EXECUTIVE SUMMARY

CADANGAN PROJEK PEMBANGUNAN TAPAK PELUPUSAN SISA PEPEJAL SANITARI DI MERSING, MUKIM TRIANG, ENDAU, DAERAH MERSING, JOHOR DARUL TAKZIM

PROJECT PROPONENT

JABATAN PENGURUSAN SISA PEPEJAL NEGARA

EIA CONSULTANT

WIRANDA (M) SDN BHD

INTRODUCTION

Jabatan Pengurusan Sisa Pepejal Negara (JPSPN) has identified 103.262 acres (41.789 ha) of land which is proposed to be developed as a solid waste disposal site to receive solid wastes at 150 tonnes daily from Mersing District Council administration

STATEMENT OF NEED

In line with National policies such as the National Strategic Plan for Solid Waste Management

To provide a comprehensive, integrated, cost-effective, and sustainable solid waste management system in line with society demand for environmental conservation and public well-being

To replace the existing landfill facility in Jemaluang which is at the end of its' lifetime.

LEGAL REQUIREMENT

First Schedule: 13. DEVELOPMENT IN SLOPE AREA:

Development or land clearing less than 50 per cent of an area with slope greater than or equal to 25° but less than 35°

Second Schedule: 14. WASTE TREATMENT AND DISPOSAL:

