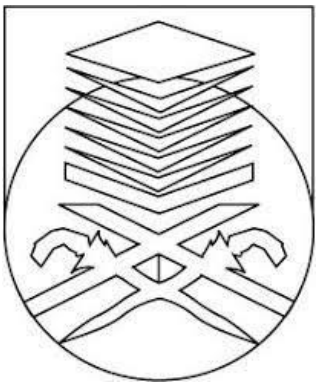

PROGRAMME IN BUILDING SURVEYING
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UNIVERSITI TEKNOLOGI MARA
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A STUDY OF SEWEGE TREATMENT PLANTS (STP) 1 AT UITM MERBOK

NURUL NAJWA SUHADAH BINTI ISMAIL

(2018683286)

BACHELOR OF BUILDING SURVEYING (HONS)

PRACTICAL TRAINING REPORT

FEBRUARY 2022

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This practical training report is fulfilment of the practical training course.

PREPARED BY

NAME : NURUL NAJWA SUHADAH BINTI ISMAIL

SIGNATURE :

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SIGNATURE :

DATE :

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Finally, my thanks go to all the people who have supported me to complete this academic project work directly or indirectly

TABLE OF CONTENT

CONTENTS

CHAPTER 1

(INTRODUCTION)

1.1 Introduction

This Industrial Training has been introduced since UiTM was established. This Industrial Training or better known as ‘Practical’ is one of the mandatory conditions imposed on all students to qualify them to be awarded a Degree or Certificate upon graduation.

The main purpose of this practical is to give a true picture of the world of work, in addition to providing guidance and valuable experience for students. In addition, students can interact with the community and officials, assess their abilities, learn more about the field they are involved in and can build confidence in each student in dealing with all kinds of problems that arise. In addition, students can discipline themselves in complying with all instructions and rules set by the company. Indirectly, this makes the student a responsible, honest, and trustworthy person.

All the experience that has been gained during this Industrial Training can help in going through the real world of work later. Hopefully, everything that has been worked on or produced can satisfy and meet the needs of all parties. In this chapter will also tell a little about the general information of the company.

1.2 Organisation Profile

table 1: Logo UiTM

Tables 1.2: *Company Profile of UiTM Cawangan Kedah*

TITLE	DISCRIPTION
Company Name	Universiti Teknologi MARA (UiTM)
Company Address	Universiti Teknologi MARA (UiTM), Cawangan Kedah, Kampus Sungai Petani, 08400 Merbok, Kedah.
Office Phone Number	+604 – 456 2000
Fax	+604 – 456 2223
Email	korporatkdh@uitm.edu.my
Website	https://kedah.uitm.edu.my/
Building Status	24 Year
Year of Built	1997

1.3 Organisation Background

YB Tun Daim Zainuddin, Minister of Finance, inaugurated UiTM Kedah on October 1, 1997. Its first semester began in November 1997, with 162 students and 25 administrative staff. In keeping with the government's goals and aspirations to promote Bumiputra abilities in many disciplines, the university acts as a catalyst in the development of the local economy and education, particularly in the states of Kedah and the north. This campus' construction is based on a master plan that assumes a maximum capacity of 7000 students. The campus spans 350 acres in Mukim Bujang (between Semeling and Merbok), about 14 kilometres from Sungai Petani, and was built using funds from the 6th Malaysian Budget Plan totaling RM38.4 million.

The Facilities Management Office was established in 1972, and it was known as the Office of Local Engineers at the time. The Office of Local Engineers changed its name to the Development and Maintenance Division in 1982. In 1994, the Development and Maintenance Division was known as the Development and Maintenance Office.

On 15th September 1995, the Development and Maintenance Office was separated under a separate head of administration. This is because the functions of the Development Office and the Maintenance Office are expanding. Both of these departments are placed directly under the Chancellery's Office. In August 1999, ITM was declared as Universiti Teknologi MARA and this development made the Maintenance Office play a wider role because the Maintenance Office is directly involved in the development, development, and progress of Universiti Teknologi MARA.

In strengthening the vision of Universiti Teknologi MARA towards becoming a global public education institution, the restructuring and rebranding of the Maintenance Office was made on 4 January 2006 and officially changed to the Facilities Management Office.

The Facilities Division is responsible for assisting the university in the management of facilities, assets, and energy to realise UiTM's vision and mission. The Facilities Division is fully confident in its expertise, professionalism, and competence, and is responsible for designing, maintaining, and managing facilities, assets, and energy so that UiTM employees can use them for successful learning, teaching, and research activities. In order to provide a sustainable campus environment, the Facilities Division also develops a comprehensive and competitive service delivery system that is in line with the most recent technology innovations.

The facilities division of UiTM Merbok is divided into six units: the Administration Unit, the Civil Unit, the Council & Landscape Unit, the Electrical & Telecommunication Unit, the Project & Contract Unit, and the Mechanical Unit. Each unit in this facility will handle repair, maintenance, and new project planning in order to modernise UiTM Merbok and provide efficient and effective facilities.

1.3.1 Functions and Responsibilities of each Unit for Facilities Management

NO	UNIT	DISCRIPTION
1.	Administration	• Coordinate counter service and customer service • Manage damage complaints received from users • Manage staff overtime claims • Manage office equipment and stationery needs • Manage and control the department's record and file system • Assist in preparing staff attendance reports • Manage and prepare customer feedback complaint reports • Assist in the management of human resource services • Coordinate the management of staff training needs • Coordinate the needs of BPF staff welfare matters • Manage meeting affairs
2.	Civil	• Provide building maintenance services and public facilities • Building cleaning and cleaning services • Pest and pest control services • Domestic waste management services • Sanitac dressing and floor mat disposal services • UiTM signage • Project management
3.	Council & Landscape	• Logistic assistance services • Event/program equipment preparation services • Prepare and manage the public address system for events/programs

		• Ornamental and landscaping tree maintenance services • Outdoor cleaning service • Manage the installation of the fabric • Project management
	Electrical & Telecommunication	• Manage infrared and internal electricity supply systems • Managing new work and electrical installations • Manage the maintenance of telecommunication sisters • Manage new installations of telephone facilities • Ensure the PABX system operates in good condition • Manage the maintenance of CCTV closed circuit cameras and barred doors • Helps in reducing electricity waste • Utility bill management • Central Audit-IDX (Building Energy Index) • Energy reporting to the Tenage Commission • Secretariat of the State Utility Management Authority • Manage the application for the installation of telecommunication transmitter tower structures and space rental • Project management
	Project & Contract	• Provide advisory services in terms of technical planning and design • Plan and implement a project • Upgrading physical facilities • Manage contract documents • Coordinate consulting and contractor services • Control the cost of work and services • Manage division budgets • Secretariat of the State Project Administration Committee • Project Management
	Mechanical	• Manage the maintenance of mechanical equipment

		such as air conditioning systems, sewage treatment plant systems, fire prevention systems, water supply systems, hoists and gas pipelines • Manage new installation, replacement and upgrading of mechanical equipment such as air conditioning systems, sewage treatment plant systems, fire prevention systems, water supply systems, hoists and gas pipelines • Assist in managing coordination of development projects • Provide air conditioning system for events/programs • Project management

