from the NSWMA to be presented to CHC President.	Community Health Committee President will be responsible for contacting the NSWMA if refuse Is not collected weekly.

Deliverable	Requirement	Acceptable criteria	Stakeholder	Metric	Manage Quality Activity	Control Quality Activity
Three Health Education sessions on the importance of proper solid waste management, the consequence of burning and dumping garbage and recycling, reusing and reducing.	Time Relevant Captures 50 residents exclusive of health committee	Three health education sessions held within the project time Topics discussed should be relevant to the solid waste management problem A minimum of 50 residents should be present at each of the health education sessions.	Project Manager Project Team Community Members NSWMA	Attendance- a minimum of 50 residents for session.	Lesson plans submitted prior to educational sessions	Field supervisor will attend each session and grade PM using Rating scale provided by the University of Technology, Jamaica. Please see Appendix 6 for rating scale.

Deliverable	Requirement	Acceptable criteria	Stakeholder	Metric	Manage Quality Activity	Control Quality Activity
Official handing over ceremony to hand over the solid waste receptacles to the community in order to close the project.	Time-bound Cost effective	A minimum of $20,000 should be spent to organize and execute ceremony. Representatives of all organizations involved should be present at ceremony.	Sponsor PM, Project Team Community Members NSWMA Municipal Corporation Member of Parliament Councilor Internship field supervisor Community business owners Suppliers	Cost – no more than $20,000	Ceremony program to be created 2 weeks prior to date.	Field Supervisor will assess cost breakdown submitted by Project Manager.

4.5.3 Roles and Responsibilities

Project Quality management requires a collaborative approach, with different stakeholders carrying out different roles and responsibilities. The table below defines the responsibilities of different stakeholders in the Lloyd Community Health Project.

Chart 18 Project Quality Roles and Responsibilities (Source: C. Gordon, The Author, October 2021)

Role	Responsibilities
Project Sponsor	Quality planning - Provision of the documented standards and framework for quality to be used during the life cycle of the project.
Project manager	Quality planning - Provision of the documented standards and framework for quality to be used during the life cycle of the project. Scheduling and management of quality control activities. Identification of quality improvement opportunities. Implementation of corrective action or process improvement.
Project Team	Quality Assurance - Provision of the necessary attention to detail for continuous improvement of activities and processes to achieve quality. Identification of quality improvement opportunities.
Academic and Field Supervisors	Quality Control -Monitoring and inspecting to ensure that every deliverable and work product is measured, tested and ensures results conform to quality standards.

Role	Responsibilities
Project manager and Project team	Identification of quality improvement opportunities.

4.5.4 Quality Requirements/Standards

Product Quality

The product quality requirements and standards are pre-determined by UTECH, Jamaica. These standards speak to the individual and communal receptacles to be placed and constructed in the community. The standards are documented in the Internship manual given to the Project Manager at the beginning of the project. The Project Manager will be expected to review these standards extensively and ensure that the project team is informed of these standards prior to the commencement of project implementation.

Process Quality

The process quality requirements and standards are similarly pre-determined by UTECH, Jamaica. However, the standards speak to the operations of the Project Manager during the Internship/Project period. The project manager is expected to understand these standards prior to the project and to ensure that the members of the project team also understand them and the importance of ensuring project quality.

4.5.5 Quality Assurance

The quality assurance of the Lloyds Community Health Project will focus on the processes used to construct the communal waste receptacle and the level to which the individual receptacles meet the project requirements. In order to ensure quality, the Internship Field Supervisor from the St. Thomas Health Department in conjunction with the Internship Academic Supervisor from the University of

Technology, Jamaica actively carry out quality assessments throughout the project life cycle. These assessments include the review of project documents and records, inspections of the constructions and placement sites and an evaluation of the project manager's overall management of the project activities such as intersectoral collaboration and health education. The table below outlines the key quality assurance metrics for the project.

Chart 19 Quality Assurance Metrics (Source: C. Gordon, The Author, October 2021)

Process Action	Acceptable Process Standards	Project Phase	Assessment Interval
Dumpsite Inspection	Completion – no solid waste left on land after clean-up activities.	Implementation	Weekly
Individual Receptacle Assessment	Capacity – 300lbs of solid waste Required dimensions - 22.5 inches inside diameter and 33.5 inches internal height Required composition - metal or plastic Secure – Close fitting cover affixed.	Implementation	Weekly

Process Action	Acceptable Process Standards	Project Phase	Assessment Interval
Communal Receptacle Assessment	Required dimensions -6ft x 6ft Required composition - Concrete	Implementation	Bi- weekly
Health education Evaluation	Content – Based on Solid Waste Problem identified, Aligned to project objectives. Reach – a minimum of 75% of the Lloyds Population	Implementation	At every session (Three times throughout project)

4.5.6 Quality Control

The quality control of the Lloyds community project is focused on the construction of the communal receptacles and the requirements of the individual receptacles. The project team, under the leadership of the project manager and quality manager will enforce the quality standards stipulated by the Health Department and University. The project team is responsible for performing all the quality assessments on the construction and placement sites to ensure the communal and individual receptacles meet the physical standards required. The project manager will be responsible for the weekly review and update of project documents. The internship field supervisor

will carry out weekly reviews of project activities, management activities and project documents. The Internship academic supervisor will review the deliverables through the process of a written evaluation.

4.5.7 Quality Control Measurements

In order for the project team to ensure that the project is meeting the Health Department and University's standards the project quality manager, also known as the Health Committee's Vice President, will be responsible for measuring project quality. The quality assurance log and a quality control log are presented in appendices 7 and 8 respectively.

4.5.8 Quality Change Control

All requests for changes in project quality will be submitted to the project manager using the change request form. The project manager holds the authority to either approve or deny the changes. In situations where the project manager feels it is necessary, the changes will be proposed to the project sponsor who will then make the final decision. Once approved, all project documents concerning the project quality will be updated.

4.6 Resource Management Plan

The availability of resources is a crucial factor in any project, whether large or small. The Lloyds Community Health Project is no different. The Project Management Institute asserts that project resource management includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project. These processes help ensure that the right resources will be available to the project manager and the project team at the right time and place (PMI,2017, p.307). As it relates to human resources, the project is planned in such a way that it requires skilled and unskilled volunteers from the community. Consequently, this plan will assist in ensuring that the most suitable candidates are chosen for the roles

and that they are aware of their roles and responsibilities prior to the project. In addition, the physical resources needed for the project are also discussed within this plan. The plan will ensure the use of these physical resources is monitored so as to prevent waste, misuse or theft.

4.6.1 Resource Management Approach

The resource management plan for the Lloyds Community Health Project will encompass all the processes necessary for the creation and management of the project team, also known as the Lloyds Community Health Committee. The project team will be made up of the Project Manager, who represents the St. Thomas Health Department as well as members of the Lloyds Community. This is a strategic move as the project is meant to empower members of the community and enhance project sustainability. The required team members and roles are outlined in the University of Technology, Jamaica's Internship manual. The resource management plan will outline roles and responsibilities of team members, how the team is chosen, team development strategies and plans for the safety and welfare of the project team.

The plan will also outline how the physical resources, such as the construction material, the tools needed for clean-up days, the drums for the individual receptacles and the personal protective equipment will be managed and by whom. These resources need to be managed to ensure that they are being used appropriately and at a rate that will not cause an unnecessary increase in the project budget or project time. The management of the resources must also be assigned to different project team members to ensure their security and protect them from theft. The plan will also speak to locations used for the community meetings and how these locations will be managed.

4.6.2 Roles and Responsibilities

The organizational structure of the project team is outlined in figure 10 below. The Project Manager will serve as the leader of the team.

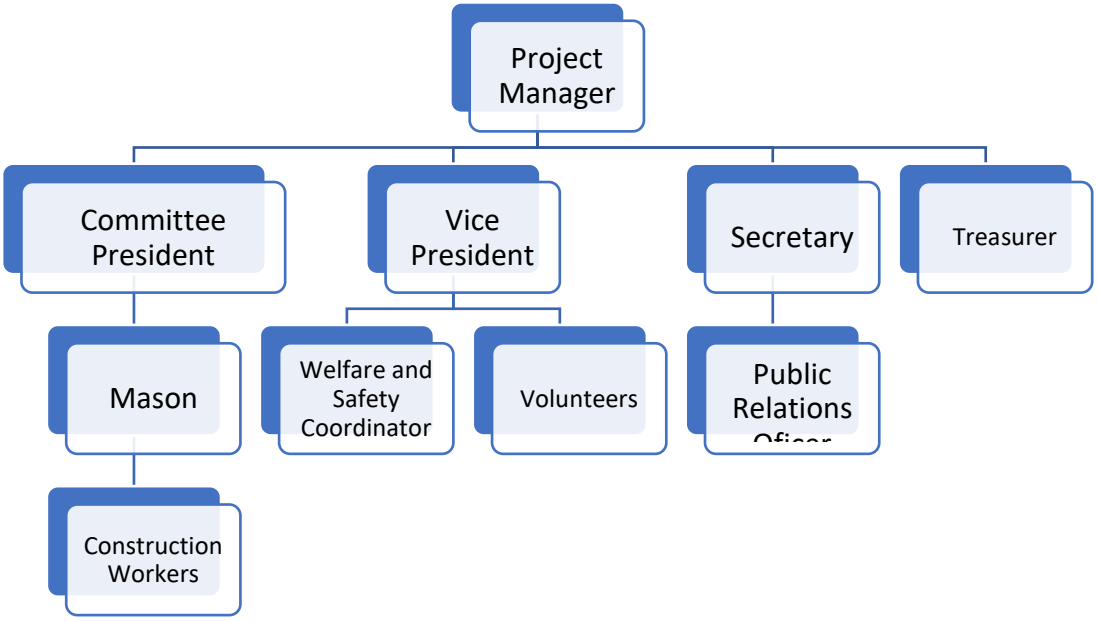


Figure 12 Organizational Structure of The Lloyds Community Health Project Team(Source: C. Gordon, The Author, November 2021)

The roles highlighted in this figure are then presented in Chart 20 along with the responsibilities attached to each role. The roles and responsibilities will be explained at the first community meeting before being assigned.

