UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

PROJECT MANAGEMENT PLAN
FOR THE
PREPARATION OF AN ENVIRONMENTAL DISPOSAL MANUAL
FOR THE
JAMAICAN ENERGY SECTOR PROJECT

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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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DEDICATION

I dedicate this project to every single female parent who has ever failed at a significant milestone but had the courage to pick themselves up and start over again. This project is a reminder to you, that you can do it. You can achieve, you can be successful if you put your mind to it, and apply yourself with discipline under God.

To my undergraduate lecturer at the University of the West Indies, Mona Campus, who was willing to recommend me for this course and in so doing, afforded me a second chance; Professor Anthony Harriott, I appreciate you.

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To friends like Christopher Sutherland, who taught me the finer points of MS Projects and Excel, I am indebted.

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Thank you all.

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ABBREVIATIONS AND ACRONYMS

AC	Air Conditioning
AHU	Air Handling Unit
CMP	Cost Management Plan
COMP	Communications Management Plan
CR	Cool Roof
EA	Executing Agency
EC	Energy Conservation
EDM	Environmental Disposal Manual
EE	Energy Efficiency
EECP	Energy Efficiency and Conservation Programme
EECTA	Energy Efficiency and Conservation Technical Assistance
EO	Environmental Officer
FO	Financial Officer
GOJ	Government of Jamaica
IDB	Inter-American Development Bank
MSET	Ministry of Science, Energy and Technology
MOE	Ministry of Education
MOF	Ministry of Finance
MOFPS	Ministry of Finance and the Public Service
NCC	National Contracts Commission
NPHL	National Public Health Lab
OPM	Office of the Prime Minister
PC	Project Coordinator
PCJ	Petroleum Corporation of Jamaica
PEU	Project Execution Unit
PM	Project Manager
PMP	Project Management Plan
PS	Permanent Secretary
PSA	Public Service Announcement
QMP	Quality Management Plan
RFP	Request for Proposals
RKMP	Risk Management Plan
RMP	Resource Management Plan
SCF	Solar Control Film
SBD	Standard Bidding Documents
SMP	Scope Management Plan
SRFP	Standard Request for Proposals
STKMP	Stakeholder Management Plan
SMP	Schedule Management Plan
TO	Technical Officer
TOR	Terms of Reference

EXECUTIVE SUMMARY (ABSTRACT)

The GOJ through the Ministry of Science, Energy and Technology (MSET), obtained funding from the Inter-American Development Bank (IDB) to design and implement EE and EC measures to improve energy efficiency and conservation (EEC) in government owned buildings and to ultimately lead to substantial cost reductions in public sector operations. This led to the establishment of the Energy Efficiency and Conservation Programme (EECP)
The EECP contracted consultancy services to develop a manual to manage the disposal of hazardous waste in the energy sector. The project was to be implemented in six (6) months however, the project failed as the consultancy deliverables did not fulfill the scope of work, and subsequent revisions to the document did not achieve the desired standard before the contract expired. This unsuccessful initiative cost the Government of Jamaica an estimated US$10,000 and presented delays on the overall EECP project schedule.

As this project is on the critical path for the EECP, the activity has to be re-done. The development of a Project Management Plan (PMP) has been recommended as a lesson learned from the first attempt at executing this project. The PMP when completed will assist by outlining pertinent project tools and techniques and is expected to contribute to successful project implementation the second time around.

The Energy Efficiency and Conservation Programme (EECP) has been executing construction and works projects using a PMP developed and submitted by contractors. The EECP in the past has taken the risk of not preparing its own PMP to manage these contracts, because given the nature of construction and works contracts; there are few changes that the EECP would make in respect of what the contractor submitted. Recommended changes to the project are usually generated at site visits, which are Minuted.

However, this is not the case for consultancy assignments, where variations and issues to do with acceptance of deliverables depend on following established protocols, including peer reviews, national public consultations, legal and sector specific consultations among others. In consultancy assignments therefore, there are more risky variables and issues to control, and this is the reason that a PMP is required to manage the consultancy assignment for the development of national guidelines.

The general objective of this assignment is to develop a Project Management Plan (PMP) to guide the preparation of an Environmental Disposal Manual for the Energy Sector Project. There are also several specific objectives, which will assist in meeting this overall goal. The specific objectives include constructing a scope management plan, creating a schedule management plan, preparing a cost management plan; establishing a quality management plan, articulating resource management plan, generating a communication management plan and a risk management plan; and lastly, developing risk and stakeholder management plans.

For this assignment, the student has a wide variety of information sources to utilize, however it is imperative that the information be accurate and from reputable sources. Information will be gleaned from primary and secondary data. This Final Graduation Project mainly uses interviews with select stakeholders as a primary source of information. Secondary data used in this FGP are the PMBOK Guide, Fifth and Sixth Editions, the internet, historical project files, meeting notes and documents; the previous terms of reference, bid document and proposal.

A research method provides a scientific framework to pursue a course of inquiry. According to www.research-methodology.net, research methods are broadly categorized as qualitative and quantitative depending on the nature of the study to be carried out. The analytic-synthetic method, adopted for the Final Graduation Project, in that the development of the PMP is broken down in manageable pieces and then re-grouped as a whole.

The in depth planning for the Project Management Plan for the Environmental Disposal Manual, carried out in this document has set the stage for a successful project outcome. The general objective has been achieved by the development of a Project Management Plan (PMP) to guide the project of preparing an EDM for the Energy Sector. The specific objectives have been realized through the successful preparation of scope, time, cost, quality, resource, communication, risk and stakeholder management plans, respectively. The plans have been appropriately supported by the inclusion of tables, charts and figures as well as a change request template to monitor and control various processes in the project.

The author recommends to the Group General Manager of the Petroleum Corporation of Jamaica and the Chief Technical Director, Ministry of Energy, Jamaica the adoption of this work as an organizational process asset. Also, that the lessons learned from this exercise be added to the community of project management practice within the entities. Further that PMI principles be consistently used for capital and non-capital investment projects. It is also recommended that the policy decision to adopt these recommendations be strengthened by including these outputs as criteria for assessment in annual staff performance appraisals. Lastly, that all support be given to advancing research into quality metrics for non-capital investment projects, which are also significant in number in the Jamaican energy sector. It is the firm belief of this author that the adoption of these recommendations will enhance the number of projects successfully completed in the Jamaican energy sector.

1. Chapter 1: Introduction

The public sector in Jamaica accounts for approximately 16% of the country's electricity consumption. The monthly electricity bill for the GoJ in 2013 was estimated at US$13.9 million which in turn translated into an annual cost of US$166 million. A Study was conducted called the Energy Efficiency and Conservation Technical Assistance (EECTA) agreement. The overall objective of the EECTA was the identification and assessment of EE opportunities in the public sector. Given the data available, the assessment focused on electricity use and conservation. EE opportunities with an estimated potential savings of J$2.6 billion per year were identified, requiring capital expenditure of approximately J$9.6 billion, yielding a simple payback of 3.7 years (estimated) and a 24.7% reduction in public sector electrical energy consumption.

As a result of the above, the Government of Jamaica (GoJ) had an objective to encourage EE and EC measures and to make the GoJ a model for responsible use of energy through energy efficiency and conservation. The GOJ through the Ministry of Science, Energy and Technology (MSET), obtained funding from the Inter-American Development Bank (IDB) to design and implement EE and EC measures to improve energy efficiency and conservation (EEC) in government owned buildings and to ultimately lead to substantial cost reductions in public sector operations.

As a part of Component 1, Institutional Strengthening, the development of national guidelines to manage hazardous waste in the energy sector was an imperative of the project sponsor. It was intended that national guidelines would be established prior to the commencement of investments in EEC measures described under Component 2, as it would inform the disposal practices for contractors and suppliers responsible for installing new air conditioning systems and applying other EEC treatments.

The Energy Efficiency and Conservation Programme (EECP) was developed to design and implement energy efficiency (EE) and energy conservation (EC) measures to improve energy efficiency and conservation (EEC) in government owned buildings; which would ultimately lead to substantial cost reductions in public sector operations. The programme is comprised of the three Components described below:

Component 1: Strengthening the institutional capacities of the MSET for the implementation of EE and EC measures.

Component 2: Supporting investments in EE and EC measures in the public sector.

Component 3: Increasing awareness and knowledge on EE and EC among key public and private stakeholders, together with the provision of demand-side management support.

As a part of Component 1, Institutional Strengthening, the development of national guidelines to manage hazardous waste in the energy sector was an imperative of the project sponsor. It was intended that national guidelines would be established prior to the commencement of investments in EEC measures described under Component 2, as it would inform the disposal practices for contractors and suppliers responsible for installing new air conditioning systems and applying other EEC treatments. The EECP commenced in November 2011 and in 2015, the partnership with the GOJ ended. However, the GOJ assumed the role of project sponsor and continued to finance project implementation.

The first attempt at developing the guidelines began in 2017 after most of the investments were completed. However, there was still value to be obtained from the assignment, as the guidelines would fill a gap in the energy sector, strengthen institutional capacity for environmental issues, which surfaced because of the investments in EEC. Ultimately, the publication of guidelines would form part of a sustainability strategy for the GOJ.

The EECP contracted the services of a consultant to develop the National Guidelines, however the deliverables submitted did not meet the required standard and the contract was not renewed after expiration.

It is to be noted that the project sponsor subsequently established the project end date for the EECP at March 31, 2019. As the development of the guidelines is a part of the critical path for the project, it must be completed before that date. The EECP now needs to commence a second project initiation for the development of the guidelines. The TOR used for the first project and the reports submitted under that consultancy are available to the Project team as needed for the seconded attempt at this assignment.

1.1 Statement of the problem

The Energy Efficiency and Conservation Programme (EECP) has been executing construction and works projects using Project Management Plans (PMPs) developed and submitted by contractors. These contractors developed PMPs however, are intended to guide the contractor in implementation, and do not reflect the EECPs inputs, tools, techniques and outputs for their management of the work. The EECP has in the past taken the risk of not preparing its own PMP to manage these contracts, because given the nature of construction and works contracts, there are few changes that the EECP would make in respect of what the contractor submitted. EECP changes are articulated through documented site visits.

However, this is not the case for consultancy assignments, where variations and issues to do with acceptance of deliverables depend on following established protocols, including peer reviews, national public consultations, legal and sector specific consultations among others. The discourse raised in these various consultations have the potential to discredit the guidelines being developed, marginalize specific stakeholders, create losses in the private sector by recommending policy changes, among others. In consultancy assignments therefore, there are more risky variables and issues to control and this is the

reason that a PMP is required to manage the consultancy assignment for the development of national guidelines.

1.2 Purpose

The EECP contracted consultancy services to develop a manual to manage the disposal of hazardous waste in the energy sector. The project was to be implemented in six (6) months however, the project failed as the consultancy deliverables did not fulfill the scope of work, and subsequent revisions to the document did not achieve the desired standard, before the contract expired. This unsuccessful initiative cost the Government of Jamaica an estimated US$10,000 and presented delays on the overall EECP project schedule.

As this project is on the critical path for the EECP, the activity has to be re-done. The development of a PMP has been recommended as a lesson learned from the first attempt at executing this project. The PMP when completed will assist by outlining pertinent project tools and techniques and is expected to contribute to successful project implementation the second time around.

1.3 General objective

To develop a Project Management Plan (PMP) to guide the project of preparing an Environmental Disposal Manual (EDM) for the Energy Sector.

1.4 Specific objectives

1. To construct a scope management plan to ensure that the objectives of the EDM are fulfilled.
2. To create a schedule management plan to ensure that deliverables are submitted and reviewed on time and that there is adherence to the overall project schedule.

3. To prepare a cost management plan to keep the consultancy on budget especially since resources were already expended for this activity without achieving the desired result.
4. To establish a quality management plan to ensure that the output meets the desired standard of the procuring entity and key stakeholders with regard to technical content, visual appeal and user friendliness.
5. To articulate a Resource Management plan to ensure that qualified and capable subject matter experts are available to work on the assignment.
6. To generate a Communication Management plan appropriate to the needs of internal and external stakeholders which will support project implementation and documentation appropriately.
7. To generate a robust Risk Management plan which will minimise the risks of a second unsuccessful execution of this consultancy.
8. To generate a Stakeholder Management plan which will assist in managing expectations of stakeholders and issues arising from their interactions with each other and project processes.

Chapter 2: THEORETICAL FRAMEWORK

2.1 Company/Enterprise framework

2.1.1 Company/Enterprise background

The development of a PMP for the creation of national guidelines to manage hazardous waste, is being undertaken by the EECP, a special project unit of the Petroleum Corporation of Jamaica (PCJ.) According to the PCJ Ministry Paper, (17/18), the PCJ is the government entity mandated to manage Jamaica's energy needs in a manner that supports the overall strategy for national development. The PCJ was established in 1979 and is an agency of the Ministry of Science, Energy and Technology (MSET).

In expanding on its role and functions, the PCJ Ministry Paper (17/18) also informs that the entity is committed to securing energy supplies for the country. PCJ's focus (2017/2018) is to "reduce the country's dependence on imported fuel while securing the affordable, sustainable energy supplies which are necessary to realize economic growth" (p. 1). PCJ Ministry Paper (2017/2018) The Petroleum Act gives the PCJ the exclusive right to explore and develop the petroleum resources of the country. The PCJ is also at the forefront of the drive to develop renewable energy resources.

2.1.2 Mission and vision statements

The mission of the PCJ is to "facilitate Jamaica's energy security through the development, promotion and use of diverse energy resources while maintaining financial viability" (PCJ Ministry Paper 2017/2018, p. 1). While it's vision is "to be Jamaica's foremost energy authority" (PCJ Ministry Paper 2017/2018, p.1).

The development of a PMP for the creation of national guidelines for hazardous waste will assist the PCJ to fulfill its mission and vision. The PMP will assist the

company to manage the resources assigned to the project and contribute to maintaining its financial viability.

This point is important given that this is the second attempt to execute the consultancy assignment and fifteen percent of the contract value was expended in the first attempt. The outcome of the PMP, which is the successful implementation of the consultancy, also improves the organization's bottom line as the standards/guidelines to be established are for the safety and protection of citizens and the private sector. Protecting the interest of these groups can prevent unnecessary compensation payments as well as untold damage to the environment of the country, and the avoided cost of implementing corrective actions, where and if possible.

The vision of being an energy authority is undoubtedly in tandem with establishing guidelines to govern business activities in the energy sector

2.1.3 Organizational structure

As reflected in Figure 1, the EECP currently reports directly to the Group General Manager of the PCJ. A Project Manager, who has eight officers reporting to her, manages the day-to-day operations of the project. Each officer has discrete duties as implied by their titles. The direct reporting relationship enhances the ability of the project to meet its goals and objectives with minimal bureaucratic interference. The figure provided was shared with participants at a meeting of the Renewable Energy and Energy Efficiency Department Meeting at the PCJ.