1.3.2 Organisation Chart

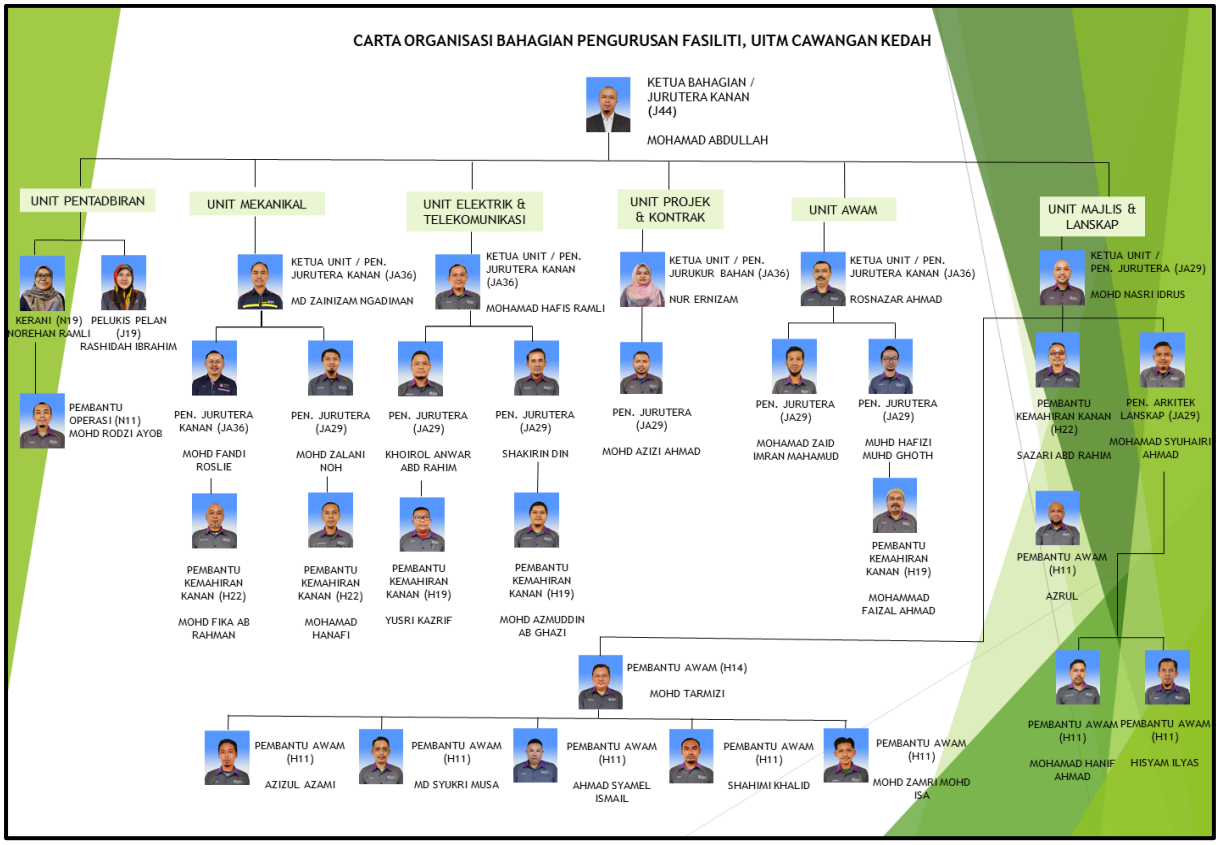

Figure 2: Organisation Chart of Facilities Management

1.3.3 Function and Role of Facilities Management

i. Prepare, implement, monitor, and evaluate maintenance work on all UiTM Kedah branch assets, infrastructure, buildings, and facilities.
ii. Prepare to put in place, monitor, and assess operational improvements, repairs, and new applications.
iii. Build and maintain all public facilities and buildings for UiTM Kedah branch consumers.
iv. Provide, construct, and ensure that all safety equipment and facilities are well-maintained.

1.3.4 Vision, Mission and Objective Facilities Management

1.3.4.1 Vision

- To establish UiTM as a world-class university in Science, Technology, Humanities, and Entrepreneurship.

1.3.4.2 Mission

- Winning professional development for Bumiputeras through sophisticated curricula and effective research

1.3.4.3 Objective

- Ensure that 80 percent of the projects under construction adhere to the authorized work programmed timetable.
- Ensure that at least 80% of customer complaints are handled within the time frame specified.
- Ensure that 90 percent of consumer concerns are responded to within one hour of their receipt.
- For a one-year period, 80 percent of the Customer Satisfaction Survey findings are satisfactory.

1.4 LOCATION PLAN UiTM KEDAH BRANCH

The Uitm campus spans 350 acres in Mukim Bujang between Semeling and Merbok, about 14 kilometres from Sungai Petani, The Facilities Management situated at Universiti Teknologi MARA (UiTM), Cawangan Kedah, Kampus Sungai Petani, 08400 Merbok, Kedah.of Sungai Petani town centre district of Kuala Muda, Kedah.

