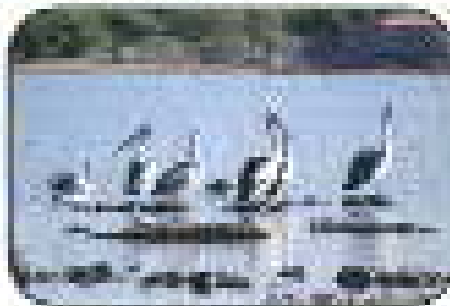


ENVIRONMENTAL MANAGEMENT PLAN

for
PROPOSED PELICAN PARADISE DEVELOPMENT,
TIBAR-TASI TOLU, TIMOR-LESTE

for
MINISTRY OF COMMERCE, INDUSTRY AND ENVIRONMENT



FINAL
APRIL 2018

Project Proponent



PELICAN PARADISE HOTEL & RESORT DEVELOPMENT
PT. LTD.

Responsible Environmental Consultant






ASPEC ENVIRONMENTAL CONSULTANTS (PVT) LTD.
(2008-01-01)

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Note: *Submitted to Pelican Paradise Holdings (Timor-Leste) for further action.

Version	Report	Date	Prepared	Checked	Approved
Final	EMP	18 April 2018	 Phinie Heng Lee Lee (Manager)	 Dr Jamie Chong Li Yean (Director)	 Dr Low Kwai Sim (Director)

Note:

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Preamble



PREAMBLE

The Draft Environmental Impact Statement (EIS) and Environmental Management Plan (EMP) for the **Proposed Pelican Paradise Development, Tibar-Tasi Tolu, Timor-Leste** was submitted to the Ministry of Commerce, Industry and Environment (MCIE) on 24 August 2017.

The Public Consultation with relevant stakeholders was conducted on 18 January 2018 and the technical comments regarding the Draft EIS and EMP were forwarded by Director General of Environment to the Project Proponent (PP), vide letter dated 26 February 2018 [Ref: 64/DGA-MDHOA/II/2018].

Clarifications and responses to the technical comments and issues raised during the Public Consultation are summarised in **Attachments 1 and 2** of this Preamble and also incorporated into the various Chapters of this Final EMP Report.

The letter from Director General of Environment is appended in **Attachment 3** of this Preamble.

ATTACHMENT 1: RESPONSES TO WRITTEN COMMENTS FROM DIRECTOR GENERAL OF ENVIRONMENT

The responses and clarifications to the written comments from Director General of Environment for the Draft Environmental Management Plan (EMP) for the Proposed Pelican Paradise Development, Tibar-Tasi Tolu, Timor-Leste, are tabled below along with the corresponding responses.

No	Pages	Sections	Ratings	Comments	Responses
1	9,13	Executive Summary	C	Table 1.8.1, 1.8.2, summary of potential significant environmental impact and mitigation measures during construction and operation phase should be rectify which consist of activity, potential impact, and mitigation measures, cost mitigation, sampling location, parameter to the monitoring, limit value or environmental quality standard, frequency of monitoring, responsibility of monitoring.	Tables 1.8.1 and 1.8.2 have been revised; refer pages 1-9 to 1-22.
	16			Table 1.8.3, summary of potential significant environmental impact and mitigation measures during deactivation stage should be omitted.	Table 1.8.3 was deleted in this Final EMP; refer pages 1-23 and 1-24.
	26			Table 1.10.3, environmental monitoring and surveillance during deactivation should be omitted.	Table 1.10.3 was deleted in this Final EMP; refer pages 1-41 and 1-42.
2.	1	Details of the project proponent	A	Description of project proponent identity such as company name, chairs, contact number and email address generally are complete.	Noted.
3.	1-5	Details of EIA consultants who carried out the study and prepared the EMP	A	Description of the EIA consultant to design the EMP such as ASPEC, qualification and experience of each personal generally are complete.	Noted.

No	Pages	Sections	Ratings	Comments	Responses
4.	1-19	Description of the project	C	Need to be alter base to the EIS alteration.	Chapter 4 was revised; refer pages 4-1 to 4-61.
5.	1-9	Legal requirement	A	Description of legal requirement such as regulation, standard and guidelines related to the environmental and social aspect that the proponent intend to comply during lifecycle of the project generally are complete.	Noted.
6.	4	Institutional roles and responsibilities	B	Table 6.2.1, roles and responsibility of developer and institutional at deactivation should be omitted, because the operation stage of this project is for long term or not limited	The institutional roles & responsibilities during the deactivation and decommissioning phase were removed. Refer to revised Table 6.2.1 in page 6-4.
7.	1	Summary of impacts	C	Table 7.2.1, summary of several impact during construction and operation stage will not be affected the mangrove, protected area, etc need to be alter. Decommissioning column should be omitted.	The decommissioning column for Table 7.2.1 was removed; refer pages 7-1 and 7-2.
	3			Sub section 7.3, summary of social impact at deactivation stage should be omitted	The deactivation stage for the social impact assessment (SIA) was removed; refer page 7-3.
8.	1-8	Description of proposed mitigation measures	C	Table 8.2.1, 8.2.2, the proposed mitigation measures of impact during construction and operation stage need to rectify that encompass of activity, potential impact, mitigation measures, cost mitigation, sampling and monitoring location, parameter to be monitoring, limit value or environmental quality standard, frequency of monitoring, responsibility of monitoring.	Tables 8.2.1 and 8.2.2 were revised; refer pages 8-2 to 8-15.

No	Pages	Sections	Ratings	Comments	Responses
8.	9-10			Table 8.2.3, the proposed mitigation measures of impact during deactivation stage should be omitted.	The decommissioning column for Table 8.2.3 was removed; refer pages 8-16 and 8-17.
9.	1-3	Governing parameters	C	Table 9.2.1, description of all key performance indicator at each stage should be appear the threshold of each aspect. Not indicated in other section, and deactivation stage should be omitted.	The key performance indicator as well as the threshold for each aspect were included in Table 9.2.1 , pages 9-2 to 9-6. The deactivation stage column was removed.
10.	2-5	Monitoring program	C	Table 10.1.1, 10.1.2, environmental monitoring and surveillance during construction and operation phase, column of compliance requirement should be completed the limit value/benchmark of each aspect (environmental component), not indicated in other section.	Tables 10.1.1 and 10.1.2 have included the limits/benchmark of each aspect (environmental component); refer pages 10-2 to 10-8.
	6-7			Table 10.1.3, environmental monitoring and surveillance during deactivation phase should be omitted.	
11.	3	Reporting requirement	B	Sub section 11.4, environmental monitoring report during deactivation phase should be omitted.	Sub-section 11.4: Deactivation/ Decommissioning Phase was removed; refer pages 11-3 and 11-4.
12.	8-9	Responsibilities for mitigation and monitoring	B	Sub section 12.4, responsibility for mitigation during deactivation stage should be omitted.	Sub-section 12.4: Decommissioning Phase was removed; refer pages 12-8 and 12-9.
13.	9	Emergency plan	B	Sub section 13.5, emergency response plan during deactivation stage should be omitted.	Sub-section 13.5: Deactivation/Decommissioning Phase was removed; refer page 13-9.

No	Pages	Sections	Ratings	Comments	Responses
14.	1-3	Decommissioning plan	B	The operation stage of this project is for long term. Therefore, deactivation plan should be omitted.	Chapter 14: Section on deactivation was removed; refer pages 14-1 to 14-3.
15.	1-2	Capacity development and training	A	Description of capacity development and training such as type of the training, trainer, objective, participant and schedule of the training generally are provided.	Noted.
16.	1-15	Public consultation and information disclosure	B	Need to summarise the public consultation of EIS and EMP draft that has been conducted in January, 2018.	The public consultation held on 18 January 2018 was included in the Final EMP. Refer Section 16.4 in pages 16-5 and 16-6; Figure 16.4.3 in page 16-10; Table 16.6.3 in pages 16-19 to 16-22.
17.	1-3	Complaints and grievances mechanisms	C	The mechanism to resolve of any complaints should be split at each stage and appear any complains related to environmental and social issues.	Chapter 17 was revised, refer pages 17-1 to 17-6.
18.	1	Work plan and implementation schedule	C	Sub section 18.4, work plan and implementation schedule at deactivation stage should be omitted. Table 18.2.2 (a), (b) and (c) the work plan and implementation schedule should be specify activity of the EMP of each aspect during the construction and operation.	Sub section 18.4 was removed, refer page 18-1. Tables 18.2.2 (a), (b) and (c) were revised; refer pages 18-9 to 18-11.
19	1	Cost estimates	D	Should be provide the cost mitigation measures base to each aspect in section 18 above.	The mitigation costs were included in Tables 19.9.1 and 19.9.2 ; refer pages 19-1 to 19-3.
20	2	Review of EMP	B	Sub section 20.5, review of the EMP at deactivation stage should be omitted.	Sub section 20.5 was removed; refer page 20-2.

No	Pages	Sections	Ratings	Comments	Responses
21.	1-10	Non-technical summary	C	Non-technical should be revise base to the EMP revision, provide in both, English and <i>tetum</i> version.	The Non-technical summary was revised accordingly.
22.	-	EMP	C	Should be revise the EMP base on technical comment of participant of the public consultation that conducted in December 2017 and January, 2018.	The Final EMP was revised accordingly.

