



UNIVERSITI
TEKNOLOGI
MARA

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Kampus Pasir Gudang



INDUSTRIAL TRAINING FIELD REPORT

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First and foremost, I am very grateful to God that gives me strength and ability to complete the industrial training.

I would like also to express my gratitude to the Founder and Director of PERUNDING NAJNA, Mr Burhanuddin Bin Abu Bakar for giving me the opportunity to undergo my industrial training at PERUNDING NAJNA. I am very honoured to to have undergone my 17 weeks of industrial training at PERUNDING NAJNA. I felt very welcomed in the company with the warm and pleasant as well as harmonious environment of the company. I wish to extend my gratefulness to my supervisor Mr Farith Zulhazlami Bin Hajemi, Environmental Executive, for the guidance and advices that he gave me throughout my internship period to help me grow as a person and an engineer. I would also like to thank Miss Natasha Zainorin, Environmental Executive who kindly led and assist me throughout my report making process. I am also thankful to the staffs of PERUNDING NAJNA that always spare their time to guide me the basics of working within the department. Their support made my industrial training period much easier and I am very grateful for that.

A special thanks to Ms Noor Hidayu Binti Abdul Rani, the Industrial Training Coordinator for giving me the opportunity to undergo this industrial training period as well as giving us guidance throughout our internship period to ease the problems that arose due to the fact that the industrial training was conducted during the pandemic.

EXECUTIVE SUMMARY

This report describes the period of internship at PERUNDING NAJNA from 22nd March 2021 to 15th July 2021 (17 weeks). At the event of internship, I had been working directly under Director of PERUNDING NAJNA SDN BHD, Ir Burhanuddin Bin Abu Bakar.

PERUNDING NAJNA SDN BHD is one of the new, emerging environmental consultancy companies in Sarawak and Malaysia that acquired substantial experience in conducting projects related to oil palm plantations, scheduled wastes recovery facilities, road developments, school projects, commercial developments and sand mining activities. The variety of project involvement has provided the company the confidence to participate in new largescale industrial projects in SCORE development areas will be PERUNDING NAJNA SDN BHD's next target to expand their knowledge and experience in environmental consultancy and services.

During my period of internship, I was entrusted to be involved in Environmental Impact Assessment (EIA), Stack Monitoring, Environmental Monitoring Report (EMR) and Written Notification or also known as Licensing Submission and Approval. Through my involvement in these projects, I gained a lot of new knowledge and experiences that will be very useful in the future. I learnt a great deal on the importance of management as at one time there were a few reports that had to be submitted. Besides that, I gained more confidence to communicate with the other staffs and co-workers as their guidance and assistance were very much needed for me to complete my tasks.

Industrial training is an important aspect of a student's education since it promotes active learning. It is a big difference between learning about a theory in class and putting it into practice in the field. As a result, industrial training prepares students for real-world situations that they will encounter in the workplace in the future. This aids students in improving and enhancing their critical thinking, practical, and learning abilities in real-life scenarios. In general, industrial training provides objectives such as preserving programme course compliance with difficulties and the fundamentals of engineering scenarios in real life. Through industrial training, students can showcase their capability to work in the industry as well as demonstrate their ability in employment so as to further work upon graduation.

Tremendous appreciation to PERUNDING NAJNA SDN BHD for guidance and knowledges delivered from the entire training supervisor. Thank you to all the staff that has made a significant guidance and valuable support. Last but not least, thanks to the Faculty of Chemical Engineering and lecturers that help to organize this industrial training.

CHAPTER 1: INTRODUCTION OF COMPANY

1.1 Background of the Company

PERUNDING NAJNA SDN BHD is one of the new, emerging environmental consultancy companies in Sarawak and Malaysia. Incorporated in early 2009 in Kuching city, Sarawak, PERUNDING NAJNA is headed by its founding Director, Environmental Consultant and Chemical Engineer, Ir. Burhanudin bin Abu Bakar. A 100% Bumiputera-owned company, PERUNDING NAJNA SDN BHD has in span of five years of its incorporation, acquired substantial experience in conducting projects related to oil palm plantations, scheduled wastes recovery facilities, road developments, school projects, commercial developments and sand mining activities. The variety of project involvement has provided the company the confidence to participate in new largescale industrial projects in SCORE development areas will be PERUNDING NAJNA's next target to expand their knowledge and experience in environmental consultancy and services.

