First Schedule

Environmental Impact Assessment Report

Proposed Development of Langkawi Federal Resort (RPP Langkawi) Through Public-Private Partnership Via Redevelop-Operate-Transfer (ROT) Model on Lot 51, Seksyen 4, Bandar Padang Mat Sirat, Langkawi, Kedah Darul Aman

Project Proponent:

SAMUDERA ANDAMAN SDN BHD



May 2026

Prepared by:
AGV Environment Sdn. Bhd.
AGV ENVIRONMENT
ENVIRONMENTAL SOLUTIONS SPECIALIST

Rujukan Kami : SASB/PJ/PDD/2026/0007
Tarikh : 15 Mei 2026

Pengarah
Jabatan Alam Sekitar Negeri Kedah
Aras 4 dan 5A, Arcade Station
Souq Commercial Centre Jalan Tun Abdul Razak
05200 Alor Setar
Kedah Darul Aman

(U/P: YBrs. Puan Sharifah Zakiah Binti Syed Sahab)

Puan,

LAPORAN PENILAIAN KESAN KEPADA ALAM SEKELILING (EIA) BAGI "PROPOSED DEVELOPMENT OF LANGKAWI FEDERAL RESORT (RPP LANGKAWI) THROUGH PUBLIC-PRIVATE PARTNERSHIP VIA REDEVELOP-OPERATE-TRANSFER (ROT) MODEL ON LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN" UNTUK TETUAN SAMUDERA ANDAMAN SDN BHD
- Pengemukaan Laporan EIA

Dengan segala hormatnya perkara di atas adalah dirujuk.

2. Untuk makluman Puan, AGV Environment Sdn. Bhd. (AGV) telah dilantik sebagai Perunding Alam Sekitar oleh penggerak projek, Samudera Andaman Sdn Bhd (SASB) untuk menyediakan Laporan EIA bagi projek berkenaan. Cadangan projek ini adalah tertakluk kepada Jadual Pertama dalam Perintah Kualiti Alam Sekeliling (Aktiviti yang Ditetapkan) (Penilaian Kesan Kepada Alam Sekeliling) 2015.

3. Bersama-sama surat ini disertakan tiga (3) salinan Laporan EIA dan satu (1) pemacu kilat USB yang mengandungi *softcopy* Laporan EIA untuk perhatian dan tindakan pihak Puan selanjutnya. Laporan Dokumen EIA ini juga telah dimuatnaik ke laman sesawang *Environmental Spatial Data Repository* (ESDR).

4. Sekiranya terdapat sebarang pertanyaan, pihak Puan boleh menghubungi wakil perunding EIA, Puan Putri Zulaikha Binti Md Bakri (wakil AGV) di talian +603-7931 1455 atau emel putri@agvenvironment.com. Segala perhatian dan kerjasama daripada pihak Puan berhubung perkara di atas amatlah dihargai dan didahului dengan ucapan terima kasih.

Yang Benar,
Samudera Andaman Sdn Bhd.

DATUK AMLI BIN TALIB
Pengarah

Lampiran:

1 Laporan EIA - 3 salinan dan 1 salinan *softcopy* (pemacu kilat USB)

s.k. *salinan* **AGV Environment Sdn. Bhd.** - *1*

Level 3A, Tower B, Atwater Corporate Offices,
Jalan Prof Diraja Ungku Aziz,
46300 Petaling Jaya, Selangor Darul Ehsan

(U/P: Datin Dr. Vijayalakshmi Samuel)

Ref. No.: SASB/PJ/PDD/2026/0008

DECLARATION BY PROJECT PROPONENT / AUTHORISED PERSON

I certify that the Land Disturbing Pollution Prevention Mitigation Measures (LD-P2M2) report has been prepared with my knowledge and I shall undertake the responsibility to ensure the actions / plans and pollution prevention and mitigation measures (P2M2) stated in the LD-P2M2 report will be implemented. I have provided sufficient allocation for the implementation of the P2M2.

PROJECT TITLE:

Proposed Development of Langkawi Federal Resort (RPP Langkawi) Through Public-Private Partnership via Redevelop-Operate-Transfer (Rot) Model on Lot 51, Seksyen 4, Bandar Padang Mat Sirat, Langkawi, Kedah Darul Aman

PROJECT ADDRESS / LOCATION:

Lot 51, Seksyen 4, Bandar Padang Mat Sirat, Langkawi, Kedah Darul Aman

Name : Datuk Amli Bin Talib
Designation : Director
Date : 15 May 2026
Company Stamp :

Project Proponent's Environmental Pledge

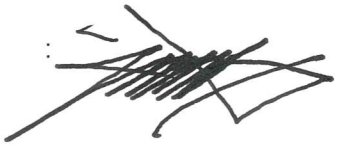
I hereby declare that the entire EIA report is the product of the Qualified Person (i.e.,the EIA Consultant) engaged by my company and all the facts stated in the report and the accompanying information are to the best of my knowledge and belief true and correct, and that I have not withheld or distorted any materials facts. I agree and I undertake the responsibility to implement all the pollution prevention and mitigation measures (P2M2s) described in the EIA report, in the Environmental ManagementPlan (EMP) and in the LD-P2M2 as proposed by the EIA Consultant. I have allocated sufficient funds for the above purpose.

Name of Project Proponent : Datuk Amli Bin Talib

NRIC Number : 630422-01-5605

Designation : Director

Signature :



Date : 15 May 2026

Company Stamp :



AGV ENVIRONMENT
ENVIRONMENTAL SOLUTIONS SPECIALIST

First Schedule Environmental Impact Assessment Report for the
Proposed Development of Langkawi Federal Resort (RPP Langkawi) Through Public-Private Partnership via Redevelop-Operate-Transfer (Rot) Model on Lot 51, Seksyen 4, Bandar Padang Mat Sirat, Langkawi, Kedah Darul Aman

Qualified Person's Declaration

I declare that the entire EIA report is the product of my own work and the work of my team members (i.e., other consultants who are also Qualified Persons) who worked under my supervision and all the facts stated in the Report and the accompanying information are to the best of my knowledge and belief true and correct and that I have not withheld or distorted any material facts. I have briefed the Project Proponent on the content of the Report and highlighted to him all the pollution prevention and mitigation measures (P2M2s) described in the Environmental Management Plan (EMP), and in the LD-P2M2, and the Project Proponent has agreed to implement them (i.e., P2M2).

EIA Consultant Team Leader : Datin Dr Vijayalakshmi Samuel

NRIC Number : 691125-05-5204

Designation : EIA Team Leader

Signature :



Date : 14 May 2026

Company's stamp :



EXECUTIVE SUMMARY

FIRST SCHEDULE ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF LANGKAWI FEDERAL RESORT (RPP LANGKAWI) THROUGH PUBLIC-PRIVATE PARTNERSHIP VIA REDEVELOP-OPERATE-TRANSFER (ROT) MODEL ON LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Project Proponent

SAMUDERA ANDAMAN SDN BHD

Samudera Andaman Sdn. Bhd.

Address : B¬05 & B¬06, Plaza Kelana Jaya, Jalan SS7/13B, Kelana Jaya, 47301 Petaling Jaya, Selangor

Telephone : 03-7877 1885 / 03-7876 8688
Contact Person : Azrul Azuan bin Aali
Email : aazuan.aa@southkey.com.my

EIA Consultant

AGV ENVIRONMENT
ENVIRONMENTAL SOLUTIONS SPECIALIST

AGV Environment Sdn. Bhd.

Address : Level 3A, Tower B, Atwater Corporate Office, Jalan Prof Diraja Ungku Aziz, 46300 Petaling Jaya, Selangor
Telephone : 03-7931 1455
Contact Person : Datin Dr. Vijayalakshmi Samuel
Email : vijayalakshmi@agvenvironment.com

Overview

LEGAL REQUIREMENT
Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015

First Schedule
Activity 12: Development in Coastal and Hill Area
(a) Construction of buildings or facilities with 80 rooms or more in a coastal area.

PROJECT OVERVIEW

- Infrastructure development of a 15-storey hotel comprising 300 rooms, a basement, and associated supporting facilities.
- Proposed demolition of existing abandoned *Rumah Peranginan Persekutuan* (RPP) Langkawi and redevelopment into OPERO Hotel along Pantai Tengah coastal area.

Statement of Need



Conformance to Government Policies and Plans

The Project is in line with the following policies and plans at national, state and local levels:

- United Nations Sustainable Development Goals, Agenda 2030
- Thirteenth Malaysia Plan (2026 – 2030);
- Fourth National Physical Plan (2021 – 2040) ;
- National Coastal Zone Physical Plan 2 (2021 – 2040);
- National Tourism Policy (2020 – 2030);
- *Rancangan Struktur Negeri Kedah* 2035 (RSN Kedah 2035);
- *Pelan Strategik Langkawi Development Authority* LADA (2022-2026); and
- *Rancangan Tempatan Daerah Langkawi* 2030

Environmental Benefits

- Promotes sustainable development practices and sustainable tourism.
- Redevelopment on an existing resort site, avoiding encroachment into undeveloped or sensitive coastal areas.
- Compliance with coastal setback regulations, responsible waste management, and energy-efficient building design.

Social Benefits

- Creates job opportunities for skilled and semi skilled workers.
- Strengthen capabilities in hospitality, tourism management, and eco-tourism practices, improving employability and career development.

Economic Benefits

- Attracts both domestic and international tourists, increasing visitor spending.
- Create demand for local products and services, benefiting small businesses.
- Boost Langkawi's tourism sector and contribute to Malaysia's overall economic growth.

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Project Location



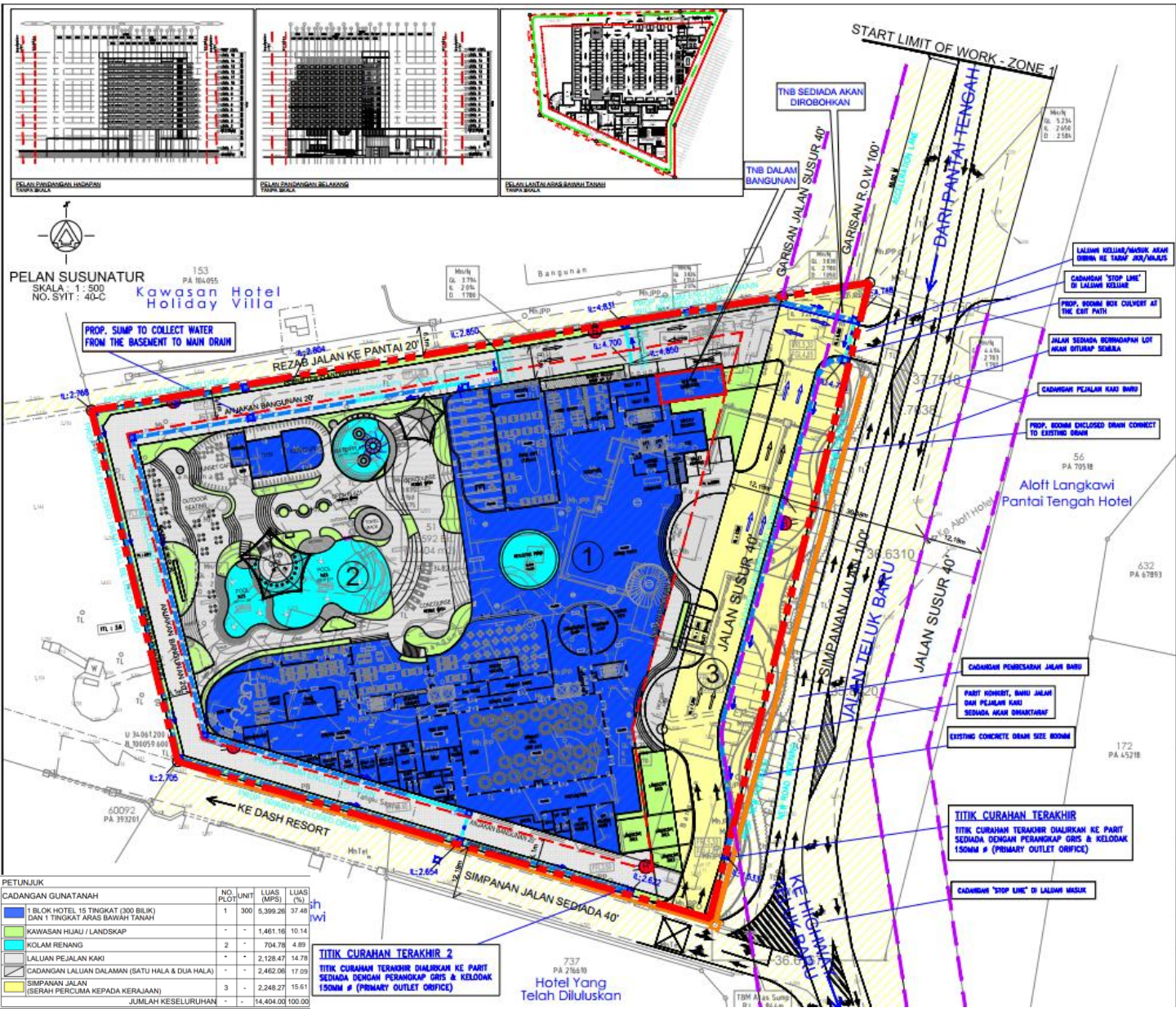


Point	Latitude (N)	Longitude (E)
1	6°16'21.21"	99°43'55.13"
2	6°16'22.07"	99°44'0.44"
3	6°16'17.76"	99°43'59.35"
4	6°16'18.83"	99°43'55.73"