ATTACHMENT 2: RESPONSES TO ISSUES RAISED DURING THE PUBLIC CONSULTATION

The responses and clarifications to the comments from various stakeholders during the Public Consultation held on 18 January 2018 for the Draft EIS and EMP for the Proposed Pelican Paradise Development, Tibar-Tasi Tolu, Timor-Leste are tabled below along with the corresponding responses.

No.	Comment By	Question/ Comment/ Concern	Response
1.	Mr Shyam Paudel [Chief Technical Advisor of United Nations Development Programme (UNDP) Timor-Leste]	<p>(i) Concerned on the relocation/resettlement of the residents within the Project site.</p> <p>(ii) Queried on the mangrove area to be reserved and location for the mangrove replanting.</p> <p>(iii) Asked on the types of plants that will be included in the reforestation plan.</p>	<p>(i) The relocation plan is under the jurisdiction of the Government of Timor-Leste as stated in EIA Chapter 10: Social Impact Assessment, page 10-1.</p> <p>(iia) The existing mangroves around the Project site had long been degraded even before the PP incepted the Project; refer to EIA Section 6.11: Mangrove, page 6-82.</p> <p>(iib) The PP has plans to rejuvenate and conserve any mangroves that were left, and to replant mangroves where there were none; especially at the perimeters of Tasi Tolu Lakes. The seeds of remnant mangroves in the Tasi Tolu area would be collected for replanting.</p> <p>(iii) Pictures of the types of potential plants for reforestation were shown to the stakeholders during the consultation. The PP has started to cultivate some of these plants in a nursery for reforestation. Refer to EIA Figure 9.9.5 in Section 9.9: Impacts on Terrestrial Ecology and Mitigation Measures, page 9-130.</p>
2.	Sr Carlos Ximenes (Senior Staff in General Directorate of Environment)	<p>(i) Concerned on the conversion of Lake A to a freshwater lake as the Lake is known as an important area for migrating birds and also considered as a sacred area to the public.</p>	<p>(i) Lake A is maintained as a saline lake similar to Lakes B and C. Refer to amendments in Section 4.3.5: Lake Rehabilitation, pages 4-23 and 4-24.</p>

No.	Comment By	Question/ Comment/ Concern	Response
2.		<p>(ii) Suggested to construct an additional lake within the golf course area for freshwater storage and to maintain the three Lakes as saltwater lakes.</p> <p>(iii) Curious on lake restoration and the lake water parameters that would be improved through the restoration (fresh sea water circulation).</p> <p>(iv) Asked if the public could access to the Lakes after Project completion.</p> <p>(v) Expressed that Timorese are supporting the Project development but also concerned on the environmental impacts caused by the Project.</p>	<p>(ii) The three Lakes are maintained as saltwater lakes, refer to amendment in Section 4.3.5: Lake Rehabilitation, pages 4-23 to 4-25. The PP may consider the suggestions to construct an additional lake for freshwater storage.</p> <p>(iii) The technical restoration of Tasi Tolu Lakes is provided in EIA Section 4.3.5: Lake Rehabilitation, pages 4-23 to 4-25.</p> <p>(iv) The public can access to the Lakes after Project completion.</p> <p>(v) Noted. The environmental impacts caused by the Project are stated in EIA Chapter 9: Impact Assessment and Mitigation Measures, in pages 9-1 to 9-205 of the same Chapter.</p>
3.	Sr Adilson da C. (La'o Hamutuk)	<p>(i) Concerned on the disruption/disturbance of habitat during the construction phase.</p> <p>(ii) Concerned on involvement of local communities in the Project development.</p> <p>(iii) Wished that the PP would protect/maintain the Tasi Tolu area (especially the lakes) while having the new development.</p>	<p>(i) The mitigation measures on ecology during the construction phase are in Table 8.2.1, pages 8-6 to 8-7.</p> <p>(ii) Priority on employment will be given to the local communities. This is stated in EIA Section 10.6.1: Employment Opportunities, page 10-18. However, it depends on the types of jobs; the working skills of the locals and most important, is the willingness to work in the Project.</p> <p>(iii) It is because of the environmental qualities, the lakes and the pelicans that the PP had decided to develop the Project in the area. Hence, all mitigation measures to protect the lakes have been keenly taken into consideration. The mitigation measures on lake ecology are in Table 8.2.1, pages 8-7 and 8.13.</p>

No.	Comment By	Question/ Comment/ Concern	Response
4.	H.E. Arq. Abrao Gabriel Santos Oliveira (Vice Minister of Housing Development, Urban Planning and Environment)	<p>(i) Rejected the option to convert the Lake A into a freshwater lake as it is a sacred and historical site.</p> <p>(ii) Emphasised on public access to the Tasi Tolu area once the Project is completed.</p> <p>(iii) Mentioned that the settlements within the Project site would definitely be relocated with or without the development.</p> <p>(iv) Mentioned that the settlements within the Project site would definitely be relocated with or without the development.</p> <p>(v) Emphasised that all investors must take care of the environment and comply with the conditions of the environmental license.</p>	<p>(i) Noted. Refer to amendments in Section 4.3.5: Lake Rehabilitation, pages 4-23 and 4-24. Lake A will remain as a saline lake.</p> <p>(ii) Noted. The public will have access to the Tasi Tolu area once the Project is completed.</p> <p>(iii) Noted. Refer to EIA Chapter 10: Social Impact Assessment, page 10-1.</p> <p>(iv) Noted.</p> <p>(v) Noted.</p>
5.	Sr Anibal A. Soares [Professional Technique (EIA), Department of Environmental Impact Assessment]	<p>(i) Rejected the idea of covering Lake A with solar panels.</p> <p>(ii) Expressed the importance of Tasi Tolu Lakes to the locals.</p> <p>(iii) Concerned on the impact to the migratory birds during Project development.</p> <p>(iv) Concerned on the impact from the construction of the floating jetty.</p>	<p>(i) Noted on the rejection of covering Lake A with solar panel. Refer to amendments in Section 4.3.5: Lake Rehabilitation, pages 4-23 and 4-24.</p> <p>(ii) Noted; the lakes will be maintained as saline lakes.</p> <p>(iii) The impact on the migratory birds is in EIA Section 9.10: Impacts on Lake Ecology and Mitigation Measures, pages 9-131 to 9-146.</p> <p>(iv) The mitigations are in EIA Section 9.8.2 (d) (ii): Mitigations for construction of the Floating Jetty, page 9-104.</p>
6.	General Directorate of Environment	<p>(i) Appreciated the effort of PP in planning the Project.</p> <p>(ii) Expressed that the Tasi Tolu Lakes are historical sites and must be conserved.</p>	<p>(i) Noted.</p> <p>(ii) Refer to EIA Section 9.10: Impacts on Lake Ecology and Mitigation Measures, page 9-136.</p>

No.	Comment By	Question/ Comment/ Concern	Response
7.	Sr José Paulo Pinto (Ministry of Public Work)	<p>(i) Informed that the Government of Timor-Leste is currently upgrading the existing Rua Terra Santa.</p> <p>(ii) Requested that the proposed drainage plan (including lakes water circulation plan) to be incorporated with the Master Drainage Plan of the upgraded road.</p> <p>(iii) Suggested PP to meet with related departments for further coordination on the drainage plan.</p> <p>(iv) Emphasised that the National Sewerage Plan must be incorporated in the Project planning, if there is a sewage treatment plant and sewerage system in Tasi Tolu area.</p>	<p>(i) Noted.</p> <p>(ii) Pelican Paradise Holdings Timor-Leste would consult with the relevant agencies on the drainage plan.</p> <p>(iii) Noted. The PP would consult with the relevant agencies on the drainage plan.</p> <p>(iv) PP has already taken note of the National Sewerage Plan when planning for the sewerage system for the Project.</p>
8.	Ms Trudiann Dale (Country Director, Conservation International)	<p>(i) Mentioned that the Dili Rock is one of the popular dive sites in Timor-Leste; it should be included as a tourism site in EIS.</p> <p>(ii) Emphasised that the Tasi Tolu is a marine protected area as the seagrass bed in this area is the habitat for dugong.</p> <p>(iii) Concerned on the impact of the discharge of circulated lake water to the seagrass bed.</p>	<p>(i) Dili Rock as a popular dive site, and has been included in EIA Figures 6.24.2 and 6.24.3, pages 6-187 and 6-188.</p> <p>(ii) The seagrass bed and dugong are included in EIA Section 6.15.4: Marine Mammals, page 6-124 and EIA Section 9.8: Impacts on Marine Ecology and Mitigation Measures, page 9-101.</p> <p>(iii) The impact of the discharge of circulated lake water to the seagrass bed is included in EIA Section 9.8: Impacts on Marine Ecology and Mitigation Measures, pages 9-102 and 9-105.</p>



Ministerio do Desenvolvimento
e Reforma Institucional



Gabinete do Vice Ministro
Desenvolvimento Para
Habitação, Ordenamento e
Ambiente

Direcção Geral do Ambiente

Fomento Building, Rua D. Boa Ventura, Dili, Mobile: 3311473, 77327062

Díli, 26th of February, 2018

Ref. Num: GA /DGA-MDHOA /II/2018

Mr. Jeremiah Chan,
Executive Director of Pelican Paradise Holdings Timor – Leste

- Cc :
1. His Excellency Prime Minister and Minister of Development and Institutional Reform, Mr. Mari Bim Amude Alkatiri
 2. His Excellency Vice Minister of Development for Housing, Spatial Planning and Environment, Mr. Abrão Gabriel Santos Oliveira

Subject : Technical Comments of Environment Impact Statement (EIS) and Environmental Management Plan (EMP) Draft