In order to pursue more challenging projects in the near future, PERUNDING NAJNA has therefore acquired the expertise of four associate consultants as part of its environmental study team, having four varying fields of specialization-civil engineering, biotechnology, socio-economy and ecology.

1.2 Company Profile

1.2.1 Company Logo



Figure 1: PERUNDING NAJNA logo

1.2.2 Company Address and Location

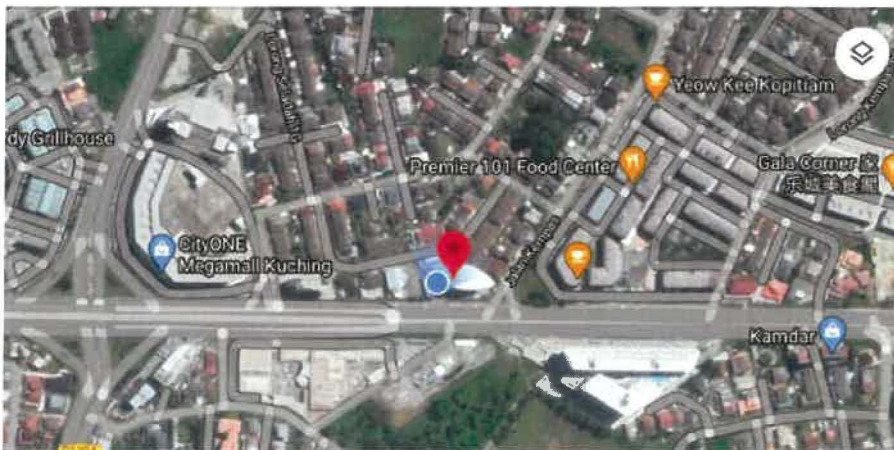


Figure 2: PERUNDING NAJNA location



Figure 3: PERUNDING NAJNA SDN BHD's Office at RCW Corporate

1.2.3 Contact Information



1.3 Services

PERUNDING NAJNA's core business is to provide professional environmental consultancy services to its esteemed clients from various sectors such as Properties Development, Plantation and Agriculture, Quarries, River and Coastal Mining, Construction and Engineering and others. These services include Environmental Impact Assessment (EIA) study, Environmental Management Plan (EMP) study, Environmental Monitoring, Environmental Permitting Reports and stack monitoring.

PERUNDING NAJNA is also capable of providing consultancy services for Feasibility study and Special Study involving new, pioneer projects that require an initial assessment prior to further project development and environmental report submissions.

Monitoring	Provide monitoring in the preparation of environmental impact assessment or regulations, as well as in many circumstances in which human activities carry a risk of harmful effects on the natural environment.
Engineering	To provide technical expertise in protecting people from the effect of adverse environmental effects, such as pollution, as well as improving environmental quality
Environmental Impact Assessment	To evaluate the impacts on environment of a proposed project or development, taking into account interrelated, socio-economic, culture and human-health impacts, both beneficial and adverse.
Licensing Submission and Approval	Getting the needed details of approval, authorization, license or permit required by or obtained from any regulatory authority of environment, safety and health.