Chart 20 Project Resource Management Roles and Responsibilities (Source: C. Gordon, The Author, October 2021)

Roles	Responsibilities
Project Manager	● Project planning and scheduling. ● Change control. ● Leadership of project team. ● Updating project documents. ● Management of project funds.

Roles	Responsibilities
Committee President	● Assisting project manager in project planning and scheduling.
Vice President	● Direct supervision of welfare and safety coordinator and volunteers. ● Assistance in scheduling and planning of project activities. ● Ensuring meeting location is booked and prepared for meetings
Secretary	● Recording of minutes at meetings. ● Overseeing registration of participants at health education sessions. ● Communication with project stakeholders such as Municipal Corporation, NSWMA, Health Department.
Public Relations Officer	● Communication with community members. ● Announcement of meetings and health education sessions ● Creation of health education content and material.
Treasurer	● Control and management of project funds ● Procurement of physical resources ● Managing physical resources supply ● Evaluate and Assign resources ● Maintain Resource Assignments
Mason	● Overseeing and participating in construction of communal receptacles.
Construction Workers	● Construction of communal receptacles. ● Steel work ● Block work ● Mixing of cement

Roles	Responsibilities
Welfare and Safety Coordinator	● Provision of food, water and refreshment on workdays, meetings, health education session. ● Provision of personal protective equipment and first aid items for workdays. ● Transportation of injured or ill persons to the Health Care Facility. ● Monitoring use of physical project resources
Volunteers	● Retrofitting, labeling and placement of individual receptacles. ● Removal of solid waste from dump sites.

4.6.2.1 Project Organizational Chart

The RACI chart below is a Responsibility Assignment Matrix which gives a graphical representation of the relationship between project tasks and project team members. The chart outlines team members that are responsible or accountable for a project task as well as those who should be consulted or informed. The table below is the RACI chart for the Lloyds Community project.

Chart 21 RACI Matrix (Source: C. Gordon, The Author, October 2021)

	PROJECT TEAM MEMBER									
TASK NAME	**Project Manager**	**Committee President**	**Vice President**	**Secretary**	**Treasurer**	**Welfare and Safety Coordinator**	**Public Relations Officer**	**Mason**	**Construction Workers**	**Volunteers**
Elimination of dump sites	R	R	R	I	C	C	I	I	A	R
Individual Receptacles	R	R	C	I	R	I	R	I	R	R
Communal Receptacles	R	R	R	I	R	R	R	R	R	I
Collection Frequency	R	R	C	R	I	I	I	I	I	I
Health Education	R	C	C	I	I	I	R	I	I	I
Project Closure	R	R	R	R	C	I	R	I	I	I
Project Management	R	R	C	A	A	I	A	I	I	I
R= Responsible			**A = Accountable**			**C= Consult**			**I=Inform**	

4.6.3 Acquisition of Team Members

The selection of team members will be a fair, democratic process. In the initial stages of the project, the project manager will make residents aware of the proposed project and inform them of the different roles available on the project team. At the first community meeting, the team members will be chosen. The responsibilities of each team member will be discussed and community members will be asked to nominate and vote for persons they believe will work efficiently in the roles. The fact that the project is a community project means that labour is provided through volunteers rather than hired workers. There is a need for skilled workers such as masons, steel workers and welders. The mason will act as leader for the skilled construction workers. This sub team will consist of a maximum of 5 workers. Unskilled workers are also needed for the placement and retrofitting of drums and the removal of solid waste from dump sites. This sub-team will be led by the Committee Vice President and will consist of a maximum of 10 volunteers.

4.6.4 Team Development

Team development will be necessary owing to the fact that the project team is nominated by community members, it can be expected that some persons will be working together for the first time. The project manager must therefore employ team development tactics to lessen the possibility of negative conflict and low productivity. During Health Committee meetings, the team will be expected to participate in various team building exercises, targeted at improving communication, teamwork, and cooperation.

4.6.5 Team Safety and Welfare

The Welfare and Safety Coordinator will be responsible for ensuring the safety and welfare of team members during clean up, placement and construction days. This will include providing protective equipment, food, and water for all workers,

administering first aid when needed and being on high alert for any medical emergencies that may occur. This team member is responsible for transporting persons to the Lloyds Health Centre for medical attention if necessary.

4.6.6 Recognition and rewards

Due to the nature of the project, monetary incentives will not be given. However, all team members who participate in the project will be recognized and honoured at the handing over ceremony.

4.6.7 Physical Resources

For the purposes of this project, a physical resource assignment will be used to document the physical resources. This document will be monitored by the Project Treasurer and Welfare and Safety Coordinator. The table below provides a template which can be used for the physical resource assignment.

Chart 22 Physical Resources Roles and Responsibilities (Source: C. Gordon, The Author, October 2021)

Physical Resources	Role	Responsibility
Construction Material	President, Mason	Allocation of resources to team members Monitoring levels of material used in relation to work done Securing material
Materials for Individual Receptacles	Vice President	Allocation of resources to team members Monitoring levels of material used in relation to work done Securing material

Physical Resources	Role	Responsibility
Protective Equipment	Welfare and Safety Coordinator	Allocation of resources to team members Monitoring levels of equipment Securing material
Meeting Venue	Vice President	Booking meeting venue ahead of required time Arranging venue for meetings Clean up of venue after meetings

4.6.7.1 Control of Physical Resources

Control resources is the process of ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned versus actual utilization of resources and taking corrective action as necessary (PMI,2017 p.352). The project manager will have the overall responsibility for the management of physical resources but will be assisted in this role by the Treasurer and Welfare and Safety Coordinator.

4.7 Communication Management Plan

The communication management plan for the Lloyds Community Health Project is intended to be a guide for the communication that will occur among project stakeholders. Communication among stakeholders has to be planned for because of the diversity of the project stakeholders and the fact that many of these groups and individuals may be working together for the first time. The Project Manager and Health Committee President will take responsibility in ensuring that communication is effective. The key section of this plan, the communication matrix, is a documentation of the information to be communicated, communication

requirements, the intended audience, communication frequency and the person responsible for the dissemination of the information.

4.7.1 Audiences

The major audiences for the project are as follows:

- Project Sponsor – St. Thomas Health Department
- Steering Team
- Project Manager
- Project Team
- Municipal Corporation
- National Solid Waste Management Authority
- Community Members

4.7.2 Communication Delivery Methods and Technologies

The primary methods of communication to be used will include face to face conversation, interviews, meetings, telephone calls, emails, WhatsApp messages, reports, town-cries, and presentations.

4.7.3 Communication Escalation Process

A communication escalation plan will be put in place. A communication escalation process is a kind of proactive risk communication where the project manager is highlighting the bottleneck to the next level in the hierarchy for attention and quick resolution.

The table below shows the Communication Escalation Plan for the Lloyds Community Health Project. It describes who should be notified about the event and communicates the details about the event to that person or to that part of the organization.

Chart 23 Communication Escalation Plan (Source: C. Gordon, The Author, October 2021)

Role	Triggers when
Project Manager	-Delays in delivery of construction material -Delays in approval letter from Municipal Corporation
President	- Construction workers unavailable - Construction issues - Delivery issues
Vice President	- Volunteers unavailable - Meeting venue not available
Treasurer	- Resource bottlenecks for construction/volunteer team - Delays of receptacle design

It is important to note that once the details are communicated, then ownership of that event is shifted to the person or part of the organisation to whom it was communicated.

4.7.4 Monitors Communication

A survey will be used to monitor project communications. Various stakeholders will be asked to complete a short survey and give their feedback on the effectiveness of project communications. This survey is presented in Appendix 9. With this information, the project manager will be able to adjust communication as needed. Communication will also be monitored at project meetings. According to the PMI, face-to-face or virtual meetings are used for decision making, responding to stakeholder requests, and having discussions with suppliers, vendors, and other project stakeholders.

4.7.5 Communication Matrix

The communication matrix for the Lloyds Community Health Project provides a summary of the communication management plan for the project. It presents the methods of communication, the delivery method, frequency, and the persons responsible for encoding the information (owner) and the intended audience.

Chart 24 Project Communication Matrix (Source: C. Gordon, The Author, October 2021)

Communication Type	Deliverables	Delivery Method	Frequency	Owner	Audience
Personal Communication	Community Sensitization	In person Interviews	Once	Project Manager	Community members
	Community Sensitization	Community Meeting 1	Once	Project Manager	Community members, Business Owners, Regulatory bodies
	Project updates	Telephone calls, email, meetings, Progress reports	As needed	Project Manager	Project Sponsor Steering Committee Internship Field Supervisor Internship Academic Supervisor
	Project Updates	Community Meetings	Monthly	Project Manager, Project Team	Community members, Business Owners, Regulatory bodies

Communication Type	Deliverables	Delivery Method	Frequency	Owner	Audience
	Authorization to construct communal receptacles	Written letter	Once	Secretary	Municipal Corporation
Meetings	Community Meeting	Planning Meeting	Once	Project Manager	Community members, Business Owners, Regulatory bodies
	Community Meeting	Progress Meeting	Monthly	Project Manager, Project team	Community members, Business Owners, Regulatory bodies
Meeting	Meeting with Sponsor	Progress Meeting	Monthly	Project Manager	Project Sponsor, steering committee
	Project Team Meeting	Progress Meeting	Weekly	Project Manager	Project Team
	Evaluation Meeting	Deliverable review	As needed	Project Manager	Internship Academic and field supervisors
Reports	Progress Report	Written Document	Weekly	Project Manager	Project Sponsor Internship Field Supervisor Internship Academic Supervisor

Communication Type	Deliverables	Delivery Method	Frequency	Owner	Audience
Presentation	Health Education	PowerPoint Presentation	Bimonthly	Project Manager	Community members, Business Owners, Regulatory bodies
Project Announcements	Meeting announcement	Town cry, text messages, posters, church, and school announcements	Weekly	Public Relations Officer	Community members
	Change request	Written (designated form)	As needed	Project Manager	Project Sponsor, steering committee

4.8 Risk Management Plan

Risk Management is a vital part of the Lloyds Community Health Project management process. The project team will be responsible for the identification and analysis of risks as well as coming up with strategies that will be employed to mitigate these risks. In The project Integration Management Plan, the project charter required the identification of preliminary projects risks. The Project Risk Management Plan, however, will encompass risk identification, analysis and the strategies that will be employed to mitigate these risks. The plan was compiled after consultation with the Field and Academic supervisor to decipher risks that are usually associated with Community Health Projects. The intention of the plan is to identify and analyse the risks. This is followed by planning appropriate responses to the identified risks. The final step is to decide the means of monitoring and controlling project risks.