(b) Solid Waste: Construction of sanitary landfill facility

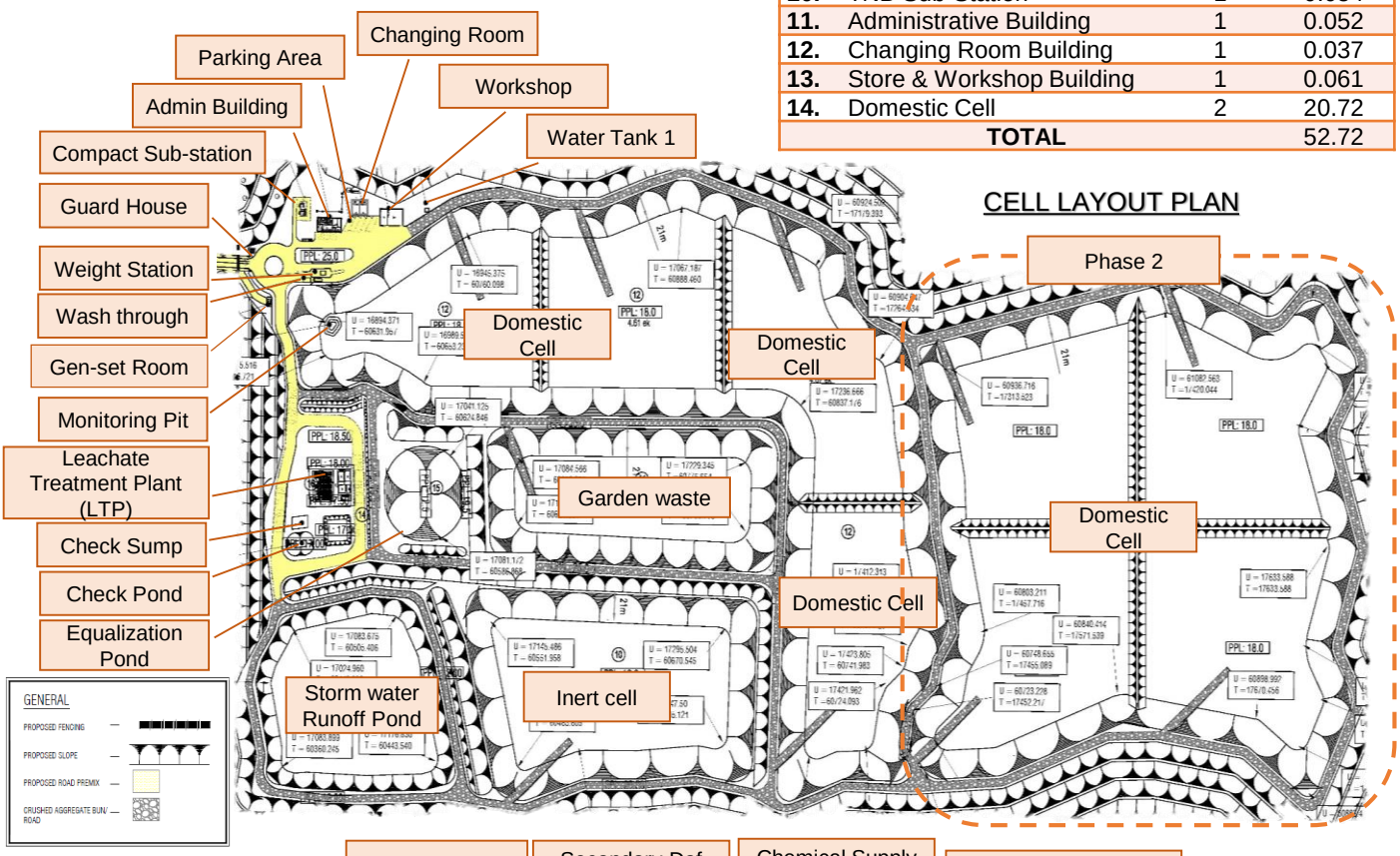
PROJECT LOCATION

CADANGAN PROJEK PEMBANGUNAN TAPAK PELUPUSAN SISA PEPEJAL SANITARI DI MERSING, MUKIM TRIANG, ENDAU, DAERAH MERSING, JOHOR DARUL TAKZIM

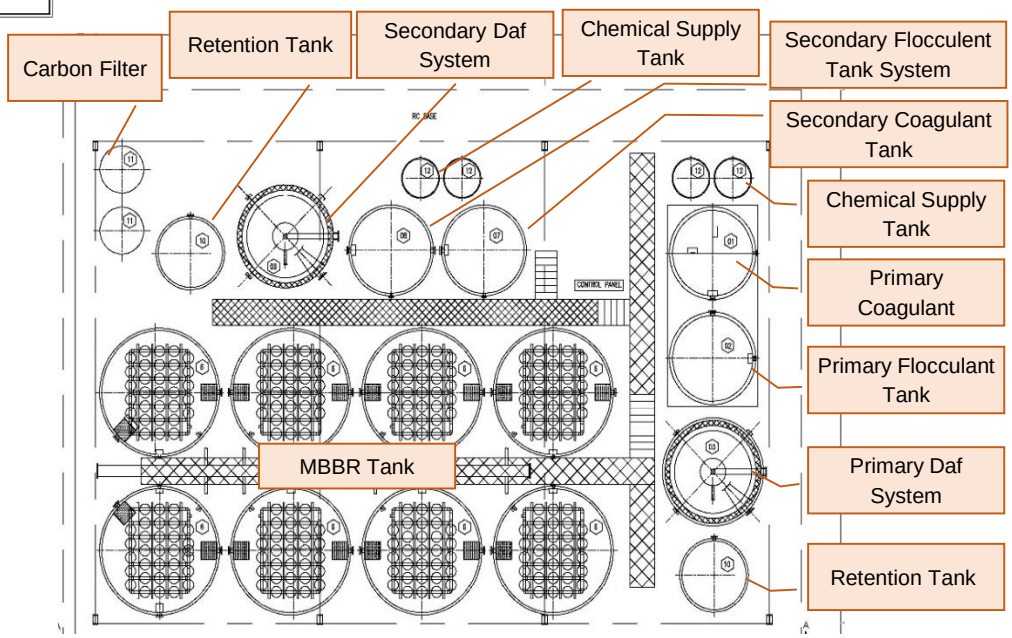
PROJECT DESCRIPTION

The proposed landfill shall receive 150 tonnes of solid wastes daily from the Mersing and Rompin District Council administration area. The new sanitary landfill is estimated to be operated for 16 years. The project will be developed in two (2) phases.