Table 1: Services Provided by PERUNDING NAJNA

1.4 Organization Chart

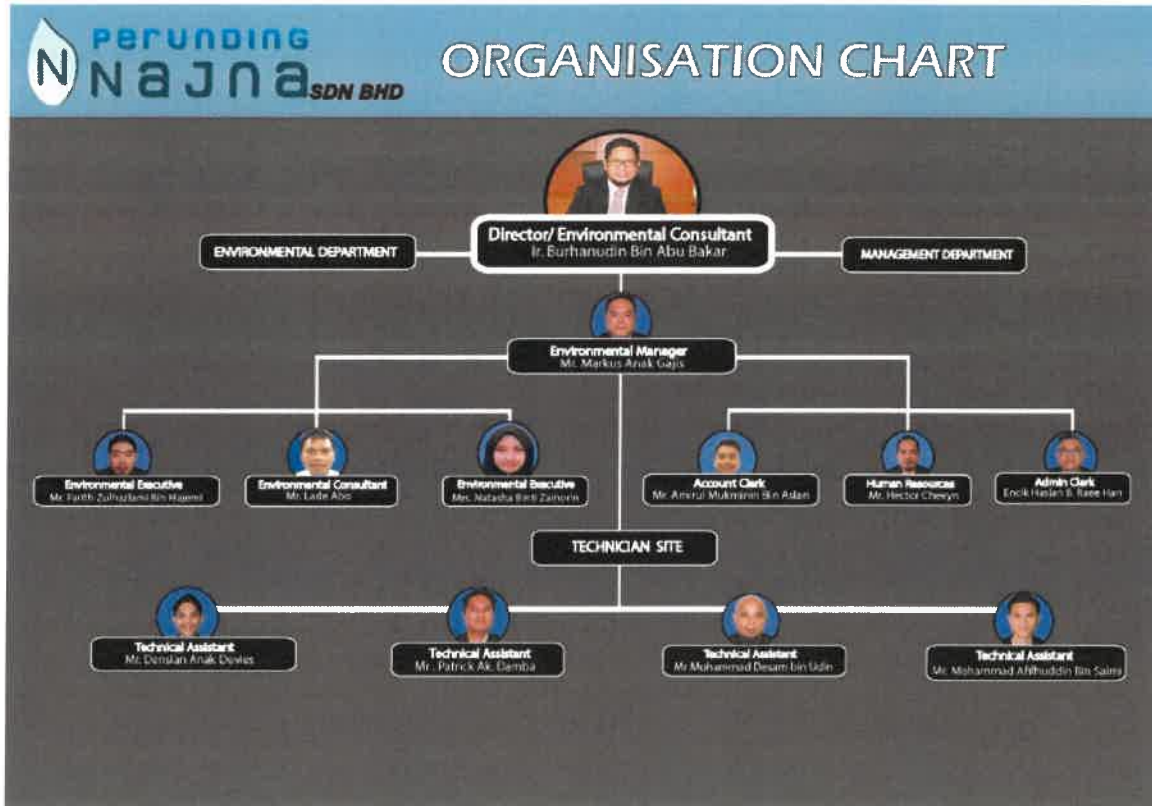


Figure 4: Organization Chart of PERUNDING NAJNA

CHAPTER 2: INDUSTRIAL TRAINING ACTIVITIES

2.1 Licensing Submission and Approval

Licensing submission and approval is the process of getting the details of any approval, authorization, license or permit required from any regulatory authority of environment, safety and health. This process is usually done in the case client want to upgrade the equipment or install a new equipment.

Activities conducted included assist in the calculation involving generator set, boiler/burner, cyclone, bag filter as well as water treatment system. Besides that, find the related journals or articles and catalogues or technical specification sheet to support or conduct the calculation.



Figure 5: Front Cover of Written Notification

2.2 Environmental Monitoring Report

Environmental monitoring report is to provide monitoring in the preparation of environmental impact assessments or regulations.

The Environmental Monitoring Reports partake are for first quarter of 2021 (January- March). The information such as Chemical Oxidation Demand (COD), Biological Oxygen Demand (BOD), Suspended Solids (TSS), pH and etc are updated quarterly. This information are obtained based on the samples taken by technical staffs of the company from the site quarterly.

The values of the item mentioned above should not exceed the limit established by Department of Environment (DOE).