PCJ ORGANOGRAM

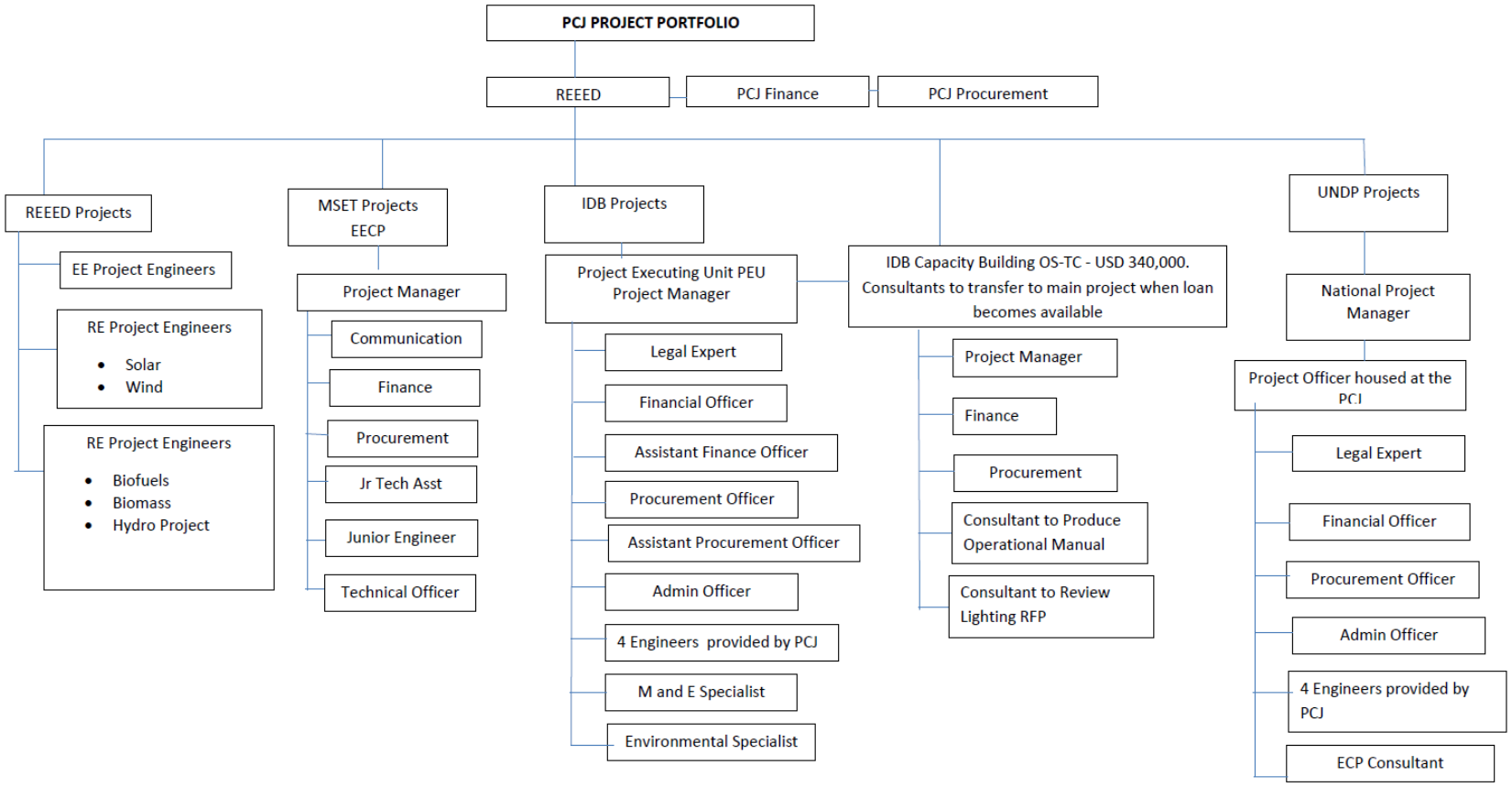

Figure 1 Organizational structure (Source: PCJ Renewable Energy and Energy Efficiency Department, (REEED))

2.1.4 Products offered

An examination of the PCJ Ministry Paper (17/18) also informs that the PCJ offers products related to renewable energy and energy efficiency and conservation expertise. The expert knowledge product provided by the PCJ is linked to the development of the PMP for managing hazardous waste both in the development of the PMP and in the output of the consultancy. The PCJ is best placed to say what key elements should be included in the PMP and how the consultancy is to be executed.

In addition to its expert knowledge in the energy sector and as outlined in the PCJ Ministry Paper (17/18) the organisation develops and manages petroleum sources. The PCJ also leads oil explorations and develops local facilities for the storage and distribution of petroleum products; is engaged in the sale of petroleum products and leads communication on all energy matters.

2.1.5 Project Management concepts

2.1.5.1 Project

According to the PMI, 2017, “a project is a temporary endeavor undertaken to create a unique product, service or result” (PMI, 2017). The temporary nature of projects indicate that each has a definite start and end date and within that timeframe it is expected that the project will meet its objectives, or ends when the objectives cannot be met, or the need that gave rise to the project becomes non-existent. The PMBOK Guide Fifth Edition discusses a wide range of possibilities of what a project can do. The most pertinent one to the discourse of this assignment is the illustration of a project as “a component of another item or an enhancement of another item or an item in itself” (PMI, 2017).

The development of a PMP for a specific task would be a project that is an end in itself, as once the PMP is completed the project too is completed. This is not to be confused with a follow on project of implementing the PMP by executing the

activity. The development of a PMP for creating national guidelines for hazardous waste meets the characteristics of projects by having clearly identified start and end dates, producing an outcome in itself, which is the PMP and being temporary in nature. A second project would be implementing the development of the national guidelines.

2.1.5.2 Project management

According to Rita Mulcahy's PMP Exam Prep, 2013, project management follows "a systematic process" (Rita Mulchahy, 2013, p. 23). This is confirmed in the PMI, 2017 which states that "project management is the application of knowledge, skills, tools and techniques to project activities to meet the project requirements" (PMBOK Fifth Edition, p.5). The forty-seven (47) processes recommended internationally by the Project Management Institute (PMI) are divided into five process groups namely, initiating, planning, executing, monitoring and controlling and closing.

The PMI, 2017 gives further clarity to the definitions by describing what project management entails. It states that "identifying requirements, addressing the needs, concerns and expectations of stakeholders; setting up, maintaining and carrying out communications among stakeholders that are active; effective and collaborative, managing stakeholders towards meeting project requirements and creating project deliverables; and balancing the competing project constraints such as scope, quality, budget, schedule, resources and risk, are all apart of project management" (PMI, 2017, p. 6).

2.1.5.3 Project life cycle

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Figure 2: Image of a the project life cycle phases:
https://www.sketchbubble.com/en/presentation-project-life-cycle.html

"A series of phases that a project passes through from its initiation to its closure" is how the PMI, 2017, p. 38, defines the project life cycle. The phases are generally followed in sequence and contribute to the development or execution of the subsequent phase. The development of the PMP must also follow the stages previously mentioned. The project is initiated when a project charter is developed for the PMP and authorized. In the planning process group, the PMI, 2017 informs that the scope of the project is established, objectives are refined, action commences to meet the objectives. In the executing process group, the PMBOK Fifth Edition explains that "those processes performed to complete the work defined in the project management plan to satisfy the project specifications" (p.49). The monitoring process group requires the project manager as stated in the PMI,

2017, “to track, review and regulate progress and performance of the project”. It also includes managing the change request process. The last process group is that of closing and under this activity, activities are performed to finalize the project across all process groups and the project is formally closed.

2.1.5.4 Project management processes

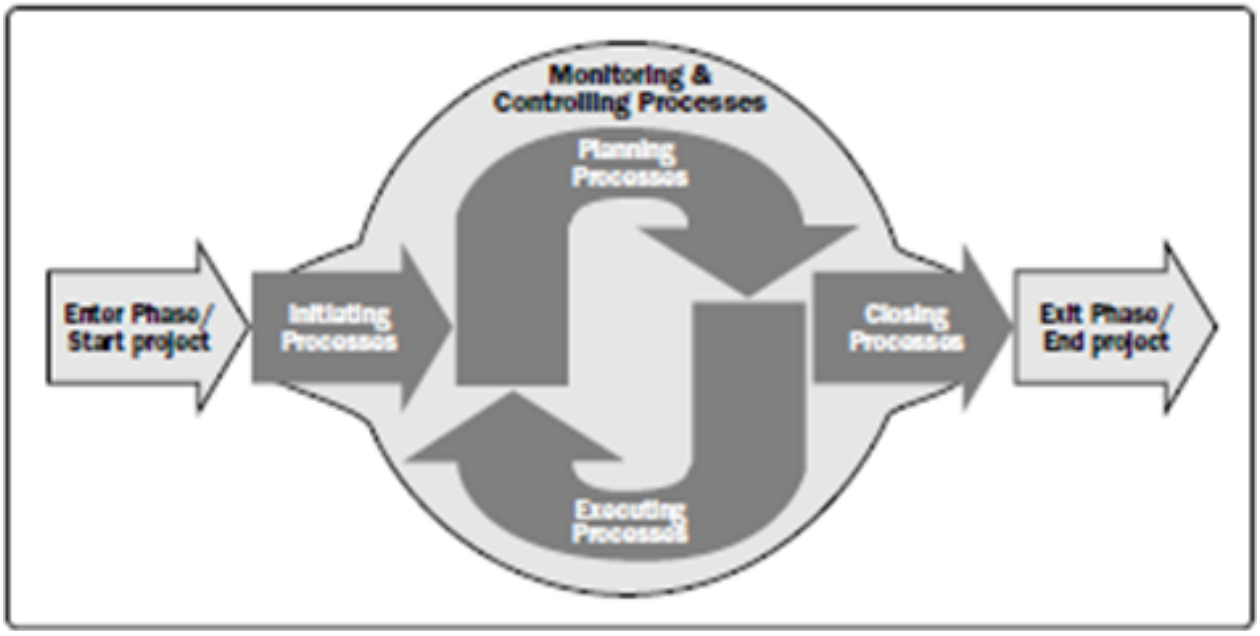


Figure 3: Project Management Process Groups, PMBOK Guide Fifth Edition, 2013, p. 50

The PMI, 2017, p. 551 defines a process as “a systematic series of activities directed towards causing an end result such that one or more inputs will be acted upon to create one or more outputs.” Project management processes are used repetitively in order to meet project objectives and the entire project management process can be used in one phase of a multi-phased project. The PMI, 2017 informs that there is “a general agreement that the application of project management processes has been shown to enhance the changes of success over a wide range of projects”. Therefore, in the project to develop a PMP, the project manager creates a project charter and preliminarily identifies stakeholders, communication methods, risks, main deliverables, budget, timelines among others, and is authorized. In the planning process group, the project manager further details the technical and resources needed for the project, finalizes the budget;

plans various opportunities for stakeholder engagement, among others. In the executing process group, the project manager would hire staff, procure goods and services, convene meetings, receive funds and conduct research as needed.

When the project advances to the monitoring and controlling process group the project manager is ensuring that the schedule and budget are maintained, that quality standards are being followed, that the risk register is updated and risks assigned owners and are being managed. In the closing process group files are updated, the project team is disbanded and physical resources of the project are handed over as was planned. Organisational process assets developed by the project are shared with the organization, lessons learned are documented and the project ends.

2.1.5.4 Project management knowledge areas

According to the project management resource book, PMI, 2017, “a knowledge area represents a complete set of concepts, terms and activities that make up a professional field, project management field, or area of specialization” (p. 60). All knowledge areas are useful for the project manager and team as they contain “tools and techniques which enhance successful project outcomes” as stated in the PMI, 2017. The knowledge areas related to developing the PMP for creating national guidelines include scope, time, cost, quality, resources, communication, risk, procurement and stakeholder management. The PMP will be considered complete when all these plans are completed and compiled into a single document for the specific purpose of this project. The table below gives a listing of all the project management processes and knowledge areas as listed in the PMI, 2017.

KNOWLEDGE AREAS	PROJECT MANAGEMENT PROCESS GROUPS				
	INITIATING	PLANNING	EXECUTING	MONITORING & CONTROLLING	CLOSING
1. Project Integration Management	Develop Project Charter	Develop Project Management Plan	Direct and manage project work Manage project knowledge	Monitor and control project work Perform integrated change control	Close project of phase
2. Project Scope Management		Plan Scope Management Collect Requirements Define Scope Create WBS			
3. Project Schedule Management		Plan Schedule Management Define Activities Estimate activity durations Develop Schedule			
4. Project Cost Management		Plan Cost Management Estimate Costs Determine Budget			
5. Project Quality Management		Plan Quality Management			
6. Project Resource Management		Plan Resource Management Estimate Activity Resources			
7. Project Communications Management		Plan Communications	Manage communications	Monitor communications	
8. Project Risk Management		Plan risk management Identify risks Qualitative risk analysis Perform quantitative risk analysis Plan risk responses	Implement risk responses	Monitor risks	
9. Project Procurement Management		Plan procurement management	Conduct procurements	Control procurements	
10. Project Stakeholder Management	Identify stakeholders	Plan stakeholder engagement	Manage stakeholder engagement	Monitor stakeholder engagement	

Figure 4: Project Management Process Groups, PMBOK Guide Sixth Edition, 2017

2.1.6 Other applicable theory/concepts related to the project topic and context

2.1.6.1 Project Management Plan (PMP)

According to the PMI, 2017, a PMP is the document that describes how the project will be executed, monitored and controlled. The resource tool, PMI, 2017, p. 78, also informs that the PMP "may be either summary level or detailed and may be composed of one or more subsidiary plans". The PMBOK Fifth Edition, also advises that "once the PMP is baselined, it can only be changed when a change request is generated and approved through the perform integrated change control process".

From the information gleaned from the PMI, 2017, the PMP should be tailored to suit the needs of the current project and is not a one size fits all tool.

2.1.6.2 PCJ Organisational Process Assets (OPAs)

As an established organization with a Project Management Office (PMO), the PCJ also has resources and OPAs, which could be used for this project. The PMO utilizes a gate system of approval for projects, which has five elements. The first, Gate 1, is obtaining approval to proceed to develop the project idea. Gate 2 is developing the project charter; Gate 3 is Approval to Proceed to Detailed Design/Specifications, Gate 4, approval to proceed to equipment procurement, construction and installation; Gate 5 is approval of project completion. The PMO also has templates for a Project Close Out Report which can be a reference document for completing this project of developing the PMP.

Chapter 3: METHODOLOGICAL FRAMEWORK

3.1 Information sources

According to www.karibouconnections.net, “information can come from virtually anywhere: personal experiences, books, articles, expert opinions, encyclopedias, the Web. The type of information needed will change depending on its application”. Being guided by this information to prepare the Final Graduation Project therefore means that the student has a wide variety of information sources to utilize for this project. It is imperative however, that information be accurate and from reputable sources so that the output it is used to create can remain valid and is fit for the purpose intended.

3.1.1 Primary sources

According to www.research-methodologies.net, “primary data is a type of data which never existed before, hence it was not previously published”. The same source further explains that “primary data is collected for a specific purpose, and critically analyzed to find answers to research question” (www.research-methodologies.net).

This Final Graduation Project mainly uses interviews with select stakeholders as a primary source of information. This is detailed in Chart 1 below.

3.1.2 Secondary sources

Secondary data “refers to a type of data that has been previously published in journals, magazines, newspapers, books, online portals and other sources”, according to www.research-methodologies.net.

This Final Graduation Project mainly uses the PMI, 2017, Internet, historical project files, meeting notes and documents; old terms of reference, bid document and proposal as sources of secondary data. These are detailed in Chart 1 below.

Chart 1: Information sources (Source: J. Grizzle, The Author, June, 2018)

Objectives	Information sources	
	Primary	**Secondary**
1. To construct a scope management plan to ensure that the objectives of the Terms of Reference (TOR) for the consultancy are fulfilled	Interview with select stakeholders	PMI, 2017, and the internet. Project files, meeting notes and documents; Old terms of reference, bid document and proposal
2. To create a schedule management plan to ensure that deliverables are submitted and reviewed on time and that there is adherence to the overall project schedule	Interview with select stakeholders	PMI, 2017, and the internet. Project files, meeting notes and documents; previous terms of reference, bid document and proposal
3. To prepare a cost management plan to keep the consultancy on budget especially	Interviews with stakeholders	PMI, 2017, and the internet. Project files, historical information,

since resources were already expended for this activity without achieving the desired result.		
4. To establish a quality management plan to ensure that the output meets the desired standard of the procuring entity and key stakeholders with regard to technical content, visual appeal and user friendliness.	Interviews with stakeholders	PMI, 2017, and the internet. Project files, historical information.
5. To articulate a Resource Management plan to ensure that qualified and capable subject matter experts are available to work on the assignment.	Interviews with stakeholders.	PMI, 2017, and the internet. Project files, historical information, meeting notes and documents.

6. To generate a Communication Management plan appropriate to the needs of internal and external stakeholders which will support project implementation and documentation appropriately.	Project files, historical information, interviews with stakeholders, meeting notes and documents	PMI, 2017, and the internet.
7. To generate a robust Risk Management plan which will minimise the risks of a second unsuccessful execution of this consultancy	Interviews with stakeholders,	PMI, 2017, and the internet. Project files, meeting notes and documents; historical information Old terms of reference, bid document and proposal
8. To generate a Stakeholder Management plan which will assist in managing expectations of stakeholders and	Interviews with stakeholders.	PMI, 2017, and the internet. Project files, meeting notes and documents; historical information Old terms of reference, bid document and proposal

issues arising from their interactions with each other and project processes		

3.1.3 Research methods

The website www.dictionary.com articulates a definition for research, which is “diligent and systematic inquiry or investigation into a subject in order to discover or revise facts, theories, applications”. The word method also defined by www.dictionary.com is “a procedure, technique, or way of doing something, especially in accordance with a definite plan”. Taken together in my own words, a research method provides a scientific framework to pursue a course of inquiry. According to www.research-methodology.net, research methods are broadly categorized as qualitative and quantitative depending on the nature of the study to be carried out. The website (research-methodology.net) also states that qualitative methodologies focus on presentation of information in “narrative fashion” while quantitative methodology focuses on the numeric presentation of data using tables, graphs and statistical analyses.

3.1.4 Analytic-Synthesis Method

According to Analysis-Synthesis Method “the terms analysis and synthesis come from (classical) Greek and mean literally "to loosen up" and "to put together" respectively (Ritchey, T, Reprint, 1996). This concept when applied to research methods simply means to break down in small parts for ease of understanding and then regroup.

This is the approach, the analytic-synthetic method, adopted for the Final Graduation Project, in that the development of the PMP is broken down in

manageable pieces and then re-grouped as a whole. The summary of research methods is shown in Chart 2 below.