4.8.1 Roles and Responsibilities

Project Risk Management is a collaborative effort among several stakeholders. Each stakeholder brings different experiences and knowledge to the project. This enables them to identify project risks and even risk responses. The roles and responsibilities of key stakeholders are outlined in the chart below.

Chart 25 Project Risk Roles and Responsibilities (Source: C. Gordon, The Author, October 2021)

Roles	Responsibilities
Project Manager	● Creation of risk register ● Monitoring risks and opportunities ● Identifying new risks and opportunities ● Evaluating/upgrading probability of occurrence and potential impacts

Roles	Responsibilities
Project Sponsor	• Allowing and disallowing change in an effort to mitigate/alleviate risks
Project Team Members	• Risk Identification • Devising and implementing response strategies
Internship Field Supervisor	• Evaluating and documenting the effectiveness of response actions
Welfare and Safety Coordinator	• Risk Monitoring on workdays

4.8.2 Identify risks

The cost management plan, schedule management plan, quality management plan and resource management plans were used as inputs to identify the risks associated with the Lloyds Community Health Project. A document review of previous project documents and expert judgement from both the Internship Academic Supervisor and Field Supervisor were used as tools and techniques. The author also consulted with the previous Project Managers who are employed to the Health Department.

The identified risks were then categorized and decomposed to form the Risk Breakdown Structure as seen below.

Chart 26 Risk Breakdown Structure for the Lloyds Community Health Project.

LEVEL 0	LEVEL 1	LEVEL 2	LEVEL 3
0. Project Risk	1. Management	1.2 Project Management	1.2.1 PM Team conflict
			1.2.2 Stakeholder engagement

LEVEL 0	LEVEL 1	LEVEL 2	LEVEL 3
	2. External	2.1 Natural environment	2.1.1 Natural disaster
			2.1.2 Soil conditions
			2.1.3 Water pollution
		2.2 Regulators	2.2.1 Approval delays
			2.2.2 Change in laws
		2.3 Suppliers	2.3.1 Availability
	3. Technical	3.1 Requirements	3.1.1 Cost estimates
			3.1.2 Quality

Following the creation of the Risk Breakdown Structure, a Risk Register was created. The risk register highlights the risks identified, the probable causes and consequences as well as the triggers that will allow the project team that action is needed. The responsible stakeholders are also stated in this matrix. The probability and Impact of the risks identified which were calculated during risk analysis were also stated in the risk register. The register is presented in the chart below.

Chart 27 Risk Register (Source: C. Gordon, The Author, October 2021)

RBS Code	Cause	Risk	Consequence	Probability	Impact	PxI	Trigger	Potential Risk Response	Owner
1.2.1	Poor communication among project team members.	Negative conflict among project team members.	Project Delays, failure to meet projected schedule.	0.7	0.40	0.28	Information expressed by members in project team meetings.	**Avoid** Ensure team development strategies encompasses communication and conflict management skills.	PM
1.2.2	Job and location diversity among project stakeholders.	Disengaged stakeholders.	Project Delays, failure to meet projected schedule	0.5	0.40	0.20	Information expressed by stakeholders in progress meetings.	**Avoid** Apply the most feasible communication strategies for each stakeholder involved.	PM

RBS Code	Cause	Risk	Consequence	Probability	Impact	PxI	Trigger	Potential Risk Response	Owner
2.1.1	Naturally occurring unpredictable weather conditions of the project environment.	Hurricanes and Tropical Storms occurring during project.	Structural destruction to communal receptacle. Extension of time needed to complete project	0.7	0.80	0.56	Warnings from the Office of Disaster Preparedness and Emergency Management.	**Mitigate/Avoid** Implement protective measures such as covering and drainage in the case of a tropical storm. Complete construction of receptacles before the beginning of the hurricane season (June 30-November 30)	PM, Welfare & Safety Coordinator.

RBS Code	Cause	Risk	Consequence	Probability	Impact	PxI	Trigger	Potential Risk Response	Owner
2.1.2	Soil composition does not allow for adequate drainage.	Inability to construct soak away pits for communal receptacles.	Project delay due to relocation of communal receptacles and reapplication of approval to construct.	0.5	0.20	0.10	Results of soil tests done by the Environmental consultant provided by the Municipal Corporation.	**Mitigate** Implement a contingency plan to construct wider pits and pack with stones to allow for adequate drainage.	PM
2.1.3	Soak away pits for communal receptacles dug in areas with a high-water table.	Inability to construct communal receptacles in designated areas.	Project delay due to relocation of communal receptacles and reapplication of approval to construct.	0.5	0.40	0.20	Results of analysis done by the Environmental consultant provided by the Municipal Corporation.	**Mitigate** Identify two additional pieces of government owned land for the construction of the receptacles.	PM

RBS Code	Cause	Risk	Consequence	Probability	Impact	PxI	Trigger	Potential Risk Response	Owner
2.2.1	Delay in confirmation of Municipal Corporation approval to build.	Inability to construct communal receptacles.	Delay in project start.	0.7	0.8	0.56	Written notice from the Building Council during application process.	**Avoid** Apply for construction approval prior to collection of data. Communicate frequently with Permanent Secretary at the Municipal Corporation.	Project Sponsor
2.2.2	Changes in building regulations by relevant authority. Political changes occurring during project execution.	New Building regulations	Changes in structural design to meet new regulations leading to an extension of project time, changes to scope and cost.	0.10	0.40	0.4	Written notice from the Building Council.	**Accept** Keep abreast of Municipal Corporation Building regulations.	PM, Mason

RBS Code	Cause	Risk	Consequence	Probability	Impact	PxI	Trigger	Potential Risk Response	Owner
2.3.1	Material needed for project not available in St. Thomas.	Inability to procure material at the cost stated in the project budget.	Extension of project time, increase in cost if alternatives have to be found.	0.10	0.40	0.4	Suppliers fail to provide required material during procurement process.	**Mitigate** Ensure suppliers from outside of St. Thomas are contacted.	Project Manager
3.1.1	Insufficient research done on project cost prior to beginning the project.	Project costs exceeded budget.	Need for additional fundraising activities which will delay project time.	0.30	0.40	0.12	Information from suppliers.	**Avoid** Carry out extensive research of project costs prior to project execution.	Project Manager
3.1.2	Inability to procure high quality individual receptacles.	Using individual receptacles of a lower quality than required.	Structural damage to individual receptacles during project work.	0.30	0.20	0.06	Feedback from volunteers while retrofitting individual receptacles.	**Mitigate** Allocate contingency funds.	Volunteers

4.8.3 Risk Analysis

This risk analysis was done using the qualitative risk analysis, in particular, the risk probability and impact assessment. This means that the risks identified in the first process of this plan, were analysed in terms of the probability of them occurring and the impact that risk would have on the project if it does occur. The analysis was done following an interview with the project manager. The various categories of probability and impact were first defined and assigned a numeric value.

Chart 28 Risk Probability (Source: C. Gordon, The Author, October 2021)

Probability	
Very High	An event that is extremely sure to occur
High	An event that is very likely to occur
Medium	An event that is somewhat greater than an even chance to occur
Low	An event that is not very likely to occur
Very Low	An event that will unlikely occur

Chart 29 Risk Impact (Source: C. Gordon, The Author, October 2021)

Impact	
Very High	A risk event that, if occurs, will have a severe impact on achieving desired results, to the extent that one or more of its critical outcome objectives will not be achieved
High	A risk event that, if occurs, will have a significant impact on achieving desired results, to the extent that one or more of its stated outcome objectives will fall below acceptable levels
Medium	A risk event that, if occurs, will have a moderate impact on achieving desired results, to the extent that one or more of its stated outcome objectives will fall below goals but above minimum acceptable levels.

Impact	
Low	A risk event that, if occurs, will have a minor impact on achieving desired results, to the extent that one or more of its stated outcome objectives will fall below goals but well above minimum acceptable levels.
Very Low	A risk event that, if occurs, will have a little or no impact on achieving outcome objectives

These levels were analysed against the probability and impact matrix, seen in the chart below and the priority levels needed for the evaluation of the threats defined and colour-coded. High priority risks are shown in red, medium priority in yellow and low priority in green.

Chart 30 Risk Probability and Impact Matrix (Source: C. Gordon, The Author, Adapted from PMI, October 2021)

Probability		**Threats**				
Very High	0.9	0.05	0.09	0.18	0.36	0.72
High	0.7	0.04	0.07	0.14	0.28	0.56
Medium	0.5	0.03	0.05	0.10	0.20	0.40
Low	0.30	0.02	0.03	0.06	0.12	0.24
Very Low	0.10	0.01	0.01	0.02	0.04	0.08
Impact		0.05	0.10	0.20	0.40	0.80
		Very Low	**Low**	**Moderate**	**High**	**Very High**

Key

High Risk	X>0.20
Medium Risk	0.05<X<=0.20
Low Risk	X<=0.05

4.8.4 Planning Risk Response

Project risk response will be the responsibility of the Project Manager and project team members. The team will work along with the Municipal Corporation's Building Consultant, Suppliers and the Project Sponsor to choose the most feasible responses to each project risks. Potential risk responses were listed in the risk register for each risk identified.

4.8.5 Monitoring and Controlling Risks

Project Risks will be monitored and controlled by the Project Manager. The Project Manager is responsible for updating the risk register periodically and deciding when a risk response should be activated. The tools and techniques to be employed include risk audits which will help to determine the effectiveness of the risk response strategies. Risk Assessments should also be done to identify new risks and to decipher whether or not risk responses will have to be changed.