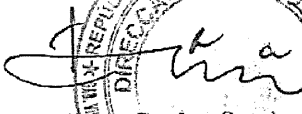
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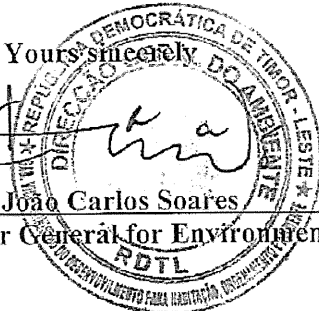
1. Pelican Paradise. Project document submission, 7th of November. 2016,
2. Pelican Paradise. Project document revision submission, 16th December, 2016;
3. DNCPIA, issued of the category project, 20th of December 2016, classify as category A project;
4. DNCPIA, reason of the Pelican Paradise Development categorize as a project category A is pursuant to annex one of Decree Law number 5/2011 on Environmental License, Tourism Sector (Hotel construction) scale of the project activity is ≥ 100 rooms, categorize as a project A;
5. Pelican Paradise, ToR draft submission, 30th of December, 2016,
6. DNCPIA, issue of the ToR technical comment, 19th of January, 2017;
7. Pelican Paradise, ToR revision resubmission, 2^{ed} of February, 2017;
8. DNCPIA. approval of the ToR. 24th February 2017;
9. Pelican Paradise, Environmental Impact Statement (EIS) and Environmental Management Plan (EMP) submission, 24/8/2017;
10. Pelican Paradise, EIS and EMP public consultation in December 2017 and January, 2018;
11. DNCPIA; review of the EIS and EMP, 25th of August 2017 to 26th of February 2018.
12. DNCPIA, issued of the EIS and EMP technical comment.

Dear Mr. Jeremiah Chan,

Referring to the EIS and EMP draft for the Pelican Paradise Development project submitted to the National Directorate of Pollution Control and Environmental Impact (NDPCEI) dated 24th of August 2017. The Environmental Impact Assessment (EIA) technical of NDPCEI, under the Directorate General of Environment (DGE), Vice Ministry of Development for Housing, Spatial Planning and Environmental (VMDHSPE), Ministry of Development of Institutional Reform has reviewed the documents and found several sections of the EIS and EMP draft version are incomplete.

Therefore, we request the proponent to revise the EIS and EMP based on technical comments and resubmit to the VMDHSPE, DGE, DNAC, DNPRB and NDPCEI in hard and soft copy. Parts of the revision should be highlighted to facilitate the review. For your information please see enclosure of technical comments.

Yours sincerely,

João Carlos Soares
Director General for Environment
RDTL



Technical Comments of the EIS

Num	Pages	Sections	Ratings	Comments
1.	13 15-16 17-19 20-22	Executive Summary	C	<p><i>Sub section 1.7, first paragraph the proposed project will cause climatic change during deactivation phase is right?</i></p> <p><i>Sub section 1.9.1, scope of the assessment, the significant positive and negative impact during deactivation phase is right?</i></p> <p><i>Tbl 1.9.1, summary of the positive and negative impact of the project also would be encompass of deactivation phase?</i></p> <p><i>Tbl. 1.9.2, summary of potential environmental impact and mitigation measures during construction phase should be include the cost mitigation, sampling location and limit value or environmental quality standard.</i></p> <p><i>Tbl. 1.9.3, summary of potential environmental impact and mitigation measures during operation phase should be rectify which consist of activity, potential impact, mitigation measures, cost mitigation, sampling location, parameter to be monitoring, limit value or environmental quality standard, frequency of monitoring, responsibility of monitoring. The mitigation of potential impact is responsibility by proponent, not the government Institution.</i></p>
2.	2	Details of the project proponent	A	Sub section 2.2, Description of the project proponent identity generally are complete.
3.	1-6	Details of the EIA consultants who carried out the study and prepared the EIS	A	Description of the EIA consultant to design the EIS such as ASPEC, qualification and experience of each personal generally are complete.
4.	8 17-24	Description of the project	C	<p><i>Tbl 4.3.1, development component, no information of the project cost of each development component that would be constructed.</i></p> <p><i>Tbl, 4.3.3 – 4.3.5, several of development component drawings are not enclosed. It should be provide and enclosed.</i></p>
5.	1-9	Policy, legal and institutional framework	A	Description of International and National legislation, regulation and guidelines that relevant with the proposed project and intent to comply generally are complete.
6.	1-218	Description of the Environmental	A	Description of environment component that existing within and surrounding project site, enclose of pictures and outcome analysis of the environment component generally are complete.
7.	10-	Climate change	C	<i>Sub section 7.5, implication of the proposed project/description of the climate change is general, it should be depicted the climate change that generated by proposed project during construction, operation and method mitigation or adaptation.</i>
8.	1-11	Alternatives	A	Details provide.

9.	1	Impact assessment and mitigation measures		<i>First paragraph, examination of significant impact would be include deactivation stages?</i>
	2			<i>Tbl. 9.1.1, significant of environmental impact would be include deactivation stages?</i>
	17			<i>Sub section 9.1.6. the project development would be include deactivation stages?</i>
	17-19			<i>Tbl 9.1.9 and 9.1.10, depicted of project activity and potential environmental impact during deactivation stages is part of construction stages,</i>
	43-44, 46			<i>Sub section 9.3.5 potential impact (soil erosion) during deactivation stages are not include because the operation stages are not limited.</i>
	47			<i>Sub section 9.3.11, summary of soil erosion impact during deactivation stages should be omitted.</i>
	51			<i>Sub section 9.4, first paragraph, potential of water quality during deactivation stages should be omitted.</i>
	59-60			<i>Section 9.4.4, potential impact and mitigation during deactivation should be omitted.</i>
	71		C	<i>Section 9.5.4, potential impact and mitigation during deactivation should be omitted.</i>
	72			<i>Deactivation stages should be omitted.</i>
	73			<i>Tbl. 9.5.2, summary of air quality at deactivation stages should be omitted.</i>
	79			<i>Sub section 9.6.4 potential impact of hydrology and mitigation measures during deactivation stages should be omitted.</i>
	81			<i>Tbl. 9.6.1, summary of hydrology impact at deactivation stages should be omitted.</i>
	93			<i>Sub section 9.7.4, Noise potential impact and mitigation measures at deactivation stages should be omitted.</i>
	95			<i>Tbl 9.7.6, summary of noise impact during deactivation stage should be omitted.</i>
	108-109		<i>Tbl 9.8.1, summary of Impact to marine ecology during deactivation stage should be omitted.</i>	
	122		<i>Tbl. 9.9.1, summary of Impact to terrestrial ecology during deactivation stage should be omitted.</i>	
	135		<i>Sub section 9.10.4, potential impact to lake ecology and mitigation should omitted.</i>	
	138		<i>Tbl 9.10.1, summary of Impact to lake ecology during deactivation stage should be omitted.</i>	

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	148			<i>Sub section 9.11.4, potential impact and mitigation measures to structure facilities and utilities should omitted.</i>
10.	18	Social impact assessment	<i>B</i>	<i>Sub section 10.5.4, depicted of social impact and socio economic issues during deactivation is not be included, because the operation stage is long term or not limited.</i>
11.	1-10	Economic assessment	A	The economic assessment such as positive and negative impact that generated by proposed project and mitigation measures of negative impact generally are good.
12.	10 16	Summary of Environmental Management Plan	<i>B</i>	<i>Table 12.2.3, summary of potential impact during deactivation stage should be omitted, because the operation stage is long term or not limited.</i> <i>TBL 12.4.3. Environmental monitoring and surveillance during deactivation stage should be omitted, because the operation stage is long term or not limited.</i>
13.	1-18	Public consultation and information disclosure	A	Summary of public consultation such enclosure of participant pictures, comments, responses and institution relevant, community leader, local leader and NGOs who has consulted generally are complete.
14.	1	Difficulties encountered	A	Summary of difficulties encountered during design the EIS such as lack of information from Government institution related to the proposed project generally is good
15.	1-9	Conclusion and recommendation	<i>B</i>	<i>Conclusion and recommendation should rectify base to the EIS revision.</i>
16.	1-7	Non technical summary	<i>C</i>	<i>Non technical summary should be rectify base to the EIS revision. Provide in both language (tetum and English) version.</i>
17	-	EIS	<i>C</i>	<i>Should be revise the EIS base on technical comment of participant of the public consultation that conducted in December 2017 and January, 2018.</i>