1.4.1 Key Plan of UiTM Kedah Branch

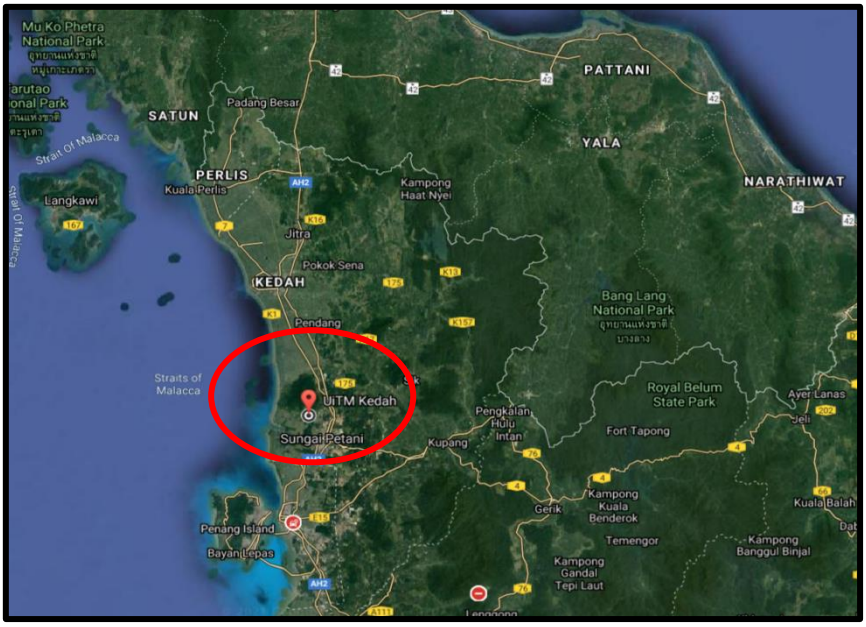

Figure 3: Key Plan Kedah Branch

This company situated at Universiti Teknologi MARA (UiTM), Cawangan Kedah, Kampus Sungai Petani, 08400 Merbok, Kedah.of Sungai Petani town centre district of Kuala Muda, Kedah.

1.4.2 Location Plan of UiTM Kedah Branch

Figure 4: Location Plan UiTM Kedah Branch

This company located at Sungai Petani Town which is under Kuala Muda district. It found in the area are surrounded which include Maktab Rendah Sains Mara, Sekolah Menengah Pendidikan Khas and Sekolah Kebangsaan Pendidikan Khas.

1.4.3 Site Plan of UiTM Kedah Branch

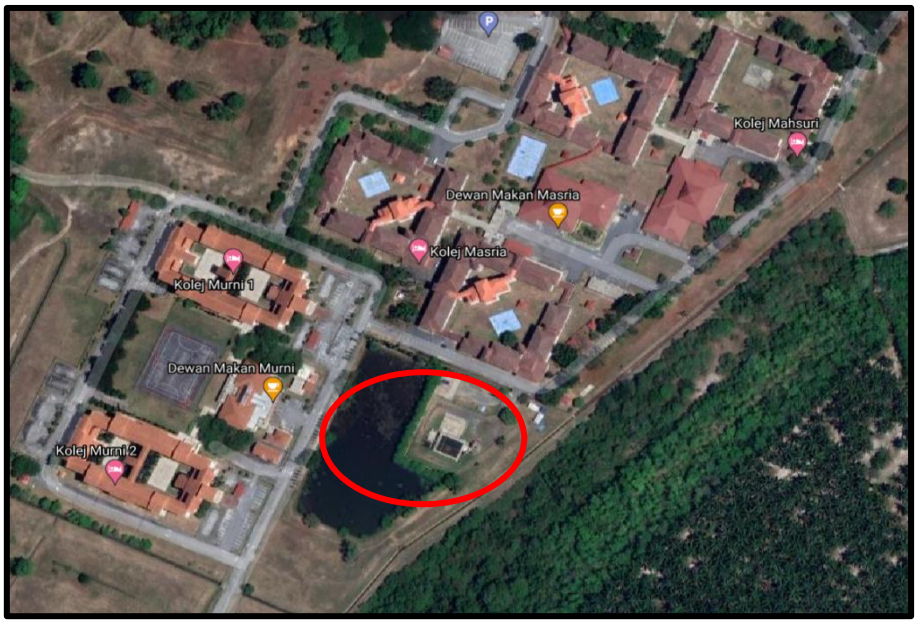

Figure 5: Site Plan UiTM Kedah Branch

CHAPTER 2

(LITERATURE RIVIEW)

This chapter provides an overview of previous research on Sewage Treatment Plants (STPS). It introduces a framework for case studies that encompasses the focus of research described in this report. The main purpose of the literature review work is to review past studies on knowledge sharing and intranet.

2.1 Introduction

Sewage and wastewater are known to be waste liquids from toilets, bathrooms and sinks discharged from residential areas, business, or industrial premises. Sewage wastewater and industrial waste are two kinds of pollution that can degrade the quality of a body of water (Walakira & Okot-Okumu, 2011). Sewage wastewater is a mixture of human excrement, urine, and even wastewater produced because of daily human activity. It is a waste liquid produced by toilets, sinks, and baths in residential areas, schools, restaurants, hospitals, agricultural areas, and industrial places (Manikam et al., 2019)

However, technically sewage is wastewater that contains organic and inorganic solids, contains microorganisms or pathogens as well as a composition of 99.9 % water and 0.1 % solids as shown in Diagram 1 below:

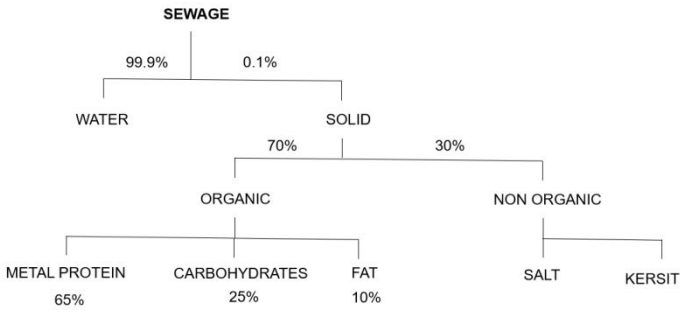

Diagram 1: Sewage Composition

Domestic wastewater is typically grey in colour, has a musty odour, and has a solid concentration of about 0.1 percent. Feces, food particles, toilet paper, grease, oil, soap, salt, metals, detergents, sand, and gravel are all examples of solid solids. The composition of wastewater is 99.9% water and 0.1 percent particulates. Chemically, wastewater is made up

of organic (70%) and inorganic (30%) substances, as well as different gases. Organic molecules are generally composed of carbohydrates (25%), proteins (65%), and fats (10%), which represent people's diets (Shon et al., 2007).

Protein and carbohydrates are the most important food sources for bacterial proliferation. Sewage contains millions of bacteria and microorganisms. If sewage wastewater is not treated to eliminate hazardous chemicals in wastewater and aqueous solutions, such as reverse osmosis clotting procedures, electrodialysis, solute extraction, adsorption membrane filtration, and electrocoagulation, it can be dangerous to humans and other living things (Izzah et al., 2020). Only a small percentage of these bacteria can transmit disease. Most of them are not detrimental to human health, but they are useful for digesting organic matter so that sewage does not contaminate the water supply into which it is diverted.

The requirement for efficient wastewater management and treatment is critical for improving water quality and overcoming difficulties such as water pollution, growing water treatment costs, and increasingly rigorous wastewater discharge rules. Adsorption methods utilizing adsorbents are widely utilized to remove pollutants in the treatment of industrial wastewater and sewage wastewater due to their strong ability to adsorb pollutants and cheaper cost compared to other treatment methods (Nandini, 2014).