4.9 Procurement Management Plan

The purpose of the Procurement Management Plan is to provide a guideline which outlines the procurement activities needed to acquire the materials and services necessary for the achievement of project objectives. This plan encompasses the items to be procured, the procurement process, the types of contracts, the criteria to be used to select suppliers and the contact process. The roles and responsibilities of project team members involved in the procurement process are also outlined. The plan was done using expert judgement from previous Project Managers hired to the Health Department as well as the Internship Academic and Field Supervisors.

4.9.1 Procurement Management Approach

Procurement Management falls directly under the ambit of the Project Manager, the Treasurer and Assistant Treasurer of the Health Committee will assist in the procurement process. From the expert judgement provided by previous Project Managers and the Internship field and Academic Supervisors, a list of items needed for the construction of the communal receptacles and the individual receptacles was created. This list will be reviewed by the President and Vice President of the Health Committee as well as the treasurer and mason before the vendor selection, purchasing and contracting process. Procurement will be done in phases; the objectives of each phase should be clearly outlined to the team members involved as well as the criteria for moving from phase to phase and the means by which the procurement process will be monitored.

4.9.2 Roles and Responsibilities

Procurement will be the responsibility of the Project Manager. However, the President, Vice President and Treasurer also have a level of responsibility. The table below shows the roles and responsibilities of the project team.

Chart 31 Procurement Roles and Responsibilities (Source: C. Gordon, The Author, October 2021)

Roles	Responsibilities
Project Manager	● Preparation of bid proposals ● Deciding vendor selection criteria ● Approving purchases ● Identifying project risks ● Vendor selection and awarding contracts.

Roles	Responsibilities
Treasurer	● Contract advertisement ● Controlling payment for goods and services ● Maintaining financial records ● Purchasing physical resources approved by the project manager
Mason	● Obtaining permission for purchasing goods

4.9.3 Procurement Definition

The following table outlines the essential items for the project. The items needed are listed, along with the required quantity and the justification for each item. The Project Manager has the option of inserting the dates by which the items will be needed, to keep the project team members involved in the procurement process informed.

Chart 32 Procurement Definition (Source: C. Gordon, The Author, October 2021)

Item/Service	Quantity	Justification	Needed by
Steel	5 lengths	The structural framework for the Communal receptacles.	7/6/2022
Sand	3 yards	Key component of the concrete mixture needed to form the walls and floors of the communal receptacles.	7/6/2022
Gravel	3 yards	Key component of the concrete mixture needed to form the walls and floors of the communal receptacles.	7/6/2022

Item/Service	Quantity	Justification	Needed by
Rusty Expanded Mesh	1 Sheet	Will be used to create the enclosures for both communal receptacles.	7/6/2022
Cement	14 Bags	Key component of the concrete mixture needed to form the walls and floors of the communal receptacles.	7/6/2022
Garbage Bags	10 packs	Will be used for the containerization of solid waste removed from illicit dump sites.	17/5/2022
Drums	20	Will be used as individual receptacles.	26/5/2022
Metal Handles		For retrofitting drums	26/5/2022
Rakes	3	Will be used for the removal of solid waste from illicit dump sites.	17/5/2022
Oil Paint	1 Gallon	Will be used to paint communal Receptacles after construction.	7/6/2022
Food Items		Used as refreshment for project team members.	20/5/2022
Paint brushes	2	Will be used to paint communal Receptacles after construction.	7/6/2022
Gloves	3 boxes	To be used as a means of personal protection by volunteers during project work.	17/5/2022
Dust Masks	1 pack	To be used as a means of personal protection by volunteers during project work.	17/5/2022

Item/Service	Quantity	Justification	Needed by
Machete	3	Will be used to clear land prior to construction of communal receptacles.	17/5/2022

4.9.4 Type of Contract to be used

A fixed price contract will be employed. According to the Project Management Institute, fixed price contracts involve setting a fixed price for the total price for a defined product, service or result to be provided (PMI, 2017 p.471). This type of contract is ideal because the Lloyds Community project will not require any drastic changes in scope, due to the time and cost limits imposed by the University of Technology Jamaica. It is also suitable because the type of work is predictable and the requirements are well defined. The particular type of contract to be used is called a Firm Fixed Price. The PMI asserts that in this type of contract, the price for good is set at the outset and not subject to change unless the scope of work changes (PMI, 2017 p.471).

4.9.5 Contract Approval Process

After defining the items to be procured for the project, the treasurer will be responsible for conducting independent cost estimates for the products needed. The treasurer will also prepare a bid document, which will be used to solicit proposals from prospective sellers. This bid document will include a request for quotation (RFQ). According to the PMI, a RFQ is commonly used when more information is needed on how vendors would satisfy the requirements and/or how much it will cost (PMI, 2017, p.477). This bid document will be sent to various hardware stores (vendors) located in the parish of St. Thomas. Each store is expected to submit a proposal within a given time frame. After the submission of all proposal, then the

approval process will begin. The approval process involves comparing the submitted bids with the independent cost estimates and a review of all the proposals to determine which of the proposals meet the project requirements.

4.9.6 Decision Criteria

In order to secure the project contract, the vendors must meet stipulated criteria. Previous Projects Managers from the Health Department were interviewed and the following criteria were deciphered. These must be met by the vendor in order to secure the project contract:

1. Ability to provide all items by the designated delivery dates
2. High quality material
3. Affordable cost
4. Proximity to Project Area
5. Corporate and Social Responsibility

4.9.7 Vendor Management

The Project Manager will be responsible for the management of the vendors chosen in the procurement process. The vendors will be required to deliver high quality materials and equipment in a timely manner. In order to ensure this, the Project Manager will engage each vendor in meetings, whether in person or via teleconference. Through these communication channels the Project Manager and vendors will be able to have constructive conversations about the specifications of the products procured in order to ensure that they meet the requirements of the project. These meetings will also provide a means by which the Project Manager and vendors can discuss changes in the procurement process, for example if there is a change in delivery time or if the supply of some products is running low. This constant engagement and communication with vendors will prevent delays in delivery and by extension, the project schedule.

4.9.8 Performance Metrics for Procurement Activities

A rating scale was created to assess the performance of the vendors engaged; this information is important to the Health Department as they participate in similar projects annually. Each metric used is rated on a scale of 1-3 as indicated in the rating scale below. The information will be saved by the Health Department and used for future projects. The rating scale is presented in Appendix 10.

4.9.9 Procurement Change Control Process

The procurement control process will follow the established change order process. If there is need for changes in the cost during the project, the project team under the guidance of the project manager will carefully analyze any potential changes to the procurement plan. The changes must be scrutinized based on the impact of the potential change on other activities, possible variance and effect on schedule management. If the change is deemed necessary, then a change request must be submitted. The designated change request form can be found in Appendix 4. The project manager will then implement the necessary changes.

4.9.10 Closed Procurements

In order to officially close the procurement process, the Project Manager will be responsible for submitting a written, formal notice to the seller to state that the contract is closed. The conditions under which the contract can be closed include;

1. All deliverables have been delivered on time
2. All deliverables meet the quality requirements
3. There are no outstanding claims or invoices
4. All final payments have been made.

4.10 Stakeholder management plan

Stakeholder Management is defined by the Project Management Institute as the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution (PMI, 2017, p. 503). Stakeholders can be categorized based on different factors. These factors include; their level of authority (power), level of concern about the project's outcomes (interest), their ability to influence the outcomes of the project (influence) or the ability to cause changes to the project's planning or execution (PMI,2017). The stakeholders involved in the Lloyds community project were identified and analysed through the expert judgement of the Internship Field Supervisor, who has a wealth of experience in community health projects similar to this one.

4.10.1 Stakeholder Management Approach

In order to adequately plan stakeholder management for this project, the author carried out an interview with the Internship Field Supervisor hired to the St. Thomas Health Department. The aim of this plan was to identify and analyse the project stakeholders in a bid to plan for and manage them efficiently during the implementation phase of the project. Four processes were used in the creation of this plan including identify stakeholders, plan stakeholder engagement, manage stakeholder engagement and monitor stakeholder engagement. The stakeholders were identified, then analysed according to their interests and power in the project. Based on this information, the level of engagement needed for each stakeholder was stated along with the strategies that will be used for this engagement.

4.10.2 Stakeholder identification

Following consultation with the Internship Field Supervisor, thirteen (13) stakeholders were identified and assessed in terms of their functional area, roles and responsibilities, whether they were internal or external to the project, their power and interest levels, their expectations and what they require from the project. This information was then tabulated to form the stakeholder register as seen in chart 31 below.

Chart 33 Stakeholder Register (Source: C. Gordon, The Author, October 2021)

LLOYDS COMMUNITY HEALTH PROJECT								
Project Manager: Shantae Golding – Anderson				**Main Sponsor: Chief Public Health Inspector, St. Thomas Health Department**				
ID	**Stakeholder**	**Functional Area**	**Roles-Responsibilities**	**Category**	**Power**	**Interest**	**Expectations**	**Requirements**
1	Project Sponsor	Environmental Health	Provision of monetary support and resources for the project.	Internal	High	High	Efficient use of project funds and resources, improvement in the number of homes in the community that practice proper solid waste management.	Financial support, human and physical resources, input on change control.
2	Steering Committee	Environmental Health	Provision of valid advice so as to ensure timely and successful creation of project deliverables.	Internal	High	High	Efficient use of project funds and resources, improvement in the number of homes in the community that practice proper solid waste management.	Assistance in critical decision making.

LLOYDS COMMUNITY HEALTH PROJECT								
Project Manager: Shantae Golding – Anderson				**Main Sponsor: Chief Public Health Inspector, St. Thomas Health Department**				
ID	**Stakeholder**	**Functional Area**	**Roles-Responsibilities**	**Category**	**Power**	**Interest**	**Expectations**	**Requirements**
3	Project Manager	Environmental Health	Application of project management best practices to the successful execution of the project.	Internal	High	High	Achievement of all project objectives in a timely manner and within budget.	Clear explanation of requirements and timely planning and documentation.
4	Project Team	Local Residents	Planning and execution of project work. Mobilization of community members to participate in project work.	Internal	Medium	High	Completion of project work in a timely manner.	Clear understanding of project objectives and requirements

LLOYDS COMMUNITY HEALTH PROJECT								
Project Manager: Shantae Golding – Anderson				**Main Sponsor: Chief Public Health Inspector, St. Thomas Health Department**				
ID	**Stakeholder**	**Functional Area**	**Roles-Responsibilities**	**Category**	**Power**	**Interest**	**Expectations**	**Requirements**
5	Community Members	Local Residents	Participation in health education sessions, project work	Internal	Medium	High	Improvement in the community's solid waste management practices. Decrease in the need to dump or burn solid waste.	Clear understanding of project objectives and requirements
6	St. Thomas Municipal Corporation	Regulatory Authority	Approval of request to construct communal solid waste receptacles on government land.	External	High	Low	Timely application for permission to build on government land.	Timely response to application for permission to build on government land.