NO	COMPONENTS	PHASE	AREA (acre)
1.	Sub-cell 1	1	4.54
2.	Sub-cell 2	1	4.61
3.	Sub-cell 3	1	4.67
4.	Sub-cell 4	1	4.55
5.	Inert Cell	1	6.11
6.	Garden Waste Cell	1	2.90
7.	Storm water Runoff P Pond	1	4.04
8.	Equalization Pond	1	0.20
9.	Leachate Treatment Plant	1	0.176
10.	TNB Sub-Station	1	0.054
11.	Administrative Building	1	0.052
12.	Changing Room Building	1	0.037
13.	Store & Workshop Building	1	0.061
14.	Domestic Cell	2	20.72
	TOTAL		52.72



CELL LAYOUT PLAN



LEACHATE LAYOUT PLAN (LTP)

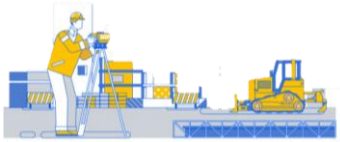
CADANGAN PROJEK PEMBANGUNAN TAPAK PELUPUSAN SISA PEPEJAL SANITARI DI MERSING, MUKIM TRIANG, ENDAU, DAERAH MERSING, JOHOR DARUL TAKZIM

PROJECT DESCRIPTION



Waste Collection from Source → Waste Transportation to Sanitary Landfill → Waste Disposal

WASTE DISPOSAL OPERATION PROCESS



PROJECT ACTIVITIES

Pre-development

- Preliminary site investigation survey

During Development

- Site clearing
- Site preparation(cut and fill, cell preparation,excavation works, drainage system, berms and bunds)
- Road network
- Construction of infrastructure and utilities

Post-development

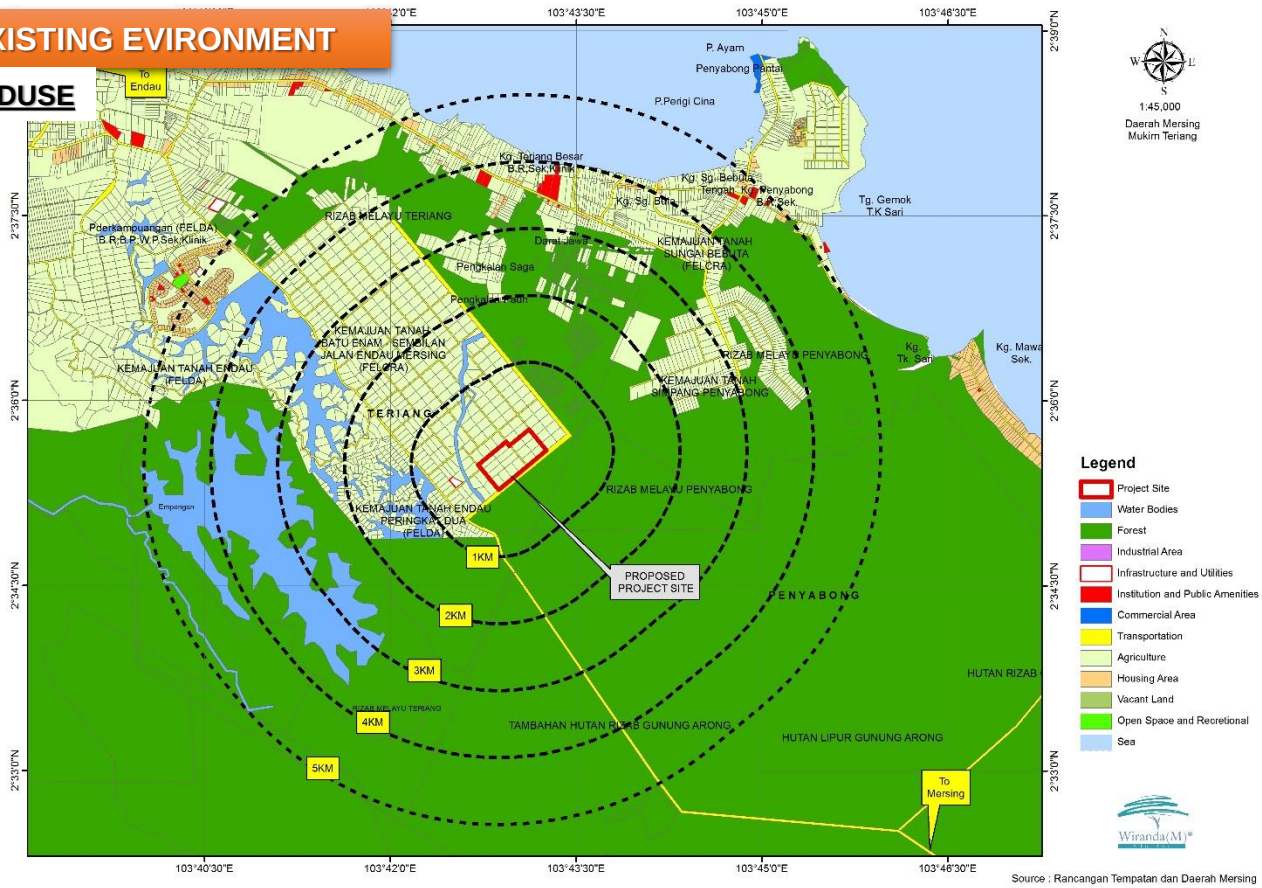
- Sanitary landfill operation
- Maintenance works
- Closure / abandonment