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Project Layout and Development Components



CADANGAN GUNATANAH	NO. PLOT	UNIT	LUAS (MPS)	LUAS (%)
1 BLOK HOTEL 15 TINGKAT (300 BILIK) DAN 1 TINGKAT ARAS BAWAH TANAH	1	300	5,399.26	37.48
KAWASAN HIJAU / LANDSKAP	-	-	1,461.16	10.14
KOLAM RENANG	2	-	704.78	4.89
LALUAN PEJALAN KAKI	-	-	2,128.47	14.78
CADANGAN LALUAN DALAMAN (SATU HALA & DUA HALA)	-	-	2,462.06	17.09
SIMPANAN JALAN (SERAH PERCUMA KEPADA KERAJAAN)	3	-	2,248.27	15.61
JUMLAH KESELURUHAN	-	-	14,404.00	100.00

Project Concept

A luxury 15-storey hotel with an underground basement.

- 300 guest rooms with supporting infrastructure and recreational facilities.
- All guest rooms, dining areas and meeting rooms will be overlooking the sea.

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Project Sketch

SHARED SPACES

1 Storeys
GFA : 12,281.40 sf
NFA : 9,825 sf
Main Lobby, Reception Counter, Concierge, Luggage Room & VIP Reception & Public Toilet

RECREATIONAL FACILITIES

1 Storeys
GFA : 34,167.01 sf
NFA : 27,333 sf
Gym, Kid's Club & Play Area, Kid's Pool, Adult Pool, Sunken Bar, Sunset Café, Open Plaza & Concourse.

Speciality Restaurant & Cafe

1 Storeys
GFA : 17,028.82 sf
NFA : 13,623 sf
Speciality Restaurant, Café, Food Prep, Food Storage, & Kitchen



HOTEL BLOCK

13 Storeys
300 units
GFA : 238,261.09 sf
NFA : 166,782.76 sf
27 units per floor
Room size : 350sqft to 1700sqft

BACK OF HOUSE

1 Storeys
GFA : 20,634.63 sf
NFA : 16,507 sf
Meeting Conference Room, Lobby, Pantry, Exclusive Karaoke, Business Lounge & Prayer Room

CONFERENCE & EVENT SPACES

1 Storeys
GFA : 54,683.78 sf
NFA : 43,747 sf
Restaurant, Banquet Hall, Prefunction & VIP Holding Rooms,

Project Activities

Pre-Construction	Construction Phase	Operational Phase
• Survey works • Engagement and liaison with authorities and stakeholders • Soil Investigation (SI) works and related studies • Planning works	• Site clearing and demolition works • Site preparation and temporary facilities • Earthworks • Piling and foundation works • Construction of buildings and structures • Infrastructure and utility development • Landscaping	• Operation as a fully developed hotel with all accommodations, hospitality and recreational facilities.

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Existing Environment

Topography

- Existing Project site has been previously developed; the current ground level has been levelled and is relatively flat
- Ground levels: between 3.2 - 4.3 m above sea level
- No steep slope found

Geology

- Quaternary Period alluvium, consists of unconsolidated mud, silt, sand, gravel, and organic matter
- Unconsolidated and potentially heterogeneous materials
- Shallow groundwater levels (0.30 to 1.30 m below ground level)

Soil

- Baging and Permatang Series; both derived from marine alluvium
- Baging soil: pale brown to very pale brown, medium to coarse single-grained sand
- Permatang soil: brownish gray, sandy clay loam

Hydrology

- Situated at the low-lying plains, along a sandy beach shoreline
- Water from the Project site drains into the stormwater drain along the eastern boundary; no river running through or adjacent to the Project site
- Perimeter storm drains along the boundary of the Project site exhibit seasonal flow behaviour

Climate & Meteorology

- Equatorial monsoon climate (NE Monsoon: Nov–Mar; SW Monsoon: May–Sep)
- Mean Temperature: 28.5 °C
- Relative Humidity: 78.4%
- Rainfall: 34.6 mm (Feb) to 446.3 mm (Sep)
- Rain days: 4 days (Feb) to 22 days (Sep)
- Winds: annual mean 1.8 m/s; prevailing NE (32.3%)

Land Use

- Site is at the abandoned RPP Langkawi
- Site is gazetted as 'Commercial' under RTDL 2030
- Area is well-known as luxury resort area with several supporting tourism sector businesses

Traffic

- Peak hours: 8–9 AM (845 PCU/h) & 5.30–6.30 PM (976 PCU/h)
- Main access: Jalan Teluk Baru (LOS A)
- Junction 1, 2 & 3 in Year 2026: all LOS B

Ecology

- Within a well-developed commercial away from any environmentally sensitive area
- **Fauna:** mostly "Protected" under WCA 2010; Long-tailed Macaque (*Macaca fascicularis*) and Dusky Leaf Monkey (*Trachypithecus obscurus*) classified as "Endangered" on the IUCN Red List 2025
- **Avifauna:** mostly "Totally Protected" under WCA 2010; all species classified as "Least Concern" on the IUCN Red List 2025

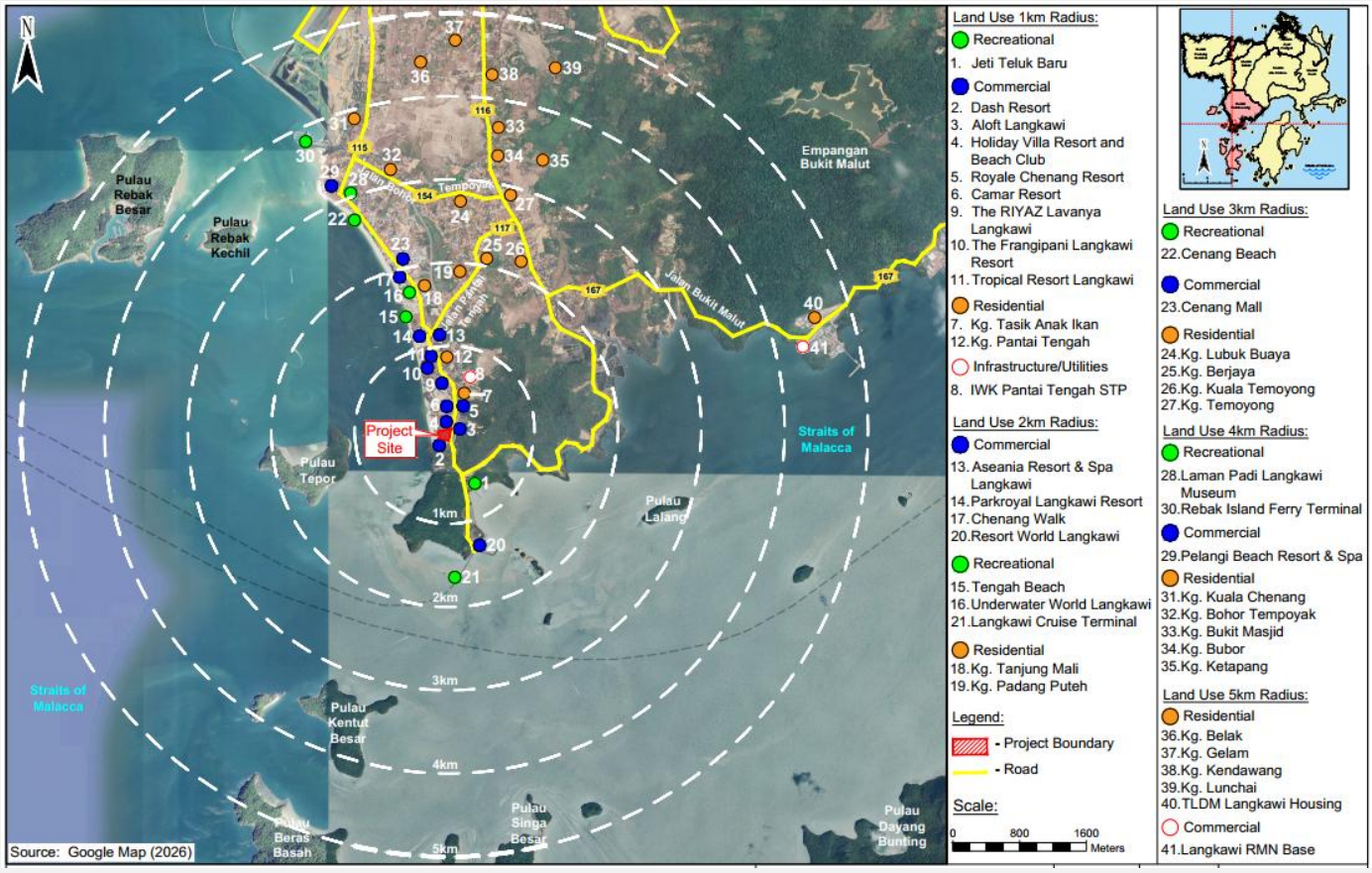
Socio-Economy

- **Engagement:** Focus Group Discussion (FGD) with community representatives and interviews with business operators
- **Summary:**
  - No issue and objection toward Project; 100% support
  - Issues/concerns: privacy; dust and noise dispersion
  - Expected to create job opportunities during both the construction and operation phases; benefit local youth; improved income levels and community economic growth

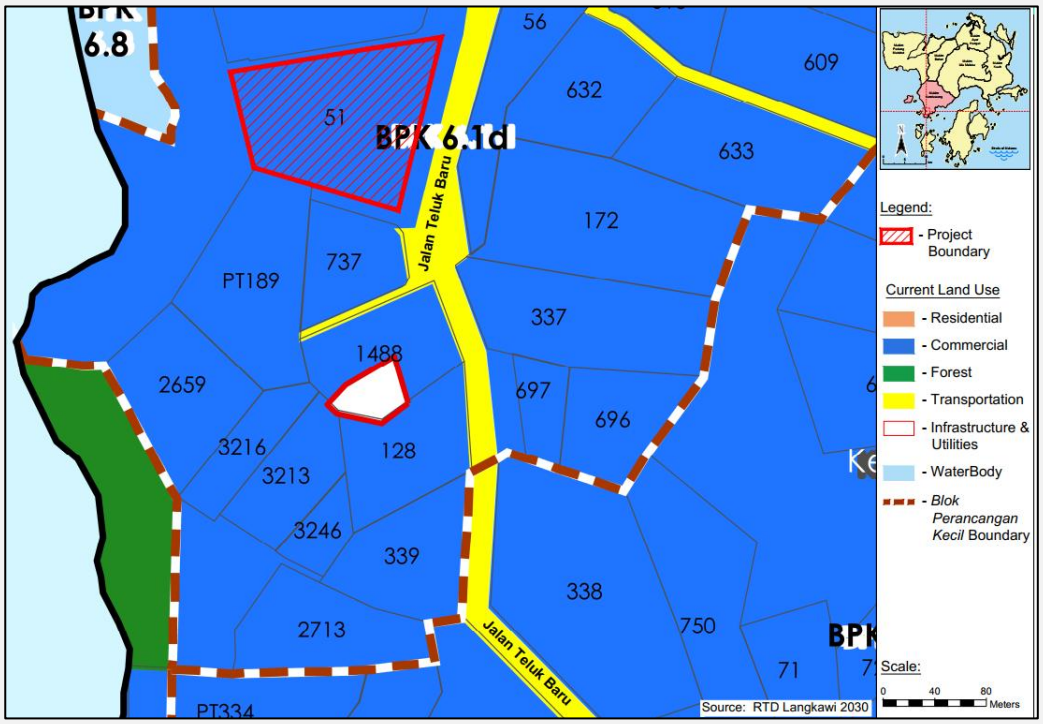
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Surrounding Land Use