Chart 2: Research methods (Source: J. Grizzle, The Author, June 2018)

Objectives	Analytical Research methods
1. To construct a scope management plan to ensure that the objectives of the Terms of Reference (TOR) for the consultancy are fulfilled	The analytical method will be used by garnering information from the sources identified in Chart 1, objective 1 to guide the development of the Scope Management Plan.
2. To create a schedule management plan to ensure that deliverables are submitted and reviewed on time and that there is adherence to the overall project schedule	The analytical method will be used by garnering information from the sources identified in Chart 1, objective 2 to guide the development of the Schedule Management Plan.
3. To prepare a cost management plan to keep the consultancy on budget especially since resources were already expended for this activity without achieving the desired result.	The analytical method will be used by garnering information from the sources identified in Chart 1, objective 3 to guide the development of the Cost Management Plan.
4. To establish a quality management plan to ensure that the output meets the desired standard of the procuring entity and key stakeholders with regard to technical content, visual	The analytical method will be used by garnering information from the sources identified in Chart 1, objective 4 to guide the development of the Quality Management Plan.

appeal and user friendliness.	
5. To articulate a Resource Management plan to ensure that qualified and capable subject matter experts are available to work on the assignment.	The analytical method will be used by garnering information from the sources identified in Chart 1, objective 5 to guide the development of the Resource Management Plan.
6. To generate a Communication Management plan appropriate to the needs of internal and external stakeholders which will support project implementation and documentation appropriately.	The analytical method will be used by garnering information from the sources identified in Chart 1, objective 6 to guide the development of the Communication Management Plan.
7. To generate a robust Risk Management plan which will minimise the risks of a second unsuccessful execution of this consultancy	The analytical method will be used by garnering information from the sources identified in Chart 1, objective 7 to guide the development of the Risk Management Plan.
8. To generate a Stakeholder Management plan which will assist in managing expectations of stakeholders and issues arising from their interactions with each other and project processes	The analytical method will be used by garnering information from the sources identified in Chart 1, objective 9 to guide the development of the Stakeholder Management Plan.

3.1.5 Tools

A tool is defined as “anything of manual operation” according to the website www.dictionary.com. A further definition can be found in Miloševic, D. & Iew Wongcharoen, B. (2004). Project management tools and techniques, where a tool is defined as “something (as an instrument or apparatus) used in performing an operation or necessary in the practice of a vocation or profession (Merriam-Webster Inc., 1996)”. Simply put, project management tools are instruments used to achieve project objectives. Tools vary in size, dimension and format.
The tools used on this Final Graduation Project are:

- Scope Management Plan template, Microsoft Word 2016, requirements traceability matrix template, requirements documentation template, requirements management plan template, Microsoft Projects 2016, meetings, expert judgment, interviews, focus groups, document analysis, group decision making techniques, observations
- Schedule Management template, decomposition, expert judgment, rolling wave planning, dependency determination, leads and lags, bottom up estimating, project management software
- Cost management plan template, expert judgment, analytical techniques, meetings, bottom up estimating, reserve analysis, forecasting, performance reviews
- Quality Management Plan template, cost-benefit analysis, meetings, project management software, analytical techniques, audits, quality control tools, inspection, benchmarking
- Resource management plan template, organizational charts and job descriptions, expert judgment, meetings, ground rules, colocation, personal assessment tools, recognition and rewards, performance appraisals, observations and conversations
- Communication management plan template, communication requirements analysis, communication technology, meetings, information management systems, expert judgment

- Risk management plan template, meetings, expert judgment, analytical tools, checklist analysis, SWOT analysis, probability and impact matrix, risk categorization, risk urgency assessment, probability and impact assessment, risk audits, strategies for negative risks, strategies for opportunities, contingent response strategies
- Stakeholder Management Plan Template, communication tools, information management systems, expert judgment, meetings, analytical tools. A summary of the tools are shown in Chart 3 below.

Chart 3: Source: Grizzle, The Author, June, 2018

Objectives	Tools
1. To construct a scope management plan to ensure that the objectives of the Terms of Reference (TOR) for the consultancy are fulfilled	Microsoft Word 2016, requirements traceability matrix template, requirements documentation template, requirements management plan template, Microsoft Projects 2016, Scope Management Plan template Meetings, expert judgment, interviews, focus groups, document analysis, group decision making techniques, observations
2. To create a schedule management plan to ensure that deliverables are submitted and reviewed on time and that there is adherence to the overall project schedule	Schedule Management template, decomposition, expert judgment, rolling wave planning, dependency determination, leads and lags, bottom up estimating, project management software
3. To prepare a cost management plan to keep the consultancy on budget especially since resources were already expended for this activity without achieving the desired result.	Cost management plan template, expert judgment, analytical techniques, meetings, bottom up estimating, reserve analysis, forecasting, performance reviews
4. To establish a quality management plan to ensure that the output meets the desired standard of the procuring entity and key stakeholders with regard	Quality Management Plan template, cost-benefit analysis, meetings, project management software, analytical techniques, audits, quality control tools, inspection, benchmarking

to technical content, visual appeal and user friendliness.	
5. To articulate a Resource Management plan to ensure that qualified and capable subject matter experts are available to work on the assignment.	Resource management plan template, organizational charts and job descriptions, expert judgment, meetings, ground rules, colocation, personal assessment tools, recognition and rewards, performance appraisals, observations and conversations
6. To generate a Communication Management plan appropriate to the needs of internal and external stakeholders which will support project implementation and documentation appropriately.	Communication management plan template, communication requirements analysis, communication technology, meetings, information management systems, expert judgment
7. To generate a robust Risk Management plan which will minimise the risks of a second unsuccessful execution of this consultancy	Risk management plan template, meetings, expert judgment, analytical tools, checklist analysis, SWOT analysis, probability and impact matrix, risk categorization, risk urgency assessment, probability and impact assessment, risk audits, strategies for negative risks, strategies for opportunities, contingent response strategies
8. To generate a Stakeholder Management plan which will assist in managing expectations of stakeholders and issues arising	Stakeholder Management Plan Template, communication tools, information management systems, expert judgment, meetings, analytical

from their interactions with each other and project processes.	tools,

3.1.6 Assumptions and constraints

The resource tool, PMI, 2017 defines assumptions as “factors in the planning process that is considered to be true, real or certain, without proof or demonstration.” The same source defines constraints as “limiting factors that affect the execution of a project or process.

These two concepts present the foundation on which a project is developed and implemented and they contribute to the establishment of a baseline. Assumptions and constraints are so critical in project planning that a change in either can have a deleterious impact on project outcomes. Assumptions outline the minimum criteria that must exist for the project to achieve its goals and objectives. On the other hand, constraints create realistic boundaries within which expectations are managed.

The assumptions for the EDM PMP are:

1. Both the TOR and Scope Plan are comprehensive in outlining all the work to be undertaken
2. There will be no changes to the scope
3. The budget developed for the assignment will be approved.
4. All information needed will be available
5. Time allocated for the development of the PMP is sufficient
6. No extension to the time is requested
7. resources are available
8. The budget developed for the assignment will be approved.
9. All the quality requirements will be identified
10. The technology available to the project is sufficient to meet the communication needs

11. All information needed will be available to inform the Risk Management Plan
12. A comprehensive listing of stakeholders will be identified

Constraints for the EDM PMP are:

1. The author desires to complete the PMP in three months or less
2. The Author has competing demands, which also have to prioritized relating to full time employment and family commitments.
3. Material is highly technical and may require more time and discussion to ensure full understanding of concepts
4. The project start date is fast approaching and the PMP may not be completed before project start.
5. Time is limited
6. Salaries for resources are fixed.
7. Material is highly technical and may require more time and discussion to ensure full understanding of concepts
8. Additional levels of approval are needed if bids exceed certain financial limits
9. Resources are limited

The assumptions and constraints are summarized in Chart 4 below.

Chart 4: Assumptions and constraints (Source: J. Grizzle, The Author, 2018)

Objectives	Assumptions	Constraints
1. To construct a scope management plan to ensure that the objectives of the Terms of Reference (TOR) for the consultancy are fulfilled	Both the TOR and Scope Plan are comprehensive in outlining all the work to be undertaken There will be no changes to the scope All information needed will be available	
2. To create a schedule management plan to ensure that deliverables are submitted and reviewed on time and that there is adherence to the overall project schedule	Time allocated for the development of the PMP is sufficient No extension to the time is requested	The author desires to complete the PMP in three months or less The Author has competing demands, which also have to prioritized relating to full time employment and family commitments.
3. To prepare a cost management plan to keep the consultancy on budget especially since	The budget developed for the assignment will be approved.	The PMP cannot exceed the approved budget.

Objectives	Assumptions	Constraints
resources were already expended for this activity without achieving the desired result.		
4. To establish a quality management plan to ensure that the output meets the desired standard of the procuring entity and key stakeholders with regard to technical content, visual appeal and user friendliness.	All the quality requirements will be identified All information needed will be available	Material is highly technical and may require more time and discussion to ensure full understanding of concepts
5. To articulate a Resource Management plan to ensure that qualified and capable subject matter experts are available to work on the assignment.	resources are available	Salaries for resources are fixed.
6. To generate a Communication Management plan appropriate to the needs of internal and external stakeholders which will support project implementation	The technology available to the project is sufficient to meet the communication needs for the assignment. Team members assigned to various communications tasks are capable of implementing communication responsibilities	

Objectives	Assumptions	Constraints
and documentation appropriately.		
7. To generate a robust Risk Management plan which will minimise the risks of a second unsuccessful execution of this consultancy	All information needed will be available to inform the Risk Management Plan	Time is limited Material is highly technical and may require more time and discussion to ensure full understanding of concepts
8. To generate a Stakeholder Management plan which will assist in managing expectations of stakeholders and issues arising from their interactions with each other and project processes	A comprehensive listing of stakeholders will be identified All stakeholders are available and can be reached by the project team Information on stakeholders is accurate and provided in keeping with project timelines	Time Resources

3.1.7 Deliverables

A deliverable is any unique and verifiable product, result, or capability to perform a service that must be produced to complete a process, phase, or project (https://explore.easyprojects.net/blog/how-to-define-project-deliverables). The production of a deliverable on a project can be used to show that milestone or other objective has been achieved. In many projects, the practice is to make payments on deliverables accomplished and accepted from the supplier.

There are eight (8) deliverables, which are linked to the completion of this PMP. These are development of scope, time, cost, quality, resources, communication, risk and stakeholder management plans. Short descriptions and a listing of these are detailed in Chart No. 5 below.

Chart 5: Deliverables (Source: J. Grizzle, The Author, June, 2018)

Objectives	Deliverables
1. To construct a scope management plan to ensure that the objectives of the Terms of Reference (TOR) for the consultancy are fulfilled	**The Scope Management Plan (SMP).** It will describe the work to be done in order to deliver the good or service or product in keeping with the required functions and features.
2. To create a schedule management plan to ensure that deliverables are submitted and reviewed on time and that there is adherence to the overall project schedule	**The Schedule Management Plan (SchMP).** It will describe how the project schedule will be controlled to ensure that the project is delivered on time.
3. To prepare a cost management plan to keep the consultancy on budget especially since resources were already expended for this activity without achieving the desired result.	**The Cost Management Plan (CMP).** This will outline the estimated project budget, allocation of resources, control and approval limits among others.
4. To establish a quality management plan to ensure that the output meets the desired standard of the procuring entity and key stakeholders with regard to technical content,	**The Quality Management Plan (QMP).** This details what will make the product of acceptable quality and how this will be executed. It will include quality policies, procedures, checks and balances among others.

visual appeal and user friendliness.	
5. To articulate a Resource Management plan to ensure that qualified and capable subject matter experts are available to work on the assignment.	**The Resource Management Plan (RMP).** This will detail the role and responsibilities of the project team show the organization chart, how staff will be recruited, controlled and released at the end of the project, among others.
6. To generate a Communication Management plan appropriate to the needs of internal and external stakeholders which will support project implementation and documentation appropriately.	**The Communication Management Plan (COMP).** It will outline how the various types of stakeholders will receive project information, including the frequency, modality and format. It also details the responsibility for disseminating information to stakeholders at different levels.
7. To generate a robust Risk Management plan which will minimise the risks of a second unsuccessful execution of this consultancy	**The Risk Management Plan (RMP).** It will include among other things a risk register, risk categories and a probability assessment of their impact, risk owners, resources to mitigate and manage risks, budget for risks and mechanisms for managing residual risks.
8. To generate a Stakeholder Management plan which will assist in managing expectations of stakeholders and issues arising from their interactions with each other and project	**The Stakeholder Management Plan (STKMP).** This will outline the strategies to manage stakeholders and their expectations during the project. It will include an assessment of their needs, interest and influence on the

processes	project and how this can affect project outcomes.

Chapter 4: RESULTS

4.1. Scope Management Plan (SMP)

The task at hand is developing an EDM. The scope management plan will therefore ensure that only work related to developing the EDM is undertaken. The scope of the project is the purview of the Project Manager who leads the development of the scope statement, work breakdown structure (WBC) and WBC Dictionary. As projects do not operate in silohs, stakeholders, including the project sponsors are engaged in developing the aforementioned deliverables and documentation on achieveing the scope is to be measured.

4.1.1 Collect Requirements

For the development of the EDM, the Requirements Matrix Summary was prepared from an analysis of questionnaires completed by key stakeholders to this process. Stakeholders were asked what items would make EDM a success from the perspective of:

a. Government document production
b. Their organisation
c. Individual User

Activities related to defining and documenting the requirements needed to meet the project objectives of developing an EDM were conducted through the development of a Requirements Matrix. In preparing the Requirements Management Plan, two main activities were used. These were the completion of a questionnaire and participation in a Focus Group Discussion by the key stakeholders. This provided the opportunity for stakeholders to define the elements that would make the Manual a success and how their needs or use for the Manual were met.

The results are summarized in the Matrix below.

Table 1: EDM REQUIREMENTS MATRIX SUMMARY
(Key Stakeholder Requirements for the Environmental Disposal Manual)

Organisation:
Employee Name:
Job Title:

No	Requirement Name	Description/Definition	Priority Level (L, M, H)
1	Island wide Situation Assessment	Summary of prevailing conditions related to local practices of disposal of hazardous waste; may include anecdotal reports and examples; reference to newspaper articles, interviews with industry players, government and international reports and studies	H
2	Case studies	Inclusion of local, regional and international case studies to highlight situation assessment and best practices	L
3	Legislative & regulatory framework (local and international)	This should include at a minimum, international conventions and domestic legislation such as ISO14001:2015 Environmental Management Systems, the Natural Resources Conservation Authority Act, National Solid Waste Management Act, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Nuclear Safety and Radiation 58 Section 4. Financial Proposal - Standard Forms 58 Protection Act, the Minamata Convention on Mercury and any other applicable	M
4	Gap analysis	Gaps related to policy implementation, enforcement, infrastructure, knowledge, training, service provisions	H
5	Risk Assessment	A Risk Assessment Matrix is to be developed to evaluate both the probability and severity of a specific risk that is anticipated/expected to occur. The assessment will indicate priority areas and types of waste for urgent and strategic interventions.	H
6	Emerging Issues	Identify, assess and prioritise emerging issues resulting from current waste management practices in the Jamaican public sector. Determine how technological advances and consumption patterns impact emerging issues.	M
7	Stakeholder Engagement	Urban and rural engagement of industry players, government ministries, departments and agencies	M
8	Reporting Format	Style, layout, graphic design, readability, practicality, illustrations, tables, photographs, colour and font	M
9	Consultant's Qualifications	Minimum academic qualifications and experience of Consultant to be recommended to execute this assignment	H
10	Budget	Recommended remuneration to execute this assignment	L
11	Other		

FOCUS GROUP DISCUSSION GUIDE FOR EDM REQUIREMENTS MATRIX

Purpose:
The purpose of the Focus Group Discussion is to meet with stakeholders and have them review the Requirements Matrix Summary and refine and assign priority rankings to the requirements identified. This will be done through group work, where organizational representatives are mixed in groups and assigned the task to review as described above.

Task:

1. Each individual should critically review each requirement and assign a number between 1 and 10
2. The group leader should tally the points assigned to each requirement and assign a ranking of low, medium or high priority
3. Calculations of low, medium or high priority are determined as follows:

   High: scores between 8-10
   Medium: scores between 4-7
   Low: scores between 1-3

A key component of scope management is the use of a change request process to evaluate requests for changes to scope. The use of this tool helps the project manager control the scope of the project and that the approved constraints of time, cost and scope, are maintained. The change request form is filled out by the individual who identifies the need for a change and submitted to the project team in accordance with the change control process.

The project manager then leads the teams in identifying, the impacts of the change, whether or not it will benefit the project, and if it will allow the project to proceed within its approved constraints. The request is then submitted to the change control board with the project team's findings where it is reviewed and either approved, rejected, or deferred until clarification can be sought. The change can only be approved by the Project Sponsor, and if the change is approved, all project documentations must be updated accordingly and the change must be

communicated to all stakeholders. Some changes may also require changes to the baseline for the cost, schedule, or scope. A sample Change Request Form is included at Appendix 3 for this project.