LTP TREATMENT PROCESS

Equalization Pond
↓
Primary chemical coagulation and flocculation tank
↓
Primary dissolved air floatation (DAF-1)
↓
Moving bed biological reactor (MBBR)
↓
Secondary Dissolved air floatation (DAF-2)
↓
Retention tank
↓
Sand filter
↓
Carbon filter
↓
Sludge day tank
↓
Filter press

EXISTING EVIRONMENT

LANDUSE



Source : Rancangan Tempatan dan Daerah Mersing

CADANGAN PROJEK PEMBANGUNAN TAPAK PELUPUSAN SISA PEPEJAL SANITARI DI MERSING, MUKIM TRIANG, ENDAU, DAERAH MERSING, JOHOR DARUL TAKZIM

EXISTING ENVIRONMENT

TOPOGRAPHY

- Slope: 0°-35°
- Elevation: 20m -40 m a.s.l.

GEOLOGY

- 3 types of lithology i.e. metasedimentary rocks of Mersing Formation, Quaternary deposits and granite

GEOTECHNICAL

- Landform: Undulating to steep terrains
- Soil Investigation: underlain by brownish/greyish stiff to hard sandy/gravelly silt and loose to dense silty sand/gravel.

HYDROGEOLOGY

- 5 points
- Groundwater levels : 6.90 m and 34.70 m

SOIL

- Soil loss Existing Condition: 1644.4 (ton/ha/yr)
- Sediment Yield for Existing Conditions: 1536.26 (mt/event)

HYDROLOGY

- River System: Sungai Tering Besar
- Catchment : 0.37km² & 13.9km²

WATER QUALITY

- WQI Sungai Teriang Besar: class II and III
- MWQI: Moderate and Good

METEOROLOGY

- Mersing station (1970 to 2018)
- Rainfall 622.1 mm
- Rain days : 181 days

AIR QUALITY

- 4 stations
- Result *of* PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO complied wih New Malaysian Ambient Air Quality Standards, 2020

ODOR

- 5 stations
- Dilution to Threshold (D/T): during afternoon, night & morning: -2 to 2

NOISE

- 2 stations
- Daytime L_{eq} : 52.9 to 53.4 dBA
- Nighttime L_{eq} : 44.7 to 45.0 dBA

EXISTING TRAFFIC

- Federal Route 3 will be main route
- Road capacity average: LOS A (0.41)

FLORA

- 2 plot
- 169 species within 135 genera and 66 families of plants

FAUNA

- 4 fauna observation points.
- 22 species of mammals,
- 42 species of birds
- 25 species of reptiles