Zoning Land Use



- Based on the RTD Langkawi 2030, the Project site is located at Mukim Padang Matsirat
- Under Planning Block (BP6): Kedawang, BPK 6.1d: Kluster Cenang_15, within the Kluster Pelaburan Khusus (KPK) of Kompleks Pelancongan Cenang
- Project site is currently zoned as “Vacant Land”; future land use plan designated as “Commercial”

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Environmental Baseline Sampling



Point	Latitude (N)	Longitude (E)
Marine Water (MW)		
MW1	6°16'18.46"	99°43'49.13"
Air/Noise/Vibration (ANV)		
ANV1	6°16'20.05"	99°43'58.28"
ANV2	6°16'17.90"	99°43'56.15"
ANV3	6°16'23.83"	99°43'59.67"
Water Quality (WQ)		
WQ1	6°16'17.79"	99°43'59.53"
WQ2	6°16'17.93"	99°43'58.99"

Water Quality

- Two (2) surface water quality (WQ1 & WQ2); one (1) marine water quality (MW1)
- Surface water: 12 parameters, results compared against NWQS Class IIB limits
- Marine water: 9 parameters, results compared against MMWQS Class III limits

Exceedance at each sampling point:

WQ1: DO, BOD_5, AN, NO_3, P; **WQ2:** DO, BOD_5, COD; **MW1:** TSS, Faecal Coliform

Ambient Air Quality

- Three (3) locations monitored (A1 – A3) for PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO, O_3
- All complied with against MAAQS 2020
- SO_2, CO, and O_3 not detected at all locations; NO_2 detected at A2 & A3, but still within limit

Noise Level

- Three (3) locations monitored (N1 – N3)
- All complied with permissible sound level, LAeq of 'Second Schedule: Recommended Permissible Sound Level (L_{Aeq}) by Receiving Land Use for New Development' in "Guidelines for Environmental Noise Limits and Control (2019)"

Vibration Level

- Three (3) locations monitored (V1 – V3)
- All complied with 'Third Schedule: Recommended Vibration Limits For Human Response And Annoyance From Intermittent Vibrations (Commercial and Business Zone)' in "Guidelines For Environmental Vibration Limits And Control (2019)" (RMS: 1.6 mm/s; R=16)

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Impact Assessment

Soil Erosion & Sedimentation



CONSTRUCTION PHASE

Soil Erosion Modelling

- Assessment conducted using RUSLE under three (3) scenarios: Existing Condition, Worst-Case (without mitigation), and With Mitigation Measures.
- Overall soil loss:
  - Existing: 2.24 t/ha/yr; Worst-Case: 71.65 t/ha/yr; With Mitigation: 11.41 t/ha/yr

Sediment Yield

- Overall sediment yield calculation by scenario:
  - Existing: 0.26 tonnes; Worst-Case: 8.27 tonnes; With Mitigation: 1.31 tonnes

Water Quality



CONSTRUCTION PHASE

- Increased surface runoff during demolition activities and earthworks causing temporary drainage channels to contain increased sediments and other pollutants.
- WQM for TSS distributions along the drainage system is within NWQS Class I - II limits if mitigation measures are in place.

OPERATIONAL PHASE

- Minimal impacts as the Project will operate as a low-density, controlled development.
- No sewage discharge from the Project site

Air Quality



CONSTRUCTION PHASE

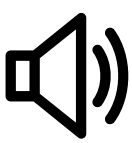
- **Site preparation and earthworks** - Clearing of vegetation for earthworks, with proper disposal of cleared materials; open burning is strictly prohibited.
- **Wind blown dust** - Exposed soil surfaces may generate fugitive dust during dry and windy conditions, though impacts are generally localized and minimal at wind speeds below 5 m/s.
- **Transportation activities** - Dust may be generated from vehicle movement on unsealed surfaces and transport of dry materials, with impacts largely confined near the source.

Air Quality Modelling

Modelling exercise for predicted Maximum Average Incremental Concentration (MAIC) of PM_{10} and $PM_{2.5}$ at three (3) ASRs for three (3) scenarios compared against MAAQS 2020 limits: -

a) Unmitigated: both PM_{10} and $PM_{2.5}$ above limits
b) Mitigated with 35% reduction: both PM_{10} and $PM_{2.5}$ above limits
c) Mitigated with 90% reduction: PM_{10} below limits except at ASR1
: $PM_{2.5}$ below limits

Noise Generation



CONSTRUCTION PHASE

- Transportation-related noise: confined to roads leading to/from the construction site.
- Construction-related activities: operation of machinery during land clearing, earthwork, unloading works, concrete works, etc.

Noise Level Simulation

- Noise level simulation at three (3) NSRs for unmitigated, partial and mitigated scenarios compared against Schedule of Permissible Sound Levels, Second Schedule – all within limits of 80 dB(A) for L_{max} .
- The anticipated community response to noise due to the Project was “None” to “Medium”.

OPERATIONAL PHASE

- Noise from human activities and traffic movement particularly from Jalan Teluk Baru associated with the Project’s day-to-day operations.

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Impact Assessment



Vibration

CONSTRUCTION PHASE
- Vibration impact assessed using FTA 2018 and DOE Guidelines 2021.
- The typical vibration generating equipment (e.g. pile drivers, rollers) & the distance of impact is assessed.
- Sensitive receptors are not within the Zone of Impact (ZOI) of 15 mm/s and 10 mm/s.
- Immediate proximity may experience perceived vibration level (<10 m/s) that can be tolerated.

OPERATIONAL PHASE
- Traffic induced ground-borne vibrations only occur in very extreme circumstances.
- No ground-borne vibration impacts anticipated.



Waste Generation

DEMOLITION AND CONSTRUCTION PHASE
- Potential for presence of asbestos within the Project site as the existing RPP was constructed between years 1990 to 1996
- Category of wastes: Biomass, construction wastes, municipal waste, and scheduled wastes
- Improper waste management: blockage to drainage, odour nuisance, potential mosquito breeding ground due to undisposed containers, soil, groundwater and odour pollutions

OPERATIONAL PHASE
- Waste types: general waste, sewage waste and scheduled waste from manufacturing, packaging, and maintenance activities.
- Improper waste management: elevated flood risk, proliferation of pests, and soil, surface water and groundwater quality contamination.



Ecology

CONSTRUCTION PHASE
- There are no exotic or endangered flora present at the Project site.
- Project site is a roaming area for some fauna and no habitats were spotted.
- Overall minimal impacts of the Project towards flora and fauna.

OPERATIONAL PHASE
- No significant ecological impact foreseen as the area will be cleared and landscaped.
- Potential human-wildlife conflicts with protected species such as the dusky leaf monkey.



Traffic

CONSTRUCTION PHASE
- Traffic impedance especially during peak hours in the morning and evening.
- Increased wear and tear of the road, leading to potholes and uneven road surface.
- Spillage or leakage of lorry loads onto the road.
- Carryover of mud and silt from the construction area onto Jalan Teluk Baru.
- Noise, fugitive dust and exhaust fumes from the heavy vehicles.

OPERATIONAL PHASE
- Natural growth of existing traffic: Traffic volumes will increase over time due to growth and changing travel patterns.
- Traffic generated by developments: The project and nearby developments will generate additional traffic.

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Impact Assessment



Visual

CONSTRUCTION PHASE

- Temporary effects are expected as the hoarding erected during the demolition and construction phase will alter the existing view.
- Visual disturbance during demolition and construction due to machinery and debris.

OPERATIONAL PHASE

- The 15-storey hotel will become a permanent visual feature within the existing landscape.
- Expected to obstruct certain views from Aloft Langkawi Pantai Tengah.
- Overall impact is acceptable due to façade treatment that is compatible with the surrounding area.



Socio-Economy

CONSTRUCTION PHASE

- Positive impacts: Increase in job and business opportunities for skilled and unskilled labour.
- Negative impacts:
  - Disturbances to the neighbouring hotels due to noise, dust and increased construction traffic.
  - Social issues due to influx of foreign workers during the construction phase.

OPERATIONAL PHASE

- Positive impacts:
  - Increase in job and business opportunities as the local population base expand.
  - Enhances the regions tourism profile.



Public Health and Safety

DEMOLITION PHASE

- There is a high likelihood of asbestos being used during the construction of the existing RPP at the Project site.
- If the presence of asbestos is confirmed, there are various health impacts towards the workers if demolition is not handled with adequate measures.
- Main diseases are associated with asbestos fibres which affect the lungs.

CONSTRUCTION PHASE

- Health risks by vector-borne diseases when monitoring and controls are not in place.
- Worker's camps will be situated within the Project site could further cause public health concern.
- Mobilisation of construction machineries on public roads may impose road safety hazards.
- Utilisation of lifting machineries produce substantial occupational hazards and risk to public.

OPERATIONAL PHASE

- Poor housekeeping practices could cause health risks due to vector borne diseases.

EXECUTIVE SUMMARY

FIRST SCHEDULE ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF LANGKAWI FEDERAL RESORT (RPP LANGKAWI) THROUGH PUBLIC-PRIVATE PARTNERSHIP VIA REDEVELOP-OPERATE-TRANSFER (ROT) MODEL ON LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Mitigation Measures

CONSTRUCTION PHASE

- The risk of soil erosion and sedimentation will be minimal with the implementation of Best Management Practices (BMPs) as per ESCP and LD-P2M2:
  - Use of construction markers and perimeter benchmarking.
  - Drainage and surface runoff controls.
  - Proper storage, transport and disposal of soil material.
  - Apply protective covers on exposed areas.
  - Sediment controls on access routes – temporary culverts, paving, surface spraying, wash through/ wheel washing facilities , etc.
  - Regular inspection and maintenance of sediment control structures, turfed slopes and drains.

OPERATIONAL PHASE

- Site will be concreted and paved with asphalt, which will greatly reduce erosion



Soil Erosion & Sedimentation

CONSTRUCTION PHASE

- Erosion and sediment controls with the implementation of BMPs as per ESCP and LD-P2M2 (as per soil erosion and sedimentation).
- Proper management of stockpiles.
- Proper fuel and chemical management.
- Proper waste management.
- Develop periodic internal environmental auditing and monitoring.

OPERATIONAL PHASE

- For stormwater management, equip the final discharge point into the concrete ditch with a silt and grease trap.



Water Quality

CONSTRUCTION PHASE

- Installation of temporary hoarding along the project site boundary before construction activities commence.
- Provision of wheel washing facilities and wash troughs at the site entrance/exit.
- Minimizing disturbance to exposed ground surfaces.

OPERATIONAL PHASE

- The main source of air quality impact during the operational phase is vehicle emissions from resident and visitor traffic.
- Smooth traffic flow and a good level of service on existing roads minimize emissions from vehicles.