LLOYDS COMMUNITY HEALTH PROJECT								
Project Manager: Shantae Golding – Anderson				**Main Sponsor: Chief Public Health Inspector, St. Thomas Health Department**				
ID	**Stakeholder**	**Functional Area**	**Roles-Responsibilities**	**Category**	**Power**	**Interest**	**Expectations**	**Requirements**
7	Member of Parliament	Political	Provision of government resources to aid in project work.	External	Low	Low	Improvement in the community's solid waste management practices. Decrease in the need to dump or burn solid waste.	Timely response to request for government resources.
8	Councilor, Yallahs Division	Political	Provision of government resources to aid in project work.	External	Low	Low	Improvement in the community's solid waste management practices. Decrease in the need to dump or burn solid waste.	Timely response to request for government resources.

LLOYDS COMMUNITY HEALTH PROJECT								
Project Manager: Shantae Golding – Anderson				**Main Sponsor: Chief Public Health Inspector, St. Thomas Health Department**				
ID	**Stakeholder**	**Functional Area**	**Roles-Responsibilities**	**Category**	**Power**	**Interest**	**Expectations**	**Requirements**
9	National Solid Waste Management Authority	Regulatory Authority	Provision of human resources and garbage collection trucks.	External	**Low**	**High**	Increase in the community's solid waste management storage capacity, additional collection point.	Weekly collection of solid waste. Collection of solid waste after cleaning up days.
10	Internship Field Supervisor	Environmental Health	Guidance for project manager in field activities.	External	**Low**	**High**	Project manager will execute duties in a timely and efficient manner.	Successful completion of project, with the time and budget constraints.

LLOYDS COMMUNITY HEALTH PROJECT								
Project Manager: Shantae Golding – Anderson				**Main Sponsor: Chief Public Health Inspector, St. Thomas Health Department**				
ID	**Stakeholder**	**Functional Area**	**Roles-Responsibilities**	**Category**	**Power**	**Interest**	**Expectations**	**Requirements**
11	Internship Academic Supervisor	Academics	Guidance for project manager in academic such as planning and reporting.	External	High	Low	Project manager will execute duties in a timely and efficient manner.	Timely submission of progress reports. Project deliverables must meet quality requirements.
12	Community Business Operators	Business	Provision of welfare items such as food and drinks for workdays.	External	Low	Low	Increased collection of solid waste, a cleaner environment, a reduction in rodent and cockroach proliferation.	Timely request for welfare items.

LLOYDS COMMUNITY HEALTH PROJECT								
Project Manager: Shantae Golding – Anderson				**Main Sponsor: Chief Public Health Inspector, St. Thomas Health Department**				
ID	**Stakeholder**	**Functional Area**	**Roles-Responsibilities**	**Category**	**Power**	**Interest**	**Expectations**	**Requirements**
13	Suppliers	Business	Provision of construction material and metal drums for project.	External	Low	High	Financial gain	Social responsibility and fairness in procurement process.

Following the creation of the stakeholder register, a power and interest grid was done to further explain the concepts of power and interest as it relates to each stakeholder identified. The chart below is the power and interest matrix for the project. An explanation is provided for each stakeholder as to why the level of power and interest is so assigned.

Chart 34 Stakeholder Power/Interest Matrix (Source: C. Gordon, The Author, October 2021)

Stakeholders		Classification		Comments
		Power	Interest	
1	**Project Sponsor St. Thomas Health Department**	**High**	**High**	The project sponsor is categorized as high power, high interest because of the decision-making authority that the organization holds and the fact that the organization has made financial investments in the project. As the project sponsor, the Health Department must be managed closely and kept informed, especially if there is need for changes during project execution. The have high interest in the project as they would like to see a return on their investment.
2	**Steering committee**	**High**	**High**	The steering committee has a high-power rating because they will be actively involved in decisions made throughout the project. They have a high interest in the project because of their association with the St. Thomas Health Department. The success of the project would provide a return on investment for the organization and the improvement in the community health status is also of great benefit to the organization.
3	**Project Manager**	**High**	**High**	The project manager is categorized at high power because this person has the authority to make pertinent project decisions. The level of interest is also high because if the project is successful, the project manager will graduate from the University of Technology, Jamaica and be hired to the St. Thomas Health Department.

Stakeholders		Classification		Comments
		Power	Interest	
4	**Project Team**	**Medium**	**High**	The project team has a medium level of power as they would have given the project manager the authority to make pertinent decisions to but they do contribute to decision making by making suggestions to the project manager. They also have the potential to cause delays in project execution if they are not properly engaged. The team however has a high interest because they are members of the community and the project stands to give them benefits such as improved environmental health and beautification of the community.
5	**Community Members**	**Medium**	**High**	Community members have a medium level of power because even though they do not have decision making authority, they have the potential to protest any decision that they deem a risk to their health or wellbeing. The community members have a high level of interest as the project will alleviate the problem of poor solid waste management in the community. It is critical to keep community members informed of project happenings and to keep them engaged throughout the project.
6	**St. Thomas Municipal Corporation**	**High**	**Low**	The Municipal Corporation has a high level of power as it is a regulatory agency and holds the authority to deny the project team permission to build on government owned lands. They do, however, have a low interest in the project because they do not stand to benefit from the project. The Corporation has to be monitored to ensure that the permission is granted before construction begins.

Stakeholders		Classification		Comments
		Power	Interest	
7	**Member of Parliament**	**Low**	**Low**	The Member of Parliament for the Eastern Division of St. Thomas has a low level of power as he does not have any decision-making authority with regards to the project. He does however have a low level of interest because the community members are members of his constituency and as a member of government, part of his responsibility is to see to the welfare of these people.
8	**Councilor, Yallahs Division**	**Low**	**Low**	The Councilor for the Yallahs Division has a low level of power as he does not have any decision-making authority with regards to the project. He does however have a Low level of interest because the community members are members of his division and as their political representative, part of his responsibility is to see to the welfare of these people.
9	**NSWMA**	**Low**	**High**	The NSWMA does not have the authority to make pertinent decisions as it relates to the project. However, they are assigned a Low level of power because it is possible for the authority to choose not to participate or lend any assistance to the project team. They do, however, hold a high level of interest as the organization stands to benefit from the increased storage capacity to be garnered from the project. The organization must be actively engaged and informed throughout the project as there is need for their participation.

Stakeholders		Classification		Comments
		Power	Interest	
10	**Internship Field Supervisor**	**Low**	**High**	The internship field supervisor does not have any decision-making authority and so they are assigned a low power status. The supervisor has to be kept informed throughout the project as they are responsible for the verification of project deliverables. The level of interest is deemed high as the supervision of the Project Manager is a job responsibility of the internship field supervisor. The supervisor's performance in this role is appraised by the Human Resource Manager.
11	**Internship Academic Supervisor**	**High**	**Low**	The Academic supervisor holds the authority to make decisions. They are given a high-power rating. The supervisor has to be kept informed throughout the project as they are responsible for the verification of deliverables and will give the Project Manager their final grade. They do however have Low interest in the project as they do not stand to benefit if the project is successful.
12	**Community Business Operators**	**Low**	**Low**	Community Members do not have any decision-making authority or influence over the project. Therefore, they fall in the low power category. They are assigned a Low interest categorization because their participation in the project can bring them benefits such as increased clientele and a good reputation in the community.
13	**Suppliers**	**Low**	**High**	Suppliers will not have any decision-making authority. Therefore, they are categorized as low power. They are considered to have a high interest in the project because they stand to gain financially.

4.10.3 Plan Stakeholder Engagement

The stakeholder register and power/interest matrix was used to create a Stakeholder Engagement Assessment Matrix. The Project Manager will use this matrix as a guide to decide the strategies needed to get each stakeholder to the ideal level of engagement, so as to ensure stakeholder satisfaction and eventually, project success. In the table below, the current level of engagement is represented by the letter C and the desired level is represented by D.

Chart 35 Stakeholder Management Assessment Matrix (Adapted from PMI, 2017)

ID	Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
1	Project Sponsor				DC	
2	Steering Committee				DC	
3	Project Manager					DC
4	Project Team					DC
5	Community Members	C			D	
6	St. Thomas Municipal Corporation	C			D	
7	Member of Parliament	C			D	
8	Councilor, Yallahs Division	C			D	
9	National Solid Waste Management Authority	C			D	
10	Internship Field Supervisor			C	D	
11	Internship Academic Supervisor			C	D	
12	Community Business Operators	C			D	
	Suppliers	C			D	

4.10.4 Manage Stakeholder Engagement

Stakeholder engagement will prove to be an integral part of the Lloyds Community Health project as it is the foundation for developing the and maintaining the deliverables of the project.

Based on information garnered from the Stakeholder register, Stakeholder Engagement Assessment Matrix and the Stakeholder Power/Interest Grid seen in Figure 11 below, the stakeholder engagement plan was developed.