AQUATIC BIOLOGY

- Phytoplankton: 31 Species
- Zooplankton: 13 Species
- Fish: 18 species

SOCIO ECONOMY

- Project Acceptability :
- Agree: 79.9%
- Disagree :17.0%
- Not Sure: 3.1%

HEALTH

- Data Survey & Klinik Kesihatan Endau and Hospital Mersing
- Eye and respiratory diseases (23.1% and 88.7%)
- No water related disease case reported

CADANGAN PROJEK PEMBANGUNAN TAPAK PELUPUSAN SISA PEPEJAL SANITARI DI MERSING, MUKIM TRIANG, ENDAU, DAERAH MERSING, JOHOR DARUL TAKZIM

POTENTIAL IMPACT & MITIGATION MEASURE

POTENTIAL IMPACT	MITIGATION MEASURE
AIR QUALITY & ODOR	
CONSTRUCTION STAGE • Site preparation & earthworks • Transportation activities • Construction related activities **OPERATION STAGE** • Formation of odorous landfill gases • Suspended particulates emitted by landfill activities	**CONSTRUCTION STAGE** • Limit truck speed • Kept moist to minimize dust • Tyre-washing facility **OPERATION STAGE** • Landfill gas monitoring programme • Odour control measures as best management practices (BMPs) • Control emissions from unpaved
NOISE & VIBRATION	
CONSTRUCTION STAGE • Piling activities • Transportation of construction material • Earthwork & construction **OPERATION STAGE** • Noise levels will inevitably increase due to waste transportation activities • Vibration from road traffic given the soil damping capability and vibration frequency as well as other obstructions	**CONSTRUCTION STAGE** • Scheduling the movement of heavy vehicles **OPERATION STAGE** • Scheduling the movement of the heavy vehicles • Speed limit when working close to residential areas
WATER QUALITY	
CONSTRUCTION STAGE • Sedimentation • Suspended Solids and Turbidity • Accidental Spillage from Skid Tanks, Oil and Grease. • Solid Wastes and Effluents from Temporary Workers Camp and Site Office **OPERATION STAGE** • Sedimentation • Failure in any part of the LTP could result in discharge of partially treated leachate, which would pollute the downstream receiving river	**CONSTRUCTION STAGE** • Implementation of LD-P2M2 • Scheduled waste generated shall comply with the environmental quality (scheduled wastes) regulations 2005 • Conduct water monitoring and audit. **OPERATION STAGE** • Implementation of LD-P2M2 • Effluent discharge limits as per Environmental Quality (Control Of Pollution From Solid Waste Transfer Station And Landfill) Regulations 2009 • Conduct water monitoring and audit.
SOIL EROSION	
CONSTRUCTION STAGE • Possible erosion and sedimentation occur during site cleaning activities and earthworks **OPERATION STAGE** • Erosion and sedimentation from earthwork activities cell soil cover	**CONSTRUCTION STAGE** • Implementation of LD-P2M2 **OPERATION STAGE** • Implementation of LD-P2M2

CADANGAN PROJEK PEMBANGUNAN TAPAK PELUPUSAN SISA PEPEJAL SANITARI DI MERSING, MUKIM TRIANG, ENDAU, DAERAH MERSING, JOHOR DARUL TAKZIM