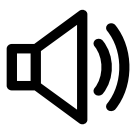
Air Quality

CONSTRUCTION PHASE

- Compliance with the noise control measures and limits stipulated in the Environmental Noise Limits and Control (2021); Annex E: Guidance on Noise Control.
- The use of acoustic enclosures or screens for noisy machinery as well as metal hoarding along the site perimeter to reduce noise levels.
  Construction activities, will be restricted to daytime hours (7.00 a.m. – 7.00 p.m.).

OPERATIONAL PHASE

- Potential sources of noise pollution are from the movement of light vehicles along completed development roads and are expected not to cause significant impacts to the community.



Noise Generation

EXECUTIVE SUMMARY

FIRST SCHEDULE ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF LANGKAWI FEDERAL RESORT (RPP LANGKAWI) THROUGH PUBLIC-PRIVATE PARTNERSHIP VIA REDEVELOP-OPERATE-TRANSFER (ROT) MODEL ON LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Mitigation Measures

CONSTRUCTION PHASE

- Compliance with the guidelines in Environmental Vibration Limits and Control (2021); Annex E: Management and Mitigation of Vibration in the Environment, including:
  - Source Control: Using vibration dampers to reduce vibration and placing, operating, or locating high-vibration sources as far as possible from sensitive areas.
  - Administrative Control: Limiting the operating time of vibration sources.

OPERATIONAL PHASE

- There are no potential sources of vibration impact during the operational phase and therefore no mitigation measures are required.



Vibration

DEMOLITION AND CONSTRUCTION PHASE

- Asbestos containing materials (ACM): Designated storage area will be provided for ACM waste.
- Biomass Waste: Impervious sheets will be used to cover the stockpiles to prevent runoff into nearby drainage systems and rivers.
- Construction Waste: Construction waste management will follow the Waste Management Hierarchy Pyramid, prioritizing waste reduction, reuse, and recycling before final disposal.
- Domestic Waste: Provision of a sufficient number of waste bins at the construction site.
- Scheduled Waste: Scheduled waste management will be carried out in accordance with the Guidelines for Packaging, Labelling and Storage of Scheduled Wastes in Malaysia (2014) and the Environmental Quality (Scheduled Wastes) Regulations 2005.

OPERATIONAL PHASE

- Domestic Waste: All domestic waste will be segregated into recyclable and non-recyclable materials.
- Scheduled Waste: The storage area will be concrete-based with a containment capacity of 110% of the largest container. All scheduled waste will be handled by competent personnel.



Waste Generation

CONSTRUCTION AND OPERATION PHASE

- Standard Operating Procedures (SOPs) are to be developed in consultation with PERHILITAN to manage wildlife encounters.
- During human-wildlife encounters PERHILITAN must be engaged to enable safe relocation.



Ecology

CONSTRUCTION PHASE

- Road construction signage and flagmen will be provided at the Project site entrance and exit points.
- Vehicle speed limits will be complied with to reduce dust dispersion and material spillage

OPERATIONAL PHASE

- Junction 3 will be upgraded from a 3-legged stop junction to a 3-legged fully chanellised stop junction.
- A new 3-legged slip out junction which provides an auxiliary lane connecting the new junction to Junction 1.



Traffic

EXECUTIVE SUMMARY

FIRST SCHEDULE ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF LANGKAWI FEDERAL RESORT (RPP LANGKAWI) THROUGH PUBLIC-PRIVATE PARTNERSHIP VIA REDEVELOP-OPERATE-TRANSFER (ROT) MODEL ON LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Mitigation Measures

CONSTRUCTION PHASE
- The site will be enclosed with proper site hoarding to screen ongoing works from public view.
- Regular housekeeping to prevent the accumulation of debris.
- Adequate signage where applicable.

OPERATIONAL PHASE
- The Project has been designed with façade treatments, materials and colour schemes that are compatible with the surrounding coastal and hotels



Visual

CONSTRUCTION PHASE
- Ensure workers are provided with adequate PPE and safety training.
- Establish a complaint management mechanism.
- Notify surrounding hotels prior to commencement of construction works.

OPERATIONAL PHASE
- To operate hotel with full compliance with local regulations, including health, safety and environmental standards.
- Conduct routine monitoring of operational impacts including noise levels, waste management, water and energy consumption and traffic flows.



Socio-Economy

DEMOLITION PHASE
- Ensure workers involved in asbestos removal are adequately trained and always wear complete PPE.
- Clear warning signs displayed at each asbestos removal area.
- Eating, drinking and smoking in the asbestos removal area is strictly prohibited.
- Asbestos removal area must be barricaded and isolated.
- Compressed air must not be used to remove or clean up dust from work surfaces. Once clean by vacuuming or damp wiping.

CONSTRUCTION PHASE
- Foreign workers will undergo pre-employment health screening through FOMEMA to prevent the spread of infectious diseases.
- Ensure movement of construction vehicles is properly scheduled and peak hours are avoided.
- Place warning signs before the construction zones to alerts drivers.
- Entry to the construction site must be limited to construction workers and authorized personnel.

OPERATIONAL PHASE
- Prepare ERP and establish an ERT and perform regular emergency response drills.
- Undertake regular maintenance of process equipment according to manufacturer's guidelines.
- Adherent to the guidelines by DOE and DOSH.



Public Health and Safety

EXECUTIVE SUMMARY

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Proposed Environmental Monitoring Program



COMPLIANCE MONITORING (CM)

- Ensures compliance with EIA approval conditions and P2M2 requirements
- Sampling and analysis by SAMM-accredited laboratory

ENVIRONMENTAL COMPLIANCE AUDIT

- Environmental Audit by a registered environmental auditor
- Possess Certified Erosion, Sediment and Storm Water Inspector (CESSWI) or Malaysian Certified Inspector of Sediment and Erosion Control (MY-CISEC) Qualifications
- Best Management Practices (BMPs) will be adopted



PERFORMANCE MONITORING (PM)

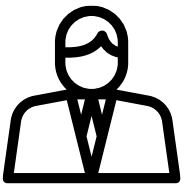
- Evaluate effectiveness of on-site pollution control measures.
- Conducted by the EO.

BASELINE MONITORING

General indication of the baseline environmental conditions at the time of reporting

ENVIRONMENTAL MONITORING PROGRAM

- Provides database of environmental impacts
- Early indicator of environmental impacts



IMPACT MONITORING (IM)

- Ensures effectiveness of pollution control systems and mitigation measures
- EO to carry out PM on site

SELF-REGULATORY MONITORING

- Ensures effectiveness of mitigating measures and compliance towards environmental regulations
- Carried out by EO

MONITORING	FREQUENCY
Performance Monitoring	
As per LD-P2M2	• Weekly • After heavy rainfall (>12.5 mm as measured by rain gauge)
Slope Maintenance and Instrumentation Monitoring • Inclinometer (cut slopes, fill slopes, and retaining wall) • Standpipe piezometer • Displacement, wall and rod settlement markers	• During construction: weekly • After completion: monthly • Standpipe piezometer: ➢ During fieldworks: daily ➢ After fieldworks: daily for first two weeks, then as required
Compliance Monitoring	
Sediment Basin and Silt Trap Discharge Outlets	• Monthly
Impact Monitoring	
Construction Phase	
• Water quality (2 stations) • Ambient Air, Noise & Vibration (3 stations each) • Aerial Survey (by drone)	• Monthly

EXECUTIVE SUMMARY

FIRST SCHEDULE ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF LANGKAWI FEDERAL RESORT (RPP LANGKAWI) THROUGH PUBLIC-PRIVATE PARTNERSHIP VIA REDEVELOP-OPERATE-TRANSFER (ROT) MODEL ON LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Emergency Response Plan

EMERGENCY RESPONSE TEAM

- A team of qualified individuals with specific roles and responsibilities to carry out during an emergency.
- Responsible for executing the following procedures:



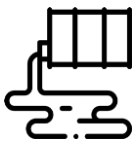
ACCIDENTS
Procedure for emergency response and reporting of major incidents.



FIRE EMERGENCY RESPONSE
Execution of evacuation procedure and fire response coordination.



ESCP FAILURE RESPONSE
Immediate reporting, rectification, and review of erosion control measures.



HAZARDOUS MATERIALS SPILLAGE RESPONSE
Evacuation, containment, and decontamination following hazardous material spills.



MEDICAL EMERGENCY RESPONSE
Immediate notification of emergency services and safe first aid by trained personnel.

Conclusion

The Project poses low environmental impacts limited during construction phase. All expected impacts can comply with stipulated limits, and can be effectively mitigated.

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Penggerak Projek

SAMUDERA ANDAMAN SDN BHD

Samudera Andaman Sdn. Bhd.

Address : B¬05 & B¬06, Plaza Kelana Jaya, Jalan SS7/13B, Kelana Jaya, 47301 Petaling Jaya, Selangor

Telephone : 03-7877 1885 / 03-7876 8688
Contact Person : Azrul Azuan bin Aali
Email : aazuan.aa@southkey.com.my

Perunding EIA

AGV ENVIRONMENT
ENVIRONMENTAL SOLUTIONS SPECIALIST

AGV Environment Sdn. Bhd.

Address : Level 3A, Tower B, Atwater Corporate Office, Jalan Prof Diraja Ungku Aziz, 46300 Petaling Jaya, Selangor

Telephone : 03-7931 1455
Contact Person : Datin Dr. Vijayalakshmi Samuel
Email : vijayalakshmi@agvenvironment.com

Gambaran Keseluruhan

KEPERLUAN UNDANG-UNDANG
Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Penilaian Kesan Kepada Alam Sekeliling) Perintah 2015

Jadual Pertama
Aktiviti 12: Pembangunan di Kawasan Pantai dan Bukit
(a) Pembinaan bangunan atau kemudahan yang mempunyai 80 bilik atau lebih di kawasan pantai.

GAMBARAN KESELURUHAN PROJEK

- Pembangunan infrastruktur hotel 15 tingkat yang terdiri daripada 300 bilik, ruang bawah tanah dan kemudahan sokongan yang berkaitan.
- Cadangan merobohkan Rumah Peranginan Persekutuan (RPP) Langkawi yang sedia ada dan pembangunan semula menjadi Hotel OPERO di sepanjang kawasan Pantai Tengah.

Pernyataan Keperluan

Pematuhan terhadap Dasar dan Rancangan Kerajaan

Projek ini selaras dengan dasar dan rancangan di peringkat kebangsaan, negeri dan tempatan berikut:

- *United Nations Sustainable Development Goals, Agenda* 2030
- Rancangan Malaysia Ke-13 (2026 – 2030);
- Pelan Fizikal Negara Keempat (2021 – 2040) ;
- Rancangan Fizikal Zon Persisiran Pantai Negara-2 (2021 – 2040);
- Dasar Perlancongan Negara (2020 – 2030);
- Rancangan Struktur Negeri Kedah 2035;
- Pelan Strategik *Langkawi Development Authority* LADA (2022-2026); and
- Rancangan Tempatan Daerah Langkawi 2030

Manfaat Alam Sekitar

- Menggalakkan amalan pembangunan dan pelancongan lestari.
- Pembangunan semula di tapak resort sedia ada, mengelakkan pencerobohan ke kawasan pantai belum dibangunkan atau sensitif.
- Pematuhan terhadap peraturan anjakan pantai, pengurusan sisa yang bertanggungjawab, serta reka bentuk bangunan cekap tenaga.

Manfaat Sosial

- Mewujudkan peluang pekerjaan kepada pekerja mahir dan separa mahir.
- Memperkukuh keupayaan dalam bidang hospitaliti, pengurusan pelancongan, dan amalan eko-pelancongan, tingkatkan kebolehpasaran pekerjaan dan pembangunan kerjaya.

Manfaat Ekonomi

- Menarik pelancong domestik dan antarabangsa, tingkatkan perbelanjaan pelawat.
- Mewujudkan permintaan produk dan perkhidmatan tempatan, memberi manfaat kepada perniagaan kecil.
- Meningkatkan sektor pelancongan Langkawi dan menyumbang pertumbuhan ekonomi Malaysia secara keseluruhan.