4.1.2 Scope Statement and Definition

The scope of this project is to create an Environmental Disposal Manual (EDM), which includes a situation assessment, legislative and regulatory framework, gap analysis, risk assessment matrix, identification of emerging issues and recommendations. The engagement of stakeholders from urban and rural communities is critical to the creation of the EDM. The EDM must be presented in a user-friendly format with appealing graphics and illustrations by a Consultant with post graduate qualifications and several years of experience. The creation of the EDM is to be completed within six months, at a cost of US100, 000.

This project will be accepted where the requirements matrix are deemed satisfactory. There are five (5) project deliverables associated with the EDM Manual and also included in the requirements matrix. The deliverables are:

1. Deliverable 1: Design of the Manual
2. Deliverable 2: Documentation of the Legislative Framework
3. Deliverable 3: Development of a Risk Assessment Matrix
4. Deliverable 4: Production of the Manual
5. Deliverable 5: Execution of the Dissemination Event

The project is not to exceed 81 days in duration or US$100,000 in spending. Support for the project was provided by the project sponsor, team members, and key stakeholders (end users of the Manual); adequate internal resources were available for the successful completion of the project. The EDM will exclude solid waste and waste not related to energy efficiency and conservation interventions. The EDM will also exclude waste to be derived from energy efficiency and conservation interventions in commercial and residential sectors.

4.1.3 Roles and Responsibilities

Various roles and responsibilities were assigned to the Project Manager, Sponsor and Team in managing the project scope. In order to manage and hold stakeholders accountable a Role and Responsibility Table was used. The table below shows the Roles and Responsibilities Table for the development of the EDM.

Table 2: Scope Management Roles and Responsibilities, Source – The Author, J. Grizzle, 2018

Name	Role	Responsibility
Robert Clarke	**Sponsor**	- Approve or deny scope change requests - Evaluate scope change requests - Accept final project deliverables
Jody Grizzle	**Project Manager**	- Evaluate and verify project scope - Facilitate scope change requests - Assess impact of scope change requests - Organise and facilitate change control meetings - Communicate change requests decisions - Update project documents based on change request decision (approval or rejection)
Nicholas Turner	**Team Member/Leader**	- Measure and verify project scope - Validate scope change requests - Participate in impact assessments of scope change requests - Communicate outcomes of scope change requests to team - Facilitate team level change review process
Quentin Cavanaugh	**Team Member**	- Participate in defining change resolutions Evaluate the need for scope changes and communicate them to the project manager as necessary
Savannah Longmore	**End User (Stakeholder)**	- Participate in defining change resolutions - Evaluate the need for scope changes and communicate them to the project manager as necessary - Has representation on Change Control Board
Zane Ashley	**Contractor (Stakeholder)**	- Can propose scope changes - Executes change decisions when approved

4.1.4 Work Break Down Structure (WBS)

In order to effectively manage the work required to complete this project, it was subdivided into individual work packages, which did not exceed 40 hours of work. This allowed the Project Manager to more effectively manage the project's scope

as the project team works on the tasks necessary for project completion. The project is broken down into five phases: Design Manual; Review Legislative & Regulatory Framework; Develop Risk Assessment Matrix; Produce Manual; Execute Dissemination Event. Each of these phases was then subdivided further to work packages which required no more than 40 hours of work and no less than 4 hours of work (see WBC structure below).

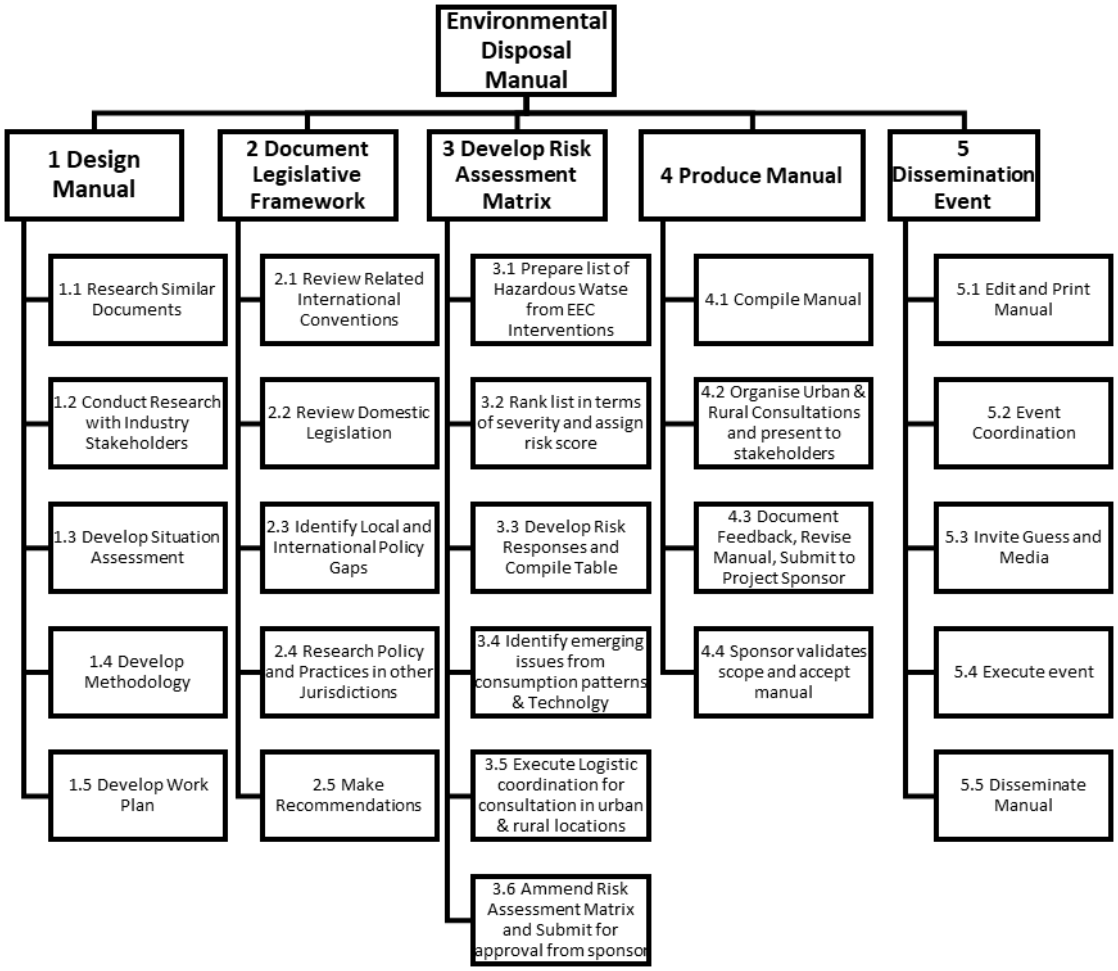


Figure 5: Work Break down Creation, The Author, Jody Grizzle, Source 2018.

4.1.5 Validate Scope

In validating the scope, the project sponsor, and key stakeholders will be asked to formally accept the project deliverables. This process will include reviewing the EDM Requirements Matrix and comparing it to the final output/project deliverable.

The Matrix used to document the key requirements will be expanded to include the achievement score in relation to the requirement stipulated. The lowest score allowed on the table is seven, as anything below that is an automatic indication that the requirement was not satisfactorily met. At the end of the table, the stakeholder will affix their signature, indicating that their requirements have been met and any additional comments they wish to make. The project sponsor will also be required to counter sign and provide comments. This process will indicate the extent to which requirements owners are satisfied with the deliverable. The draft is shown in the table below, the achievement score column remains blank until project completion.

4.1.6 Control Scope

This requires careful management of changes to the scope baseline and prevention of scope creep, which is unauthorized scope changes. For the development of the EDM, a Change Request Process and Form was developed to manage changes and is included at Appendix 4. The description of the process and the Form is shown below.

4.2. Schedule Management Plan

The schedule management plan shows the project sponsor, team and stakeholders the status of the project at a specific point in time. The Time Management or Schedule Management Plan as it is sometimes called outlines how the team will monitor the project schedule, establish a baseline schedule and manage changes which may arise. Specifically for the development of the EDM, the schedule management plan will ensure that deliverables are submitted and reviewed on time and that there is adherence to the overall project schedule.

4.2.1 Schedule Management Approach

The Work Breakdown Structure (WBS) was used as the basis for creating the project schedule in MS Projects and outlined the time plan for executing the EDM. The project deliverables were broken down into phases and activities for each

phase defined and sequenced. After the activities were sequenced, the project team estimated the duration of each activity and the resources were assigned. This completed the first draft of the project schedule which was reviewed by the team before review and approval from the project sponsor. The approval of the project sponsor was received and this schedule is now the baseline for the project.

The EDM was executed over a five month period between May 8, and October 4, 2018. In planning the schedule, the project team utilised organisational process assets and lessons learned from similar projects executed, and especially reviewing the length of time for different tasks associated with the first attempt at developing the EDM. Other factors which informed the schedule plan were enterprise environmental factors such as the length of time needed to obtain approval from key stakeholders and the project sponsor on deliverables where necessary.

The project team also identified which activities could be completed simultaneously, and which activities had to be completed for others to start and end. So for example, the schedule below shows that completing Activity 1.1, under Design Manual, work advance Activities 2.1, 2.2, and 2.3 under Review Legislative and Regulatory Framework. Similarly, Activities 2.4 and 2.5 would move progress on the schedule to Activity 3.4 and 3.3 respectively.

In summary, plan schedule management utilised the project team' experience with the previous aborted consultancy along with organisational process assets. Defining activities utilised expert judgement from stakeholders and the decomposition of the WBS. Defining and sequencing of activities are shown in the project schedule below.

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**Environmental Disposal Manual**	**108 days**	**Tue 8/5/18**	**Thu 4/10/18**	
2		**Design Manual**	**21 days**	**Tue 8/5/18**	**Tue 5/6/18**	
3		Research Similar Documents	5 days	Tue 8/5/18	Mon 14/5/18	
4		Conduct Research with Industry Stakeholders	5 days	Tue 15/5/18	Mon 21/5/18	3
5		Develop Situation Assessment	3 days	Tue 22/5/18	Thu 24/5/18	4
6		Develop Methodolgy	5 days	Fri 25/5/18	Thu 31/5/18	5
7		Develop Work Plan	3 days	Fri 1/6/18	Tue 5/6/18	6
8		Design Completion	0 days	Tue 5/6/18	Tue 5/6/18	7
9		**Document Legislative Framework**	**35 days**	**Wed 6/6/18**	**Tue 24/7/18**	
10		Review Related International Conventions	10 days	Wed 6/6/18	Tue 19/6/18	8
11		Review Domestic Legislation	5 days	Wed 20/6/18	Tue 26/6/18	10
12		Identify Local and International Policy Gaps	5 days	Wed 27/6/18	Tue 3/7/18	11
13		Research Policy and Practices in other jurisdictions	10 days	Wed 4/7/18	Tue 17/7/18	12
14		Make Recommendations	5 days	Wed 18/7/18	Tue 24/7/18	13
15		Framework Completion	0 days	Tue 24/7/18	Tue 24/7/18	14
16		**Develop Risk Assessment Matrix**	**41 days**	**Wed 6/6/18**	**Wed 1/8/18**	
17		Prepare list of Hazardous Waste from EEC Interventions	3 days	Wed 6/6/18	Fri 8/6/18	8
18		Rank list in terms severity and assign risk score	3 days	Mon 11/6/18	Wed 13/6/18	17
19		Develop Risk Response and Compile Table	10 days	Thu 14/6/18	Wed 27/6/18	18
20		Identify emerging issues from consumption patterns & technology	5 days	Thu 28/6/18	Wed 4/7/18	19
21		Execute logistic coordination for consultation in urban and rural locations	15 days	Thu 5/7/18	Wed 25/7/18	20
22		Ammend Risk Assessment Matrix and submit for approval	5 days	Thu 26/7/18	Wed 1/8/18	21
23		Risk Matrix Completion	0 days	Wed 1/8/18	Wed 1/8/18	22
24		**Produce Manual**	**30 days**	**Thu 2/8/18**	**Wed 12/9/18**	
25		Compile Manual	5 days	Thu 2/8/18	Wed 8/8/18	23
26		Organise Urban and Rural Consultations and present to stakeholders	10 days	Thu 9/8/18	Wed 22/8/18	25
27		Document Feedback, Revise Manual, Submit to Project Sponsor	10 days	Thu 23/8/18	Wed 5/9/18	26
28		Sponsor Validates scope and accept manual	5 days	Thu 6/9/18	Wed 12/9/18	27
29		Manual Production Completion	0 days	Wed 12/9/18	Wed 12/9/18	28
30		**Dissemination Event**	**16 days**	**Thu 13/9/18**	**Thu 4/10/18**	
31		Edit and Print Manual	10 days	Thu 13/9/18	Wed 26/9/18	29
32		Event Coordination	2 days	Thu 27/9/18	Fri 28/9/18	31
33		Invite Guess and Media	2 days	Mon 1/10/18	Tue 2/10/18	32
34		Execute Event	1 day	Wed 3/10/18	Wed 3/10/18	33
35		Disseminate Manual	1 day	Thu 4/10/18	Thu 4/10/18	34
36		End	0 days	Thu 4/10/18	Thu 4/10/18	35,8,15,23,29

Table 3: EDM Activity Sequencing & Schedule

4.2.2 EDM Critical Path

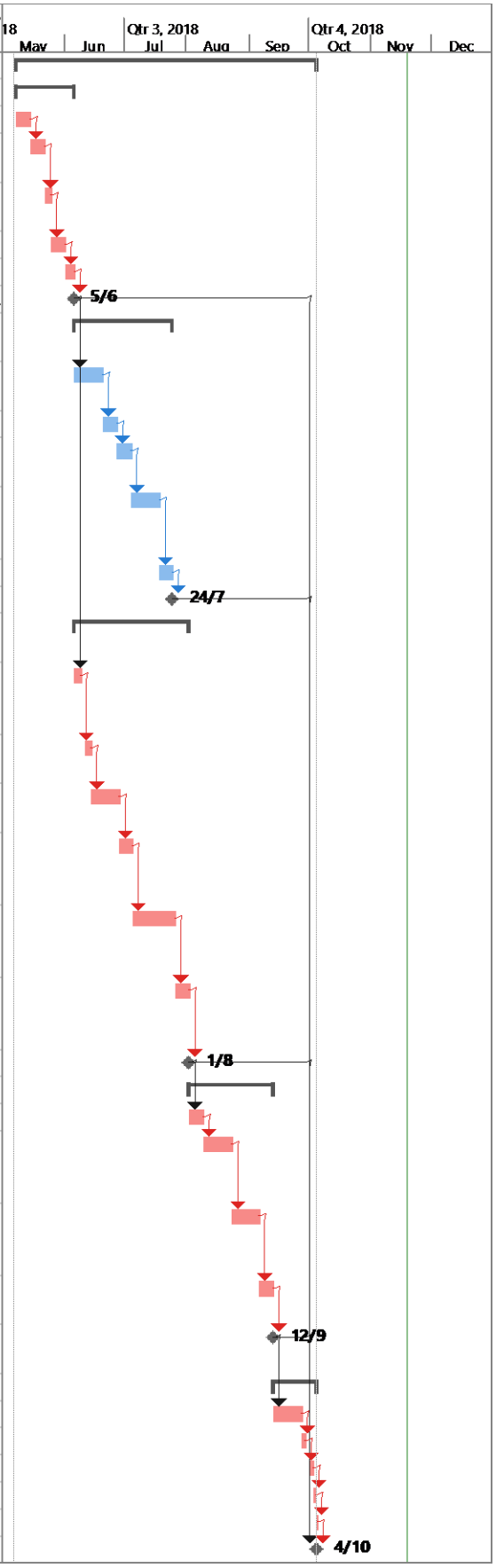
The Critical Path was used to estimate the minimum project duration and determine the amount of schedule flexibility on the logical network path within the

schedule model. The crtical path is the sequence of activities that represents the longest path through a project, which determines the shortest possible project duration. The critical path is used to calculate the amount of scheduling flexibility on the logical network paths within the schedule model.

Schedule flexibility is measured by the amount of time that a schedule activity can be delayed or extended from its early start date without delaying the project finish date. The definition of the critical path for the project is of importance because it sets the minimum project duration based on the longest activity path. This will most likely be adjusted along the way, with clear procedures and approvals. The Critical Path for the development of the EDM project is shown below.