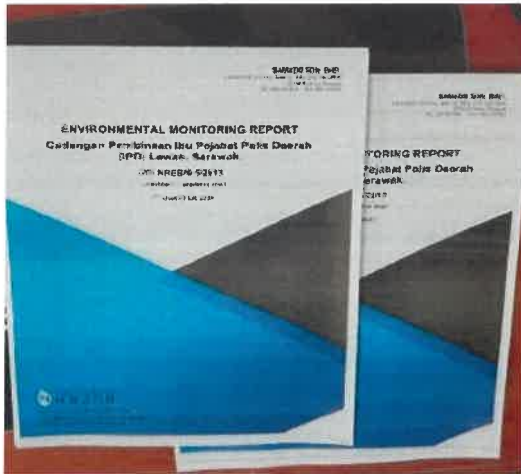


Figure 6: Front Cover of Environmental Monitoring Report



Figure 7: Process of Sampling at W1 for EMR Along Btg Saribas

2.3 Environmental Impact Assessment

Environmental impact assessment is the process of evaluating the likely environmental impact of proposed project. It is conducted before a project is started on the site. The process usually takes a long time depending on the current needs and wants of the related authorities mainly Department of Environment (DOE).

2.4 Stack Monitoring

The process of stack monitoring enables the facility managers, inspectors as well as other key personnel to measure the level of industrial waste and/or pollutants a stack emits into the atmosphere.

2.5 Site Visit

Due to the current situation, we did not obtain a lot of opportunities to do a site visit as it is considered risky. Fortunately, we did obtain an opportunities to visit Halal Abattoir Complex to do a monthly monitoring visit to the wastewater treatment system.



Figure 8: Entrance of Halal Abattoir Complex



Figure 9: Aeration Tank of the Wastewater Treatment System at Halal Abattoir Complex

CHAPTER 3: PROJECT ASSIGNED

3.1 Introduction

The project falls under the licensing and approval submission category titled 'Written Notification on Air Emission Sources (Centrifugal Dust Collector) Under Regulations 5 of the Environmental Quality (Clean Air) Regulation, 2014'. The project is to install 2 units of multi cyclone at Kion Hoong Cooking Oil Mills Sdn Bhd. The project is coordinated by KMIW Engineering Works Sdn Bhd and had appointed PERUNDING NAJNA SDN BHD as Environmental Consultant who is responsible for preparing and submitting relevant documentation to the Department of Environment Sarawak for installation of the said equipment.

There is no requirement for Environmental Impact Assessment and Environmental Management Plan study for the project. This is because the project is not a prescribed activity under Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987.

The report in regard of the project is submitted to Department of Environment (DOE) for their approval and critique. In the case it was not approved, the report has to be revised based on the comments and requirements aligned with the request from Department of Environment.

3.2 Problem Statement

The purpose of this project is for installations 2 units of multi cyclone at Kion Hoong Cooking Mills that meet the requirement and standards as well as the guidelines set by Department of Environment (DOE). The most common type of initial separators is the cyclone. Cyclones are usually used as precleaners in combination with other more expensive dust control equipment such as the fabric filter or electrostatic precipitators. Cylone removes large and abrasive particulates and reduces dust loading to the fabric filter. These typical situations where cyclones are used in oil mills production. To handle a large volumes of gas stream number of cyclones are used in parallel that such an arrangement is termed 'multi cyclone'.

3.3 Objectives

- i. Notify the related authorities regarding the plan to install the equipment
- ii. To ensure the project comply with legislative requirement, and any other requirement stipulated by other agencies, department, and the overall project environmental objectives.

3.4 Scope of Work

The project is covering the area of Pending, Kuching Sarawak. The specific location is located at Syarikat Kion Hoong Cooking Oil Mills Sdn Bhd. Lot 1897, Batu 2½, Jalan Pending, 93450 Kuching Sarawak. There are 2 public facilities in the area within 300 m radius from the location which are school and clinic.