Technical Comments of the EMP

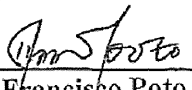
No	Pages	Sections	Ratings	Comments
1.	9, 13 16 26	Executive Summary	C	<i>Tbl. 1.8.1, 18.2, summary of potential significant environmental impact and mitigation measures during construction and operation phase should be rectify which consist of activity, potential impact, mitigation measures, cost mitigation, sampling location, parameter to be monitoring, limit value or environmental quality standard, frequency of monitoring, responsibility of monitoring.</i> <i>Tbl. 1.8.3, summary of potential significant environmental impact and mitigation measures during deactivation stage should omitted.</i> <i>Tbl. 1.10.3, environmental monitoring and surveillance during deactivation stage should omitted.</i>
2.	1	Details of the project proponent	A	Description of project proponent identity such as company name, chairs, contact number and email address generally are complete.
3.	1-5	Details of the EIA consultants who carried out the study and prepared the EMP	A	Description of the EIA consultant to design the EMP such as ASPEC, qualification and experience of each personal generally are complete.
4.	1-19	Description of the project	C	<i>Need to be alter base to the EIS alteration.</i>
5.	1-9	Legal requirement	A	Description of legal requirement such as regulation, standard and guidelines related to the environmental and social aspect that the proponent intend to comply during lifecycle of the project generally are complete.
6.	4	Institutional roles and responsibilities	B	<i>Tbl. 6.2.1, Roles and responsibility of developer and institutional at deactivation stage should be omitted, because the operation stage of this project is for long term/not limited.</i>
7.	1 3	Summary of impacts	C	<i>Tbl. 7.2.1, Summary of several impact during construction and operation stage will not be affected the mangrove, protected are, etc need to be alter. Decommissioning column should be omitted.</i> <i>Sub section 7.3, summary of social impact at deactivation stage should be omitted</i>
8.	1-8 9-10	Description of proposed mitigation measures	C	<i>Tbl . 8.2.1, 8.2.2, The proposed mitigation measures of impact during construction and operation stage need to be rectify that encompass of activity, potential impact, mitigation measures, cost mitigation, sampling and monitoring location, parameter to be monitoring, limit value or environmental quality standard, frequency of monitoring, responsibility of monitoring.</i> <i>Tbl 8.2.3, The proposed mitigation measures of impact during deactivation stage should be omitted.</i>
9.	1-3	Governing parameters	C	<i>Tbl. 9.2.1, description of all key performance indicator at each stage should be appear the threshold of each aspect. Not indicated in other section, and deactivation stage should be omitted.</i>
10.	2-5	Monitoring program	C	<i>Tbl. 10.1.1, 10.1.2, environmental monitoring and surveillance during construction and operation phase, column of compliance requirement should be completed the limit value/benchmark of each aspect (environmental component), not indicated in other section.</i>

	6-7			<i>Tbl. 10.1.3, environmental monitoring and surveillance during deactivation phase should be omitted.</i>
11.	3	Reporting requirements	<i>B</i>	<i>Sub section 11.4, environmental monitoring report during deactivation phase should be omitted.</i>
12.	8-9	Responsibilities for mitigation and monitoring	<i>B</i>	<i>Sub section 12.4, responsibility for mitigation during deactivation stage should be omitted.</i>
13.	9	Emergency plan	<i>B</i>	<i>Sub section 13.5, emergency response plan during deactivation stage should be omitted.</i>
14.	1-3	Decommissioning plan	<i>B</i>	The operation stage of this project is for long term. Therefore deactivation plan should be omitted
15.	1-2	Capacity development and training	<i>A</i>	Description of capacity development and training such as type of the training, trainer, objective, participant and schedule of the training generally are provide.
16.	1-15	Public consultation and information disclosure	<i>B</i>	<i>Need to summarize the public consultation of EIS and EMP draft that has been conducted in January, 2018.</i>
17	1-3	Complaints and grievances mechanisms	<i>C</i>	<i>The mechanism to resolve of any complaints should be split at each stage and appear any complaints related to environmental and social issue.</i>
18	1 9	Work plan and implementation schedule	<i>C</i>	<i>Sub section 18.4, work plan and implementation schedule at deactivation stage should be omitted.</i> <i>Tbl. 18.2.2 (a), (b) and (c) the work plan and implementation schedule should be specific activity of the EMP of each aspect during construction and operation.</i>
19	1	Cost estimates	<i>D</i>	<i>Should be provide the cost mitigation measures base to each aspect in section 18 above.</i>
20	2	Review of the EMP	<i>B</i>	<i>Sub section 20.5, review of the EMP at deactivation stage should be omitted,</i>
21	1-10	Non-technical summary	<i>C</i>	<i>Non technical should be revise base to the EMP revision, provide in both, English and tetum version.</i>
22	-	EMP	<i>C</i>	<i>Should be revise the EMP base on technical comment of participant of the public consultation that conducted in December 2017 and January, 2018.</i>

Rating scale:

- A – Excellent : General is good, no need to revise;
 B – Good : General is good and satisfies, some part mistake but very few;
 C – Sufficient : Satisfied but need to completed some part;
 D – Not good : Some part is not complete, must be consider, not satisfied;
 E – Poor : All is not complete and not satisfied;
 NA : The review section is not applicable.

Technical review



 Francisco Poto
 Head of EIA Department

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28. SUCO TIBAR
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30. VILLAGERS FROM KG FATUNIA
31. VILLAGERS FROM KG LIBAULELO
32. VILLAGERS FROM KG 30 DE AGUSTO
33. VILLAGERS FROM KG MORIS FOUN
34. VILLAGERS FROM KG TERRA SANTA
35. VILLAGERS FROM KG FOMENTO I
36. VILLAGERS FROM KG FOMENTO II
37. VILLAGERS FROM KG FOMENTO III
38. VILLAGERS FROM KG LEMCARI
39. VILLAGERS FROM KG METIN I
40. LA'O HAMUTUK
41. LUTA HAMUTUK
42. CONSERVATION INTERNATIONAL

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**ENVIRONMENTAL MANAGEMENT PLAN
FOR
PROPOSED PELICAN PARADISE DEVELOPMENT,
TIBAR-TASI TOLU, TIMOR-LESTE**

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ABBREVIATIONS

~	Approximately
<	Less than
≤	Less than or equal to
≥	Greater than or equal to
AQG	World Health Organisation Air Quality Guideline
ARB	Antibiotic-resistant Bacteria
ASEAN	Association of Southeast Asian Nations
ASPEC	Asia Pacific Environmental Consultants Sdn Bhd
Attn	Attention
BMPs	Best Management Practices
BOD/BOD ₅	Biochemical Oxygen Demand
C&D	Construction and Demolition
CGM	Complaints and grievances mechanism
COD	Chemical Oxygen Demand
Cont'	Continue
CSR	Corporate Social Responsibility
DC	Decommissioning Contractor
dia	diameter
DO	Dissolved Oxygen
DOE	Department of Environment
Dr	Doctor
DRTL	Democratic Republic of Timor-Leste
E	East
e.g.	Example given
EA	Environmental Assessment
EBL	Decree-Law No.26/2012 on Environmental Basic Law
EBRD	European Bank for Reconstruction and Development
EDTL	<i>Electricidade de Timor-Leste</i>
EHS	Environmental, Health, and Safety
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ELL	Decree-Law No.5/2011 on Environmental Licensing Law
EMCP	Environmental Management Compliance Plan
EMP	Environmental Management Plan
EMR	Environmental Management Reports
EMT	Environmental Management Team
EnvA	Environmental Auditor
EnvMC	Environmental Monitoring Consultant
EO	Environmental Officer
EPI	Environmental Performance Indicator
EQR	Environmental Quality Report
ERP	Emergency Response Plan
ERT	Emergency Response Team
ESCP	Erosion and Sediment Control Plan
etc.	Et cetera
FA	First Aider
Fax	Facsimile
GDP	Gross Domestic Product
GIS	Geographical Information System
GPS	Global Positioning System
HSSC	Hotel service support centre
i.e.	id est
IFC	International Finance Corporation
IT	Information Technology
Kg	<i>Kampung/ Village/ Aldeia</i>
L ₁₀	Ten percentile level

L ₅₀	Fifty percentile level
L ₉₀	Ninety percentile level
L _{Aeq}	Equivalent A-Weighted Continuous Sound Level
L _{eq}	Equivalent Continuous Sound Level
L _{max}	Maximum A-Weighted Continuous Sound Level
L _{min}	Minimum A-Weighted Continuous Sound Level
MAAQS	Malaysian Ambient Air Quality Standards
MBR	Membrane bioreactor
MBR-RO	Membrane bioreactor reverse osmosis
MC	Main Contractor
MCIE	Ministry of Commerce, Industry and Environment
MOM	Minutes of meeting
Mr	Mister
MRT	Mass Rapid Transit
MWQCS	Malaysian Marine Water Quality Criteria and Standards
NCR	Non-compliance report
ND	Not Detected
NDE	National Directorate of Environment
NDPCEI	National Directorate of Pollution Control and Environmental Impact
NE	Northeast/ Not Evaluated
NEQ	Northeast Quadrant
NGO	Non-government Organisations
no.	Number
NTU	Nephelometric Turbidity Unit
NWQS	Malaysian National Water Quality Standards
O&G	Oil and grease
PD	Project Document
PM	Project Manager
PM ₁₀	Particulate Matter 10 micrometre
PM _{2.5}	Particulate Matter 2.5 micrometre
PNMB	Percetakan Nasional Malaysia Berhad
PP	Project Proponent
PPE	Personal Protective Equipment
PPHTL	Pelican Paradise Holdings (Timor-Leste)
RE	Resident Engineer
Ref	Reference
RIAM	Rapid Impact Assessment Matrix
RO	Reverse osmosis
S	South
SC	Sub-contractors
SDP	Strategic Development Plan
SEA	Strategic Environment Assessment
SEIS	Simplified Environmental Impact Statement
SHE	Safety, Health and Environment
SIA	Social Impact Assessment
SOP	Standard Operating Procedures
SPAN	National Water Services Commission
STP	Sewage Treatment Plant
SWRO	Seawater Reverse Osmosis
TBA	To be appointed
Tel	Telephone
TOR	Terms of Reference
TSS	Total suspended solid
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNTAET	United Nations Transitional Administration in East Timor
WHO	World Health Organisation
ZOI	Zone of Impact