2.2 Characteristics of Wastewater

A wastewater treatment plant treats wastewater from a community, a specific area, or a specific city. Among the many functions of wastewater treatment are:

2.2.1 Stay free from pollution.

Wastewater treatment has grown in importance as a means of preventing environmental pollution. High quantities of pollutants can be found in wastewater or sewage. For example, the content of organic matter in wastewater in the form of Biochemical Oxygen Demand (BOD) is high at around 250 mg/L, compared to the standard effluent value of 50 mg/L that must be met for emissions under Malaysian legislation. Similarly, the suspended solid concentration is 360 mg/L, which is higher than the acceptable norm of 100 mg/L (Rosmawati, 2013). As a result, sewage must be treated before being released into the environment in order to reduce its values to this level.

2.2.2 Perfectly manage wastewater

The resulting wastewater or sewage must be appropriately handled, as it must be collected, treated, and released back into the environment. The main causes of water pollution can be

categorized into point source and non-point source (Grundmann, 2002). Point source pollution refers to the release of sources or waste from pipes or drains directly into a body of water at a particular location. These sources also include emissions from industry, sewage treatment plants and livestock farms (Ang, 2015). In other words, most of the pollution produced is due to human activities and sewage wastes that are not properly managed before being released into the environment.

2.2.3 Prevent infection

Inadequate wastewater management can lead to the spread of infectious illnesses. This is due to the presence of several disease-carrying organisms in the wastewater. Human urine, for example, has large levels of ammonia, and if this waste is released into a river, the river becomes readily polluted. According to the Ministry of Health's National Guidelines on Drinking Water Quality, the ammonia concentration of raw or untreated water should not exceed 0.5 parts per million (PPM), as the material can be harmful if it surpasses 200 PPM per kilogram of body weight (JAS, 2019). Excessive ammonia exposure in humans can induce watery eyes and sore throat symptoms such as coughing, which can lead to coma and death depending on the degree and length of exposure.

2.2.4 Wastewater treatment as a critical infrastructure component

Wastewater treatment systems, like water supply systems and other basic facilities, are critical components of infrastructure. Sewage wastewater treatment is also required to remove contaminants such as bacteria, viruses, and protozoa before it is released (Mohd. Azlan Abdullah, 2001). This is done to rid the environment of disease-carrying organisms and to safeguard water supplies from contamination.

2.3 Extended Aeration

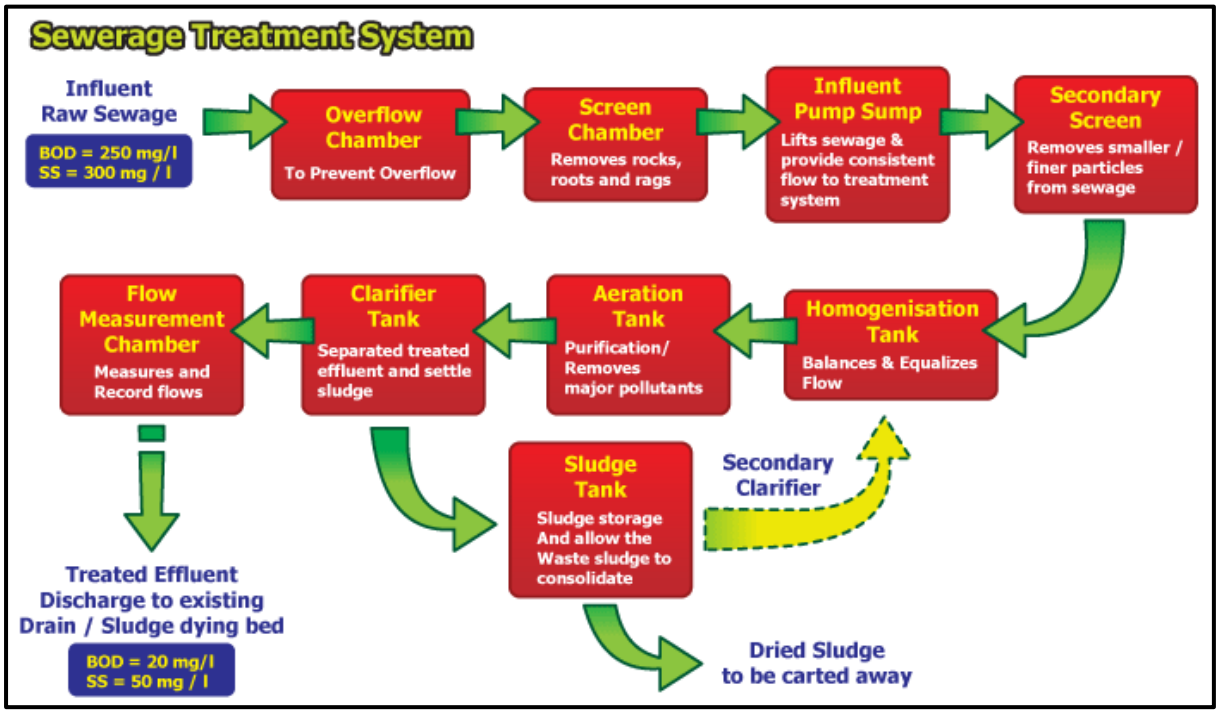

Diagram 2: Extended Aeration

In this Extended Aeration System, it processes wastewater biologically, by creating a condition in which to grow the bacteria contained in the wastewater better, and perform the process of decomposition of pollutants optimally, and safe to be channeled to Drainage. There are also advantages of this system, the water from the treatment can be reused to water the plants, which of course the water is safe (Mines et al., 2020).

2.3.1 This process operates under the following theory:

Raw domestic wastewater from last manhole is channelled into the primary screen where mechanical coarse screen was installed to remove coarse solid materials. The screened sewage inside wet well will then be lifted to the secondary screen by a set of raw sewage pumps. A duty mechanical fine screen was also installed at the secondary screen chamber to remove finer solid materials in the sewage. Two aerated grit chambers are proposed subsequent to fine screen chamber for removing inert materials such as fine sand, gravel etc. Finally for the pre-treatment system, a grease/oil removal system is used to remove the potential oil in sewage to ensure good performance of the extended aeration system (Parkson Corporation, 2011).

2.3.2 Advantages of Extended Aeration System:

i. Easily maintained mechanical work.
ii. Extended aeration processes are often better at handling organic loading and flow fluctuations, as there is a greater detention time for the nutrients to be assimilated by microbes.
iii. Systems are odor free, can be installed in most locations, have a relatively small footprint, and can be landscaped to match the surrounding area.
iv. Extended aeration systems have a relatively low sludge yield due to long sludge ages, can be designed to provide nitrification, and do not require a primary clarifier.