Table 4: EDM Critical Path

ID	Task Mode	Task Name	Duration	Start	Finish	Predece	Success
1		**Environmental Disposal Manual**	**108 days**	**Tue 8/5/18**	**Thu 4/10/18**		
2		**Design Manual**	**21 days**	**Tue 8/5/18**	**Tue 5/6/18**		
3		Research Similar Documents	5 days	Tue 8/5/18	Mon 14/5/18		4
4		Conduct Research with Industry Stakeholders	5 days	Tue 15/5/18	Mon 21/5/18	3	5
5		Develop Situation Assessment	3 days	Tue 22/5/18	Thu 24/5/18	4	6
6		Develop Methodolgy	5 days	Fri 25/5/18	Thu 31/5/18	5	7
7		Develop Work Plan	3 days	Fri 1/6/18	Tue 5/6/18	6	8
8		Design Completion	0 days	Tue 5/6/18	Tue 5/6/18	7	36,10,1
9		**Document Legislative Framework**	**35 days**	**Wed 6/6/18**	**Tue 24/7/18**		
10		Review Related International Conventions	10 days	Wed 6/6/18	Tue 19/6/18	8	11
11		Review Domestic Legislation	5 days	Wed 20/6/18	Tue 26/6/18	10	12
12		Identify Local and International Policy Gaps	5 days	Wed 27/6/18	Tue 3/7/18	11	13
13		Research Policy and Practices in other jurisdictions	10 days	Wed 4/7/18	Tue 17/7/18	12	14
14		Make Recommendations	5 days	Wed 18/7/18	Tue 24/7/18	13	15
15		Framework Completion	0 days	Tue 24/7/18	Tue 24/7/18	14	36
16		**Develop Risk Assessment Matrix**	**41 days**	**Wed 6/6/18**	**Wed 1/8/18**		
17		Prepare list of Hazardous Waste from EEC Interventions	3 days	Wed 6/6/18	Fri 8/6/18	8	18
18		Rank list in terms severity and assign risk score	3 days	Mon 11/6/18	Wed 13/6/18	17	19
19		Develop Risk Response and Compile Table	10 days	Thu 14/6/18	Wed 27/6/18	18	20
20		Identify emerging issues from consumption patterns & technology	5 days	Thu 28/6/18	Wed 4/7/18	19	21
21		Execute logistic coordination for consultation in urban and rural locations	15 days	Thu 5/7/18	Wed 25/7/18	20	22
22		Ammend Risk Assessment Matrix and submit for approval	5 days	Thu 26/7/18	Wed 1/8/18	21	23
23		Risk Matrix Completion	0 days	Wed 1/8/18	Wed 1/8/18	22	36,25
24		**Produce Manual**	**30 days**	**Thu 2/8/18**	**Wed 12/9/18**		
25		Compile Manual	5 days	Thu 2/8/18	Wed 8/8/18	23	26
26		Organise Urban and Rural Consultations and present to stakeholders	10 days	Thu 9/8/18	Wed 22/8/18	25	27
27		Document Feedback, Revise Manual, Submit to Project Sponsor	10 days	Thu 23/8/18	Wed 5/9/18	26	28
28		Sponsor Validates scope and accept manual	5 days	Thu 6/9/18	Wed 12/9/18	27	29
29		Manual Production Completion	0 days	Wed 12/9/18	Wed 12/9/18	28	36,31
30		**Dissemination Event**	**16 days**	**Thu 13/9/18**	**Thu 4/10/18**		
31		Edit and Print Manual	10 days	Thu 13/9/18	Wed 26/9/18	29	32
32		Event Coordination	2 days	Thu 27/9/18	Fri 28/9/18	31	33
33		Invite Guess and Media	2 days	Mon 1/10/18	Tue 2/10/18	32	34
34		Execute Event	1 day	Wed 3/10/18	Wed 3/10/18	33	35
35		Disseminate Manual	1 day	Thu 4/10/18	Thu 4/10/18	34	36
36		End	0 days	Thu 4/10/18	Thu 4/10/18	35,8,15	



4.2.3 Control Schedule

Controlling the project schedule is extremely important in this second attempt of the EDM. It requires the project team to monitor activities, change processes and how the schedule is progressing. Schedule control defines what will be done and in what time, based on the resources available, constraints, project scope, and project charter among others.

For the EDM, different strategies will be used to control the schedule. This includes weekly team meetings and status update reports allowing the team to recognize both potential and actual deviation from the plan and make corrective and preventative actions and therefore minimize risks. The project manager will also determine the schedule performance index (SPI), an earned value management tool which assesses the ratio of the earned value to the planned value. If the SPI is less than one, the project is behind schedule, if equal to one it is on schedule, and greater than one, the EDM is ahead of schedule. These tools will help the PM to control the EDM project schedule.

Assessments of the schedule performance will be done in intervals after the submission and approval of deliverables for the EDM.This is estimated at every three weeks and therefore schedule updates will be included as a standard feature of monthly reports. In controlling the schedule, the project manager and team also manage the change control process by insisting that requests for changes be assessed for the triple constraints on time, scope and cost and how this will impact the schedule plan and project baseline. This also means that the EDM critical path will be assessed monthly and updated accordingly. New critical paths identified will then be compared to the baseline established at Table 5. As stated previously, the change control form and description of the process for the EDM is included at Appendix 3.

4.3. Cost Management Plan (CMP)

The Cost Management Plan describes how project related costs will be managed for the project duration. It outlines the standards and formats for reporting information and how the budget will be controlled. The Cost Plan also identifies who is responsible for managing costs, who can approve changes to the project or its budget, how expenditure performance is measured and reported on, the frequency of reporting and with whom reports are to be shared.

4.3.1 Plan Cost Management

Responsibility for the CMP for the EDM rests with the project manager. For the project of developing the EDM, the Project Manager has ultimate responsibility for CMP, and the Project Finance Officer (FO)has specific tasks to undertake. Through weekly and monthly meetings, and the preparation of various reports planning for the EDM occurs. This involves determining the budgets, approving changes, establishing expenditure performance targets, and making cash flow requests in order to make payment for approved deliverables under the EDM. The Finance Officer would reconcile accounts and recommend budget ceilings for various activities and ensures that expenditures are in line with budget limits.

4.3.2 Estimate Costs

In estimating costs, the FO would use bottom up estimating, expert judgment and analyse historical financial data from organisation process assets. So for example the Dissemination Event included main tasks such as edit and print manual, and event coordination. The steps involved in estimating costs associated with these outputs are shown below:

Edit & Print Manual:

- Develop physical specifications for the EDM in terms of type of paper, book cover, number of pages, finish (glossy or matte), colour and binding
- Obtain 3 quotations to print the document from printeries using the specifications developed

- Time for completing printing was also included as rush jobs attracted an additional fee
- Editing services from a Graphic Designer were included to ensure the manual was laid out (or type set) in appropriate software for printing

Event Coordination:

- Developing requirements for the event venue including number of guests, menu selection, meal service, decorations, audio visual equipment, public address system, chairperson, media promotions and outside broadcast, eletronic or printed invitations, parking, security, videography and photography services, social media streameing, wifi connection

Bottom up estimating would involve working backwards from the production of the event to the planning stage to ensure that costs for all items and requirements that the project team deems necessary have been included in the budget and that the budget is realistic. At the end of the estimating exercise when quotations have been received, the project team reviews and the FO prepares an estimated budget as shown in Table 6. Please note that there is not a total as these are estimates, the final budget is derived when the Project Sponsor approves the plans as shown in the section on Determine Budget.

Table 5: Activity Cost Estimates for Dissemination Event

No	Activity	Cost (US$)
1	Copy Editor Services to edit manual	3,000.00
2	Graphic Design services	3,000.00
3	Hotel Venue and Refreshments	6,000.00
4	Decorator	3,000.00
5	Audio visual equipment (public address system, multi media projector	1500.00
6	Videography and photography services	2,000.00
7	Printed documents (banner, programme)	1,500.00
8	Printing of EDM	10,000.00
	Sub-total for Dissemination Event	**30,000.00**

4.3.3 Determine Budget

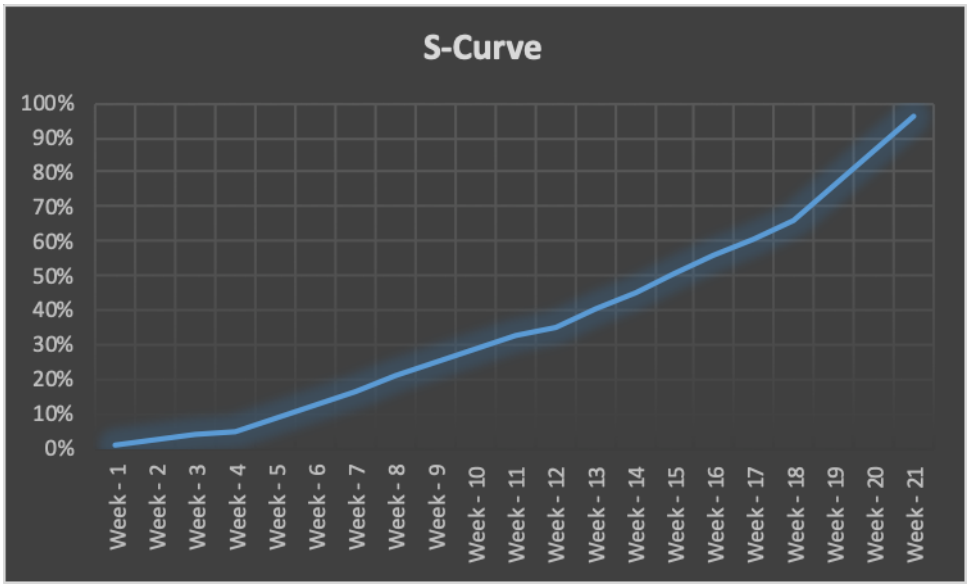
The budget is determined when it is approved by the project sponsor. At this point, the PM reviews for comprehensiveness and estimates for contingencies are included. Contingency fees can include a percentage of the sub total. In addition to contingency fees, the PM must consider the possibility of risks referred to as unknown unknowns which can only be funded through management reserves. Management reserves are funds provided outside the project from the functional operations; however this figure is not included in the budget. The final budget is shown below.

Table 6: Estimate Cost for the EDM (including an activity cost)

No	Activity	Cost (US$)
1	Design Manual	5,000.00
2	Document Legislative & Regulatory Review	10,000.00
3	Develop Risk Matrix	20,000.00
4	Produce Manual	30,000.00
5	Dissemination Event • Copy Editor Services to edit manual • Graphic Design services • Hotel Venue and Refreshments • Decorator • Audio visual equipment (public address system, multi media projector • Videography and photography services • Printed documents (banner, programme) • Printing of EDM • **Sub-Total for Dissemination Event**	 3,000.00 3,000.00 6,000.00 3,000.00 1,500.00 2,000.00 1,500.00 10,000.00 **30,000.00**
6	Contingencies	5,000.00
7	**Total Estimated Cost**	**100,000.00**

Once the budget is determined you would have established a cost baseline. This is then assessed at intervals against actual achievement. As noted in the table below, there is a slow start to the project with acceleration on expenditure in the middle and slowing down towards the end of the project as the work is completed.

Table 7: EDM S-Curve for the EDM



4.3.5 Cost Control

The Project Manager and Finance Officer performs cost control by determining the cost performance index for the project througout its implementation. This will give an indication of the earned value of the project and determine whether the project is behind budget, on target or has exceeded its allocation. Cost control is also represented on the Change Control Form referenced in Appendix 4, as changes to the project are also assessed for the impact on the budget before approval can be given to proceed with a change. Approvals for project budget/cost changes are to be approved by the project sponsor.

4.4 Quality Management Plan

According to www.investopedia.com/terms/q/quality-management.aso, quality management is the act of overseeing all activities and tasks to maintain ad esired level of excellence. A characteristic of quality mangement therefore is consistent application of systems, policies, methods and practices in executing project activities. This is the way to guarantee that “outputs, benefits and the process that are delivered meet stakeholder requirements and are fit for purpose” according to www.apm.org.uk/body-of-knowledge/delivery/quality-management/.

The development of an EDM does not lend itself to the traditional quality metrics associated with tactile activities such as construction, where the materials can be quantified, labeled, tested by strength among other things. But the EDM will require the application of the quality concepts for assurance and control which fit the product being developed. Planning quality management, providing quality assurance and control for the EDM are discussed below and a quality metrics are proposed.

4.4.1 Plan Quality Management

In planning quality for the EDM, the project team has decided on the establishment of a Technical Working Group (TWG) which consists of experts and policy makers in the field of environmental management, who are employed to the

Government of Jamaica in various capacities. In the course of their normal duties they will direct citizens, contractors and other users to ensure adherence to guidelines for environmental management similar to the proposed content of the EDM. The Quality Metrics for the EDM are shown in Table 9. The quality metrics are shared at the start of the work to develop the EDM.

4.4.2 Quality Assurance

The TWG will provide quality assurance for the technical content of the EDM based on their knowledge and experience. Further, all deliverables for the development of the EDM will be reviewed by the TWG to provide feedback and signature of approval of the work.

4.4.3 Quality Control

The TWG which acts as an advisory group to the project sponsor and team, will also be involved in reviewing the Requirements Matrix for the EDM and establishing quality standards for the work to be undertaken. Members of the TWG also participated in the urban and rural stakeholder consultations and helped to distill topics of conflict and provided balance and clarity on the perspectives shared by stakeholders.

4.4.4 Quality Assessment Intervals

The Project Manager will ensure that quality of the Manual is assessed at intervals. These intervals are established as deliverables under the contract and attached to a payment schedule subject to satisfactory completion of the deliverable which the Project Manager is required to sign before payments can be made. Quality control is ensured as before approval to pay is granted, a recommendation and endorsement from the TWG is required.

Table 8: QUALITY METRICS FOR DEVELOPMENT OF EDM (Source: The Author, J. Grizzle, 2018)

No	Requirement Name	Description/Definition	Quality Standards Required	Quality Score & TWG Comments
1	Island wide Situation Assessment	Summary of prevailing conditions related to local practices of disposal of hazardous waste; may include anecdotal reports and examples; reference to newspaper articles, interviews with industry players, government and international reports and studies	GIS mapping of locations of hazardous waste identified	Maximum Score: 12 points
2	Case studies	Inclusion of local, regional and international case studies to highlight situation assessment and best practices	Case studies to include focus on key hazardous waste (in particular lighting,refrigerants, hydrofluorocarbns), identified in USA, Latin America Australia	Maximum Score: 8 points
3	Legislative & regulatory framework (local and international)	This should include at a minimum, international conventions and domestic legislation	Legislation and Regulation must review: - ISO14001:2015 Environmental Management Systems, - Natural Resources Conservation Authority Act, National Solid Waste Management Act, - Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Nuclear Safety and Radiation 58 Section 4. - Financial Proposal - Standard Forms 58 Protection Act, - Minamata Convention on Mercury - Any other applicable	Maximum Score: 12 points
4	Gap analysis	Gaps related to policy implementation, enforcement, infrastructure, knowledge, training, service provisions	- Clear recommendations given on how these gaps can be met in the short, medium and long term - Ability of the Government of Jamaica to meet the gaps	Maximum Score: 8 points

No	Requirement Name	Description/Definition	Quality Standards Required	Quality Score & TWG Comments
5	Risk Assessment	A Risk Assessment Matrix is to be developed to evaluate both the probability and severity of a specific risk that is anticipated/expected to occur. The assessment will indicate priority areas and types of waste for urgent and strategic interventions.	- Risk Score to be determined by Probability X Impact - The risk assessment should consider: a) potential level of impact on the environment b) proposed management criteria for liquid, gas and solid wastes c) measures to ensure stability of the disposal sites, recycling facilities, temporary/permanent storage facilities d) methods to prevent seepage and contamination of surface water and groundwater from stockpiles and/or disposals e) design criteria to be used to ensure that waste containment and/or storage facilities perform satisfactorily f) market demand for recyclable and reusable waste g) measures to ensure waste does not attract or propagate pests, disease vectors or vermin, and does not impact general public health recovery requirements at source	Maximum Score: 30 points
6	Emerging Issues	Identify, assess and prioritise emerging issues resulting from current waste management practices in the Jamaican public sector. Determine how technological advances and consumption patterns impact emerging issues.	- Time projections for emerging issues to become a major challenge - Practical short, medium and long term efforts to counteract issues - Identification of government agencies to intervene - Preliminary assessment of response cost	Maximum Score: 12 points
7	Stakeholder Engagement	Urban and rural engagement of industry players, government ministries, departments and agencies	- Consultations should target 30 – 40 persons from 15-20 agencies in government, comercial sector,	Maximum Score: 8 points

No	Requirement Name	Description/Definition	Quality Standards Required	Quality Score & TWG Comments
			residences, academic community, NGO sector, citizens groups, media - Consultations to be held in urban and rural settings	
8	Reporting Format	Style, layout, graphic design, readability, practicality, illustrations, tables, photographs, colour and font	- Refer to PCJ Communication Policy for print and electronic media - APA Format using approved template	Maximum Score: 5 points
9	Consultant's Qualifications	Minimum academic qualifications and experience of Consultant to be recommended to execute this assignment	a. Graduate qualifications in Natural Science, Environmental Science, Environmental Law, Occupational & Environmental Health & Safety, or Engineering b. Prior documented experience in the development and/or review of standards, protocols, policies and guidelines. c. Prior documented experience in the management of hazardous materials would be considered an advantage. d. Experience in the development of manuals/guidelines/standards would also be an asset	Maximum Score: 5 points
Minimum Score required: 75			**TOTAL POINTS SCORE:**	**100 points**

Recommendation: This version of the Environmental Disposal Manual (EDM) dated _____ has met the Quality Metrics of the Technical Working Group, convened for this purpose. We recommend that the document be adopted for the Jamaica Energy Sector Project.