CHEMICALS

AN	Ammoniacal Nitrogen
As	Arsenic
Cd	Cadmium
CN	Cyanide
Cr	Chromium
Cr ⁶⁺	Chromium Hexavalent
Cu	Copper
Fe	Iron
Hg	Mercury
Mn	Manganese
NO ₂	Nitrogen Dioxide
NO ₂ ⁻	Nitrite
NO ₃ ⁻	Nitrate
P	Phosphorus
Pb	Lead
Se	Selenium
Zn	Zinc

UNITS

%	Percentage
°	Degree
°C	Degree Celsius
µg/L	Microgramme per litre
µg/m ³	Microgramme per cubic metre
CFU/100 mL	Colony Forming Unit per one hundred millilitre
dB	Decibel
ha	Hectare
km	Kilometre
kW	kilowatt
m ²	Square metre
m ³	Cubic metre
m ³ /day	Cubic metre per day
mg/L	Milligramme per litre
MLD	Million litre per day
mm	Millimetre
MPN	Most probable number

Chapter 1

Executive Summary

CHAPTER 1: EXECUTIVE SUMMARY

1.1 INTRODUCTION

- This Project is for the:

ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED PELICAN PARADISE DEVELOPMENT, TIBAR-TASI TOLU, TIMOR-LESTE.
- The Project is an integrated mixed development with a focus on resort living and recreation, comprising commercial, institutional and environment components. It is supported by infrastructure and utilities.
- The Project covers a land area of 563.04 ha, which straddles Post Administration Dom Aleixo, Dili Municipality, and the Post Administration Bazartete, Liquica Municipality. It is located ~2 km southwest of Presidente Nicolau Lobato International Airport and ~8 km from the capital, Dili.
- This Environmental Management Plan (EMP) is prepared to mitigate the adverse impacts, while enhancing the positive impact throughout the construction and operation phases of the Project.

1.2 PROJECT PROPONENT

Pelican Paradise Holdings (Timor-Leste)

Suite 333B, Timor Plaza
Rua Presidente Nicolau Lobato
Dili, Timor-Leste

Tel: +670 7310 7777

E-mail: enquiries@pelican-paradise.com

Website: www.pelican-paradise.com

Attn: Mr Ravi Kathiravelu (Director)

Dr Jeremiah Chan Kin Meng (Executive Director)

1.3 ENVIRONMENTAL CONSULTANTS

Asia Pacific Environmental Consultants Sdn Bhd

30-2, Jalan 9/125D, Taman Desa Petaling
57100 Kuala Lumpur
Malaysia

Tel: +603 9057 4392

Fax: +603 9057 3943

E-mail: Lkspec@gmail.com

Website: www.aspec.com.my

Attn: Dr Low Kwai Sim (Director)

Dr Jamie Chong Li Yean (Executive Director)

1.4 PROJECT DESCRIPTION

1.4.1 Identification of Project

- **Figure 1.4.1** shows the Project area and the coordinates of the Project boundary.

1.4.2 Category of Project

- The NDPCEI has categorised the Project under Category A, vide letter [ref: 353/DNCPIA/XXII/2016 dated 20 December 2016], which requires an Environmental Assessment (EA) that involves the preparation of an Environmental Impact Statement (EIS) and an EMP, which is the subject of this submission.

1.4.3 Brief Description of the Project

- The Project advocates for an eco-friendly concept development with the following design aspirations:
 - (i) Good access.
 - (ii) Efficient and sustainable use of natural resources.
 - (iii) Economic, social and cultural interactions.
 - (iv) Urban and environmental enrichment.
 - (v) Sufficient utilities and amenities.
- The Project has four major components:
 - (i) Commercial component: comprises an 18-hole golf course, two hotels, service apartments, residential units and commercial centres.
 - (ii) Institutional component: comprises a youth development and community centre, a school and a hospital.
 - (iii) National and environmental component: comprises parks and hill areas, which will be reforested.
 - (iv) Infrastructure and utility component: comprises a utility centre, sewage treatment plant (STP) and water recycling plant, etc.
- **Table 1.4.1** and **Figure 1.4.2** show the 13 Plots of land usage in the Project area. A total of 62.94% will remain as hill forest, which is the largest component; followed by commercial (26.95%); residential development (8.09%); institutional (1.46%) and infrastructure and utilities (0.56%).
- The Project does not include the areas under Plot 12, which is for a large iconic national public park to be developed by the Government separately.
- The Project will be developed in three phases within the duration of six years with overlapping development over the three phases.

Table 1.4.1: Development Components

No	Development	Area (ha)	Percentage (%)
Commercial Component			
1	Plot 1: 5-Star Hotel (464-room)	27.15	4.82
2	Plot 2: 18-Hole Championship Standard Golf Course	98.19	17.44
3	Plot 3: Service Apartments (117 units)	5.91	1.05
4	Plot 7: Commercial Centre 1	9.25	1.64
5	Plot 8: Residential Units	14.56	2.58
6	Plot 9: Residential Units	31.00	5.51
7	Plot 10: 2 nd Hotel	9.68	1.72
8	Plot 13: Commercial Centre 2	1.55	0.28
	Sub-total	197.29	35.04
Institutional Component			
9	Plot 5: School	3.00	0.53
10	Plot 6: Hospital	3.04	0.54
11	Plot 14: Youth Development and Community Centre	2.17	0.39
	Sub-total	8.21	1.46
National and Environmental Component			
12	Plot 11: Forest Reserve Area (Reforestation)	354.38	62.94
	Sub-total	354.38	62.94
Infrastructure and Utility Component			
13	Plot 4: Hotel Service Support Centre (Utility Centre)	3.16	0.56
	Sub-total	3.16	0.56
	Grand Total	563.04	100

Note: The acreage of public park (Plot 12 – 58.80 ha) which will be developed by the Government of Timor-Leste is not included in the total area of Project site (563.04 ha).

1.4.4 Justification and Need for Project

- The need to develop the Project is predicted on a number of strategic factors underpinning the scope of works (see **Chapter 4: Description of the Project**) as follows:
 - (i) Promote tourism activities in Timor-Leste.
 - (ii) Integrated development planning and future growth.
 - (iii) Socio-economic development.
 - (iv) Conserve and rehabilitate the environment.

1.5 LEGAL REQUIREMENTS

- **Table 1.5.1** provides the environmental policies, legislation and regulations for the EIS and EMP to follow.
- Standards and guidelines for environmental quality benchmarking from the World Health Organisation (WHO), Malaysia and other Association of Southeast Asian Nations (ASEAN) countries will be referred to, when there is a lack in Timor-Leste.

Table 1.5.1: Legislation, Regulation, Standard and Guidelines Related to the Project

Components	Legislation, Regulation, Standard and Guidelines
Environmental Assessment	<p><u>Legislations</u></p> <ul style="list-style-type: none"> • Decree-Law No.26/2012 on Environmental Basic Law (EBL) • Decree-Law No.5/2011 on Environmental Licensing Law (ELL) <p><u>Regulations and Guidelines</u></p> <ul style="list-style-type: none"> • Guidelines on Ministerial Diploma on Regulation on Detailed Requirements for Screening, Scoping and the Terms of Reference, Environmental Impact Statements and Environmental Management Plans for Environmental Assessment • Guidelines on Ministerial Diploma for Regulations on Status and Rules of Procedures for Evaluation Committee for Managing the Environmental Assessment Procedure for Category A Projects • Guidelines on the Ministerial Diploma for Regulations on Impacts and Benefits • Ministerial Diploma for Regulation on the Public Consultations Procedures and Requirements during the Environmental Assessment Project
Biodiversity and Protected Areas	<p><u>Legislations</u></p> <ul style="list-style-type: none"> • UNTAET Regulation No.2000/19 on Protected Places • UNTAET Regulation No.2000/17 on the Prohibition of Logging Operation and Export of Wood from East Timor • Draft Decree-Law on Biodiversity • Draft Decree-Law on Forest Management, Draft 6
Fisheries and Aquaculture Legislation	<p><u>Legislations</u></p> <ul style="list-style-type: none"> • Decree-Law No.6/2001 on General Bases of the Legal Regime for Management and Regulation of Fisheries and Aquaculture
Environmental Management	<p><u>Standards and Guidelines</u></p> <ul style="list-style-type: none"> • International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability • World Bank Environmental, Health, and Safety General Guidelines (EHS Guidelines) • IFC Workers' Accommodation: Process and Standards • World Health Organisation (WHO) Guidelines for Community Noise • WHO Air Quality Guidelines
Environmental Quality	<p><u>Standards and Guidelines</u></p> <ul style="list-style-type: none"> • Marine Water Quality: Malaysian Marine Water Quality Criteria and Standard (MWQCS) • Lake Water Quality: Malaysian National Water Quality Standards (NWQS) • Groundwater Quality: Decree-Law No.5/2009 Licensing Regulations, Sale and Quality of Drinking Water and Malaysian Drinking Water Quality Standard • Effluent: Malaysian Sewerage Industry Guidelines • Air Quality: WHO Air Quality Guidelines • Noise Level: WHO Guideline Values for Community Noise in Specific Environments

1.6 INSTITUTIONAL ROLES AND RESPONSIBILITIES

- The institutions that will play a vital role in ensuring a smooth and environmentally sound development of the Project for each phase of development are listed in **Table 1.6.1**.