Figure 10: Locality Plan of the Project

3.5 Sections of the Report

a) Form ASB/PUB/N-JANA

This form compiled the details of the project. It was divided to a few sections namely:

i. General Information for Notification

Information of the applicants (clients) and the information of the manufacturer (consultants) is compiled at this section. The information regarding the location of the project is also entailed at this section.

ii. Centrifugal Dust Collector Information

This section compiled the information of the multi cyclone installed for the project which included:

- Type of cyclone
- Type of Airlock
- Proposed dimension of single cyclone
- Effective number of turn N_e
- Dust collector efficiency
- Particulate Concentration

iii. Solid Particulate Emission Stream Information

This section carried the particulate details on the type of particulate, the limit value, particle density, concentration of the particulate and also particle diameter. This section need to state on the source of dust emission and the list of equipments and other infrastructure emitting dust that will be controlled by the centrifugal dust collector. In this case, fire tube boiler is the equipment that have been used by the Kion Hoong company. Therefore, the emitting dust from the boiler will be controlled by centrifugal dust collector.

iv. **Design of Ventilation System**

This section compiled the information of the design of the ventilation system which included:

- Total volumetric flowrate through duct
- Estimated temperature at the inlet of centrifugal dust collector
- Total pressure loss through duct
- Total pressure loss through centrifugal dust collector
- Total pressure loss through stack
- Total system pressure loss

v. **Fan Information**

This section compiled the information of the fan information which included:

- Type of fan
- Capacity at temperature of operation
- Fan speed
- Static pressure
- Blade type

vi. **Motor Information**

This section compiled the information of the motor information which included:

- Motor output
- Motor speed
- Speed ratio

vii. **Chimney design**

This section compiled the information of the chimney design which included:

- Chimney design
- Height of the highest building
- Efflux velocity
- Chimney number
- Diameter/dimension at the top

viii. **Performance monitoring program**

Describe using additional attachment the detailed proposal on performance monitoring program for major unit operation with suitable normal range including information on equipment.

ix. **Plan/ Drawing/Catalogue/Technical Specification/Calculation**

This section act as a reminder or checklist of the information or guidelines that have to be included in the report. This section consists of followed:

- Attach drawings showing construction details of the exhaust
- Land use plan and location plan within the radius of 500 metre from the exhaust
- Building layout and elevation plan showing location of the multi cyclone and air pollution control system
- Related catalogue and document All plans and engineering drawings should be in A1 and certified by professional engineer preferably in the discipline of Environmental Engineering, Chemical Engineering, Civil Engineering or Mechanical Engineering. All plans should be completed with title and reference number.

x. **Declaration**

Declaration from the engineer involved in the instalment of the equipment.

b) Drawings/Layout Plans

This section comprised of the drawings of the project. The drawings typically included are:

i. Locality Plan

It shows the site location of the proposed project in details.

ii. Typical Plan Elevation of Generator Set

It shows the details of the generator to be installed in different perspective.

c) Calculations

A specific calculation is conducted in accordance to the guidelines given by Department of Environment (DOE) to calculate the noise generate by the generator. There is a range of noise generated that is approved by Department of Environment that have to be followed. Therefore, the calculation is vital to make sure the noise generated comply with the approved range.

d) Catalogue/ Technical Specification Sheet

Both catalogue and technical specification sheet are important as both carried the information needed to perform the calculation of noise produced by generator and fuel consumption.

e) Appointment Letter

A formal appointment letter of applicants (clients) appointing the environment consultant as a reference for the related authorities.

f) Performance Monitoring Sheet

In order to make sure the equipment function at best condition, performance monitoring sheet is provided to give the idea to the related authorities of how the monitoring process of the equipment is conducted.

Date	Pressure Gauge (If any)		Dark smoke		Signature
	In	Out	Yes	No	

Table 2: Example of Site Daily Monitoring Log

Date	Sign of Corrosion	Boiler Operation Frequency (How many days operation?)	Any dust particulate within 3 meters of boiler compound	Signature

Table 3: Example of Monthly Monitoring Logbook

Date	Type of Upset Condition	Diagnosis of Cause of Upset Condition	Any Non- Compliance of Emission Standard? – give explanation	Corre ctive Action Taken	When condition Returned to Normal	Signature of Reporting Officer