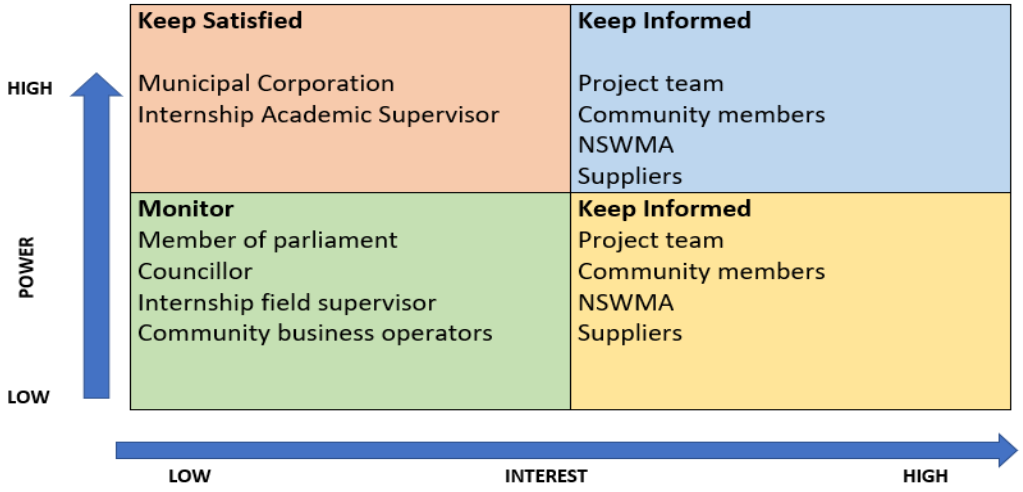


Figure 13 Stakeholder Power and Interest Grid (Source: C. Gordon, The Author, October 2021)

Chart 36 Stakeholder Engagement Matrix (Source, C. Gordon, The Author, October 2021)

ID	Stakeholder	Project Phase	Engagement Approach	Engagement Tools	Frequency
1	Project Sponsor	All	Consult	Meetings Emails	Frequent
2	Steering Committee	All	Consult	Meetings Emails	Frequent
3	Project Manager	All	Consult	Meetings Emails	Frequent

ID	Stakeholder	Project Phase	Engagement Approach	Engagement Tools	Frequency
				Text Messages	
4	Project Team	All	Consult	Meetings Emails Text messages Phone calls	Very Frequent
5	Community Members	All	Consult, collaborate	Meetings Emails Text messages Phone calls Town-cry Posters Information pamphlets	Very Frequent
6	St. Thomas Municipal Corporation	Planning Phase	Consult	Letters Emails	Frequent
7	Member of Parliament	Implementation Phase	Dialogue	Letters Emails Phone calls Visit to Office	Less frequent
8	Councilor, Yallahs Division	Implementation Phase	Dialogue	Letters Emails Phone calls Visit to Office	Less frequent
9	National Solid Waste Management Authority	Planning Phase	Consult, collaborate	Letters Emails Phone calls Visit to Office	Frequent
10	Internship Field Supervisor	All	Consult, dialogue	Emails Phone calls Text Messages Meetings Weekly Progress reports	Very Frequent

ID	Stakeholder	Project Phase	Engagement Approach	Engagement Tools	Frequency
11	Internship Academic Supervisor	All	Consult, dialogue	Emails Phone calls Text Messages Meetings Weekly Progress reports	Very Frequent
12	Community Business Operators	Planning	Consult, collaborate	Emails Text messages Meetings Phone calls	Frequent
13	Suppliers	Planning	Consult, collaborate	Contracts Emails Text messages Meetings Phone calls	Very Frequent

4.10.5 Monitor Stakeholder Engagement

Monitor Stakeholder Engagement is the process of monitoring project stakeholder relationships and tailoring strategies for engaging stakeholders through modification of engagement strategies and plans (PMI ,2017, p.530). The level of engagement is expected to change throughout the lifecycle of the project. However, it is critical that the stakeholders do not become disengaged at any time. This will require various communication strategies.

One way to ensure the levels of engagement are transitioning smoothly through the use of meetings. Stakeholders will also be invited to the project meeting, during which the most appropriate means of engagement will be discussed. The other communication media highlighted in the Communication Management Plan will also be used as a means of monitoring stakeholder engagement. Stakeholders will be able to provide direct feedback to the project manager and project team through the use of email, text messages and site visits.

5 CONCLUSIONS

1. The first subsidiary plan, the Integration Management Plan, involved the creation of a project charter which can be readily applied to the Lloyds Community Health Project. The project charter will be particularly useful to the St. Thomas Health Department, as prior its development, project approval was garnered through the use of a project proposal template. The proposal template has proven to be inadequate for proper project management as it does not speak to key areas such as risk management, quality management or communication management. The Integration management plan also gives guidance of the change control process. Prior to its development, change control was the responsibility of the project team which led to conflicts, missed deadlines and unmet project objectives.

2. The scope management was useful in identifying, defining, and organizing the project work that has to be done for the Lloyds Community Health Project In previous internship projects, project scope was defined using a workplan template provided by the University of Technology, Jamaica which was not detailed in nature. The scope management plan will be beneficial as it provides detailed breakdown of the proposed project work in the form of the WBS. Concise, comprehensible definitions of the proposed project work in the form of the WBS dictionary. This is particularly important as the Community Health Committee is composed of both skilled and unskilled workers. The scope management plan will greatly assist the project team in understanding exactly what work needs to be done to achieve project objectives. In addition, it promotes a formal change control process which will significantly improve change control in the Department’s projects

3. The schedule management plan provides clear definitions of project activities and outlines the time needed to complete each. Prior to the development of a Schedule management plan, the project was controlled through the use of an action plan template provided by the University of Technology, Jamaica. The action plan provided a general description of project milestones and the proposed dates of achievement. This schedule management plan provides detailed activity list which breaks down project work packages into activities which was not a requirement for the internship project in previous years. The Gantt chart created presents the work packages in terms of the estimated duration of time needed. This will improve the probability of the project manager meeting project schedule goals and completing the project in time to meet the University's graduation requirements and the Health Department's employment requirements.

4. The cost management plan will evoke change in the way in which the project manager plans, monitors and controls the project budget. Previously, a very simple budget was required as a part of the project proposal. This budget provided no information on how to control project finances. The plan introduces the concept of a contingency reserve which is not taught by the University or practiced by the Health Department. The plan also proves to be useful in introducing the concept of cost performance measurement, which was never a consideration in internship projects. Rather than the usual reactive approach to the management of the project budget, the plan also promotes the proactive approach usually associated with proper project management. One example is the guidance the plan provides for cost variance response process which clearly states the indicators for corrective action. This will prevent overspending and waste of funds.

5. The quality management plan explicitly states the quality requirements for each deliverable of the project. UTECH provides an internship manual which states the quality requirements for Health Education as a deliverable but there is no information provided for the other deliverables including the solid waste receptacles. Information on quality requirements for these deliverables are usually provided during the Solid Waste Management module of the Environmental Health Programme and the Project Manager would have to carry out research to decipher these standards. The quality management plan therefore saves the Project Manager time by presenting the quality requirements for all the deliverables and providing feasible, affordable means through which project quality will be assured and controlled.

6. The resource management plan will prove beneficial as the resource management currently practiced by the Health Department is inadequate. The UTECH Internship manual merely provides information on how to acquire the project team but failed to provide guidance on the management of physical resources. This resource plan provides comprehensible guides for the management of both human and physical resources. This will set a precedence going forward to ensure that during the execution of the project both types of resources are seen as priority so as to protect and promote the efficient and effective use of both types of resources.

7. A communication management plan was developed to prevent breakdown in communication due to the diversity in stakeholders and the fact that they would be working together for the first time as a team. The plan will facilitate efficient communication within the project team, which will be composed of people from different careers, different political influences, different religious influences.

8. The risk management plan will help to change the current management of project risks practiced by the St. Thomas Health Department. The UTECH internship project manual does not highlight risk management as an important aspect of the community health projects. The internship manual which is used to guide these projects does not mention risk management. The risk management plan introduces the concept of project risk and provides a template for the identification and documentation of project risk which did not exist in the Department before. This is particularly important as uncontrolled risks can lead to project failure.

9. Procurement management for the Lloyds Community Health Project is more extensive than merely purchasing items needed to create project deliverables. The procurement management plan developed will serve as guide for the creation and award of contracts. This will prevent the risk of being unable to source items in a timely manner or having a supplier run out of the particular item needed. Suppliers will be mandated to supply the items due to the legal nature of the contracts. This project management plan can set a precedence for other community health projects to ensure that contracts are drafted and enforced during the procurement process.

10. Stakeholder engagement is an integral part of the Lloyds Community Health Project because there are different stakeholders from various government agencies, the community, the project team it is therefore necessary to devise a plan of engagement to prevent stakeholders from becoming disengaged. The plan will be beneficial in finding the most suitable ways to engage each group or individual.

6 RECOMMENDATIONS

1 The St. Thomas Health Department should create and implement a Project Management Methodology to ensure the good practices outlined by the project management institute (PMI) and the PMBOK Guide ® are used for future projects.

2 The Project Manager (Public Health Inspector Intern) must ensure that the project management plan is strictly adhered to.

3 The Internship Field Supervisor must conduct assessments of each PHI Intern to determine their level of project management knowledge before the project period.

4 The Environmental Health Programme Director at the University of Technology, Jamaica should develop project management training modules which include the use of project management tools and techniques as part of the internship programme.

5 The Environmental Health Programme Director at the University of Technology, Jamaica should ensure that training is provided for each Internship Field supervisor to ensure they have a thorough understanding of the project management plan inclusive of the use of the templates.

6 The Chief Public Health Inspector should create a collection of Internship Project Management plans and templates to be stored on the Health Department’s data cloud and can be accessed by all Project Managers (Interns).

7 The Chief Public Health Inspector should initiate the archiving of hard copies of the projects conducted by PHI Interns.

8 The Chief Public Health Inspector and Internship Field Supervisor must ensure that the project management plan developed is only applied to the Lloyds Community Health Project. It should not be applied uniformly to all projects of the department; each unit within the department is responsible for creating project management plans by determining what is appropriate for any given project.

9 The Project Manager must consult the author of this project before making any changes to the Project Management plan or any of the templates included.

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11 APPENDICES

Appendix 1: FGP Charter

PROJECT CHARTER	
Date:	**Project Name:**
May 10, 2021	Project Management Plan for a Solid Waste Management Project in Lloyds, St. Thomas.
Knowledge Areas / PM Processes:	**Application Area (Sector / Activity):**
Knowledge areas: Integration, Scope, Schedule, Cost, Quality, Resource, Communication, Risk, Procurement, Stakeholder. **PM Processes:** Initiation, Planning, Monitoring, Control	Environmental Health
Project Start Date:	**Project Finish date:**
May 10, 2021	November 4, 2021
Project Objectives (General and Specific):	
General Objective: To develop an integrated project management plan for a sustainable solid waste management project to alleviate illicit dumping and burning of solid waste in Lloyds, Jamaica. **Specific Objectives:** 1. To develop an integration management plan to unify and coordinate the processes and project management activities during the project.	