Table 1.6.1: Institutions Involved in the Project Development

Phase	Key EMT Members
Pre-construction	(i) National Directorate of Pollution Control and Environmental Impact (NDPCEI) (ii) Pelican Paradise Holdings (Timor-Leste) or PP (iii) Asia Pacific Environmental Consultants Sdn Bhd (ASPEC)
Construction	(i) National Directorate of Pollution Control and Environmental Impact (NDPCEI) (ii) National Directorate of Land, Property and Cadastral Services (iii) National Directorate of Roads, Bridges and Flood Control (iv) National Directorate of Water and Sanitation (v) National Directorate of Aquaculture and Fisheries (vi) National Directorate of Sanitation Control and Environmental Health (vii) Department of Policy and Strategic Planning (viii) Suco Comoro and Tibar (iv) Pelican Paradise Holdings (Timor-Leste) or PP (ix) Main Contractor (MC) (x) Environmental Monitoring Consultant (EnvMC) (xi) Environmental Auditor (EnvA)
Operation	(i) National Directorate of Pollution Control and Environmental Impact (NDPCEI) (ii) National Directorate of Water and Sanitation (iii) National Directorate of Forestry and Watershed Management (iv) Pelican Paradise Holdings (Timor-Leste) or PP (v) Environmental Monitoring Consultant (EnvMC) (vi) Environmental Auditor (EnvA)

1.7 SUMMARY OF IMPACTS

- The Project will result in both positive and negative impacts to its environs. The potential significant impacts from various Project activities during construction and operational phases are detailed in **Table 1.7.1**.

Table 1.7.1: Summary of Positive and Negative Impacts from the Project

Impacts		Description
Pre-construction Phase		
Significant Negative Impacts		<ul style="list-style-type: none"> No significant negative impacts ascertained. Result: No mitigations needed.
Construction Phase		
Significant Negative Impacts	Major	<ul style="list-style-type: none"> Soil erosion and sedimentation. Marine and lake water quality deterioration. Air pollution. Result: Mitigations required. Time Period: Short to mid-term.
	Minor	<ul style="list-style-type: none"> Alteration of hydrological system. Displacement of fauna through loss of habitat. Increased noise. Landuse change. Traffic congestion. Social conflicts. Result: Intermittent mitigations required. Time Period: Short to mid-term.
Significant Positive Impacts		<ul style="list-style-type: none"> More jobs and business opportunities. Multiplier effects on the local economy. Result: Need only enhancements. Time Period: Short to long-term.
Operational Phase		
Significant Negative Impacts	Major	<ul style="list-style-type: none"> Water pollution by sewage effluents. Increased traffic volumes. Result: Mitigation measures required. Time Period: Short to mid-term.
	Minor	<ul style="list-style-type: none"> Air pollution. Increased noise level. Increased peak flow discharges. Result: Intermittent mitigation measures required. Time Period: Short to mid-term.
Significant Positive Impacts		<ul style="list-style-type: none"> Aesthetic improvements to Tasi Tolu area. Enhanced terrestrial and lake ecology. Generation of jobs and business. Land value appreciation. Increase in housing, commercial and institutional development. Improvements in standard of living. Increased Gross Domestic Product (GDP) of the country. Increased tourist arrival. Result: Need only enhancements. Time Period: Short to long-term.

1.7.1 Potential Social Impacts

- The potential social impacts are shown in **Table 1.7.2**. The main impacts will likely be in the pre-construction phase when the Government will resettle the communities living within the Project site. During the construction and operational phases, the influx of migrant workers to work in the Project may cause social conflicts with the local population around the area.

Table 1.7.2: Potential Social Impacts during Project Development

Phase	Impacts
Pre-Construction	<p><u>Relocation</u></p> <ul style="list-style-type: none"> • Relocation could cause some psychological impacts among the affected villagers. • As the Government will provide the area free of encumbrances to the PP, the scope of work will not include the relocation aspects in the EIS and EMP.
Construction	<p><u>Public Amenities and Services</u></p> <ul style="list-style-type: none"> • Influx of migrant workers will increase pressures on existing amenities and services. <p><u>Public Health and Safety</u></p> <ul style="list-style-type: none"> • Noise and air pollution from construction activities will affect the workers. • Poor sanitation coupled with inadequate waste disposal facilities will affect both workers and local community health. <p><u>Social Conflicts</u></p> <ul style="list-style-type: none"> • Conflicts may arise between local residents within the 3-km ZOI and migrant workers due to differences in social behaviours and way of life. • Job competition and social ills will likely to be sources of social conflicts.
Operation	<p><u>Social Conflicts</u></p> <ul style="list-style-type: none"> • Tranquillity and way of life affected by arrival of “outsiders”.

1.8 MITIGATION MEASURES

- Since there is no significant impact environmentally during the pre-construction phase, no mitigation measure is required.
- The mitigation measures for the potential negative impacts identified during construction and operational phases, are described in **Tables 1.8.1 – 1.8.2** respectively.

1.8.1 Mitigation Measures for Potential Social Impacts

- **Table 1.8.3** provides the mitigation measures for socio-economic impacts. The mitigation measures are based on employment opportunities, stakeholder engagement, public safety and health and the economy.

Table 1.8.1: Summary of Potential Significant Environmental Impacts and Mitigation Measures during Construction Phase

Project Activity	Potential Significant Environmental Impact	Mitigation Measures	Mitigation Cost (USD)	Sampling Location/ Monitoring Parameters/ Limits	Monitoring Frequency/ Responsibility	Mitigation Responsibility					
<ul style="list-style-type: none"> • Mobilisation by contractors • Labour recruitment • Setting up base camp and site office • Mobilisation of construction equipment and machinery • Construction of the jetty • Land clearing • Biomass removal • Demolition of remnant squatter houses • Earthwork and platform formation • Earthworks, sculpturing and shaping the golf course • General piling and structural works • Final finishing and landscape 	<p>Geology</p> <ul style="list-style-type: none"> • Disturbance to the natural slopes through excavations and other such activities may cause slope slumping and failure, depending on the local geological strikes and dips of the Alieu Formations at the site. 	<p>Geomorphology and Geology</p> <ul style="list-style-type: none"> • Spraying of shotcrete to control rock falls, surface erosion, progressive disintegration of exposed bedrock and infiltration of surface water into the rock cut. • Concrete buttresses to support overhanging rock blocks. • Potentially loose blocks to be secured by applying various reinforcement techniques such as the installation of dowels, rock bolts of rock anchors. • Removal of unstable rock areas and replacement with reinforced wall. • Surface water to be diverted away from the cut slopes. • Horizontal or inclined subsurface drains drilled into the slope cuts will reduce the groundwater level within and prevent build-up of excess water pressure. 	\$100,000	<ul style="list-style-type: none"> • No sampling required. 	<ul style="list-style-type: none"> • Weekly inspection by Environmental Officer (EO). 	<ul style="list-style-type: none"> • Contractor 					
	<p>Soil Erosion</p> <ul style="list-style-type: none"> • Soil erosion has been identified as important during earthworks and construction, which may affect water quality in the lakes and sea. 	<p>Soil Erosion and Sedimentation</p> <ul style="list-style-type: none"> • Minimise earthworks during the rainy season. • Implement best management practices (BMPs) in Erosion and Sediment Control Plan (ESCP). • Turfing to stabilise exposed areas. • Runoff control including earth drain, check dam, temporary berm drain and temporary slope drain to be constructed and well-maintained. • Erosion control including use of covers, such as plastic sheets, turfing and planting, buffer strips and surface roughening. • Sediment control includes building the long bund, check dams, silt fence, silt traps and wash trough to be constructed before commencement of the construction phase. • Monitoring total suspended solid (TSS) and turbidity at discharge points of silt traps. 	\$20,000	<ul style="list-style-type: none"> • Condition of stockpile area. • BMPs implemented. • Water to be sampled monthly at the outlets of silt traps. The parameters to be analysed and its limits are provided below: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Parameter</th> <th>Limits</th> </tr> </thead> <tbody> <tr> <td>Total Suspended Solid (TSS)</td> <td><50 mg/L</td> </tr> <tr> <td>Turbidity</td> <td><250 NTU</td> </tr> </tbody> </table>	Parameter	Limits	Total Suspended Solid (TSS)	<50 mg/L	Turbidity	<250 NTU	<ul style="list-style-type: none"> • Daily inspection by Environmental Officer (EO). • Monthly discharge sampling by Environmental Officer (EO). • Quarterly inspection by Environmental Monitoring Consultant (EnvMC).
Parameter	Limits										
Total Suspended Solid (TSS)	<50 mg/L										
Turbidity	<250 NTU										