POTENTIAL IMPACT & MITIGATION MEASURE

POTENTIAL IMPACT	MITIGATION MEASURE
GEOTECHNICAL	
CONSTRUCTION STAGE • Soil Erosion and Sedimentation • Foundation and Bearing Capacity **OPERATION STAGE** • Landfill failure : Sliding mass • Failure of leachate collection system • Failure of final cover of the liner system	**CONSTRUCTION STAGE** • Slope from excavation shall be designed to Factor of Safety (FOS) minimum 1.3 • Dumping of excavated material without proper placement and compaction effort **OPERATION STAGE** • Regular field inspection and monitoring to be carried out
HYDROLOGY	
CONSTRUCTION STAGE • Determine flooded areas and low flow **OPERATION STAGE** • Increase of surface runoff which eventually increases flow volume and velocity.	**CONSTRUCTION STAGE** • Detention pond or holding pond **OPERATION STAGE** • A detention pond is to meet the condition where the post-development peak outflow at the outlet is less than or equal to the pre-development
GROUNDWATER	
CONSTRUCTION STAGE • Insignificant impacts as no significant ground excavation that punches water table **OPERATION STAGE** • Potential change in groundwater levels and flow pattern • Potential change in groundwater quality and contaminant movement	**CONSTRUCTION STAGE** • Layering of clay liner or any other low permeable barriers to prevent direct contact of groundwater and the overlying landfill materials **OPERATION STAGE** • Continuous monitoring of groundwater conditions
WASTE	
CONSTRUCTION STAGE • Biomass waste • Sewage and Solid Wastes • Scheduled Wastes **OPERATION STAGE** • Solid Waste: Potential effects on land, ground water, surface water, atmosphere, local communities and public health and safety, transportation and infrastructure • Scheduled Wastes: Generated from LTP and vehicle maintenance activities	**CONSTRUCTION STAGE** • Zero burning method • Provide garbage bins to collect solid wastes • Scheduled waste handling procedures conform to the environmental quality (scheduled wastes) regulations 2005 **OPERATION STAGE** • Scheduled waste handling procedures conform to the environmental quality (scheduled wastes) regulations 2005 • Liners can be installed beneath and on the sides of waste fill area to control the movement of leachate • Site supervision and inspection

CADANGAN PROJEK PEMBANGUNAN TAPAK PELUPUSAN SISA PEPEJAL SANITARI DI MERSING, MUKIM TRIANG, ENDAU, DAERAH MERSING, JOHOR DARUL TAKZIM

POTENTIAL IMPACT & MITIGATION MEASURE

POTENTIAL IMPACT	MITIGATION MEASURE
TRAFFIC	
CONSTRUCTION STAGE • Increase heavy vehicle movement, potential accident, road damage and traffic congestion • Dust emitted from transportation and landfill development activities **OPERATION STAGE** • Odour Nuisance – foul odour from the accumulation of solid waste	**CONSTRUCTION STAGE** • Adequate temporary signage and markings • Ensure parked trucks along the roadside not to cause traffic congestion **OPERATION STAGE** • Scheduling the movement of heavy vehicles • Followed Guideline procedures recommended by the authority
RISK ASSESSMENT	
OPERATION STAGE • Landfill Gas Generation Hazards • Risk associated with level 4 sanitary landfill is in the category between low to medium	**OPERATION STAGE** • The landfill management should establish effective procedure
FLORA	

CONSTRUCTION STAGE
• Vegetation Loss: : Not located within any forest reserve with no connection to adjacent forest
• Impact on Flora Diversity: No plant species were listed as threatened categories under IUCN Red List and Malaysia Plant Red List
• Biomass Generation estimated at 1,882.31 tonne.
	CONSTRUCTION STAGE
	• Planning of Clearing Activities
	• Biomass Management
	  ○ Dumping of biomass along river/ stream area is not allowed
	  ○ Restriction of Open Burning

FAUNA	

CONSTRUCTION STAGE
• Habitat Loss: Not located within any forest reserve with no connection to adjacent forest
• Loss and Displacement of Fauna: Not all fauna would be able to make their escape especially those slow moving and small
• Impact on Faunal Diversity
• not all fauna would be able to make their escape especially those slow moving and small
• Illegal Wildlife Hunting and Collecting
• Human wildlife conflict
	CONSTRUCTION STAGE
	• Direction of Site Clearing Activities
	• Wildlife Management
	  ○ Prohibited hunting, poaching
	  ○ Engagement with PERHILITAN if there is concern regarding wildlife conflict

AQUATIC BIOLOGY	
CONSTRUCTION STAGE • Water quality deterioration (total suspended solid) • Drastic modification or aquatic environment due to siltation	**CONSTRUCTION STAGE** • Maintained the river water quality • Monitor and control

CADANGAN PROJEK PEMBANGUNAN TAPAK PELUPUSAN SISA PEPEJAL SANITARI DI MERSING, MUKIM TRIANG, ENDAU, DAERAH MERSING, JOHOR DARUL TAKZIM