2.4 Requirements of Water Turbidity Standards

Tables 1: Requirements of Water Turbidity Standards

Parameter	**Standard A (mg/L)**	**Standard B (mg/L)**
Temperature	40	40
PH Value	6.0 – 9.0	5.5 – 9.0
Oxygen Demand Biology	20	50
Chemical Oxygen Demand	50	100
Suspended Solids	50	100
Ammoniacal Nitrogen	15	25

There are currently no rules in place for ammoniacal nitrogen emissions, and all sewage treatment plants in Malaysia are not equipped to remove ammoniacal nitrogen. However, as shown in the chart above, public sewage treatment plants are generally in conformity with the standards of Standards "A" and "B."

CHAPTER 3

(CASE STUDY)

3.1 Building Background

Case study is located in the Sungai Petani town centre district of Kuala Muda, Kedah, at Universiti Teknologi MARA (UiTM), Cawangan Kedah, Kampus Sungai Petani, 08400 Merbok, Kedah. STP 1 was the research area's name, and it was completed in 2013. Ilham Jurutera SDN. BHD, situated in Taman Sejati Sungai Petani, has been awarded the contract to complete this project. From 2012 to June 2013, this project took a year to complete. The enhanced Aeration system is used by STP 1. The STP research area is approximately 1.252 acres, or 5064.7374m2. This STP 1 can house up to 7000 Population Equivalent (P.E). A fence surrounds the entire 1,252-acre property.

3.2 Location Plan

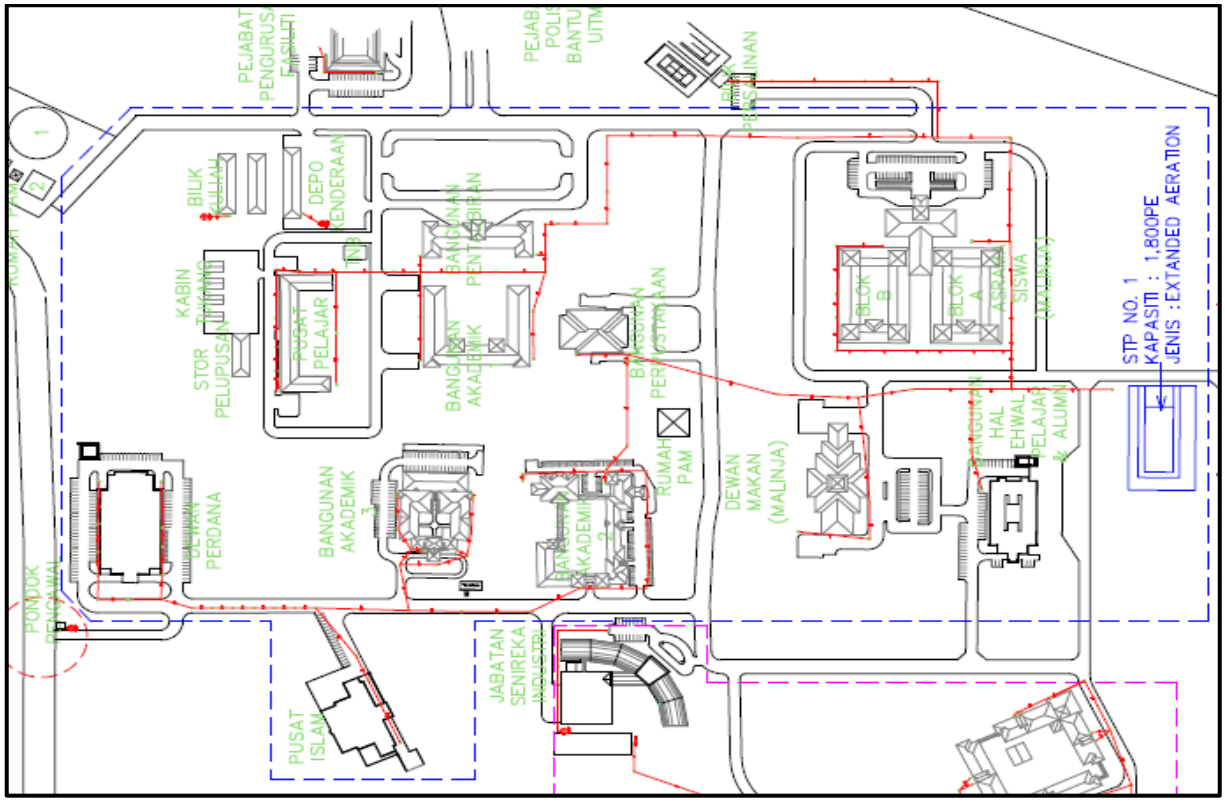

Figure 6: Location Plan

STP 1 is located in the ladies' dormitory section (Kolej Malinja) at UITM Merbok and has an existing reservoir pool. The study area is 1.252 acres (5064.7374m2) in size and can hold 1800 P.E Population Equivalent. This is the Fisrt STP to meet the increase in Population

Equivalent as a result of the increased number of female dormitory structures (Kolej Malinja).

3.2 Component of Sewage Treatment Plants (STP)

NO	COMPONENT
1.	 *Figure 7: Screen Chamber*
2.	 *Figure 8: Secondary Screen*
3.	

Figure 9: Ejection Pump

Figure 10: Scumscimmer

Figure 11: Weir Plate

Figure 12: Ras Pump

3.3 Sewage Water Treatment System in UiTM Merbok

Sewage treatment refers to the process of eliminating toxins from wastewater, primarily from domestic sewage. To eliminate these impurities and produce an environmentally safe treated effluent, it must go through a chemical, physical, and biological process. Sewage sludge is a semi-solid slurry produced as a by-product of sewage treatment. This sludge is further treated before it may be applied on land. Pipes and pumps carry sewage waters to sewage water

treatment plants. In the sewage water treatment plant, the sewage travels through the following basic stages.