Chairman, TWG: _____ Signature:_____

4.5 Resources Management Plan

Without resources, a project cannot be implemented. The Resource Management Plan (RMP) assists the project manager to manage the project's resources until resources are released at the end of the project. The EDM RMP includes the following components expounded on below:

- Roles and responsibilities of team members throughout the project
- Responsibility, Accountability, Communicate and Inform (RACI) Matrix
- Project organization charts
- Staffing management plan to include:
    a. How resources will be acquired
    b. Timeline for resources/skill sets
    c. Training required to develop skills
    d. How performance reviews will be conducted
    e. Recognition and rewards system

4.5.1 Team Roles and Responsibilities

These must always be clearly defined in a project team. It is particularly important when human resources are shared within a functional organisation and it is a critical element in minimising potential conflict in teams. The elements of roles and responsibilities are explained below:

- A team member's role is related to the activities for which he or she is accountable. In this project, the roles of team members have been outlined in the RACI Index.
- The authority of team members to make decisions, commit project resources or give approvals should also be shared.
- Team members should be aware of what activities and tasks are their responsibility. This is also linked to their performance assessment
- Competency – this specifies the skills required to complete assigned tasks as well as the quality levels required.

Project Manager (PM), (1 position): responsible for the overall success of the EDM Development Project. The PM must authorize and approve all project expenditures. The PM is also responsible for approving that work activities meet established acceptability criteria and fall within acceptable variances. The PM will be responsible for reporting project status in accordance with the communications management plan. The PM will evaluate the performance of all project team members and communicate their performance to functional managers within the PCJ as necessary. The PM is also responsible for acquiring resources for the project through coordination with PCJ functional managers. The PM must possess the following skills: leadership/management, budgeting, scheduling, and effective communication.

Technical Officer (TO), (1 position):

Ensures the delivery and proper implementation of the technical components of the Jamaica Energy Sector Project Providing monitoring function for District Operations; The development and implementation of standards for new construction projects and retrofit programs to decrease costs in existing facilities. The development of workshops related to maintenance for project personnel. The monitoring interventions for compliance with international and domestic legislation and regulatory practices. The performance of operational reviews as related to maintenance activities. Provide technical support for energy sector; perform inspections on government buildings for unit condition. The incumbent is required to recommend changes to the GOJ Maintenance Management Program and the design or construction of new facilities and to work within established GOJ policies, procedures and regulations and building codes and regulations.

Environmental Officer (EO), (1 position): The Environmental Officer has specialist knowledge to ensure the authenticity of the Manual and the Consultant is contracted to develop the Manual. Must have sufficient knowledge on environmental assessment, monitoring, reporting, policymaking, and planning and any other necessary environmental issues. Once the Manual has been accepted, the Environmental

Officer will disseminate through various training workshops the content of the document. Also responsible for training the Technical Officer and Project Coordinator as Trainers of Trainers to ensure that they can roll out the training (in a separate project) after his tenure has been completed.

Project Coordinator (PO), (1 position):duties include: Coordinating project management activities, resources, equipment and information, breaking projects into do-able actions and set timeframes; liaise with clients to identify and define requirements, scope and objectives, assign tasks to internal teams and assist with schedule management; make sure that clients' needs are met as projects evolve, help prepare budgets, analyze risks and opportunities, oversee project procurement management, monitor project progress and handle any issues that arise, act as the point of contact and communicate project status to all participants, work with the Project Manager to eliminate blockers, use tools to monitor working hours, plans and expenditures, create and maintain comprehensive project documentation, plans and reports, ensure standards and requirements are met through conducting quality assurance tests

Finance Officer (PO), (1 position): The role of the Finance Officer involves providing financial and administrative support to colleagues, clients and stakeholders of the business. Duties include: assisting in the preparation of budgets, managing records and receipts, reconciling daily, monthly and yearly transactions, preparing balance sheets, processing invoices, developing an in-depth knowledge of organisational products and process, providing customer service to clients, resolve financial disputes raised by the customer service and sales teams, being a key point of contact for other departments on financial and accounting matters, supporting the Project Manager with projects and tasks when required

4.5.2: RACI Matrix

The RACI Matrix is a powerful tool to assist in the identification of roles and assigning of cross-functional responsibilities to a project deliverable or activity. RACI represents: ***R*** - Responsibility, ***A*** - Accountable, ***C*** - Consulted, and ***I*** – Informed. The RACI provides a graphic summary of the responsibilities for the positions in the project organisational chart.

Table 9: RACI MATRIX for the EECP, (Source: The Author, J. Grizzle, 2018)

RACI Definitions:

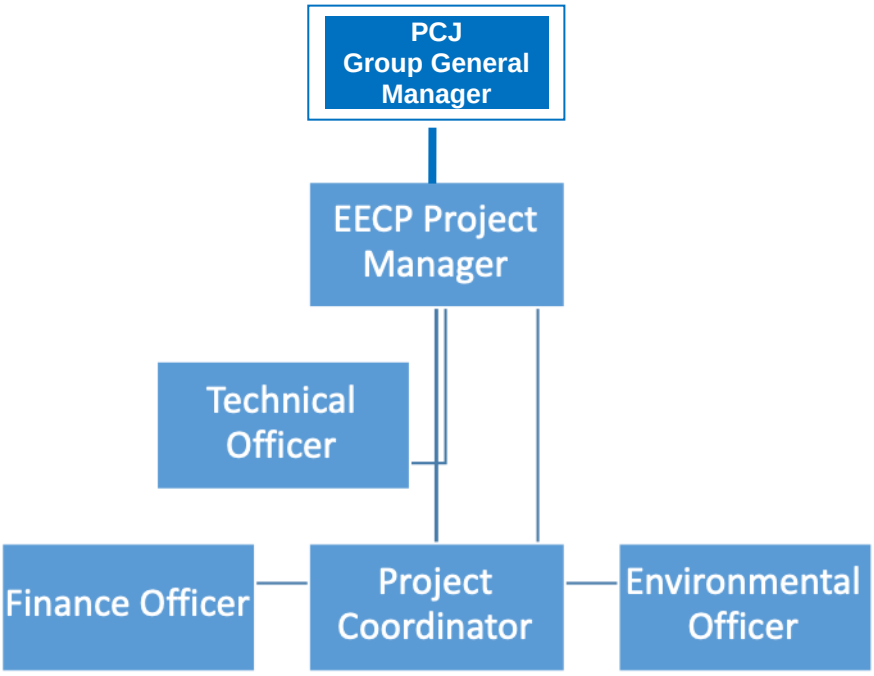
Responsibility = person or role responsible for actually doing or completing the item
Accountable = person or role responsible for ensuring that the item is completed
Consulted = person or role whose subject matter expertise is required in order to complete the item
Informed = person or role that needs to be kept informed of the status of item completion

Person/Title	**Jody Grizzle (Project Manager)**	**Nicholas Turner (Technical Officer)**	**Quentin Cavanaugh(Finance Officer)**	**Savannah Longmore (Project Coordinator)**	**Zane Ashley(Environmental Officer)**
Staff Contracts	R,A	I	I	I	I
Project Communication	A	I	I	R	C
Budget	A	I	R	C	I
Develop Terms of Reference for Manual and issue RFP	A	C	I	C	R
Stakeholder Consultations	A	I	C	R	C
Graphic design, editing, publishing, printing	A	I	I	R	C
Dissemination Event	A	I	I	R	C
Identify risks, Risk Responses (Risk Register)	A	C	I	C	R
Project Schedule	A	I	I	C	R
Change Control Documents	A	I	I	C	R

4.5.3 EECP Organisational Structure

The project organisational structure provides an image of the reporting relationships for the project. The positions described are linked to the RACI Matrix above as well as to the PCJ Organisational Chart shared in the introduction sections. The Project Manager for the EECP has a direct reporting relationship to the Group General Manager, which connects the project to the parent organisation.

Table 10: EECP Project Organisational Chart, (Source: The Author, J. Grizzle, 2018)



4.5.4 Staffing Management Plan

The Staffing Management Plan contains information on several areas including: when and how resource requirements will be acquired, the timeline for when resources are needed and may be released, training for any resources with identified gaps in skills required, how performance reviews will be performed, and the rewards and recognition system to be used.

Staff Acquisition:

For the EDM development Project the project staff will consist entirely of internal resources, already employed to the project. There will be no outsourcing/contracting performed within the scope of this project. The Project Manager will negotiate with functional and department managers if additional resources are required and if so, obtain the requisite approvals from PCJ functional managers before the resource may begin any project work. The project team will continue to co-locate for this project in the workspace currently assigned to the project.

Training:

There is currently no training scheduled with regard to the Software Upgrade Project since the organization has adequate staff with required skill sets. Due to the short time for project implementation, resources acquired for the project are expected to come with all the expertise and skills needed to execute the job. As a result, there are no opportunities for on the job training for specific positions duties. However, if training requirements are identified for aspects of the EDM, funding will be provided from the project reserve to meet this need.

Performance Reviews:

The project manager will review each team member's assigned work activities at the onset of the project and communicate all expectations of work to be performed. The project manager will then evaluate each team member throughout the project to evaluate their performance and how effectively they are completing their

assigned work. Prior to releasing project resources, a final performance appraisal will be conducted with employees to provide feedback on employee project performance.

Recognition and Rewards:

Although the scope of this project does not allow for ample time to provide cross-training or potential for monetary rewards there are several planned recognition and reward items for project team members shown below:

- Upon successful completion of the EDM Project, a Lunch Party will be held to celebrate the success with the team.
- Upon successful completion of the project, any team member who satisfactorily completed all assigned work packages on time will share the spot light with the Hon. Minister of Energy in unveiling the EDM at the Dissemination Event, along with a certificate of thanks from the PCJ Group General Manager.
- The PCJ will provide complimentary gas vouchers valued at $US100 each for the top performer on the EDM project.

4.6 Communications Management Plan

It has been established that to be an effective Project Manager you must be a premier communicator, as 80% of that job is dedicated to communication tasks. A Communications Management Plan tells the project manager what information to share, how (via meetings, email, telephone among other medium); when and the frequency of communication needed. The plan also identifies the responsible communication officer and the communication requirements for stakeholders on the project. The Communication Plan should also address how to treat with sensitive information, how changes are to be communicated, how to manage/escalate conflicts and formats and templates for communicating.

4.6.1 Plan Communications

Using expert judgment, enterprise environmental factors and organisational process assets, the project team developed the Communication Matrix below for the EDM Manual. For the development of the EDM, the communication plan is established for the duration of the project. It is not an absolute document; but subject to updates as there are changes in communication needs. A communication matrix has also been proposed to show the communication requirements of key stakeholders on the project. Meetings are a standard and regular part of project planning, execution and monitoring and a Meeting Guide has also been developed for the project team.

COMMUNICATIONS MATRIX FOR ENVIRONMENTAL DISPOSAL MANUAL							
Communication Type	**Objective of Communication**	**Medium**	**Frequency**	**Audience**	**Owner**	**Deliverable**	**Format**
Kickoff Meeting	Launch project; introduce team; share project objectives	Face to Face	Once	Project Sponsor Project Team Key Stakeholders Group General Manager PMO	Project Manager	Agenda Project Charter Project Schedule	Soft copy document
Team Meetings	Review status of the project with team; review risks; schedule; tasks	Face to Face	Weekly	EECP Project Team	Project Manager	Agenda Meeting Notes Project Schedule	Soft copy document
Technical Working Group	Review submissions from the Consultant; endorse content; recommend changes	Face to Face and via electronic submissions	As required	Technical Staff Key Stakeholders	Environmental Officer	General and Specific comments on Consultants' submissions	Soft copy document
Project Status Meetings	Report on project status to management	Face to Face	monthly	PMO Group General Manager	Project Manager	Multi media presentation	Soft copy document
Project Status Reports	Provides progress update on project implementation, schedule, cost and issues		monthly	Project Sponsor Project Team Key Stakeholders Group General Manager PMO	Project Manager	Project Status Report	Soft Copy

Table 11: Communications Matrix for the EDM (Source: The Author, J. Grizzle, 2018)

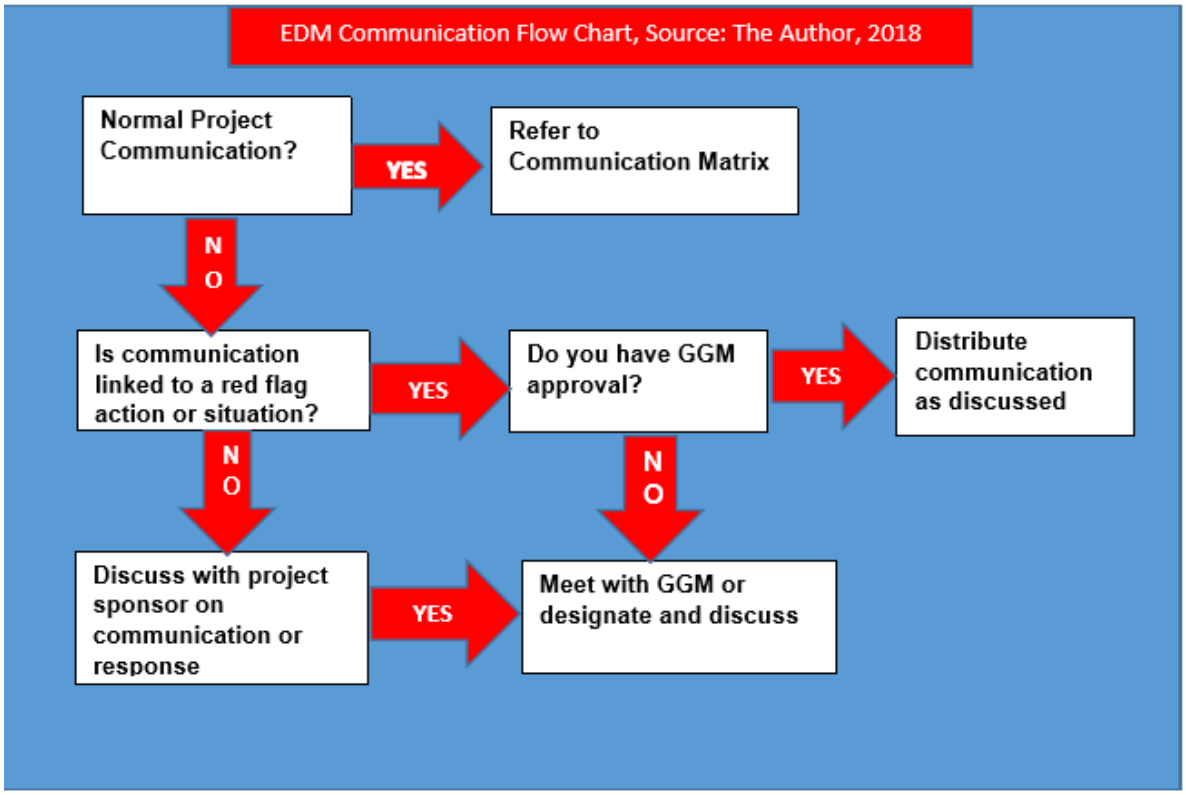
In planning communication, the project manager compiled a Project Directory with contact information for the project team and key stakeholders. The Directory which can be viewed at Table 12 currently has the project sponsor and team but will be progressively elaborated throughout the EDM project.

Table 12: PROJECT DIRECTORY: ENVIRONMENTAL DISPOSAL MANUAL, Source: The Author, J. Grizzle, 2018

ROLE/TITLE	NAME	TITLE	ORGANISATION /DEPARTMENT	EMAIL	PHONE
PROJECT SPONSOR	ROBERT CLARKE	GROUP GENERAL MANAGER	PCJ	GGM.CLARKE@PCJ.COM	876-234-6789
PROJECT MANAGER	JODY GRIZZLE	PROJECT MANAGER	EECP, PROJECT UNIT	PMGRIZZLE@PCJ.COM	876-874-2356
TECHNICAL OFFICER	NICHOLAS TURNER		EECP, PROJECT UNIT	N.TURNER@PCJ.COM	876-584-1235
PROJECT COORDINATOR	SAVANNAH LONGMORE		EECP, PROJECT UNIT	S.LONGMORE@PCJ.COM	876-258-9631
ENVIRONMENTAL OFFICER	ZANE ASHLEY		EECP, PROJECT UNIT	Z.ASHLEY@PCJ.COM	876-324-7456
FINANCE OFFICER	QUENTIN CAVANAUGH	FINANCE OFFICER	EECP, PROJECT UNIT	Q.CAVANAUGH@PCJ.COM	876-951-7536
PROJECT STAKEHOLDERS (END USER OF MANUAL)	SEE STAKEHOLDER REGISTER	SEE STAKEHOLDER REGISTER	SEE STAKEHOLDER REGISTER	SEE STAKEHOLDER REGISTER	SEE STAKEHOLDER REGISTER
CONSULTANT	MARCUS GARVEY	PROFESSOR	BLUE MOUNTAIN UNIVERSITY	M.GARVEY@BLUEMOUNTAIN.EDU.JM	876-654-9874

The project manager also adopted an organisational process asset from the PCJ which illustrated a process flow for another department. The PM decided to modify it and along with the project team a Communication Flow Chart was developed. The flow chart shows both the team and stakeholders the steps for communication and is attached for perusal in Table 15.