Project Activity	Potential Significant Environmental Impact	Mitigation Measures	Mitigation Cost (USD)	Sampling Location/ Monitoring Parameters/ Limits	Monitoring Frequency/ Responsibility	Mitigation Responsibility																																																																																																													
<ul style="list-style-type: none"> Mobilisation by contractors Labour recruitment Setting up base camp and site office Mobilisation of construction equipment and machinery Construction of the jetty Land clearing Biomass removal Demolition of remnant squatter houses Earthwork and platform formation Earthworks, sculpturing and shaping the golf course General piling and structural works Final finishing and landscape (Cont'd)	Water Quality <ul style="list-style-type: none"> Silt and sediment have been identified as the main pollutants. Accidental leaks and spills from new and used oil, fuel and chemical storage sites affect the aquatic resources and groundwater. Inadequate waste management could also cause water pollution. 	Water Pollution <ul style="list-style-type: none"> Implement all mitigation measures proposed for soil erosion. Stockpile of fine materials to be sited away from any watercourses and lakes. Piling works at proposed jetty to be carried out carefully to minimise sediment plume effect. Manage all chemicals, fuel, machine oil and scheduled wastes on-site within proper storage spaces. Adequate construction and domestic waste bins to be provided. All solid wastes to be disposed off at a designated waste disposal area within the Project site before being taken to a designated landfill. Waste segregation to be carried out and clearly labelled. Prohibit disposal of waste generated on-site into drains and the lakes. Temporary sanitary facilities to be provided at the base camp(s), site office and other strategic locations within the working area(s) and to be de-sludged regularly. Kitchens or canteens to be fitted with oil and grease traps with regular maintenance. All scheduled wastes to be managed properly e.g. collected in durable containers with proper labels for neutralisation or treatment. Conduct regular water quality monitoring. 	\$30,000	Ambient Water Quality (for Tasi Tolu Lakes) <ul style="list-style-type: none"> Water sampling points: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="2">Lake Saltwater Sampling</th> </tr> <tr> <th>Points</th> <th>Coordinates</th> </tr> </thead> <tbody> <tr> <td>LW1 (Lake C)</td> <td>S8.56623° E125.51079°</td> </tr> <tr> <td>LW2 (Lake B)</td> <td>S8.56587° E125.50720°</td> </tr> <tr> <td>LW3 (Lake A)</td> <td>S8.56198° E125.49990°</td> </tr> </tbody> </table> As the lake water quality will take some time to stabilise with rehabilitation, it is recommended that the lake water shall be comply with the baseline water quality as shown below. Monitoring parameters/limits (baseline): <table border="1" style="margin-left: 20px;"> <thead> <tr> <th rowspan="2">Parameter⁽ⁱ⁾</th> <th colspan="3">Limits (Baseline)⁽ⁱⁱ⁾</th> </tr> <tr> <th>Lake A (LW3)</th> <th>Lake B (LW2)</th> <th>Lake C (LW1)</th> </tr> </thead> <tbody> <tr><td>Temperature</td><td>37.0</td><td>37.8</td><td>36.5</td></tr> <tr><td>Total Suspended Solid (TSS)</td><td>23</td><td>66</td><td>31</td></tr> <tr><td>Dissolved Oxygen (DO)</td><td>6.3</td><td>4.7</td><td>5.1</td></tr> <tr><td>pH</td><td>7.99</td><td>8.48</td><td>8.40</td></tr> <tr><td>Salinity</td><td>35.0</td><td>48.7</td><td>50.2</td></tr> <tr><td>Conductivity</td><td>41</td><td>51</td><td>54</td></tr> <tr><td>Oil and Grease (O&G)</td><td>ND (<0.5)</td><td>ND (<0.5)</td><td>ND (<0.5)</td></tr> <tr><td>Phenol</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Faecal Coliform</td><td>Absent</td><td>Absent</td><td>Absent</td></tr> <tr><td>Mercury (Hg)</td><td>ND (<0.8)</td><td>ND (<0.8)</td><td>ND (<0.8)</td></tr> <tr><td>Cadmium (Cd)</td><td>ND (<2.0)</td><td>ND (<2.0)</td><td>ND (<2.0)</td></tr> <tr><td>Chromium (VI) (Cr⁶⁺)</td><td>ND (<5.0)</td><td>ND (<5.0)</td><td>ND (<5.0)</td></tr> <tr><td>Copper (Cu)</td><td>24</td><td>28</td><td>12</td></tr> <tr><td>Arsenic (As)</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Lead (Pb)</td><td>ND (<10.0)</td><td>18.7</td><td>ND (<10.0)</td></tr> <tr><td>Zinc (Zn)</td><td>150</td><td>42</td><td>18</td></tr> <tr><td>Cyanide (CN)</td><td>ND (<10.0)</td><td>ND (<10.0)</td><td>ND (<10.0)</td></tr> <tr><td>Ammonia</td><td>64.0</td><td>64.4</td><td>35.5</td></tr> <tr><td>Nitrite (NO₂⁻)</td><td>69.3</td><td>135</td><td>69.7</td></tr> <tr><td>Nitrate (NO₃⁻)</td><td>361</td><td>140</td><td>283</td></tr> <tr><td>Total Phosphorus</td><td>ND (<90)</td><td>104</td><td>282</td></tr> <tr><td>Turbidity</td><td colspan="3" style="text-align: center;">-</td></tr> <tr><td>Phosphate⁽ⁱⁱⁱ⁾</td><td colspan="3" style="text-align: center;">75 µg/L</td></tr> </tbody> </table> <p>Note: (i) Parameters shown in the table above are analysed for ambient lake water quality. (ii) Limits values shown in the table above are baseline findings. (iii) Limits value for phosphate is adopted from Class 2 of Malaysia Marine Water Quality Criteria and Standards (MWQCS).</p>	Lake Saltwater Sampling		Points	Coordinates	LW1 (Lake C)	S8.56623° E125.51079°	LW2 (Lake B)	S8.56587° E125.50720°	LW3 (Lake A)	S8.56198° E125.49990°	Parameter ⁽ⁱ⁾	Limits (Baseline) ⁽ⁱⁱ⁾			Lake A (LW3)	Lake B (LW2)	Lake C (LW1)	Temperature	37.0	37.8	36.5	Total Suspended Solid (TSS)	23	66	31	Dissolved Oxygen (DO)	6.3	4.7	5.1	pH	7.99	8.48	8.40	Salinity	35.0	48.7	50.2	Conductivity	41	51	54	Oil and Grease (O&G)	ND (<0.5)	ND (<0.5)	ND (<0.5)	Phenol	ND (<1.0)	ND (<1.0)	ND (<1.0)	Faecal Coliform	Absent	Absent	Absent	Mercury (Hg)	ND (<0.8)	ND (<0.8)	ND (<0.8)	Cadmium (Cd)	ND (<2.0)	ND (<2.0)	ND (<2.0)	Chromium (VI) (Cr ⁶⁺)	ND (<5.0)	ND (<5.0)	ND (<5.0)	Copper (Cu)	24	28	12	Arsenic (As)	ND (<1.0)	ND (<1.0)	ND (<1.0)	Lead (Pb)	ND (<10.0)	18.7	ND (<10.0)	Zinc (Zn)	150	42	18	Cyanide (CN)	ND (<10.0)	ND (<10.0)	ND (<10.0)	Ammonia	64.0	64.4	35.5	Nitrite (NO ₂ ⁻)	69.3	135	69.7	Nitrate (NO ₃ ⁻)	361	140	283	Total Phosphorus	ND (<90)	104	282	Turbidity	-			Phosphate ⁽ⁱⁱⁱ⁾	75 µg/L			<ul style="list-style-type: none"> Quarterly monitoring by EnvMC 	<ul style="list-style-type: none"> Contractor
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works at proposed jetty to be carried out carefully to minimise sediment plume effect. • Manage all chemicals, fuel, machine oil and scheduled wastes on-site within proper storage spaces. • Adequate construction and domestic waste bins to be provided. • All solid wastes to be disposed off at a designated waste disposal area within the Project site before being taken to a designated landfill. • Waste segregation to be carried out and clearly labelled. • Prohibit disposal of waste generated on-site into drains and the lakes. • Temporary sanitary facilities to be provided at the base camp(s), site office and other strategic locations within the working area(s) and to be de-sludged regularly. • Kitchens or canteens to be fitted with oil and grease traps with regular maintenance. • All scheduled wastes to be managed properly e.g. collected in durable containers with proper labels for neutralisation or treatment. • Conduct regular water quality monitoring. <p>(Cont'd)</p>	(cont'd)	<p>Ambient 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	<p>Hydrology and Drainage</p> <ul style="list-style-type: none"> • Localised ponding may occur because of earthworks and rehabilitation of the lakes. 	<p>Hydrology</p> <ul style="list-style-type: none"> • Provide temporary drainage systems to divert high flows to detention ponds or the lakes when they are yet to be rehabilitated. • Silt traps and earth drains to be constructed before earthwork commencement. 	\$10,000	<ul style="list-style-type: none"> • No sampling required. 	<ul style="list-style-type: none"> • Weekly inspection by Environmental Officer (EO). 	<ul style="list-style-type: none"> • Contractor 														