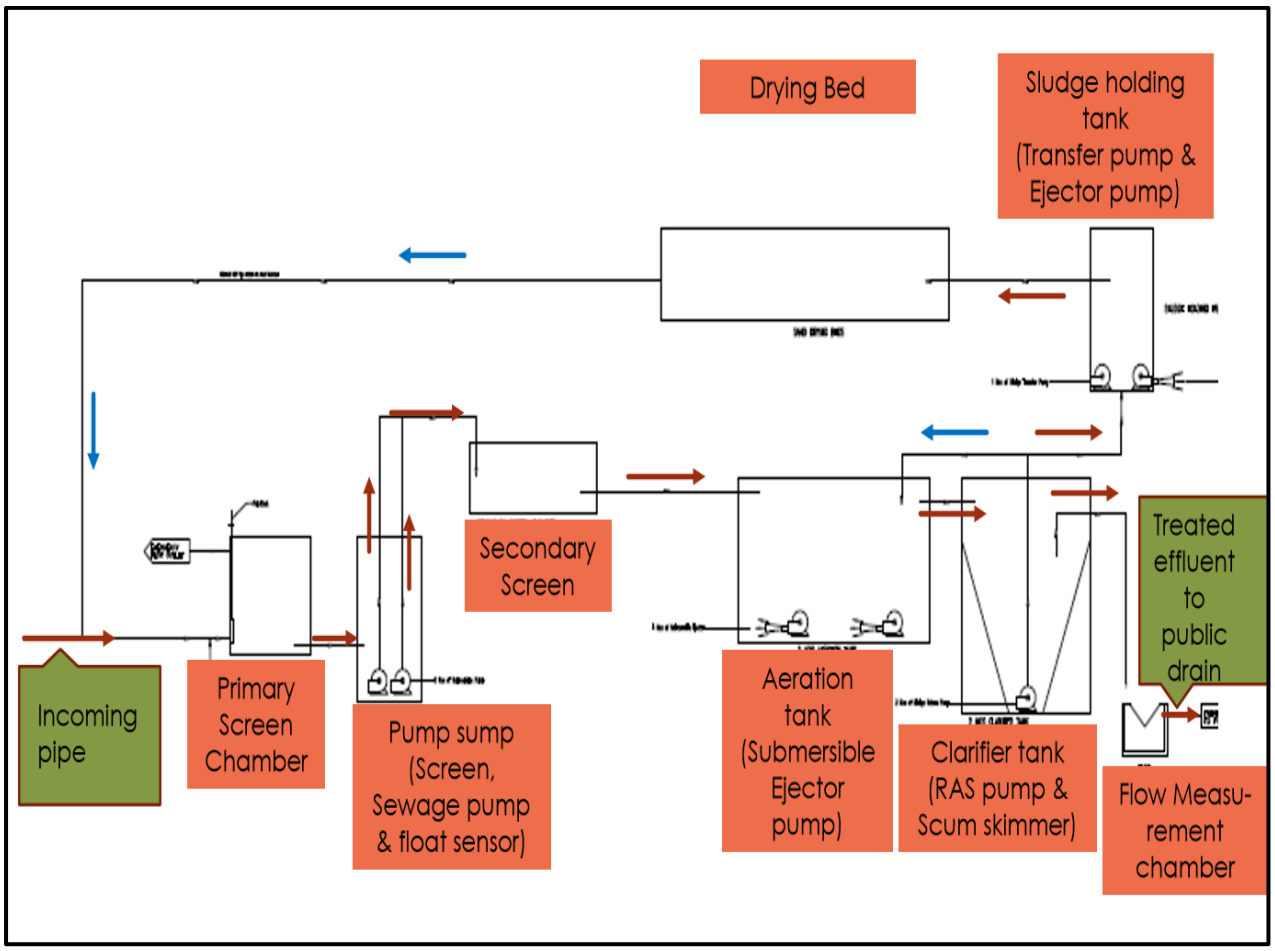

Figure 13: Sewage Treatment Plant No 1

Figure shows sewage Treatment Plant System No 1. At UiTM Merbok Branch using Aerobic Sewage Treatment. Aerobic bacteria consume the contaminants in this technique. The bio-zone is regularly supplied with air at the sewage water treatment plant. Air currents are used in aerobic sewage systems. By completely oxidising and absorbing organic pollutant and materials into carbon dioxide, nitrogen, and water, this procedure eliminates pollutant and odours. As a result, the treated effluent is pollutant-free and can be released for use. The traditional sewage water treatment plant consists of two to three stages: primary, secondary, and tertiary treatment. Rags, sanitary items, garments, and other materials are removed from the sewage works prior to the start of the procedure, which is known as Pre-Treatment.

3.3.1 Preliminary Treatment

Figure 14: Primary Screen Chamber

Wastewater must be pre-treated before it can be discharged into the sewage system. Regulatory agencies establish pre-treatment requirements. Remove any contaminants that will not be treated by the sewer system, as well as any materials that will interfere with the biological processes in secondary treatment. Silver ions, for example, are poisonous to bacteria and may interfere with biological processes. Thus, silver ions are eliminated during pre-treatment prior to the biological process to ensure that bacterial performance is not compromised.

When wastewater enters the sewage system, it is routed via a bar screen, which removes large solid particles like sticks and rags. The wastewater flow is slowed as it exits the bar screen and enters the grit tank, allowing sand, gravel, and other heavy material that was too small to be collected by the bar screen to sink to the bottom. All the grit tank and bar screen material are disposed of in a sanitary landfill.

3.3.2 Primary Treatment

Figure 15: Secondary Chamber

The second step in wastewater treatment is primary treatment. It is capable of physically separating particles and greases from wastewater. The filtered wastewater is directed into a primary settling tank, where it is held for several hours to allow solid particles to settle to the bottom and oils and greases to float to the top.

3.3.3 Secondary Treatment

Figure 16: Aeration Tank

Biological treatment of wastewater that eliminates dissolved organic material. The partially treated wastewater from the settling tank flows into an aeration tank by gravity. The utilisation of air bubbles for mixing and oxygen delivery in the mixing of water to particles including that use oxygen to digest the remaining organic matter in the wastewater as their food supply. The final clarifier receives a liquid mixture that includes, for example, solids with microorganisms and water. Solids sink to the bottom of the clarifier, where some of the material is transported to the solids handling process and some is recycled back to refill the population of microorganisms in the aeration tank, which is used to treat incoming wastewater.

3.3.4 Tertiary Treatment

Figure 17: Clarifier Tank

Clarifier Tank is a system for the deposition of floc particles that is Activated Sludge. Some of the active sludge will be returned to the aeration tank and the rest will be dumped into the sludge tank. The Airlift System installed on this tank aims to return most of the accumulated lumor for recycling, while the Scum Skimmer serves to suck up surface water from light debris. Airlift and Scum Skimmer are used using air energy blown from a water blower. The return of active sludge and foam must be continuous for the process to be successful. In the Clarifier Tank there is deposition of active sludge, while the treated wastewater is more clear flowing gravity through into the public drain.