POTENTIAL IMPACT & MITIGATION MEASURE

POTENTIAL IMPACT	MITIGATION MEASURE
SOCIO ECONOMY	
CONSTRUCTION STAGE • Heavy Vehicle Issues • An influx of Foreign Workers • Air Pollution Nuisance • Job and Business Opportunities **OPERATION STAGE** • Benefit to community: Comprehensive waste management practices • Odour nuisance • Safety and health	**CONSTRUCTION STAGE** • Proper air, noise, and vibration measures must be implemented • Follow the Traffic Management Plan • Employment opportunities to the local • Provide the training **OPERATION STAGE** • Employment opportunities to the local • Proper traffic, odour, air, noise, health and safety measures must be implemented
HEALTH	
CONSTRUCTION STAGE • Inhalation Exposure to Air Pollutants • PM_{10} will be the air pollutant of concern **OPERATION STAGE** • Gaseous pollutants as hydrogen sulphide, methyl mercaptan and ethyl mercaptan • Breeding sites for rodents and disease vectors	**CONSTRUCTION STAGE** • Proper measures must be implemented for air pollutant **OPERATION STAGE** • Minimize the possibility of pest breeding and the spread of pest-related diseases • Proper measures must be implemented for air pollutant
ECONOMIC EVALUATION	
• At The Rate of 8%, the total present value of the stream annual loss amounts to –RM 2,034,210 over a 50 - year period • A 4% rate of discount is used, the corresponding value is equal to -RM4,120,120	

CADANGAN PROJEK PEMBANGUNAN TAPAK PELUPUSAN SISA PEPEJAL SANITARI DI MERSING, MUKIM TRIANG, ENDAU, DAERAH MERSING, JOHOR DARUL TAKZIM

ENVIRONMENTAL MONITORING PROGRAM

IMPACT MONITORING (IM)

COMPONENT	REGULATED PARAMETERS	COMPLIANCE LIMIT	FREQUENCIES
Ambient Air Quality and Odour*	PM_{10}	100 µg/m^3	Quarterly
	$PM_{2.5}$	35 µg/m^3	
	NO_2	70 µg/m^3	
	SO_2	80 µg/m^3	
	CO	30 mg/m^3	
	Odour	Refer baseline data for the reference limits	
Noise**	L_{10}	*Guidelines for Environmental Noise Limits and Control, 2019	Quarterly
	L_{50}		
	L_{90}		
	L_{min}		
	L_{max}		
	L_{Aeq}		
Water Quality***	Total Suspended Solids (TSS)	50 mg/L	Monthly
	Biochemical Oxygen Demand (BOD_5)	3 mg/L	
	pH	6.0 – 9.0	
	Turbidity	250 NTU	
	Chemical Oxygen Demand (COD)	25 mg/L	
	Ammoniacal Nitrogen (N-NH_3)	0.3 mg/L	
	Fecal Coliform (count/ 100mL)	400	
	Oil and Grease	0.04;N	
	Temperature	-	
	Dissolved Oxygen (DO)	5 – 7 mg/L	
Groundwater Quality******	Total dissolved solids	1500 mg/L	Half yearly
	Sulfate	250 mg/L	
	Nitrate	10 mg/L	
	Total coliform	5000 MPN/100 mL	
	Manganese	0.2 mg/L	
	Chromium	0.05 mg/L	
	Zinc	3.0 mg/L	
	Arsenic	0.01 mg/L	
	Selenium	0.01 mg/L	
	Chloride	250 mg/L	
	Phenol	0.002 mg/L	
	Iron	1.0 mg/L	
	Copper	1.0 mg/L	
	Lead	0.05 mg/L	
	Cadmium	0.003 mg/L	
	Mercury	0.001 mg/L	

Note:

* *New Malaysian Ambient Air Quality Standard, 2020 (DOE).*

** *First Schedule: Recommended Permissible Sound Level (Laeq) By Receiving Land Use for New Development Guidelines for Environmental Noise Limits and Control, 2019*