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Lokasi Projek





Point	Latitude (N)	Longitude (E)
1	6°16'21.21"	99°43'55.13"
2	6°16'22.07"	99°44'0.44"
3	6°16'17.76"	99°43'59.35"
4	6°16'18.83"	99°43'55.73"

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Pelan Susun Atur dan Komponen Projek



CADANGAN GUNATANAH	NO. PLOT	UNIT	LUAS (MPS)	LUAS (%)
1 BLOK HOTEL 15 TINGKAT (300 BILIK) DAN 1 TINGKAT ARAS BAWAH TANAH	1	300	5,399.26	37.48
KAWASAN HIJAU / LANDSKAP	-	-	1,461.16	10.14
KOLAM RENANG	2	-	704.78	4.89
LALUAN PEJALAN KAKI	-	-	2,128.47	14.78
CADANGAN LALUAN DALAMAN (SATU HALA & DUA HALA)	-	-	2,462.06	17.09
SIMPANAN JALAN (SERAH PERCUMA KEPADA KERAJAAN)	3	-	2,248.27	15.61
JUMLAH KESELURUHAN	-	-	14,404.00	100.00

Konsep Projek

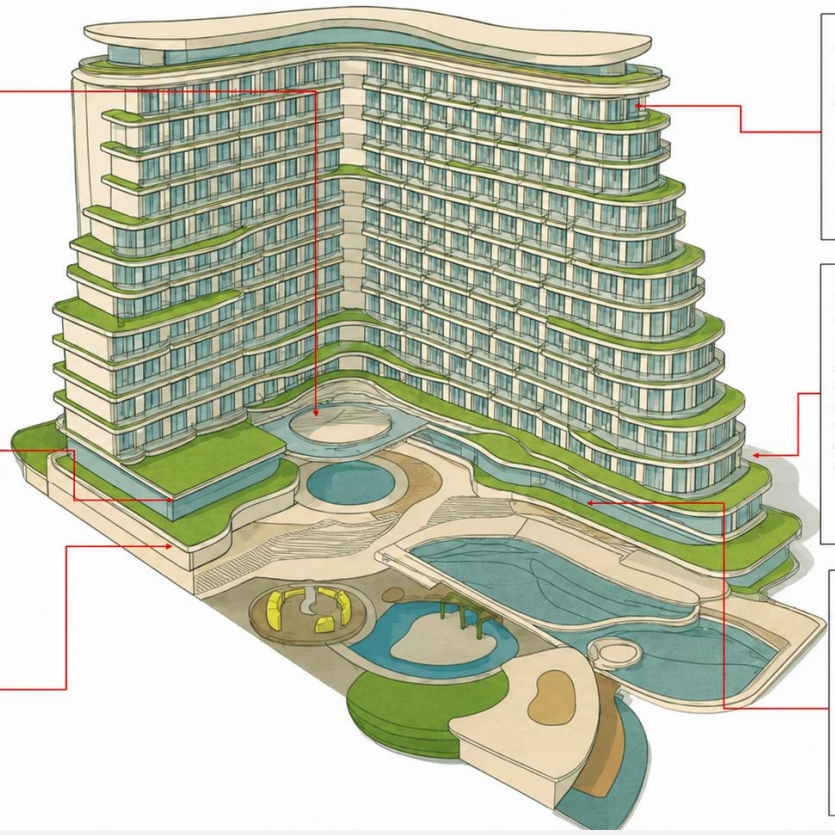
Sebuah hotel mewah 15 tingkat dengan ruang bawah tanah.

- 300 bilik penginapan beserta infrastruktur sokongan dan kemudahan rekreasi.
- Semua bilik penginapan, ruang makan dan bilik mesyuarat menghadap ke arah laut.

RINGKASAN EKSEKUTIF

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Lakaran Projek



RUANG BERKONGSI

1 Tingkat
GFA : 12,281.40 kp
NFA : 9,825 kp
Lobi Utama, Kaunter Penerimaan Tetamu, Perkhidmatan Concierge, Bilik Simpanan Bagasi & Tandas Awam

KEMUDAHAN REKREASI

1 Tingkat
GFA : 34,167.01 kp
NFA : 27,333 kp
Gim, Kelab Kanak-kanak & Kawasan Bermain, Kolam Renang (Kanak-kanak & Dewasa), Dek Matahari, Kafe, Plaza Terbuka & Laluan Bersiar-siar

RESTORAN & KAFE ISTIMEWA

1 Tingkat
GFA : 17,028.82 kp
NFA : 13,623 kp
Restoran Istimewa, Kafe, Penyediaan Makanan, Stor Makanan & Dapur

BLOK HOTEL

15 Tingkat
300 unit
GFA : 238,261.09 kp
NFA : 166,782.76 kp
27 unit setiap tingkat
Saiz bilik : 35 kp hingga 1700 kp

BAHAGIAN BELAKANG (BACK OF HOUSE)

1 Tingkat
GFA : 20,634.63 kp
NFA : 16,507 kp
Bilik Mesyuarat, Lobi Kakitangan, Bilik Pantri, Bilik Eksklusif Karaoke, Ruang Santai Perniagaan & Bilik Solat

RUANG MESYUARAT & ACARA

1 Tingkat
GFA : 54,683.78 kp
NFA : 43,747 kp
Restoran, Dewan Bankuet, Bilik Pra-fungsi & Bilik Tamu VIP

Aktiviti Projek

Pra-Pembinaan	Fasa Pembinaan	Fasa Operasi
• Kerja-kerja ukur • Penglibatan dan penyelarasan dengan pihak berkuasa serta pihak berkepentingan • Kerja-kerja Penyiasatan Tanah (SI) dan kajian berkaitan • Kerja-kerja perancangan	• Kerja-kerja pembersihan tapak dan perobohan • Penyediaan tapak dan kemudahan sementara • Kerja-kerja tanah • Kerja-kerja cerucuk dan asas • Pembinaan bangunan dan struktur • Pembangunan infrastruktur dan utiliti • Landskap dan kerja-kerja penghijauan	• Operasi sebagai sebuah hotel yang dibangunkan sepenuhnya dengan semua kemudahan penginapan, hospitaliti dan rekreasi.

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Persekitaran Sedia Ada

Topografi

- Tapak Projek sedia ada telah dibangunkan sebelum ini; paras tanah semasa telah diratakan dan secara relatifnya adalah rata
- Paras tanah: antara 3.2 – 4.3 m dari aras laut
- Tiada cerun curam ditemui

Geologi

- Aluvium Zaman Kuaterner, terdiri daripada lumpur, kelodak, pasir, kerikil, dan bahan organik yang tidak terkonsolidasi
- Bahan tidak disatukan dan berpotensi heterogen
- Paras air bawah tanah cetek (0.30 hingga 1.30 m di bawah paras tanah)

Tanah

- Siri Baging dan Permatang; berasal dari aluvium marin
- Baging: coklat pucat hingga coklat sangat pucat, pasir berbutir tunggal sederhana hingga kasar
- Permatang: kelabu keperangan, tanah liat berpasir

Hydrologi

- Terletak di dataran rendah, di sepanjang garis pantai berpasir
- Air dari tapak Projek mengalir ke saliran air hujan di sepanjang sempadan timur; tiada sungai yang mengalir melalui atau bersebelahan dengan tapak Projek
- Saliran air hujan di perimeter sempadan tapak Projek menunjukkan aliran bermusim

Cuaca & Meteorologi

- Iklim monsun khatulistiwa (Monsun NE: Nov–Mac; Monsun SW: Mei–Sep)
- Purata Suhu: 28.5 °C
- Kelembapan Bandingan: 78.4%
- Hujan: 34.6 mm (Feb) – 446.3 mm (Sep)
- Hari hujan: 4 hari (Feb) – 22 hari (Sep)
- Angin: purata tahunan 1.8 m/s; arah utama NE (32.3%)

Guna Tanah

- Tapak berada di RPP Langkawi yang terbengkalai
- Tapak diwartakan sebagai 'Komersial' di bawah RTDL 2030
- Kawasan terkenal sebagai kawasan peranginan mewah dengan beberapa perniagaan sektor pelancongan sokongan

Ecologi

- Dalam tapak komersil yang telah terbangun jauh dari mana-mana kawasan sensitif alam sekitar
- **Fauna:** kebanyakan "Dilindungi" di bawah WCA 2010; Kera ekor panjang (*Macaca fascicularis*) dan Lontong cengkung (*Trachypithecus obscurus*) diklasifikasikan sebagai "Terancam" dalam Senarai Merah IUCN 2025
- **Avifauna:** kebanyakan "Dilindungi Sepenuhnya" di bawah WCA 2010; semua spesies diklasifikasikan sebagai "Kurang Kebimbangan" dalam Senarai Merah IUCN 2025

Trafik

- Waktu puncak: 8–9 AM (845 PCU/j) & 5.30–6.30 PM (976 PCU/j)
- Akses utama: Jalan Teluk Baru (LOS A)
- Persimpangan 1, 2 & 3 pada Tahun 2026: semua LOS B

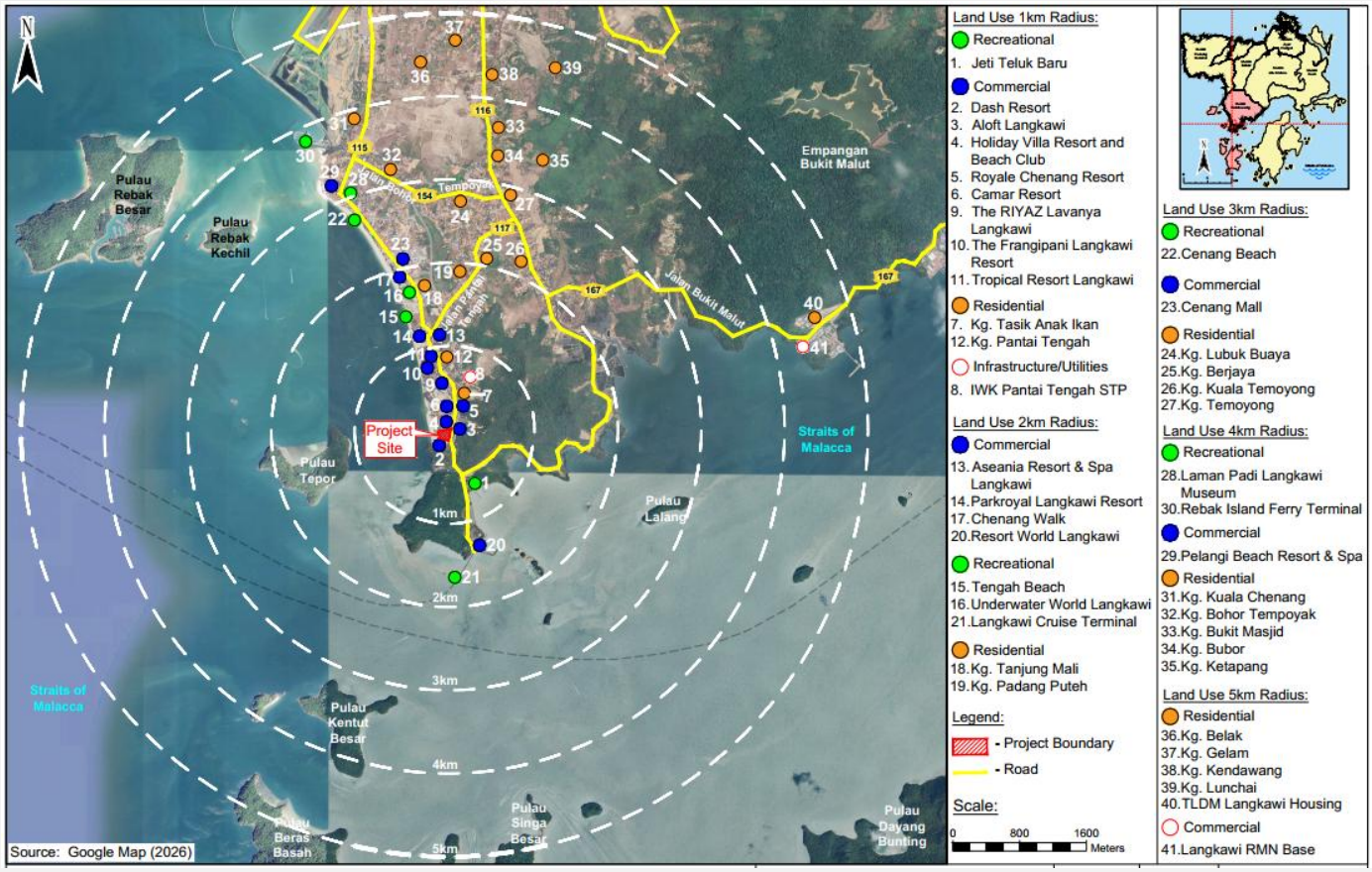
Socio-Ekonomi

- **Libat Urus:** Perbincangan Kumpulan Fokus (FGD) dengan wakil masyarakat dan temu bual dengan pengendali perniagaan
- **Ringkasan:**
  - Tiada isu dan bantahan terhadap Projek; sokongan 100%
  - Isu/kebimbangan: privasi; penyebaran habuk dan bunyi
  - Dijangka mewujudkan peluang pekerjaan semasa fasa pembinaan dan operasi; memberi manfaat kepada belia tempatan; tahap pendapatan yang lebih baik dan pertumbuhan ekonomi masyarakat