Table 13: EDM Communication Flow Chart, Source: The Author, J. Grizzle, 2018



4.6.2 Manage Communications

The PM decided that given the importance and role of meetings as a form of communication for different elements of the EDM, guidelines for managing meetings should be developed so that team members and stakeholders are aware of the standards. The Meeting Guidelines below was developed for the EDM.

Table 14: EDM Meeting Plan Template, Source: The Author, J. Grizzle, 2018

Meeting Date_____ Use this form to structure meetings, guide discussion and actions, and to document activity that occurs between meetings. Adapt or extend this to suit your purposes.
1. Agenda Preparation. Before your meeting, note topics you want to discuss and why. (Refer to your last meeting plan) Outline what you want to say in the form of Speaking Notes
2. Work Update. Review action sheet and report on work completed since your last meeting. Describe current tasks and activities Highlight challenges, achievements, stakeholder involvement or key points in current tasks; identify risks, opportunities and threats Discuss, and note recommendations here.
3. Upcoming Work. Discuss projects and challenges ahead. Describe next steps and identify the areas for which support is needed. Discuss, and note recommendations here.

4. Goals Check. Track several immediate work goals and at least one long-term career goal. Goals: Focus on advancing specific technical or professional skills as well as building understanding of the company and the industry. Actions: Refer to the Activities Guide for action ideas. Status: Track status as “not started,” “continuing,” or “complete.”		
Goals	**Actions (What will you do, who will help?)**	**Status**
5. Set Meeting Date. When and where will you meet next? _____ Contemplate logistical needs for example: refreshments, IT support, parking, prints/hand outs, venue, identify and assign note taker		
6. Agenda List. Discussion or action items you know you want to cover next meeting.		

4.6.3 Control Communications

The project team using expert judgment, enterprise environmental factors and organisational process assets has proposed a system of red flags for project happenings that would trigger systems to monitor communications. The team brainstormed the following actions or situations for red flags prior to communicating outside the project team and to the public:

- Sensitive information which could affect security or health of people, communities and the organisation
- Humanitarian crises
- Natural Disasters
- Unusual increase in media attention (positive or negative)
- Unusual financial loss or gain
- Excessive disgruntlement or conflict among stakeholders
- Unusual political interest

4.7 Risk Management Plan (RKMP)

As a result of the first unsuccessfull attempt to develop and EDM, this project management plan was recommended as a lesson learned to mitigate against the risk of a second unsuccessful attempt. It is therefore logical to think that if a Project Management Plan was recommended as a risk mitigation strategy, that the RKMP would be of great significance to the project sponsors for the development of the Environmental Disposal Manual. Risk is defined as “A probability or threat of damage, injury, liability, loss, or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through preemptive action.”; this is according to http://www.businessdictionary.com/definition/risk.html

4.7.1 Plan Risk Management

The risk management approach adopted includes a process of assessment by the team to identify, score and rank various risks on the project. Risk owners are assigned to the risks and have the responsibility of implmementing approved mitigation strategies. The RKMP also allows the project team to develop response strategies to the risks. It is important to determine the risk score for the project and this is achieved by identifying and documenting all risks in a risk register and determining the probability of a risk occuring and the impact this would have on achieving the project objectives. The total of all the probabilities multiplied by all the impacts will indicate the overall risk score on the project. A Risk Register for this project was developed and is shown below after which the top three risks for this project are given explained.

Table 15: EDM Meeting Plan Template, Source: The Author, J. Grizzle, 2018

Risk Description	Cause	Consequence	Trigger	Owner	Probability	Impact	PxI	Strategy	Strategy Response	Cost to manage Risk
OPERATIONAL/REGULATORY Consultants bidding on project fail to meet eligibility requirements as outlined in GOJ Procurement Guidelines	Common errors when submitting bids	Bid is deemed non responsive and is discarded Risk that procurement process has be aborted and a new one started which impacts on project timelines.	N/A	Technical Officer	2	4	8	**Mitigate**	Include checklist for submission of bids Pre-Bid Meeting to review compliance requirements with bidder	**Cost of Pre-Bid Meeting**
OPERATIONAL/ REGULATORY There are no responses to the Request for Proposal issued.	The field of experts in Jamaica is small and if Consultants are not interested or are unaware of the procurement opportunity this risk may materialise	There are no tenders to evaluate and the project schedule is impacted as the Request for Proposal has to be repeated or extended. Also, HR Contracts for short term staff would have to be extended		Technical Officer	2	3	6	**Mitigate**	Advertise procurement opportunity in several locations. Identify prospective consultants and inform them that a tender has been issued. Check in with Consultants prior to bid submission to ensure that they intend to participate in the tender	**Cost of administrative support**
FINANCIAL Contract price may increase due to fluctuations in exchange rate	delay in obtaining approval for procurement during which JMD value depreciated	Insufficient budgetary provisions for contract implementation	Exchange rate fluctuations	Finance Officer	2	1	2	**Accept**	Need to request additional funds to complete project; Discuss maintaining bid price at upcoming Stakeholders Meeting	**Cost of Pre-Bid Meeting**

Risk Description	Cause	Consequence	Trigger	Owner	Probability	Impact	PxI	Strategy	Strategy Response	Cost to manage Risk
TECHNICAL **Knowledge of** Unavailability of preferid bidder to execute contract due to over allocated resources	The contractor could have taken on other business given the delays in completing the procurement	Contractor's staff and resources are over the allowable limit for NCC and unless additional resources are secured the contractor would be unable to execute the contract at the specified time.	Number of participants attending the pre-bid conference	Technical Officer	1	1	1	**Accept**	Raise issue at Stakeholder Meeting for the contractor to handle	**Cost of Stakeholder Meeting**
OPERATIONAL/REGULATORY No extension to project duration granted	Project sponsor unwilling to extend and fund project extension	Project is terminated at original timeline	Project Sponsor does not include project in 2019/2020 budget	Project Manager	2	5	10	**Avoid**	Send letter to MOFPS requesting extension and meeting to discuss the surrounding issues Obtain GGM's support for course of action	
FINANCIAL Reduction in budgetary provisions	If the overall project budget is reduced by the government	Reduction in funds allocated for project implementation monthly.	Favorable assessment of overall project expenditure and performanc e as at December 2018	Finance Officer	2	3	6	**Mitigate**	Manage cash flow requests, contractor relationships, closely monitor payments at Accounts	

Risk Description	Cause	Consequence	Trigger	Owner	Probability	Impact	PxI	Strategy	Strategy Response	Cost to manage Risk
OPERATIONAL Lack of cooperation, access	Unwillingness of stakeholders to provide access or share information which is key to the study; especially informal operators in the sector	The consultant is unable to make concrete recommendations on some aspects of the study	Participant involvement /interest in stakeholder consultation	Environmental Officer	2	2	4	**Mitigate**	Strengthening stakeholder consultations and participation.	**Cost of Stakeholder Meeting**
	TOTAL PROJECT RISK SCORE					**38**				

LEGEND	
PxI Score	**Description**
Zero (0)	**No Risk**
From 1 to 3	**Low Risk**
From 4 to 7	**Medium Risk**
From 8 to 9	**High Risk**
Ten (10)	**Maximum Risk**

4.7.1 Analysis of Top Three EDM Project Risks

1. OPERATIONAL/REGULATORY:Consultants bidding on project fail to meet eligibility requirements as outlined in GOJ Procurement Guidelines. The cause I associated with common errors when submitting bids and has a serious consequence of the Bid being deemed non responsive and discarded. This results in the procurement process hbeing aborted and a new one has to be initiated which impacts on project timelines. A high risk score of 8 is given for this activity. This risk can only be mitigated by using strategies such as including a checklist for submission of bids and convening a mandatory Pre-Bid Meeting to review compliance requirements with bidder. One other option exists and that is to change the procurement methodology from the submission of bids to an assessment of Consultants' Qualifications.

2.OPERATIONAL/REGULATORY: There is a significant risk if an extension to the project duration is not granted. The end of project date was established for March 31, 2019 however due to procurement setbacks, not all the deliverables under the project have been completed. If the project sponsor is unwilling to extend and fund an extension, the project would be terminated at the aforementioned timeline. The trigger for this action is if the project sponsor does not include project financing in the Budget Call for the 2019/2020 fiscal year. The risk score applied is at the maximum of ten as the impact is greatest. The EECP can only attempt to avoid this risk by submitting a timely request for an extension of the project and obtaining support from key stakeholders for a new end of project date to be established.

3.FINANCIAL: Reduction in budgetary provisions: This risk would be caused by an overall reduction in the project budget. The impact or consequence of such an action is that there would be inadequate funding to implement activities as conceptualised or planned. The trigger for this risk is the failure of the project to maintain acceptable expenditure/disbursement targets on a quarterly basis. This risk can be mitigated by managing cash flow requests, monitoring submission of contractor invoices and closely supervising payments of invoices.

4.7.2 Control Risks

Controlling risks requires ongoing monitoring of the Risk Register and ongoing assessment of the key elements of the register such as the triggers, the risk score, risk response strategy and cost to manage the risks. Risk owners are assigned from the project team to execute these functions and regular updates provided to the PM in team meetings. The PM then recommends strategic actions based on the type of change in the risk score to manage project risks. This is guided by the legend at the bottom of Table 16 which uses stoplight colours to demonstrate low, medium and high risks.

4.8 Stakeholder Management Plan (StkMP)

The Stakeholder Management Plan helps you effectivly manage the positive and negative impact that stakeholders can have on your project. The plan will help the project team to identfy stakeholders and strategies to manage their power and influence, identify potential sources of resistance, conflict and even synergies.

4.8.1 Identify Stakeholders

For the EDM PMP, the project team conducted a brainstorming session to define and identify stakeholders. The PM established the following ground rules for this exercise:

GROUND RULES

1. There are no dumb or foolish ideas
2. Don’t criticize other people’s ideas
3. Add value to ideas
4. Unfilter your thought process
5. Get as many ideas as possible
6. Listen to each other
7. One conversation at a time

Next, the PM organized the session in segments so that the team could focus on a topic at a time. A discussion guide was developed with the following questions to assist in brainstorming:

1. Who or what will be directly or indirectly affected by the project?
2. What is the power or influence of the person or entity being affected?
3. Through what medium do/can they influence the project?
4. What entities or individuals have special skills needed by the project?
5. Who are likely to be winners and losers from the project?

Manual tools were employed such as circular post its, flip chart papers, permanent markers, and a white board. Team members were asked to write their contributions on the post it and place them in concentric circles on the flip chart and white board. After all ideas were collected, ideas were collectively eliminated. From this process, a starting list of stakeholders was developed and included in the Project Charter. The PM indicated that this process would be repeated at intervals throughout project implementation as stakeholders' power and influence is subject to change. The information compiled in the brainstorm session was analysed and documented in the Stakeholder Power Interest table below.

Table 16: EDM Stakeholder Power Interest Chart, Source, J. Grizzle, 2018

Keep Satisfied Technical Working Group (TWG) Min. Of Science, Energy & Technology (MSET) National Environment & Planning Agency (NEPA) Environmental Health Department-Ministry of Health (EHD-MOH) Planning Institute of Jamaica (PIOJ)	**Manage Closely** Environmental Officer (EO)
Monitor Technical Officer (TO)	**Keep Informed** PCJ MSET NEPA Jamaica Environment Trust (JET) EHD-MOH PIOJ Energy Management & Efficiency Programme (EMEP) Ministry of Finance-Asset Management Division (MOF-AMD)

4.8.2 Plan Stakeholder Management

From the information obtained in the brainstorming session, a stakeholder analysis was conducted which is summarised in Table 19 below.

Table 17: EDM Stakeholder Analysis, Source – The Author, J. Grizzle, 2018

Organization	Role	Level of Interest/Power
GOVERNMENT		
PCJ ● Group General Manager ● Legal Officer ● Environmental Engineer	Internal	High
PCJ – EECCP ● Project Manager ● Technical Team ● Procurement Officer	Internal	Core members of Steering Committee Key Repository of Information
Office of the Prime Minister, Energy Division (OPM, ED) • Principal Director, Energy • Energy Policy Specialist	Internal	Medium
Environmental Health Department, Ministry of Health	External	Steering Committee
Planning Institute of Jamaica (PIOJ)	External	Steering Committee
Bureau of Standards, Jamaica (BSJ)	External	Steering Committee
National Environment & Planning Agency (NEPA)	External	Steering Committee
PRIVATE SECTOR		
Grade 1 and 2 HVAC Contractors registered with the NCC	External	Medium
ACADEMIA/ RE Training Institutions		
UWI, Mona- Science & Technology Department	External	Low
UTech, Jamaica – School of Engineering	External	Low
Northern Caribbean University	External	Low
HEART Trust/NTA – National Tool & Engineering Institute	External	Low
Vector Technology Institute	External	Low
Caribbean Maritime University –School of Engineering	External	Low
SPECIAL INTEREST GROUPS		
Jamaica Environment Trust (JET)	External	Low
Jamaica Conservation and Development Trust (JCDT)	External	Low
United Nations Environment Programme (UNEP)	External	Low
Environmental Foundation of Jamaica (EFJ)	External	Low
Environmental Health Foundation (EHF)	External	Low

4.8.3 Monitor Stakeholder:

The PM along with the team will monitor stakeholder engagement throughout the EDM Project. The team recognises that the PMP is an iterative process and that additional stakeholders can be identified or the roles, power, interest of current stakeholders can change depending on external factors or evening the project phase. The team is prepared to continuously scan the environment and update the Tables 16 and 17 throughout project implementation.

Chapter 5: CONCLUSIONS

The in depth planning for the Project Management Plan for the Environmental Disposal Manual, carried out above has set the stage for a successful project outcome. The conclusion can be made that all the specific objectives of the EDM Project have been achieved as shown below:

1. The general objective has been achieved by the development of a Project Management Plan (PMP) to guide the project of preparing an EDM for the Energy Sector, in keeping with PMI principles by the acceptance of this document.

The specific objectives have been realized by:

1. The preparation of a scope management plan to ensure that the objectives of the EDM are fulfilled. The scope management plan includes the requirements matrix, scope definition and statement, roles and responsibilities and the work breakdown structure.
2. The creation of a schedule management plan which identifies activities, places them in implementation sequence and provides a schedule and critical path for project implementation. This is complemented by steps to control the schedule including comparing the schedule performance to the schedule baseline.
3. Planning and and estimating costs, determining the budget, establishing a cost baseline, articulating mechanisms to control costs and the use of the SCurve to assess cost performance.
4. Quality metrics have been established to ensure that the EDM meets the desired standard with regard to technical content, visual appeal and user friendliness.
5. A Resource Management Plan has been prepared which outlines the both the project structure and how it links to the organisation. Additionally, roles and responsibilities of team members have been documented. The RACI Matrix prepared presents this information in a snapshot for easy reference

and a staff management plan outlining training, performance appraisals and rewards has been prepared.

6. A Communication Management plan is now in place and the Communications Matrix summarizes the communication type, meidum frequency, audience and format. This is complemented by a Project Directory, Process Flow Chart for project communication and a Meeting Guide Template.
7. The project has a plan to manage risks. Risks have been identified, and a risk register prepared with triggers, a risk score, response strategies, risk owners and costs for risk mitigation.
8. Stakeholders have been identified, and their power, interest and influence on the project analysed. The project team has also articulated how stakeholders will be monitored from inception to completion.

Chapter 6: RECOMMENDATIONS

The author directs these recommendations to the Group General Manager of the Petroleum Corporation of Jamaica and the Chief Technical Director, Ministry of Energy, Jamaica.