Table 4: Example of Table for Corrective Action for Upset Condition

CONCLUSION

In conclusion, the objectives of the case study which are to notify the related authorities regarding the plan to install the equipment is achieved by the submission of this report. The Department of Environment (DOE) have been notified regarding the plan to install 2 units of multicyclone at Syarikat Kion Hoong Cooking Oil Mills Sdn Bhd by the submission of the Written Notification. Albeit that, the objective to make sure the project complies with legislative requirement, and any other requirement stipulated by other agencies are still in discussion as it take a few weeks for the authorities to go through the report and made sure all of the information needed are entailed, the guidelines are followed and the limit established are complied. In the case the submission is approved, the installation of the multi cyclone can proceed and in the case it is not approved the report will be revised.

RECOMMENDATION

To make sure all of the information and details are complete, it is for the best to start from the Form ASB/PUB/N-JANA. This form is divided into sections that have to be filled and at the same time it inform the details that have to be included in the report. Therefore, it is important to refer to the form concurrently preparing the report. This is to make sure no important details are missing and lead to submission of incomplete form.

Besides that, it is important to refer to the guidelines provided by authorities or in this case guidelines provided by Department of Environment (DOE). Department of Environment provided guidelines for each equipment that had to be installed to make sure it complies to their needs and wants. For example, the design has to be in certain way that will not harm the environment and it have to be complied by environment consultant. Failure to do so will lead to rejection to the written notification and the submission will have to be revised.

Last but not least, the method of calculation always has to be in sync with the method of calculation provided by Department of Environment. Every environment consultant has a different approach to calculation, in this case calculation of final noise generated by the generator. Despite having different approach, the Department of Environment insist that their method of calculation had to be applied. Therefore, it is safer to apply their method of calculation.

REFERENCES

Department of Environment. (n.d.). Retrieved 16 July 2021, from National Water Quality Standard Malaysia.

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<https://www.doe.gov.my/portalv1/wp-content/uploads/2013/01/Guidelines-Noise-2019.pdf>*

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*Department of Environment (DOE). (2020). Licensing Submission and Approval. Retrieved 16 July 2021, from Guidelines for Environmental Air pollution engineering manual, 1992:
<https://www.doe.gov.my/portalv1/wp-content/uploads/2013/01/Guidelines-Air Pollution-2019.pdf>*

Receiving Land Use Category	L_{Aeq} Day 7.00 am - 10.00 pm	L_{Aeq} Night 10.00 pm - 7.00 am
Low Density Residential, Noise Sensitive Receptors, Institutional (School, Hospital, Worship).	55 dBA	50 dBA
Suburban Residential (Medium Density), Recreational	60 dBA	55 dBA
Urban Residential (High Density), Mixed Development	65 dBA	60 dBA
Commercial Business Zones	65 dBA	60 dBA
Industrial Zones	70 dBA	65 dBA

Appendix 3: Recommended Permissible Sound Level

GUIDANCE DOCUMENT FOR FUEL BURNING EQUIPMENTS AND AIR POLLUTION CONTROL SYSTEMS

Table 16: Ratios and Cyclone Type

	Cyclone Type					
	High efficiency		Conventional		High Throughput	
	(1)	(2)	(3)	(4)	(5)	(6)
Body diameter D_b/D_o	1.0	1.0	1.0	1.0	1.0	1.0
Height of inlet H/D_o	0.5	0.44	0.5	0.5	0.75	0.8
Width of inlet W/D	0.2	0.21	0.25	0.25	0.375	0.35
Diameter of gas exit, D_e/D_o	0.5	0.4	0.5	0.5	0.75	0.75
Length of vortex finder, S/D_o	0.5	0.5	0.625	0.6	0.875	0.85
Length of body L_b/D_o	1.5	1.4	2.0	1.75	1.5	1.7
Length of cone L_c/D_o	2.5	2.5	2.0	2.0	2.5	2.0
Diameter of dust outlet, D_d/D_o	0.375	0.4	0.25	0.4	0.375	0.4

Source: Air Pollution Engineering Manual, 1992

Appendix 4: Table of ratios and cyclone type