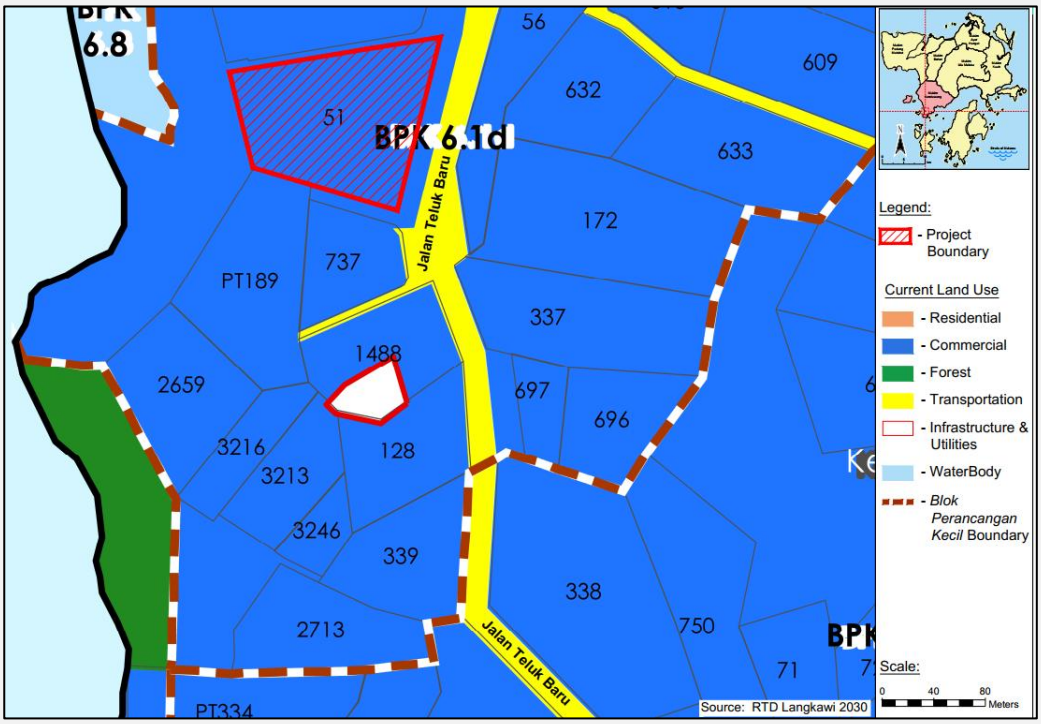
RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Guna Tanah Sekitar



Zon Guna Tanah



- Berdasarkan Rancangan Pembangunan Wilayah Langkawi 2030, tapak Projek terletak di Mukim Padang Matsirat
- Di Bawah Blok Perancangan (BP6): Kedawang, BPK 6.1d: Kluster Cenang_15, dalam Kluster Pelaburan Khas (KPK) Kompleks Pelancongan Cenang
- Tapak Projek kini dizonkan sebagai "Tanah Kosong"; rancangan guna tanah masa hadapan ditetapkan sebagai "Komersial"

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Persampelan Garis Dasar Alam Sekitar



Point	Latitude (N)	Longitude (E)
Marine Water (MW)		
MW1	6°16'18.46"	99°43'49.13"
Air/Noise/Vibration (ANV)		
ANV1	6°16'20.05"	99°43'58.28"
ANV2	6°16'17.90"	99°43'56.15"
ANV3	6°16'23.83"	99°43'59.67"
Water Quality (WQ)		
WQ1	6°16'17.79"	99°43'59.53"
WQ2	6°16'17.93"	99°43'58.99"

Kualiti Air

- Dua (2) kualiti air permukaan (WQ1 & WQ2); satu (1) kualiti air marin (MW1)
- Air permukaan: 12 parameter, keputusan dibandingkan dengan had Kelas IIB NWQS
- Air marin: 9 parameter, keputusan dibandingkan dengan had Kelas III MMWQS

Paras melebihi had di setiap lokasi persampelan:
WQ1: DO, BOD_5, AN, NO_3, P; **WQ2:** DO, BOD_5, COD; **MW1:** TSS, Faecal Coliform

Kualiti Udara Ambien

- Tiga (3) lokasi dipantau (A1 – A3) untuk PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO, O_3
- Semua mematuhi had MAAQS 2020
- SO_2, CO dan O_3 tidak dikesan di semua lokasi; NO_2 dikesan pada A2 & A3, tetapi masih dalam had

Tahap Bunyi

- Tiga (3) lokasi dipantau (N1 – N3)
- Semua mematuhi tahap bunyi yang dibenarkan, LAeq bagi '*Second Schedule: Recommended Permissible Sound Level (L_{Aeq}) by Receiving Land Use for New Development*' dalam "*Guidelines for Environmental Noise Limits and Control* (2019)"

Tahap Getaran

- Tiga (3) lokasi dipantau (V1 – V3)
- Semua mematuhi '*Third Schedule: Recommended Vibration Limits For Human Response And Annoyance From Intermittent Vibrations (Commercial and Business Zone)*' dalam "*Guidelines For Environmental Vibration Limits And Control* (2019)" (RMS: 1.6 mm/s; R=16)

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Kajian Impak

Hakisan Tanah & Pemendapan

FASA PEMBINAAN

Pemodelan Hakisan Tanah

- Penilaian dijalankan menggunakan RUSLE di bawah tiga (3) senario: Keadaan Sedia Ada, Senario Terburuk (tanpa mitigasi), dan Dengan Langkah Mitigasi.
- Kehilangan tanah keseluruhan:
  - Sedia Ada: 2.24 t/ha/thn; Terburuk: 71.65 t/ha/thn; Dengan Mitigasi: 11.41 t/ha/thn.

Hasil Sedimen

- Pengiraan jumlah hasil sedimen keseluruhan mengikut senario:
  - Sedia Ada: 0.26 tan; Terburuk: 8.27 tan; Dengan Mitigasi: 1.31 tan

Kualiti Air

FASA PEMBINAAN

- Peningkatan larian permukaan semasa aktiviti perobohan dan kerja tanah menyebabkan saluran saliran sementara mengandungi peningkatan sedimen dan bahan pencemar lain.
- WQM untuk TSS di sepanjang sistem perparitan adalah dalam had NWQS Kelas I - II jika langkah-langkah mitigasi dilaksanakan.

FASA OPERASI

- Kesan minimum kerana Projek akan beroperasi sebagai pembangunan berketumpatan rendah dan terkawal.
- Tiada pelepasan air kumpahan dari tapak Projek

Kualiti Udara

FASA PEMBINAAN

- **Penyediaan tapak dan kerja tanah** - Pembersihan tumbuh-tumbuhan untuk kerja tanah, dengan pelupusan bahan yang dibersihkan dengan betul; pembakaran terbuka adalah dilarang sama sekali.
- **Debu yang ditiup angin** - Permukaan tanah yang terdedah boleh menghasilkan habuk terampai semasa keadaan kering dan berangin, walaupun impak secara adalah setempat dan minimum pada kelajuan angin di bawah 5 m/s.
- **Aktiviti pengangkutan** - Debu mungkin terhasil daripada pergerakan kenderaan pada permukaan yang tidak tertutup dan pengangkutan bahan kering, dengan kesan secara am adalah berhampiran punca.

Pemodelan Kualiti Udara

- Latihan pemodelan untuk Kepekatan Peningkatan Purata Maksimum (MAIC) PM_{10} dan $PM_{2.5}$ yang diramalkan pada tiga (3) ASR untuk tiga (3) senario berbanding had MAAQS 2020: -
  - a) Tanpa mitigasi: kedua-dua PM_{10} dan $PM_{2.5}$ melebihi had
  - b) Dengan mitigasi pengurangan 35%: kedua-dua PM_{10} dan $PM_{2.5}$ melebihi had
  - c) Dengan mitigasi pengurangan 90% : PM_{10} di bawah had kecuali pada ASR1
    : $PM_{2.5}$ di bawah had

Bunyi Bising

FASA PEMBINAAN

- Bunyi bising berkaitan pengangkutan: terhad kepada jalan menuju ke/dari tapak pembinaan.
- Aktiviti berkaitan pembinaan: pengendalian jentera semasa pembersihan tanah, kerja tanah, kerja, kerja konkrit, dan sebagainya.

Simulasi Tahap Bunyi

- Simulasi paras bunyi di tiga (3) NSR bagi senario tanpa mitigasi, mitigasi separa, dan mitigasi penuh telah dibandingkan dengan Jadual Tahap Bunyi Dibenarkan (Jadual Kedua) – semua berada dalam had 80 dB(A) bagi L_{max}
- Jangkaan tindakbalas komuniti terhadap bunyi bising Projek adalah “Tiada” hingga “Sederhana”.

FASA OPERASI

- Bunyi bising daripada aktiviti manusia dan pergerakan lalu lintas terutamanya dari Jalan Teluk Baru yang berkaitan dengan operasi harian Projek.

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Kajian Impak



Getaran

FASA PEMBINAAN
- Kesan getaran dinilai menggunakan FTA 2018 dan Garis Panduan JAS 2021.
- Peralatan yang biasanya menghasilkan getaran (e.g. pemacu cerucuk dan penggelek) serta jarak kesannya telah dinilai.
- Penerima sensitif tidak berada dalam Zon Pengaruh (ZOI) bagi had 15 mm/s dan 10 mm/s.
- Kawasan dalam jarak dekat (<10 m) mungkin mengalami aras getaran yang dapat dirasai, namun masih berada pada tahap yang boleh diterima.

FASA OPERASI
- Getaran tanah akibat trafik hanya berlaku dalam keadaan yang amat ekstrem.
- Tiada kesan getaran tanah dijangka berlaku.



Janaan Sisa

FASA PEROBOHAN DAN PEMBINAAN
- Potensi kehadiran asbestos di dalam tapak Projek kerana RPP sedia ada telah dibina antara tahun 1990 hingga 1996
- Kategori sisa: Biojisim, sisa pembinaan, sisa perbandaran dan sisa terjadual
- Pengurusan sisa yang tidak betul: tersumbat kepada saliran, gangguan bau, potensi tempat pembiakan nyamuk akibat bekas yang tidak dibuang, tanah, air bawah tanah dan pencemaran bau

FASA OPERASI
- Jenis sisa: sisa am, sisa kumbahan dan sisa terjadual daripada aktiviti pembuatan, pembungkusan dan penyelenggaraan.
- Pengurusan sisa yang tidak betul: peningkatan risiko banjir, percambahan perosak, dan tanah, air permukaan dan pencemaran kualiti air bawah tanah.



Ekologi

FASA PEMBINAAN
- Tiada flora eksotik atau terancam hadir di tapak Projek.
- Tapak projek adalah kawasan perayauan untuk beberapa fauna dan tiada habitat dikesan.
- Keseluruhan kesan minimum Projek terhadap flora dan fauna.