Figure 18: Sludge Holding Tank

The Sludge Holding Tank serves as a temporary muck reservoir before the disposes of it. To prevent septic conditions, air is used to agitate, ensuring aerobic conditions. When this tub is almost full, it should be disposed away using a faeces cart.

Figure 19: Jar Test

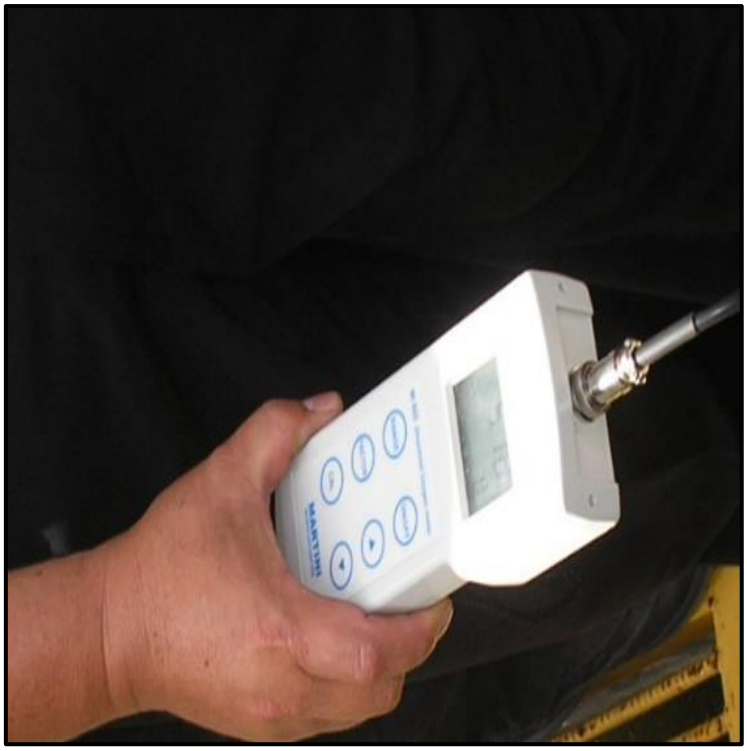

Figure 20: D.O Test

The final stage is the turbidity test of the water discharged into a public drain. Effluent discharge from sewage plants must meet the standards set under the Environmental Quality Act, 1974 and comply with the requirements of Standards "A" and "B".

3.4 Service & Maintenance at STP 1

For service and maintenance of STP at UiTM Merbok is by using the Preventive Maintenance method. Preventive maintenance (PM) is the periodic and routine maintenance of equipment and assets to keep them functioning and to avoid any costly unplanned downtime from unexpected equipment failures. A successful maintenance strategy requires planning and scheduling equipment maintenance before problems occur. A good preventive maintenance plan also involves keeping records of past inspections and servicing equipment. Due to the complexity of maintaining a preventive maintenance schedule for a large number of equipment, UiTM Merbok facility management uses preventive maintenance software to organize the required preventive maintenance tasks.

3.4.1Service & Maintenance at STP 1

NO.	TYPES OF SERVICE	FREQUENCY
1.	General cleaning work	Everyday
2.	Cut the grass	Every 2 weeks
3.	Service pump	Every month
4.	Service of control panels and electrical systems	Every month
5.	Service valve	Every month
6.	Sample analysis	Every month

3.4.2 Service & Maintenance of Fat Traps & Septic Tanks

NO.	TYPES OF SERVICE	FREQUENCY
1.	Fat Trap Service	Every month
2.	Septic Tank Service	Every 6 month

Above is the STP preventive maintenance schedule at UiTM Merbok to help organize and prioritize maintenance tasks so that the maintenance contractor can create the best working conditions and lifespan for the equipment. By performing regular preventive maintenance can ensure the equipment continues to operate efficiently and safely. Time -based preventive maintenance is an approach of scheduling preventive maintenance tasks using a set time interval, as in the table above. The preventive maintenance performed by UiTM Merbok is like a regular critical inspection on the first day of each month or once in 6 months.

CHAPTER 4

(ISSUE AND PROBLEMS)

4.1 Introduction

Facilities management requires monitoring and effort to manage because facilities management is essential if a company wants to be in the best possible shape. The main task and performance of the building maintenance group is maintenance on the allocated equipment. Related equipment is typically used in detecting common building problems and repairing or repairing damage in construction systems and construction elements inspected.

There are several steps in this planned work, generally consisting of inspection, maintenance, lubrication and adjustment and replacement of minor and major components, minor assembly, and subassembly. The designated installation manager or maintenance engineer will understand his or her own duties in carrying out the maintenance program, lead the maintenance team to ensure work is done perfectly on time and will satisfy building occupants as they seek comfort.

Problems often occur when a company does not have in -house expertise in dealing with a problem. Therefore, companies need to outsource in managing the problem. In outsourcing, companies need to think about the possible implications. Many facility service outsourcing problems can be traced to situations where the two parties really have no common interest. Where all parties look to their own interests. Contractors want higher profit margins, increased income, and long-term connections as tactics for maintaining or increasing market share. On the other side, management chooses the contractor based on pricing rather than quality of work.

4.2 Issue and Problem in STP Process

Several problems and concerns can be found when executing the STP 1 process at UiTM Merbok based on observations and experiences when implementing industrial training at UiTM Merbok. This issue stems from management and the contractor. The following issues have been identified:

4.2.1 Contractors are chosen depending on price.

Companies will compete to bid on their respective rates at UiTM Merbok during contract selection. The cheapest pricing bid will be chosen to enter into a contract with UiTM. Contractors recognise that when price is the driving factor and they bid at a cheap price, work

is completed after receiving the contract in response. The biggest challenge that UiTM Merbok faces when choosing a contract based on pricing is the quality of work that will be obtained that is comparable to the specified price. The contractor will try to cut costs secretly or the work will be done casually.

4.2.2 Give full trust to the contractor

The main issue was that the contractor failed to service and clean according to the agreed-upon schedule. STP 1 should be serviced and maintained once a month, and general cleaning should be done everyday. The contractor, on the other hand, did not adhere to the service and maintenance schedule. The service and maintenance plan is designed to perform preventive maintenance on the equipment used to run the STP process. If the equipment is not properly serviced and maintained, the PH of the processed water will not meet standards A and B before being dumped into the river. This is due to the fact that the facilities management personnel at UiTM Merbok does not monitor the contractor's service work. Monitoring the contractor's work is necessary so that the contractor understands that the management of the UiTM Merbok site is concerned about the quality of service and the quality of their work. The UiTM facility management did not self-test the released water PH even after the water PH test was performed. This resulted in an element of deception on the part of the contractor, who claimed that the PH of the water supplied to meet standards A and B was documented in the service and maintenance book provided by UiTM facility management.