2. To create a scope management plan that ensures that the project includes all the work required and only the work required for project success.
3. To create a schedule management plan to ensure the timely completion of the project.
4. To develop a cost management plan to ensure that project funds are appropriately controlled.
5. To create a quality management plan to identify quality requirements and document how project deliverables will comply with said requirements.
6. To create a resource management plan to guide the identification and acquisition of both human and physical project resources.
7. To develop a communication management plan to ensure timely creation and dissemination of project information to stakeholders.
8. To develop a risk management plan which will identify, analyze and plan responses to potential risks.
9. To create a procurement management plan to administer contracts to the most suitable suppliers.
10. To develop a stakeholder management plan to effectively identify, categorize and engage the various project stakeholders.

Project purpose or justification (merit and expected results):

A solid waste management system that serves a residential area should facilitate the appropriate storage, collection and disposal of refuse. Unfortunately, there have been issues in all three of these processes in the community of Lloyds for over twenty years. The problem stemmed from the infrequency of refuse collection by the National Solid Waste Management Authority (N.S.W.M.A.) trucks designated to the community. The problem is further compounded by a lack of communal waste receptacles. As such, there is nowhere for residents to store refuse in the event that the receptacles in their home/yard become full. As a result of the deficiencies in collection and storage residents have resorted to the inappropriate disposal practices of burning and dumping.

A community survey done by the Public Health Inspector Intern at the St. Thomas Health Department revealed that 30% of residents have had solid waste accumulated in their yards or engage in illicit dumping. Another 26% of premises inspected had active burning sites. A project management plan will therefore be developed to guide a sustainable intervention project to alleviate these problems. This project management plan will assist the public health intern in conducting a project that empowers community members to work towards improving the

environmental health status of their community thereby creating an environment conducive to their health and wellness.

Description of Product or Service to be generated by the Project – Project final deliverables:

An integrated project management plan which contains nine subsidiary plans to be used as a framework to guide the sustainable solid waste management project to alleviate illicit dumping and burning of solid waste in Lloyds, St. Thomas.

Assumptions:

- The project can be completed within the 4 months designated by the University.
- The project can be done using the good practices presented in the Project Management Book of Knowledge (PMBOK® Guide).
- The St. Thomas Health Department will be willing to incorporate the information provided in the project in the internship programme.
- There will be frequent and adequate communication between the facilitator and writer of the project.
- The project can be done at no cost to the organization.

Constraints:

- Time - The project has to be completed within 4 months.
- Cost- The project is being done at no cost to the St. Thomas Health Department despite the need to visit the study area.

Preliminary Risks:

1. If the project deliverables are not completed and submitted on time the corresponding points for the course grade will be lost.
2. If the student does not understand the weekly objectives, this will cause a delay in the time taken to complete deliverables.

3. If the project corrections are not made in a timely manner there might be a delay in submitting deliverables.

Budget:

The project management plan will be done free of cost as the plan will not incur any expense on the writer and will be done as a contribution to the St.Thomas Health Department Internship Programme.

Milestones and dates:

Milestone	Start date	End date
1. Graduation Seminar	May 10,2021	June 13, 2021
2. Tutoring Process	July 19, 2021	September 22, 2021
3. Reading by Reviewers	September 23, 2021	October 8, 2021
4. Adjustments	October 9, 2021	October 29, 2021

Relevant historical information:

The organization for which the project management plan is being developed is the St.Thomas Health Department. This government agency is responsible for enforcing the Environmental and Public Health regulations and protecting the health and safety of residents in the Jamaican parish of St.Thomas. Each year through its internship programme, the department surveys communities in a bid to implement a project that alleviates at least one environmental health problem.

Stakeholders:

Direct stakeholders:

Cleodeen Gordon , Project Manager

Intern Public Health Inspector

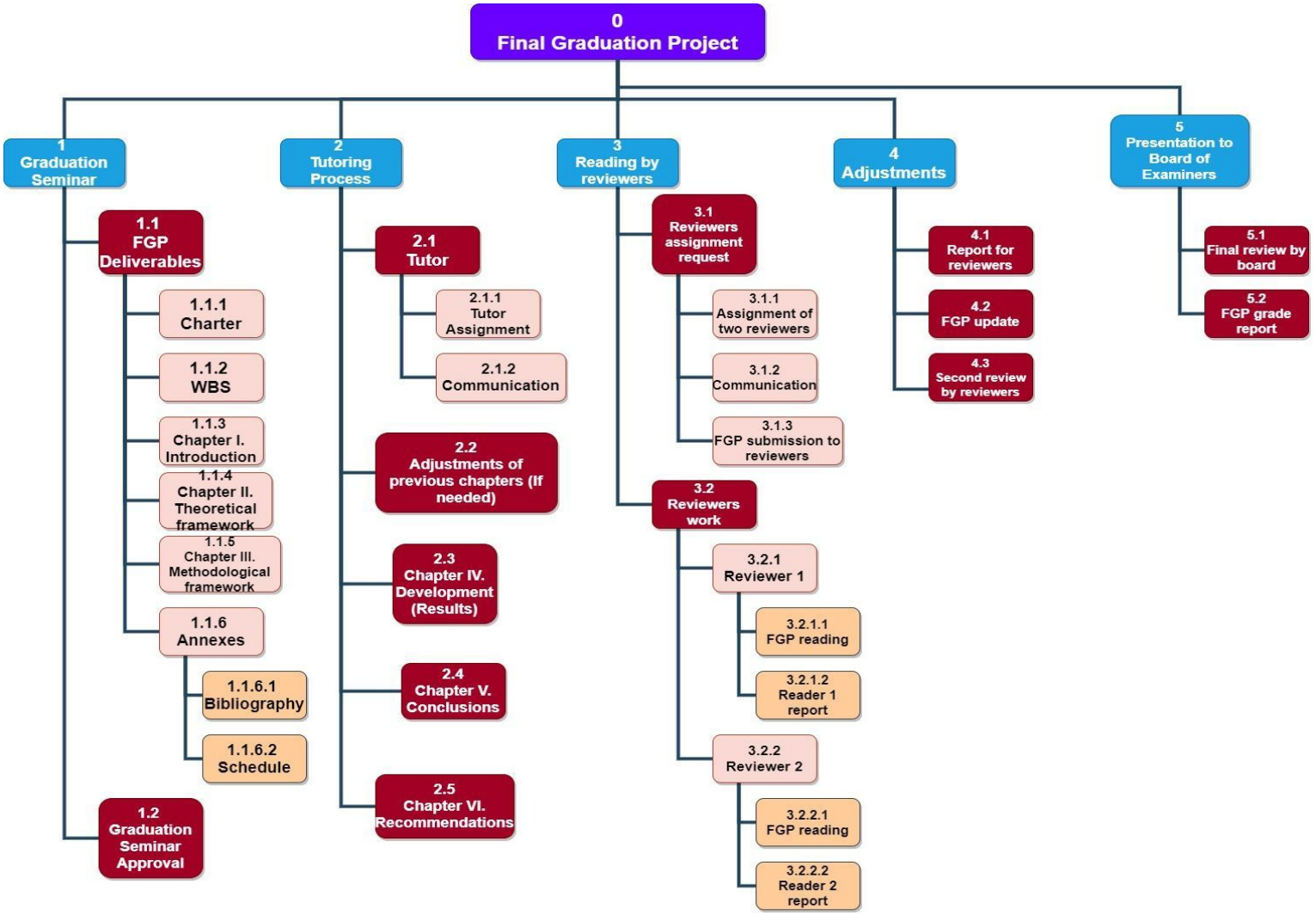
St. Thomas Health Department

Indirect stakeholders:

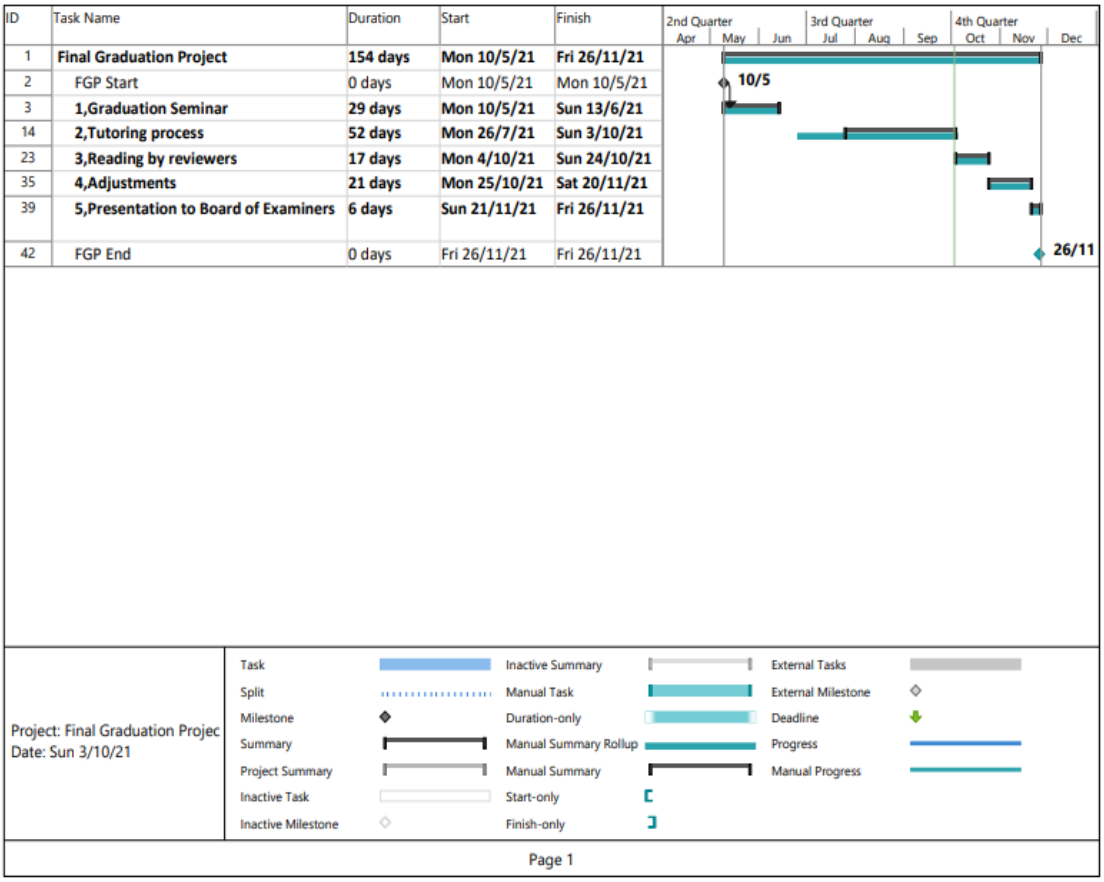
Residents of Lloyds

St. Thomas Municipal Corporation National Solid Waste Management Authority	
Approval:	
Project Manager: Cleodeen Gordon	Signature: C. Gordon
Authorized by:	Signature:

Appendix 2: FGP WBS



Appendix 3: FGP Schedule



ID	Task Name	Duration	Start	Finish
1	**Final Graduation Project**	**154 days**	**Mon 10/5/21**	**Fri 26/11/21**
2	FGP Start	0 days	Mon 10/5/21	Mon 10/5/21
3	**1,Graduation Seminar**	**29 days**	**Mon 10/5/21**	**Sun 13/6/21**
14	**2,Tutoring process**	**52 days**	**Mon 26/7/21**	**Sun 3/10/21**
23	**3,Reading by reviewers**	**17 days**	**Mon 4/10/21**	**Sun 24/10/21**
35	**4,Adjustments**	**21 days**	**Mon 25/10/21**	**Sat 20/11/21**
39	**5,Presentation to Board of Examiners**	**6 days**	**Sun 21/11/21**	**Fri 26/11/21**
42	FGP End	0 days	Fri 26/11/21	Fri 26/11/21

Project: Final Graduation Projec
Date: Sun 3/10/21

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress

Page 1

Appendix 4: Change Request Form

Project Name:			
Requested by:		Date:	
Request Number:		Name of request:	
Change Description:			
Change Reason:			
Impact of change:			
Proposed Action:			
Status	In Review	Approved	Rejected
Approval date:			
Approved by:			

Appendix 5: Lesson Learned Register Template

ID No.	Event	Date Raised	Recommendations	Actions Taken	Owner	WBS ID	Status

Appendix 6: Rating Scale used to Control Quality of Health Education

UNIVERSITY OF TECHNOLOGY, JAMAICA

SCHOOL OF PUBLIC HEALTH & HEALTH TECHNOLOGY

PUBLIC HEALTH INSPECTION INTERNSHIP PROGRAMME

Intern Evaluation Instrument by Field Supervisor

RATING SCALE – HEALTH EDUCATION (60 POINTS)

Name of Intern:		**Name of Supervisor:**		**Health Department:**		**Community**
Component:	**5**	**4**	**3**	**2**	**1**	**Remarks**
3.1 Identifies needs for Health Education based on problems found in the study area						
3.2 Selects Target groups according to problems and needs identified						
3.3 Plans educational sessions based on problems and needs identified						
3.4 States the objectives of the Health Education session clearly and specifically						
3.5 Selects appropriate literature/teaching aid for educational session						
3.6 Employs appropriate educational						

Name of Intern:		**Name of Supervisor:**		**Health Department:**		**Community**
Component:	**5**	**4**	**3**	**2**	**1**	**Remarks**
strategies based on the particular environmental health problem						
3.7 Presents accurate information regarding the topic being taught						
3.8 Using teaching aids appropriately and effectively						
3.9 Communicates clearly at a level appropriate for the learners						
3.10 Demonstrates skills in gaining and holding the attention of the learners						
3.11 Evaluates the effectiveness of the educational session						

Appendix 7: Quality Assurance Log

Process Assessment #1	Date	Process Measured	Required Value	Actual Measured	Acceptable? (Y/N)	Recommendation	Date Resolved

Appendix 8: Quality Control Log

Deliverable #1	Date	Item Measured	Required Value	Actual Measured	Acceptable? (Y/N)	Recommendation	Date Resolved

Appendix 9 Communication Survey

Lloyds Community Health Project

Communication Survey

Dear Participant, this survey is aimed at getting your feedback on communication management of the Lloyds Community Project. Please fill out the required sections and place a tick in the response of your choice.

Name:	**Company/Team:**	**Date:**

1. Which best describes your impression of communication within the project?

   () Keeps us fairly informed

   () Keeps us adequately informed

   () Gives us only a limited amount of information

2. Do you receive project information in a timely manner?

   () yes () no

3. How do you feel about the information you receive?

   () I can almost always believe it

   () I can't usually believe it

   () I can always believe it

4. How do you rate the project manager's communication skills?
   () Excellent

   () Very good

   () Good

   () Fair

   () Poor

Name:	**Company/Team:**	**Date:**
5. How do you currently get information about the project?		
6. Do you have any suggestions to improve project communication?		
Signature:		

Appendix 10 Vendor Performance Rating Scale

Vendor	Material Quality	Delivery Time	Material Cost	Customer Service

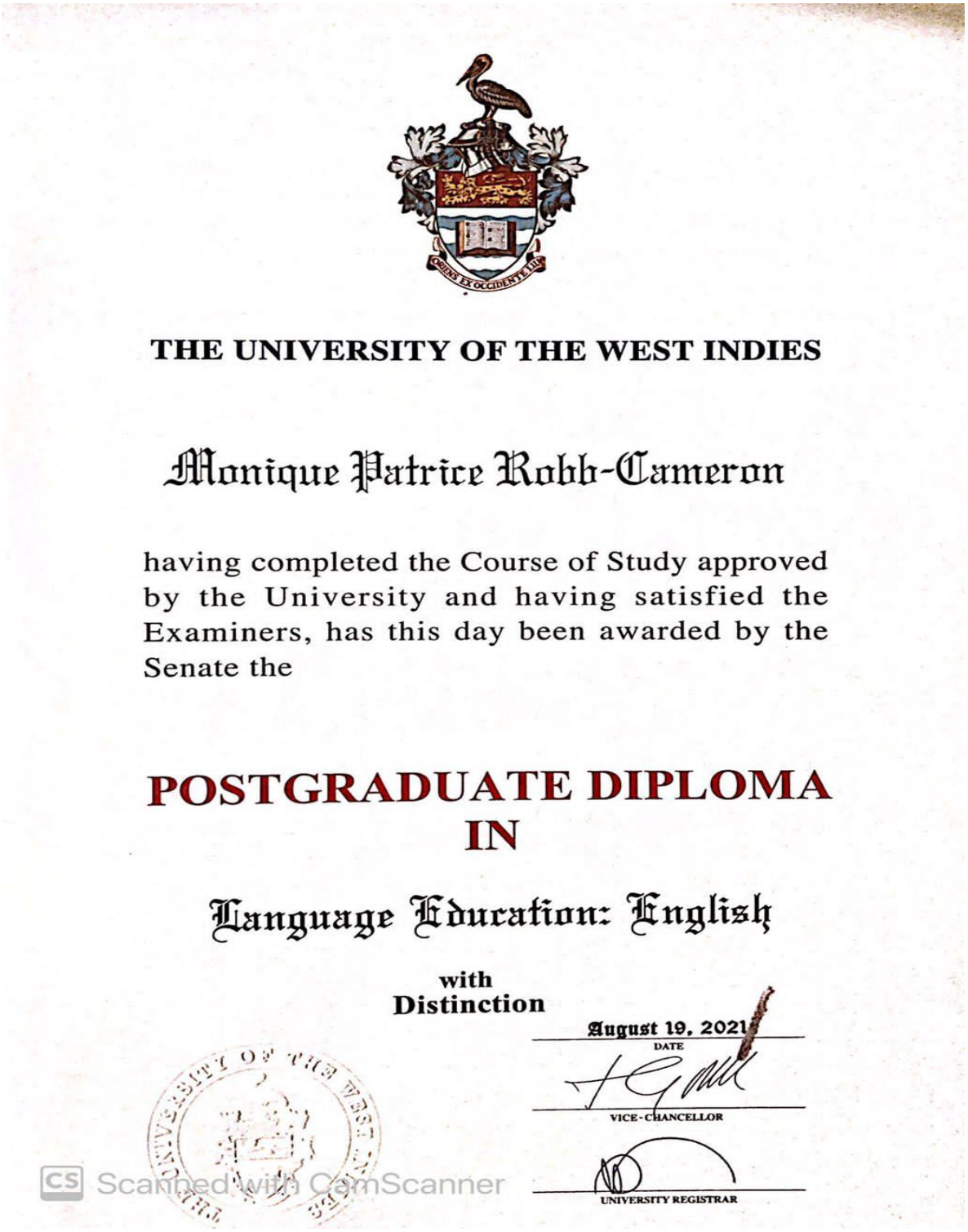
Rating Scale:

1- Poor

2- Satisfactory

3- Exceptional

Appendix 11 Philologist Credentials



THE UNIVERSITY OF THE WEST INDIES

Monique Patrice Robb-Cameron

having completed the Course of Study approved by the University and having satisfied the Examiners, has this day been awarded by the Senate the

POSTGRADUATE DIPLOMA IN

Language Education: English

with Distinction

August 19, 2021
DATE

VICE-CHANCELLOR

UNIVERSITY REGISTRAR

Appendix 12 Revision Dictum

Greater Portmore,
St. Catherine,
Jamaica, W.I.

November 12, 2021

To Whom It May Concern:

This is to notify you that with over 7 years as an English Language and Literature teacher, I have reviewed Ms. Cleodeen Gordon's Final Graduation Project, making structural, typographical and grammatical errors where necessary.

I hold a Post Graduate Diploma in Language Education : English (with Distinction) from the University of the West Indies. A copy of same is attached.

Sincerely,

MRobb-Cameron

Monique Patrice Robb-Cameron (Mrs.)