FASA OPERASI
- Tiada kesan ekologi yang ketara dijangka kerana kawasan itu akan dibersihkan dan dilandskapkan.
- Potensi konflik manusia-hidupan liar dengan spesies yang dilindungi seperti lotong cengkung.



Trafik

FASA PEMBINAAN
- Halangan trafik terutamanya pada waktu puncak pada waktu pagi dan petang.
- Peningkatan haus dan lusuh jalan, menyebabkan jalan berlubang dan permukaan jalan tidak rata.
- Tumpahan atau kebocoran muatan lori ke jalan raya.
- Pengangkutan lumpur dan kelodak dari kawasan pembinaan ke Jalan Teluk Baru.
- Bunyi bising, habuk buruan dan asap ekzos dari kenderaan berat.

FASA OPERASI
- Jumlah trafik akan meningkat dari semasa ke semasa disebabkan pertumbuhan dan perubahan corak perjalanan
- Trafik yang dijana oleh pembangunan: Projek dan pembangunan berdekatan akan menjana trafik tambahan.

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Kajian Impak

Visual

FASA PEMBINAAN

- Kesan sementara dijangka kerana penimbunan yang didirikan semasa fasa perobohan dan pembinaan akan mengubah pandangan sedia ada.
- Gangguan penglihatan semasa perobohan dan pembinaan disebabkan oleh jentera dan serpihan.

FASA OPERASI

- Hotel 15 tingkat itu akan menjadi ciri visual kekal dalam landskap sedia ada.
- Dijangka menghalang pandangan tertentu dari Aloft Langkawi Pantai Tengah.
- Kesan keseluruhan boleh diterima kerana rawatan fasad yang serasi dengan kawasan sekitar.

Socio-Ekonomi

FASA PEMBINAAN

- Kesan positif: Peningkatan dalam peluang pekerjaan dan perniagaan untuk pekerja mahir dan tidak mahir.
- Kesan negatif:
  - Gangguan kepada hotel berjiranan disebabkan oleh bunyi bising, habuk dan peningkatan trafik pembinaan.
  - Isu sosial akibat kebanjiran pekerja asing semasa fasa pembinaan.

FASA OPERASI

- Kesan positif:
  - Meningkatkan peluang pekerjaan dan perniagaan apabila pangkalan penduduk tempatan berkembang.
  - Meningkatkan profil pelancongan wilayah.

Kesihatan dan Keselamatan Awam

FASA PEROBOHAN

- Terdapat kemungkinan besar asbestos digunakan semasa pembinaan RPP sedia ada di tapak Projek.
- Sekiranya kehadiran asbestos disahkan, terdapat pelbagai kesan kesihatan terhadap pekerja sekiranya perobohan tidak dikendalikan dengan langkah yang sewajarnya.
- Penyakit utama dikaitkan dengan gentian asbestos yang menjejaskan paru-paru.

FASA PEMBINAAN

- Risiko kesihatan oleh penyakit bawaan vektor apabila pemantauan dan kawalan tidak dilaksanakan.
- Kem pekerja akan terletak di dalam tapak Projek boleh menyebabkan kebimbangan orang awam dari segi kesihatan.
- Mobilisasi jentera pembinaan di jalan awam boleh mendatangkan bahaya keselamatan jalan raya.
- Penggunaan jentera pengangkat menghasilkan bahaya dan risiko pekerjaan yang besar kepada orang ramai.

FASA OPERASI

- Amalan kekemasan yang lemah boleh menyebabkan risiko kesihatan oleh penyakit bawaan vektor.

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Langkah Mitigasi

FASA PEMBINAAN

- Risiko hakisan tanah dan pemendapan adalah minimal dengan pelaksanaan Amalan Pengurusan Terbaik (BMP) seperti yang dinyatakan dalam ESCP dan LD-P2M2:
  - Penggunaan penanda pembinaan dan penandaan perimeter.
  - Perancangan dan pelaksanaan berfasa bagi kerja-kerja pembersihan tanah dan kerja tanah.
  - Kawalan saliran dan aliran air permukaan.
  - Penyimpanan, pengangkutan dan pelupusan bahan tanah yang betul.
  - Gunakan penutup pelindung pada kawasan yang terdedah.
  - Kawalan mendapan di laluan masuk – e.g. culvert sementara, turapan, semburan permukaan, kemudahan pencucian tayar/kenderaan, dll.
  - Pemeriksaan dan penyelenggaraan berkala.

FASA OPERASI

- Tapak akan dikonkritkan dan diturap dengan asfalt, yang akan mengurangkan hakisan



Hakisan Tanah & Pemendapan

FASA PEMBINAAN

- Kawalan hakisan dan mendapan dengan pelaksanaan BMP seperti yang dinyatakan dalam ESCP dan LD-P2M2 (berdasarkan hakisan tanah dan pemendapan).
- Pengurusan penyimpanan bahan binaan yang betul.
- Pengurusan bahan api dan bahan kimia yang betul.
- Pengurusan sisa yang betul.
- Laksanakan pengauditan dan pemantauan alam sekitar dalaman secara berkala.

FASA OPERASI

- Untuk pengurusan air ribut, lengkapkan titik pelepasan akhir ke dalam parit konkrit dengan perangkap kelodak dan gris.



Kualiti Air

FASA PEMBINAAN

- Pemasangan penimbunan sementara di sepanjang sempadan tapak projek sebelum aktiviti pembinaan dimulakan.
- Penyediaan kemudahan mencuci roda dan palung cucian di pintu masuk/keluar tapak.
- Meminimumkan gangguan pada permukaan tanah yang terdedah.

FASA OPERASI

- Sumber utama impak kualiti udara semasa fasa operasi adalah pelepasan kenderaan daripada lalu lintas penduduk dan pelawat.
- Aliran trafik yang lancar dan tahap perkhidmatan yang baik di jalan sedia ada meminimumkan pelepasan daripada kenderaan.



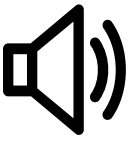
Kualiti Udara

FASA PEMBINAAN

- Pematuhan terhadap langkah kawalan bunyi dan had yang ditetapkan dalam Had dan Kawalan Bunyi Alam Sekitar (2021); Lampiran E: Panduan tentang Kawalan Bunyi.
- Penggunaan kepungan akustik atau skrin untuk jentera bising serta penimbunan logam di sepanjang perimeter tapak untuk mengurangkan tahap hingar. Aktiviti pembinaan, akan dihadkan pada waktu siang (7.00 pagi – 7.00 malam).

FASA OPERASI

- Punca pencemaran bunyi yang berpotensi adalah daripada pergerakan kenderaan ringan di sepanjang jalan pembangunan yang telah siap dan dijangka tidak mendatangkan kesan yang ketara kepada masyarakat.



Bunyi Bising

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Langkah Mitigasi

FASA PEMBINAAN

- Pematuhan garis panduan dalam Had dan Kawalan Getaran Alam Sekitar (2021); Lampiran E: Pengurusan dan Pengurangan Getaran dalam Persekitaran, termasuk:
  - Kawalan Sumber: Menggunakan penebat getaran untuk mengurangkan getaran dan meletakkan, mengendalikan atau mencari sumber getaran tinggi sejauh mungkin dari kawasan sensitif.
  - Kawalan Pentadbiran: Mengehadkan masa operasi sumber getaran.

FASA OPERASI

- Tiada potensi sumber kesan getaran semasa fasa operasi dan oleh itu tiada langkah pengurangan diperlukan.



Getaran

FASA PEMBINAAN

- Bahan mengandungi asbestos (ACM): Ruang simpanan yang ditetapkan akan disediakan untuk sisa ACM.
- Sisa Biojisim: Lembaran kalis air akan digunakan untuk menutup simpanan stok untuk mengelakkan air larian ke dalam sistem saliran dan sungai berdekatan.
- Sisa Pembinaan: Pengurusan sisa pembinaan akan mengikut Piramid Hierarki Pengurusan Sisa, mengutamakan pengurangan, penggunaan semula dan kitar semula sisa sebelum pelupusan akhir.
- Sisa Domestik: Penyediaan bilangan tong sampah yang mencukupi di tapak pembinaan.
- Buangan Terjadual: Pengurusan sisa terjadual akan dilaksanakan mengikut Garis Panduan Pembungkusan, Pelabelan dan Penyimpanan Buangan Terjadual di Malaysia (2014) dan Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005.

FASA OPERASI

- Sisa Domestik: Semua sisa domestik akan diasingkan kepada bahan kitar semula dan tidak boleh dikitar semula.
- Sisa Terjadual: Kawasan penyimpanan akan berasaskan konkrit dengan kapasiti pembendungan sebanyak 110% daripada bekas terbesar. Semua sisa terjadual akan dikendalikan oleh kakitangan yang cekap.



Janaan Sisa

FASA PEMBINAAN DAN OPERASI

- Prosedur Operasi Standard (SOP) akan dibangunkan dengan berunding dengan PERHILITAN untuk menguruskan pertemuan hidupan liar.
- Semasa pertemuan manusia-hidupan liar PERHILITAN mesti terlibat untuk membolehkan pemindahan selamat.



Ekologi

FASA PEMBINAAN

- Papan tanda pembinaan jalan dan penanda bendera akan disediakan di pintu masuk dan keluar tapak Projek.
- Had laju kenderaan akan dipatuhi untuk mengurangkan penyebaran habuk dan tumpahan bahan

FASA OPERASI

- Persimpangan 3 akan dinaik taraf daripada persimpangan hentian 3 kaki kepada persimpangan hentian berkanal sepenuhnya berkaki 3.
- Persimpangan gelincir keluar 3 kaki baharu yang menyediakan lorong tambahan yang menghubungkan persimpangan baharu ke Persimpangan 1.



Trafik

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Langkah Mitigasi

FASA PEMBINAAN
- Tapak ini akan disertakan dengan penimbunan tapak yang betul untuk menapis kerja yang sedang dijalankan daripada pandangan umum.
- Pengemasan tetap untuk mengelakkan pengumpulan serpihan.
- Papan tanda yang mencukupi jika berkenaan.

FASA OPERASI
- Projek ini telah direka bentuk dengan rawatan muka depan, bahan dan skema warna yang serasi dengan kawasan pantai dan hotel di sekitarnya



Visual

FASA PEMBINAAN
- Memastikan pekerja dibekalkan dengan PPE dan latihan keselamatan yang mencukupi.
- Wujudkan mekanisme pengurusan aduan.
- Maklumkan hotel sekitar sebelum memulakan kerja-kerja pembinaan.

FASA OPERASI
- Untuk mengendalikan hotel dengan pematuhan penuh terhadap peraturan tempatan, termasuk piawaian kesihatan, keselamatan dan alam sekitar.
- Menjalankan pemantauan rutin impak operasi termasuk tahap bunyi, pengurusan sisa, penggunaan air dan tenaga serta aliran trafik.



Socio-Ekonomi

FASA PEROBOHAN
- Memastikan pekerja yang terlibat dalam penyingkiran asbestos dilatih dengan secukupnya dan sentiasa memakai PPE yang lengkap.
- Tanda amaran yang jelas dipaparkan di setiap kawasan penyingkiran asbestos.
- Makan, minum dan merokok di kawasan pembuangan asbestos adalah dilarang sama sekali.
- Kawasan penyingkiran asbestos mesti dihalang dan diasingkan.
- Udara termampat tidak boleh digunakan untuk mengeluarkan atau membersihkan habuk dari permukaan kerja. Pembersihan harus dilakukan dengan penyedut atau mengelap lembap.

FASA PEMBINAAN
- Pekerja asing akan menjalani pemeriksaan kesihatan pra-pekerjaan melalui FOMEMA untuk mencegah penularan penyakit berjangkit.
- Memastikan pergerakan kenderaan pembinaan dijadualkan dengan betul dan waktu puncak dielakkan.
- Letakkan tanda amaran sebelum zon pembinaan untuk memberi amaran kepada pemandu.
- Kemasukan ke tapak pembinaan mestilah terhad kepada pekerja binaan dan kakitangan yang diberi kuasa.