1. That the PCJ in partnership with the Ministry of Science, Energy and Technology should devise a robust regulatory framework to monitor and evaluate the impact of the new regulations and the extent to which it has increased the knowledge base of target populations for the regulation
2. Conduct end user and supplier surveys, which can guide subsequent editions of the publication and identify emerging trends and gaps in policy in a coordinated way at established intervals.
3. Have targeted public education programmes and training to support the uptake of the regulations in the public, commercial and residential sectors for the management of hazardous waste in their operating environs
4. Support the roll out of the national regulatory document by creating a knowledge platform for stakeholder groups to access information, report non-compliance and share within a community of practice.
5. Facilitate the transformation of stakeholder groups into organized bodies which will ultimate enhance policy formulation and good governance initiatives. By doing this, the national regulatory policy network becomes empowered and active which results in shorter response time by the government to issues on the ground .
6. That this body of work be adapted as an organizational process asset for both entities
7. That the tools, processes and lessons learned contained herein are added to the community of project management practice within the Jamaican energy sector
8. The adoption and consistent use of PMI principles for the execution of both consultancy and capital investment projects in the Jamaican energy sector.

9. That the preparation of project management plans be regularized, standardized and incorporated in performance appraisals of project teams and within the operational reporting structure of the entities.
10. Financial, technical and policy level support for research into identifying quality metrics for non traditional projects such as these which are not of the usual genre, such as information technology or construction, and which was one short coming of this body of work.

It is the firm belief of this author that the adoption of these recommendations will enhance the number of projects successfully completed in the Jamaican energy sector.

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APPENDICES

Appendix 1: FGP Charter

PROJECT CHARTER	
Date	**Project Name:**
Sunday May 20, 2018	**Project Management Plan for the preparation of an Environmental Disposal Manual for the Jamaican Energy Sector**
Knowledge Areas / Processes	**Applicacion Area (Sector / Activity)**
Should indicate the knowledge areas and process groups which are related to the project **Knowledge areas:** 1. Scope Management 2. Schedule Management 3. Cost Management 4. Quality Management 5. Resource Management 6. Communication Management 7. Risk Management 8. Procurement Management 9. Stakeholder Management **Process groups:** 1. Initiation 2. Planning 3. Executing 4. Monitoring/Controlling 5. Closing	Energy Sector in Jamaica
Start date	**Finish date**
Sunday, May 20, 2018	Sunday, June 17, 2018

Project Objectives (general and specific)

General objective:

To develop a Project Management Plan (PMP) to guide the preparation of an EDM for the Energy Sector

Specific objectives:

1. To construct a scope management plan to ensure that the objectives of the Terms of Reference (TOR) for the consultancy are fulfilled
2. To create a schedule management plan to ensure that deliverables are submitted and reviewed on time and that there is adherence to the overall project schedule.
3. To prepare a cost management plan to keep the consultancy on budget, especially since a resources were already expended for this activity without achieving the desired result.
4. To establish a quality management plan to ensure that the output meets the desired standard of the procuring entity and key stakeholders with regard to technical content, visual appeal and user friendliness.
5. To articulate a Resource Management plan to ensure that qualified and capable subject matter experts are available to work on the assignment.
6. To generate a Communication Management plan appropriate to the needs of internal and external stakeholders which will support project implementation and documentation appropriately.
7. To generate a robust Risk Management plan which will minimise the risks of a second unsuccessful execution of this consultancy
8. To develop a Procurement Management plan which will guide the acquisition of goods and services in accordance with government procurement regulations
9. To generate a Stakeholder Management plan which will assist in managing expectations of stakeholders and issues arising from their interactions with each other and project processes.

Project purpose or justification (merit and expected results)
The EECP contracted consultancy services to develop a manual to manage the disposal of hazardous waste in the energy sector. The project was to be implemented in six (6) months however, the project failed as the consultancy deliverables did not fulfill the scope of work, and subsequent revisions to the document did not achieve the desired standard, before the contract expired. This unsuccessful initiative cost the Government of Jamaica an estimated US$10,000 and presented delays on the overall EECP project schedule. As this project is on the critical path for the EECP, the activity has to be re-done. The development of a PMP has been recommended as a lesson learned from the first attempt at executing this project. The PMP when completed will assist by outlining pertinent project tools and techniques and is expected to contribute to successful project implementation the second time around.
Description of Product or Service to be generated by the Project – Project final deliverables
The deliverable of this project is a Project Management Plan containing the nine elements detailed in the specific objectives and acceptnce as the management tool for the execution of the consultancy.

Assumptions
It is assumed that: - ten hours per week is sufficient to meet the demands of the course - the organisation will approve the use of this project for my academic pursuits
Constraints
Time: Finding balance between professional, personal and academic life as all compete for the hours in my day **Scope:** The content of an EDM is specialised and technical; this may present some limitations in understanding the material and being able to assess with respect to quality and scope

Preliminary risks

The main risks identified presently are:

- The project starts before the PMP is completed or at an advanced stage resulting in the PMP not being used as intended.
- Project staff are tardy in providing information for the PMP which fall under their portfolio
- Project implementation does not adhere to the PMP

Budget

The general cost to prepare the PMP is US$1000.

Milestones and dates

Milestone	Start date	End date
Final Graduation Project	May 21, 2018	October 12, 2018
1. Graduation Seminar	May 21, 2018	June 17, 2018
1.1 FGP deliverables	May 21, 2018	August 5, 2018
1.1.1 Charter	May 21, 2018	May 28, 2018
1.1.2 WBC	May 21, 2018	May 28, 2018
1.1.3 Chapter I - Introduction	May 28, 2018	June 4, 2018
1.1.4 Chapter II – Theoretical Framework	June 4, 2018	June 11, 2018
1.1.5 Chapter III – Methodological Framework	June 11, 2018	June 18, 2018
1.1.6 Annexes	June 11, 2018	June 25, 2018
1.1.6.1 Bibliography	June 11, 2018	June 18, 2018
1.1.6.2 Schedule	May 28, 2018	June 4, 2018
1.2 Graduation seminar aproval	June 17, 2018	June 17, 2018
2. Tutoring Process	June 25, 2018	August 5, 2018
2.1 Tutor	June 25, 2018	June 27, 2018
2.1.1 Tutor assignment	June 25, 2018	June 25, 2018
2.1.2 Communication	June 25, 2018	June 27, 2018
2.2 Adjustments of previous chapters	June 25, 2018	July 1, 2018
2.2.1 Adjust Charter	June 25, 2018	July 1, 2018
2.2.2 Adjust WBC	June 25, 2018	July 1, 2018
2.2.3 Adjust Chapter 1	June 25, 2018	July 1, 2018
2.2.4 Adjust Chapter II	June 25, 2018	July 1, 2018
2.2.5 Adjust Chapter III	June 25, 2018	July 1, 2018
2.3 Chapter IV – Development (Results)	July 16, 2018	July 21, 2018
2.4 Chapter V - Conclusions	July 23, 2018	July 28, 2018
2.5 Chapter VI - Recommendations	July 30, 2018	August 4, 2018
Tutor Approval	August 5, 2018	August 5, 2018
3. Reading by reviewers	August 6, 2018	August 21, 2018
3.1 Reviewers assignment request	August 6, 2018	August 8, 2018
3.1.1 Assignment of two reviewers	August 9, 2018	August 10, 2018
3.1.2 Communication	August 11, 2018	August 12, 2018
3.1.3 FGP submission to reviewers	August 13, 2018	August 13, 2018
3.2 Reviewers Work	August 14, 2018	August 21, 2018
3.2.1 Reviewer	August 21, 2018	August 28, 2018
3.2.1.1 FGP reading	August 14, 2018	August 28, 2018
3.2.2.2 Reader 2, report	August 29, 2018	August 29, 2018
4. Adjustments	August 30, 2018	September 10, 2018
4.1 Report for reviewers	August 30, 2018	September 10, 2018
4.2 FGP Update	September 11, 2018	September 11, 2018
4.3 Second review by reviewers	Septemerb 12, 2018	September 22, 2018
5. Presentation to Board of Examiners	September 24, 2018	October 2, 2018
5.1 Final review by Board	October 2, 2018	October 9, 2018

5.2 FGP Grade Report	October 10, 2018	October 12, 2018
FGP END	October 12, 2018	October 12, 2018

Relevant historical information

The Energy Efficiency and Conservation Programme (EECP) was developed to design and implement energy efficiency (EE) and energy conservation (EC) measures to improve energy efficiency and conservation (EEC) in government owned buildings; which would ultimately lead to substantial cost reductions in public sector operations. As a part of Institutional Strengthening, the development of National Guidelines to manage hazardous waste in the energy sector was an imperative of the project sponsor. The EECP contracted the services of a consultant to develop the National Guidelines, however the deliverables submitted did not meet the required standard.

As the activity is a part of the critical path for the Project, a second Project initiation is to be undertaken to complete the assignment. The TOR used for the first project and the reports submitted under that consultancy are available to the Project team as needed for the seconded attempt at this assignment.

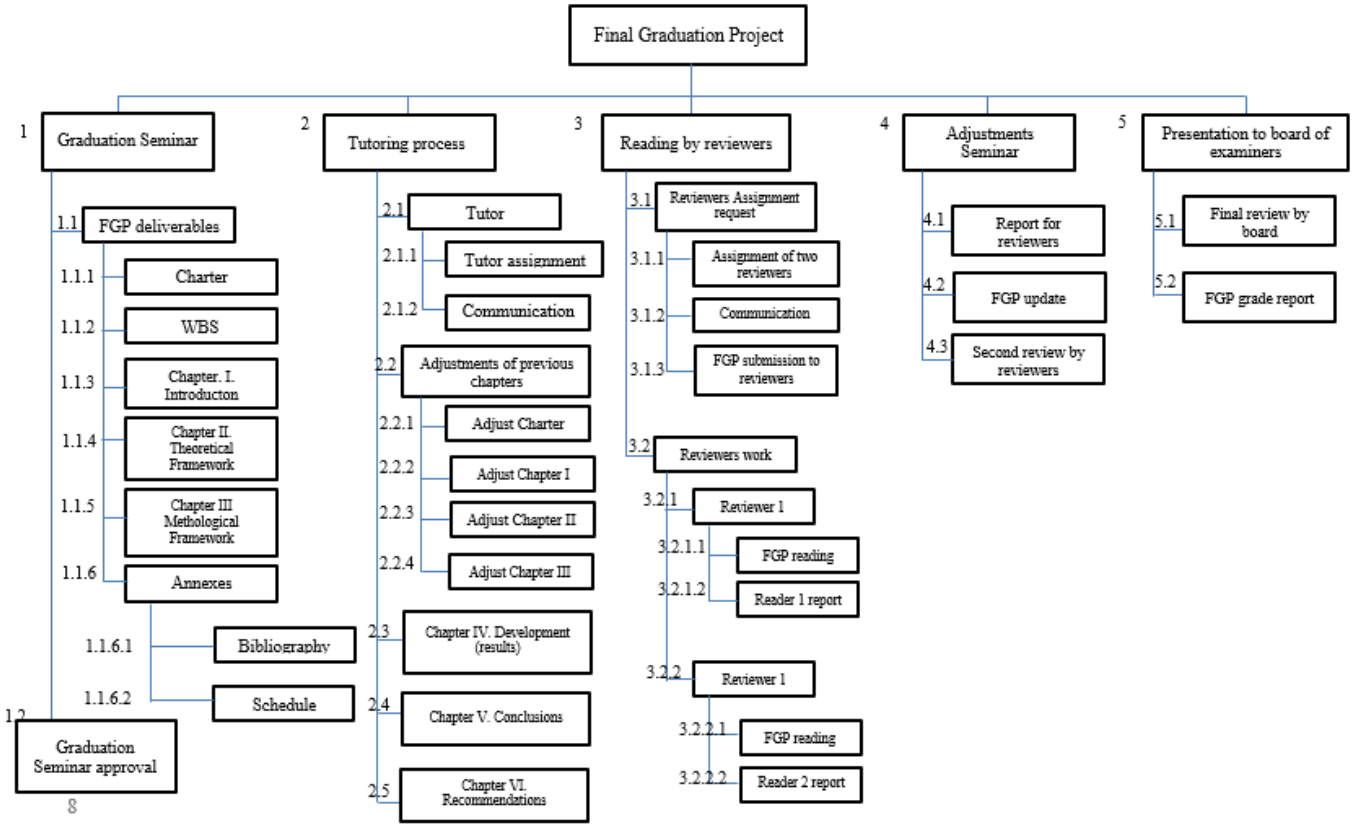
Stakeholders

Direct stakeholders:
Tutor
Reviewer 1
Reviewer 2
Dean, UCI

Indirect stakeholders:
Classmates
EECP Project Team
PCJ Head of Entity

Project Manager: JODY GRIZZLE	**Signature:** 
Authorized by:	**Signature:**

Appendix 2: Work Break Down Creation (WBC) for the EDM



Appendix 3:

Energy Efficiency & Conservation Programme (EECP)

CHANGE REQUEST PROCESS

NAME OF PROJECT:

DATE REQUESTED:

Change request forms are the primary project management tool used for requesting any changes to a specific project and are one piece of the change management process. All project managers must manage change carefully and implement a thorough change control process to ensure project's remain within their approved constraints. Some projects have many stakeholders with varying levels of interest in the project and change is an inevitable part of any project lifecycle.

The change request form is filled out by the individual who identifies the need for a change and submitted to the project team in accordance with the change control process. The project manager then leads the team in identifying the impacts of the change, whether or not it will benefit the project, and if it will allow the project to proceed within its approved constraints. The request is then submitted to the change control board with the project team's findings where it is reviewed and either approved, rejected, or deferred until clarification can be sought.

If the change is approved, all project documentation must be updated accordingly and the change must be communicated to all stakeholders. Some changes may also require re-baselining of the costs, schedule, or scope. There are many formats for change requests depending on the organization.

Change Management Process

The process starts with the creation of an RFC (Request for Change) by three (3) persons representing the contractor, facility and the EECP. Once the RFC has been signed it is submitted to the Project Manager (EECP), who conducts an initial assessment and evaluation and decides if the RFC is to be accepted, rejected or requires amendment.

Changes have to be approved according to their classification and impact level. When the RFC has been authorized, its implementation is planned, communicated and executed. Then the change implementation is evaluate by the requesters who confirm if the implementation was successful or not. The necessary actions to remedy the unexpected or undesired effects of the implementation are performed if required. Finally the project manager reviews the development of the change and closes the RFC.

Change Impact Threshold

Area	Criteria	Action
Cost	< 10% of contingency reserve	Project Manager
	15% > of contingency reserve	Change Control Board
Scope	All	Change Control Board
Schedule	> one day float remains	Project Manager
	Likely effect to critical path	Change Control Board
Updates	All	Project Manager
Quality	All	Project Manager

Decision Matrix

	Scope change	Increase budget	Not increase budget	Increase risk	Not increase risk	Increase schedule	Not increase schedule
Decision by Project Manager	N	N	Y	N	Y	N	Y
Vet with Sub Committee	Y	Y	N	Y	N	Y	N
Decision by Control Board	Y	Y	Y	Y	Y	Y	Y

CHANGE REQUEST TEMPLATE:

Change Request			
Project: Development of an Environmental Disposal Manual			**Date:**
Change Requestor:			**Change No:**
Change Category (Check all that apply): □ Schedule □ Cost □ Scope □ Requirements/Deliverables □ Testing/Quality □ Resources			
Does this Change Affect (Check all that apply): □ Corrective Action □ Preventative Action □ Defect Repair □ Updates □ Other			
Describe the Change Being Requested:			
Describe the Reason for the Change:			
Describe all Alternatives Considered:			
Describe any Technical Changes Required to Implement this Change:			
Describe Risks to be Considered for this Change:			
Estimate Resources and Costs Needed to Implement this Change:			
Describe the Implications to Quality:			
Contractor Comments	**EECP Comments**	**Facility Comments**	
Change Board Approval: **Disposition:** □ Approve □ Reject □ Defer			
Justification of Approval, Rejection, or Deferral:			

Name	**Signature**	**Date**

Proposed Membership of Change Control Board (TO BE DETERMINED)

1. Project Sponsor
2. Project Manager, EECP
3. Technical Officer, EECP
4. Principal Director, Energy
5. Academic Representative/JIE Representative
6. Finance Representative
7. Procurement Representative

Draft

Name	Role	Responsibility	Authority
Mr. Robert Clarke	Change Control Board Chair	As committee chair his signature is necessary for all approvals. He will ensure that the project will meet requirements set by the PCJ.	Assess and evaluate change for necessity to project. Decide whether to proceed with the change
Ms. Jody Grizzle	Project Manager EECP/PCJ	Update documentation based on decision of Board	Negotiate contract changes. Give go ahead for Executing contract changes
	Financial Officer EECP/PCJ	Manages expenditure and disbursement of funds relating to the project. His reports on financial activity would be important in decision making process.	Decide whether to proceed with the change. Review and discuss analysis of change request. Generate approval signature sheets for each outstanding change request.
	Principal Director, Energy	Overall responsibility for the success of the entire project. He oversees all aspects of the project from planning to closing.	Validate change request with project team members as appropriate. Assess and evaluate change for necessity to project. Update change request with target date for completion of analysis.
	Procurement Officer- EECP/PCJ	Will ensure approval of all major changes for the project meets safety requirements	If change request should be escalated to the National Agency, request will be placed on agenda for next meeting