Based on SEM firms' experience and observations when executing preventative maintenance in STP 1, it can be seen that they need to service and perform maintenance such as pump service, control panel service and electrical system, valve service, and sample analysis once a month. STP 1 has two Ejector pumps in the Aeration tank and two Ras pumps in the Holding tank, both of which must be serviced once a month. However, the findings of the observation revealed that only two pumps, one Ejector pump in the Aeration tank and another Ras pump in the Holding tank, were serviced once a month. Even general cleaning should be done on a daily basis, but just once a week.

Figure 21: Aeration Tank At STP 1

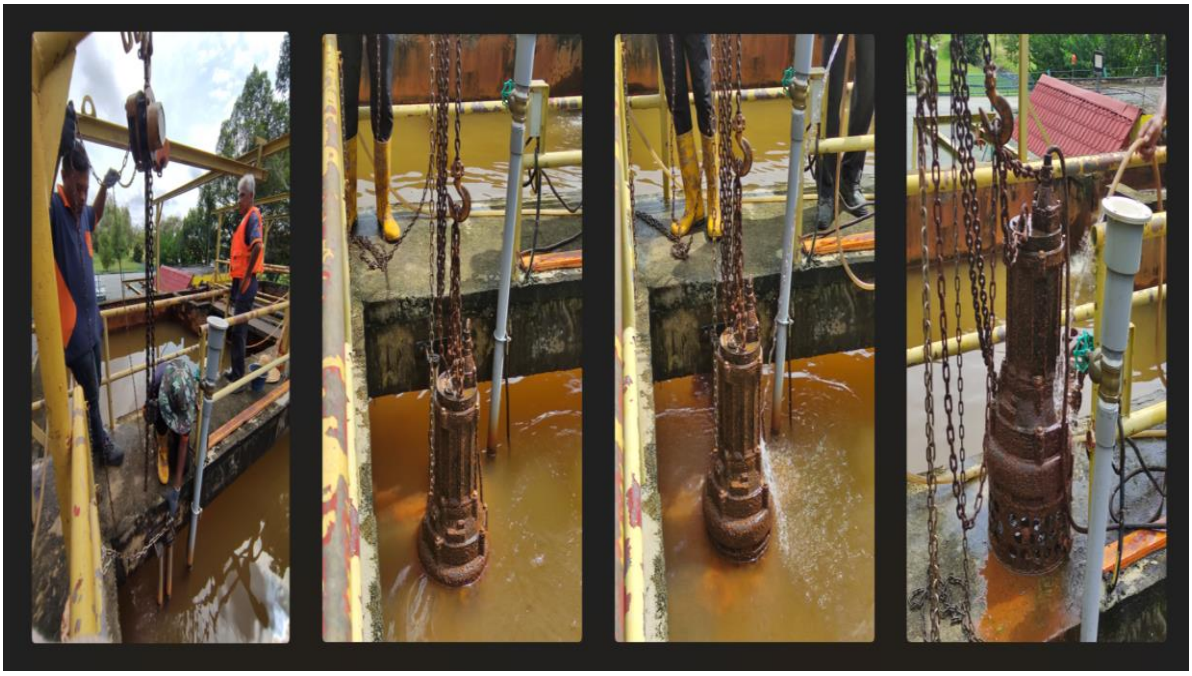

Figure 22: Ejector Pumps at Left Aeration Tank

Figures 7 and 8 depict the aeration tank as well as the repair and maintenance of the ejector pump in the aeration tank. Aeration is comprised of two pools and two ejector pumps. This aeration tank's ejector pump will operate automatically once every 12 hours on alternating days. According to the findings of the observation, each pump should be serviced once a

month, as indicated in table 3.4 in chapter 3, but the contractor only serviced one pump per month.

Figure 23: Holding Tank at STP 1

Figure 24: Right Ras Pump at Holding Tank

Figure 25: Left Ras Pump at Holding Tank

Figures 24 and 25 depict the method of servicing and maintaining the Ras pump in the Holding tank for the left and right tanks, respectively. The findings of the observations that if the facility management team watches the contractor's work, the contractor will execute complete servicing and maintenance on time. On 24 October 2021, the facility management staff paid a surprise site visit and stated that the contractor would only conduct the scheduled work if the UiTM Merbok facility management was onsite.

CHAPTER 5

(CONCLUSION AND RECOMMENDATION)

5.1 Conclusion

Based on the results, the turbidity concentration, BOD, and COD for STP 1 at UiTM Merbok found that for effluent wastewater testing, the turbidity concentration, BOD, and COD are sometimes within the permitted range, which is the limit specified by Malaysian standards A and B. The phosphorus concentration in STP 1 effluent wastewater is within the range permitted for release into any inland or Malaysian waters. But sometimes it does not reach the set standard level because the concentration of phosphorus in effluent wastewater in STP 1 is higher than Malaysian standards A and B for wastewater discharge limits. This is due to STP 1's cleaning and maintenance not being completed in accordance with the work schedule established by UiTM. As a result, discharge of effluent water from STP 1 into bodies of water utilised for residential purposes or irrigation without sufficient treatment will have a negative impact on human health and the environment. To avoid this happening in the future, UiTM must devise a few solutions to the problem.

5.2 Recommendation

This research has a few consequences for management procedures at UiTM Merbok. As previously said, contractor qualities are the most essential aspects that contribute to the contractor's performance of the work. Here are some recommendations for future improvement based on the study's findings and conclusions:

5.2.1 Review the best pricing for the contractor

The management of UiTM Merbok needs to set the contract price based on the current price to prevent the contractor from secretly cutting costs. The work given or scheduled by UiTM Merbok has a non -matching causing the contractor to do the work carelessly. If UiTM Merbok cuts costs, the price of goods purchased by the contractor is also cheaper and the quality of work is also lower. Therefore, the management of UiTM must ensure that the best price is set for the contractor so that the work done is also of good quality and reaches the set standards so that it will not be a problem in the future.

5.2.2Make surprise monitoring of the contractor

The superior should conduct a surprise inspection of contractors to ensure that the job meets realistic goals and that their performance is at an optimal level. Continuous monitoring is very important in improving STP management and enhancing employee productivity.

Surprising monitoring should be performed to guarantee that the contractor does not abandon the job or perform it irresponsibly. Based on the observations, the contractor performed the work outside of the scope established by UiTM Merbok. To ensure that the contractor is performing the work in accordance with the prescribed scope, management must conduct surprise inspections and visits to the site to ensure that the work of cleaning or maintaining the STP system can be properly maintained, and that the contractor performs the work in accordance with the set schedule.

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