FASA OPERASI
- Sediakan ERP dan wujudkan ERT dan lakukan latihan tindak balas kecemasan secara berkala.
- Menjalankan penyelenggaraan berkala peralatan proses mengikut garis panduan pengilang.
- Mematuhi garis panduan oleh JAS dan JKKP.



Kesihatan dan Keselamatan Awam

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Cadangan Program Pemantauan Alam Sekitar



PEMANTAUAN PEMATUHAN
- Memastikan syarat kelulusan EIA dipatuhi oleh Pemaju Projek
- Dijalankan oleh makmal yang bertauliah

AUDIT PEMATUHAN ALAM SEKITAR
- Audit dilakukan oleh juruaudit alam sekitar yang berdaftar
- Memiliki kelayakan *Certified Erosion, Sediment and Storm Water Inspector* (CESSWI) atau *Malaysian Certified Inspector of Sediment and Erosion Control* (MY-CISEC)
- Amalan Pengurusan Terbaik (BMP) akan diguna pakai



PEMANTAUAN PRESTASI
- Memastikan keberkesanan sistem kawalan pencemaran dan langkah-langkah mitigasi
- Dilakukan oleh EO di tapak

PEMANTAUAN GARIS DASAR

Indikasi umum kepada garis dasar keadaan alam sekitar semasa laporan

PROGRAM PEMANTAUAN ALAM SEKITAR
- Menyediakan pengkalan data impak alam sekitar
- Indikasi awal kepada impak alam sekitar



PEMANTAUAN IMPAK
- Memastikan impak yang berpotensi seperti yang dinyatakan semasa penyediaan EIA adalah tepat
- Memastikan kaedah mitigasi dilaksanakan secara terurus

PEMANTAUAN KAWAL SELIA
- Memastikan keberkesanan langkah-langkah mitigasi dan pematuhan terhadap peraturan alam sekitar
- Dijalankan oleh EO

PEMANTAUAN	KEKERAPAN
Pemantauan Prestasi	
Berdasarkan pelan LD-P2M2	• Mingguan • Selepas hujan lebat (>12.5 mm seperti diukur oleh tolok hujan)
Penyelenggaraan Cerun dan Pemantauan Instrumentasi • Inklinometer (cerun potongan, cerun tambakan, dan benteng) • Piezometer jenis *standpipe* • Penanda anjakan, dinding dan rod pemendapan	• Semasa pembinaan: mingguan • Selepas tamat: bulanan • Piezometer jenis *standpipe*: ➢ Semasa kerja lapangan: setiap hari ➢ Selepas kerja lapangan: setiap hari untuk dua minggu pertama, seterusnya mengikut keperluan
Pemantauan Pematuhan	
Titik pelepasan perangkap kelodak dan kolam sedimen	• Bulanan
Pemantauan Impak	
Fasa Pembinaan	
• Kualiti air (2 stesen) • Udara ambien, Bunyi dan Getaran (3 stesen setiap satu) • Tinjauan Udara (dengan dron)	• Bulanan
Fasa Operasi	
• Kolam Takungan Air • Efluen daripada lepasan STP	• Bulanan

RINGKASAN EKSEKUTIF

PENILAIAN KESAN KEPADA ALAM SEKELILING JADUAL PERTAMA BAGI CADANGAN PEMBANGUNAN LANGKAWI FEDERAL RESORT (RPP LANGKAWI) MELALUI KERJASAMA AWAM-SWASTA SECARA MODEL *REDEVELOP-OPERATE-TRANSFER (ROT)* DI LOT 51, SEKSYEN 4, BANDAR PADANG MAT SIRAT, LANGKAWI, KEDAH DARUL AMAN

Pelan Respon Kecemasan

PASUKAN RESPON KECEMASAN

- Pasukan yang dianggotai oleh individu berkelayakan dengan peranan dan tanggungjawab yang spesifik semasa kecemasan
- Bertanggungjawab untuk melaksanakan prosedur tersebut:



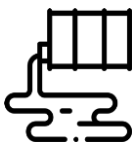
KEMALANGAN
Prosedur tindak balas kecemasan dan pelaporan insiden besar.



RESPON KECEMASAN KEBAKARAN
Pelaksanaan prosedur evakuasi dan penyelarasan respon kebakaran.



RESPON KEGAGALAN ESCP
Pelaporan segera, pembetulan dan kajian semula langkah-langkah kawalan hakisan.



RESPON TUMPAHAN BAHAN KIMIA
Pemindahan, pembendungan dan penyahcemaran berikutan tumpahan bahan merbahaya.



RESPON KECEMASAN PERUBATAN
Pemberitahuan segera perkhidmatan kecemasan dan pertolongan cemas selamat oleh kakitangan terlatih.

Rumusan

Projek ini menimbulkan impak alam sekitar yang rendah. Semua impak yang dijangkakan boleh mematuhi had yang ditetapkan, dan boleh dikurangkan dengan berkesan.

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List of Abbreviations

µS/cm	microsiemens per centimeter
ALARP	As Low As Reasonably Practicable
AN	Ammoniacal Nitrogen
APHA	American Public Health Association
ASR	Air Sensitive Receptor
BH	Borehole
BMP	Best Management Practice
BOD	Biological Oxygen Demand
BOH	Back of House
BP	*Blok Perancangan*
BPK	*Block Perancangan Kluster*
CEMS	Continuous Emission Monitoring Systems
CePBFO	Certified Environmental Professional in Bag Filter Operation
CePEOEIA	Certified Professional for Environmental Officer in EIA
CePSO	Certified Environmental Professional in Scrubber Operation
CEPSWaM	Certified Environmental Professional in Scheduled Waste Management
CESSWI	Certified Erosion, Sediment and Storm Water Inspector
CFU/100mL	Colony-Forming Units per 100 milliliters
CIDB	Construction Industry Development Board
CISEC	Certified Inspector of Sediment and Erosion Control
CM	Compliance Monitoring
CO	Carbon Monoxide
COA	Certificates of Analysis
COD	Chemical Oxygen Demand
CSU	Compact Substation Unit
CTMP	Construction Traffic Management Plan
DID	Department of Irrigation and Drainage
DO	Dissolved Oxygen
DOE	Department of Environment
DOSH	Department of Occupational Safety and Health
DSM	Department of Standards Malaysia
EF	Emission Factor
EGiM	Environmental Impact Assessment Guidelines in Malaysia
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EiMAS	Environmental Institute of Malaysia
EMP	Environmental Management Plan
EMR	Environmental Monitoring Reports
EMT	Environmental Mainstreaming Tools
EO	Environmental Officer
EPMD	Environmental Performance Monitoring Document
EQA	Environmental Quality Act
ERP	Emergency Response Plan
ERT	Emergency Response Team

ES	Environmental Scoping
ESA	Environmentally Sensitive Area
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
FDT	Field Density Test
FGD	Focus Group Discussion
FOMEMA	Foreign Workers' Medical Examination Monitoring Agency in Malaysia
FOS	Factor of Safety
FTA	Federal Transit Administration
FTTB	Fiber to the Building
GAR	Geotechnical Assessment Report
GDP	Gross Domestic Product
GLC	Ground Level Concentration
GSR	Guided Self-Regulation
GTM	Geological Terrain Report
IM	Impact Monitoring
ISMP	Integrated Shoreline Management Plan
IUCN	International Union for Conservation of Nature's Red List of Threatened Species
IWK	Indah Water Konsortium
JKKP	*Jabatan Kesihatan dan Keselamatan Pekerjaan*
JKR	*Jabatan Kerja Raya* / Public Works Department
JMG	*Jabatan Mineral Dan Geosains*
JPS	*Jabatan Pengairan dan Saliran*
JPSPN	*Jabatan Pengurusan Sisa Pepejal Negara*
JUPEM	*Jabatan Ukur dan Pemetaan Malaysia*
Kg/Kpg	Kampung
KM	*Kebenaran Merancang*
KPK	*Kluster Pelaburan Khusus*
L_{Aeq}	Equivalent Continuous Noise Level
LC	Least Concern
LD-P2M2	Land Disturbing Pollution Prevention and Mitigating Measures
L_{max}	Maximum Noise Level
L_{min}	Minimum Noise Level
LOS	Level of Service
LSANK	*Lembaga Sumber Air Negeri Kedah*
MAAQS	Malaysian Ambient Air Quality Standards
MAIC	Maximum Average Incremental Concentration
MC	Main Contractor
mg/L	Miligrams per litre
mm/s	Milimeter per second
MMD	Malaysian Meteorological Department
MMWQS	Malaysia Marine Water Quality Standards
MOH	Ministry of Health
MP	Malaysia Plan
MPFN	*Majlis Perancang Fizikal Negara*

MPLBP	*Majlis Perbandaran Langkawi Bandaraya Perlancongan*
MSIG	Malaysian Sewerage Industry Guidelines
MSMA	Urban Storm Water Management
MY-CISEC	Malaysia Certified Inspector of Sediment and Erosion Control
NAHRIM	National Water Research Institute of Malaysia
NASA	National Aeronautics and Space Administration
ND	Not Detected
NE	Not Evaluated
NECD	National Emission Ceilings Directive
NH_3-N	Ammoniacal Nitrogen
NO_2	Nitrogen Dioxide
NO_3	Nitrate
NPP4	National Physical Plan 4
NPS	Network Pumping Station
NSR	Noise Sensitive Receptor
NTU	Nephelometric Turbidity Unit
NWQSM	National Water Quality Standards for Malaysia
O&G	Oil & Grease
O_3	Ozone
OSHA	Occupational Safety and Health Act
P.E.	Population Equivalent
P.Geol.	Professional Geologist
PBT	*Pihak Berkuasa Tempatan*
PCO	Pest Control Officer
PCU	Passenger Car Units
PEPC	Professional Engineer with a Practice Certificate
PPP	Public-Private Partnership
PM	Performance Monitoring
PM_{10}	Particulate Matter ≤10 microns
$PM_{2.5}$	Particulate Matter ≤2.5 microns
PMR	Performance Monitoring Report
PPE	Personal Protective Equipment
RC	Reinforced Concrete
RMN	Royal Malaysian Navy
RMS	Root Mean Square
ROT	Redevelop-Operate-Transfer
RORO	Roll-on Roll-off
ROW	Right-of-Way
RPP	*Rumah Peranginan Persekutuan*
RQD	Rock Quality Designation
RSN	*Rancangan Struktur Negeri*
RSNK	*Rancangan Struktur Negeri Kedah*
RTD	*Rancangan Tempatan Daerah*
RTDK	*Rancangan Tempatan Daerah Kulim*
SADA	*Syarikat Air Darul Aman*
SAMM	Skim Akreditasi Makmal Malaysia

SASB	Samudera Andaman Sdn. Bhd.
SBW	Standard Specifications for Building Works
SDG	Sustainable Development Goals
SEA	Socio-Economic Assessment
Sg.	Sungai
SI	Soil Investigation
SIA	Social Impact Assessment
SME	Small and Medium Enterprise
SMP	Systematic Management Plan
SO_2	Sulphur Dioxide
SOP	Standard Operating Procedure
SPAN	*Suruhanjaya Perkhidmatan Air Negara*
SPC	State Planning Committee
SPEIA	*Sistem Pemantauan EIA*
SPT	Standard Penetration Test
SS	Suspended Solids
STP	Sewage Treatment Plant
SW	Scheduled Waste
TGM	Trip Generation Manual
TIA	Traffic Impact Assessment
TLDM	*Tentara Laut Diraja Malaysia*
TNB	*Tenaga Nasional Berhad*
TSS	Total Suspended Solids
UBBL	*Undang-Undang Kecil Bangunan Seragam, 1984*
UKBS	Uniform Building By-Laws, 1984
USEPA	United States Environmental Protection Agency
USLE	Universal Soil Loss Equation
USM	Unsuitable soil material
WCA	Wildlife Conservation Act
WQI	Water Quality Index
WRS	Water Recovery System
YDP	Yang DiPertua
ZOI	Zone of Influence
ZOS	Zone of Study
µS/cm	microsiemens per centimeter