*** *National Water Quality Standards for Malaysia (NWQS), Department of Environment Malaysia (DOE)*

****Groundwater Quality Standards for Conventional Raw Water Treatment (Drinking Water), 2017 (DOE)*

CADANGAN PROJEK PEMBANGUNAN TAPAK PELUPUSAN SISA PEPEJAL SANITARI DI MERSING, MUKIM TRIANG, ENDAU, DAERAH MERSING, JOHOR DARUL TAKZIM

COMPLIANCE MONITORING (CM)

COMPONENT	REGULATED PARAMETERS	COMPLIANCE LIMIT	FREQUENCIES
Ambient Air Quality and Odour*	PM_{10}	100 µg/m^3	Quarterly
	$PM_{2.5}$	35 µg/m^3	
	NO_2	70 µg/m^3	
	SO_2	80 µg/m^3	
	CO	30 mg/m^3	
	Odour	Refer baseline data for the reference limits	
Noise**	L_{10}	Guidelines for Environmental Noise Limits and Control, 2019	Quarterly
	L_{50}		
	L_{90}		
	L_{min}		
	L_{max}		
	L_{Aeq}		
Water Quality***	Total Suspended Solids (TSS)	50 mg/L	Monthly
	Biochemical Oxygen Demand (BOD_5)	3 mg/L	
	pH	6.0 – 9.0	
	Turbidity	250 NTU	
	Chemical Oxygen Demand (COD)	25 mg/L	
	Ammoniacal Nitrogen (N-NH_3)	0.3 mg/L	
	Fecal Coliform (count/ 100mL)	400	
	Oil and Grease	0.04;N	
	Temperature	-	
	Dissolved Oxygen (DO)	5 – 7 mg/L	
Groundwater Quality****	Total dissolved solids	1500 mg/L	Half yearly
	Sulfate	250 mg/L	
	Nitrate	10 mg/L	
	Total coliform	5000 MPN/100 mL	
	Manganese	0.2 mg/L	
	Chromium	0.05 mg/L	
	Zinc	3.0 mg/L	
	Arsenic	0.01 mg/L	
	Selenium	0.01 mg/L	
	Chloride	250 mg/L	
	Phenol	0.002 mg/L	
	Iron	1.0 mg/L	
	Copper	1.0 mg/L	
	Lead	0.05 mg/L	
	Cadmium	0.003 mg/L	
	Mercury	0.001 mg/L	
Sediment Quality	Total suspended solids	Standard B of the Fifth Schedule of the Environmental Quality (Industrial Effluent) Regulations, 2009.	Monthly
	Oil &Grease		
Effluent Quality	Full parameters of Second Schedule of Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulations 2009	Second Schedule of Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulations 2009.	Monthly

Note:

* *New Malaysian Ambient Air Quality Standard, 2020 (DOE).*

** *First Schedule: Recommended Permissible Sound Level (Laeq) By Receiving Land Use for New Development Guidelines for Environmental Noise Limits and Control, 2019*

*** *National Water Quality Standards for Malaysia (NWQS), Department of Environment Malaysia (DOE)*

****Groundwater Quality Standards for Conventional Raw Water Treatment (Drinking Water), 2017 (DOE)*

PERFORMANCE MONITORING (PM)

P2M2 TOOLS	PERFORMANCE MONITORING (PM) PARAMETERS	RECOMMENDED LIMITS	FREQUENCIES
Sediment Basin/ Trap	Silt marker	2/3 depth of the basin	Weekly or after rainfall event greater than 12.5mm (in-situ)
Silt Fence	Sediment level	-	Biweekly or after rainfall event greater than 12.5mm
Earth Drain with Check Dam	Sediment level	-	
Wash Trough	Sediment level	-	
Effluent Quality	Online monitoring of ammoniacal nitrogen on continuous basis Volume discharge to be monitored via flow meter Conduct performance monitoring of leachate treatment system to be specified by DOE	Guidance Document on Performance Monitoring of Industrial Effluent Treatment System, DOE Oct 2009 Results refer to Second Schedules of Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulations 2009.	Daily
Scheduled Waste	-	Environmental Quality (Scheduled Wastes) Regulations 2005	Daily inventory when necessary