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	<p>Marine Ecology</p> <ul style="list-style-type: none"> • Land clearing, earthworks and construction of the floating jetty will cause re-suspension of silt in the seabed and erosion from the beaches that can affect the corals. • Anchors from shipping vessels could destroy the corals. • Spilled/leaked oil and chemicals could contaminate the seawater. • Leaking sewage and sullage may cause algal blooms. • Disposal of solid waste in the sea may lead to water pollution and death of large sea animals if ingested. • Collection of corals and marine organisms could cause damage. 	<p>Marine Ecology</p> <ul style="list-style-type: none"> • Implement all mitigation measures proposed for soil erosion, water quality and waste generation. • Provision of silt traps and silt curtain on land to reduce silt from flowing into the sea. • Use silt curtains around piling works during jetty construction to help control the spread of re-suspended silt. • Loading and unloading of materials and equipment to be done with care, so as not to disturb unnecessarily large areas of the beach. • Materials spilled onto the Rua Terra Santa have to be taken away immediately. • For shipping vessels, to ensure they dock only at certain areas away from any corals areas. • Spill kits to be kept on floating jetty. • Penalties such as fines to be imposed to dissuade workers from littering. • Workers are prohibited from fishing and hunting at the nearshore waters. 	\$50,000	<p>Marine Ecology</p> <ul style="list-style-type: none"> • Marine ecology monitoring points: <table border="1"> <thead> <tr> <th colspan="2">Coral Reef</th> <th colspan="2">Phytoplankton and Zooplankton</th> </tr> <tr> <th>Points</th> <th>Coordinates</th> <th>Points</th> <th>Coordinates</th> </tr> </thead> <tbody> <tr> <td>T1</td> <td>S 8.55743° E 125.50452°</td> <td>B1</td> <td>S8.54759° E125.51584°</td> </tr> <tr> <td>T2</td> <td>S 8.55678° E 125.50447°</td> <td>B2</td> <td>S8.55638° E125.50647°</td> </tr> <tr> <td>T3</td> <td>S 8.55722° E 125.50043°</td> <td>B3</td> <td>S8.55572° E125.48918°</td> </tr> <tr> <td>T4</td> <td>S 8.55588° E 125.50070°</td> <td></td> <td></td> </tr> <tr> <td>T5</td> <td>S 8.55450° E 125.48945°</td> <td></td> <td></td> </tr> <tr> <td>T6</td> <td>S 8.55477° E 125.48993°</td> <td></td> <td></td> </tr> <tr> <td>T7</td> <td>S 8.55547° E 125.49722°</td> <td></td> <td></td> </tr> <tr> <td>T8</td> <td>S 8.55527° E 125.49807°</td> <td></td> <td></td> </tr> </tbody> </table> <ul style="list-style-type: none"> • No specific compliance limits/standard for the marine ecology monitoring. The monitored marine components will be benchmarked against the baseline findings. • The marine ecology components during monitoring are: <table border="1"> <thead> <tr> <th>Marine Component</th> <th>Analysis/Observation⁽ⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Phytoplankton and Zooplankton</td> <td> <ul style="list-style-type: none"> • Density. • Species Diversity. </td> </tr> <tr> <td>Coral Reef</td> <td> <ul style="list-style-type: none"> • Percentage cover of live corals, dead coral, rock, sand and rubble. • Observation on coral bleaching, broken or damaged corals. </td> </tr> </tbody> </table>	Coral Reef		Phytoplankton and Zooplankton		Points	Coordinates	Points	Coordinates	T1	S 8.55743° E 125.50452°	B1	S8.54759° E125.51584°	T2	S 8.55678° E 125.50447°	B2	S8.55638° E125.50647°	T3	S 8.55722° E 125.50043°	B3	S8.55572° E125.48918°	T4	S 8.55588° E 125.50070°			T5	S 8.55450° E 125.48945°			T6	S 8.55477° E 125.48993°			T7	S 8.55547° E 125.49722°			T8	S 8.55527° E 125.49807°			Marine Component	Analysis/Observation ⁽ⁱ⁾	Phytoplankton and Zooplankton	<ul style="list-style-type: none"> • Density. • Species Diversity. 	Coral Reef	<ul style="list-style-type: none"> • Percentage cover of live corals, dead coral, rock, sand and rubble. • Observation on coral bleaching, broken or damaged corals. 	<ul style="list-style-type: none"> • Half yearly monitoring by EnvMC. 	<ul style="list-style-type: none"> • Contractor
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<ul style="list-style-type: none"> • Mobilisation by contractors • Labour recruitment • Setting up base camp and site office • Mobilisation of construction equipment and machinery • Construction of the jetty • Land clearing • Biomass removal • Demolition of remnant squatter houses • Earthwork and platform formation • Earthworks, sculpturing and shaping the golf course • General piling and structural works • Final finishing and landscape (Cont'd) 	<p>Terrestrial Ecology</p> <ul style="list-style-type: none"> • Although the terrestrial habitat is not rich with low numbers of wildlife, nevertheless, removal of scrub vegetation will cause some disruptions to the wildlife that is still there. • Destruction of existing habitat with removal of plants and food sources. • Disturbance caused by construction noise. • Poaching and human-wildlife conflicts. 	<p>Terrestrial Ecology</p> <ul style="list-style-type: none"> • Any major wildlife displaced or encountered shall be recorded and immediately contact the relevant authority to relocate them to safe areas. • The hills at the background will be reforested. • Replant native vegetation around the Project site. • Provide hoardings wherever necessary. • Signages and posters placed at the worker camps to inform workers not to harass the animals. 	\$500,000	<ul style="list-style-type: none"> • No sampling required. • When carrying out marine resources management, the following have to be complied with: <ul style="list-style-type: none"> (i) UNTAET Regulation 2000/19 on Protected Places. (ii) Decree Law No. 26/2012 Environmental Basic Law, Article 27. (iii) UNTAET Regulation 2000/17 on the Prohibition of Logging Operations and the Export of Wood from East Timor. (iv) Draft Decree Law on Biodiversity dated March 2012. (v) Draft Decree Law on Forest Management, Draft 6. (vi) National Biodiversity Strategy and Action Plan (2011 – 2012). (vii) Forestry Sector Policy Goal Objective and Strategy. 	<ul style="list-style-type: none"> • <i>Half yearly inspection by EnvMC.</i> 	<ul style="list-style-type: none"> • Contractor
	<p>Lake Ecology</p> <ul style="list-style-type: none"> • Excavated materials from Lakes A and C may contain heavy metals. • Lake rehabilitation will improve the aesthetic value of the Project area. 	<p>Lake Ecology</p> <ul style="list-style-type: none"> • Implement all mitigation measures proposed for soil erosion and water quality • Re-stocking the lakes with appropriate organisms and fish to restore the ecological balance. 	-	<ul style="list-style-type: none"> • No sampling required, already covered under ambient water quality. • Limits in terms of lake management are not provided as no limits were seen in the following laws and regulation (however compliance will be based on it): <ul style="list-style-type: none"> (i) UNTAET Regulation 2000/19 on Protected Places. (ii) Decree Law No. 26/2012 Environmental Basic Law, Article 27. (iii) Draft Decree Law on Biodiversity dated March 2012. (iv) National Biodiversity Strategy and Action Plan (2011 – 2012). 	<ul style="list-style-type: none"> • Half yearly inspection by EnvMC. 	<ul style="list-style-type: none"> • Contractor
	<p>Infrastructure and Utilities</p> <ul style="list-style-type: none"> • Road damage and congestion due to heavy equipment, construction materials transport. • Increase demand for electricity and potable water. 	<p>Infrastructure and Utilities</p> <ul style="list-style-type: none"> • Repair damaged roads immediately. • Place proper signage to inform other road users of construction occurring ahead. • Regular road cleaning of spilled dirt to be carried out at the roads. • Impose maximum load limit. 	\$10,000	<ul style="list-style-type: none"> • No sampling required. 	<ul style="list-style-type: none"> • Monthly inspection by Environmental Officer (EO). 	<ul style="list-style-type: none"> • Contractor • PP
	<p>Landuse</p> <ul style="list-style-type: none"> • Increased pressures on existing infrastructure and services especially at the northeast quadrant (NEQ) of Zone of Impact (ZOI). • Possible difficulties of access to religious, recreational or residential houses, will cause distress. 	<p>Landuse</p> <ul style="list-style-type: none"> • Ensure good traffic management at all times. • Rapid response to mishaps, accidents, damage to property and even road rage. • Provide alternative transport routes if needed. • Provision of alternative ingress/egress for scheduled entry to religious, recreational and residential houses. 	\$5,000	<ul style="list-style-type: none"> • No sampling required. 	<ul style="list-style-type: none"> • Monthly inspection by Environmental Officer (EO). 	<ul style="list-style-type: none"> • Contractor • PP

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	<p>Traffic</p> <ul style="list-style-type: none"> • Occasional traffic congestion. • Higher risk of traffic accidents. 	<p>Traffic</p> <ul style="list-style-type: none"> • Plan, schedule and control trips of road loaders, tractors, etc. to avoid peak road hours. • Positioning flagmen at suitable locations to indicate traffic diversion, if any. • Minimum of two flagmen at suitable locations or temporary traffic lights to be installed to control traffic movement. 	\$1,000	<ul style="list-style-type: none"> • No sampling required. 	<ul style="list-style-type: none"> • Monthly inspection by Environmental Officer (EO). 	<ul style="list-style-type: none"> • Contractor

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They have to be tested before used as refined fills. <p>Construction and Demolition (C&D) Wastes</p> <ul style="list-style-type: none"> • Rusted steel and decomposed wood may contaminate runoff. • They are also hazards in working areas, and have to be disposed off properly. <p>Scheduled/Hazardous Wastes</p> <ul style="list-style-type: none"> • Water pollution may occur if discharged directly into water bodies. • Workers may be exposed via direct contact due to improper handling or storage. <p>Municipal Solid Wastes</p> <ul style="list-style-type: none"> • Improper management of wastes may lead to water pollution, odour and public health impacts. • Uncollected solid waste may attract pest/scavengers. • Open burning may trigger air pollution and health problems. <p>Sewage</p> <ul style="list-style-type: none"> • Untreated sewage may contaminate runoff and water bodies. • Faecal coliform contained in sewage may spread water-borne diseases to humans. 	<p>Waste Generation</p> <p>Biomass</p> <ul style="list-style-type: none"> • Generally sold if there is commercial value. • Unsold biomass to be stored on-site at designated stockpile areas to decompose naturally. • Burning of biomass is prohibited. <p>Spoils</p> <ul style="list-style-type: none"> • Excess spoils to be used for landscaping and reforestation works. <p>Construction and Demolition (C&D) Wastes</p> <ul style="list-style-type: none"> • All C&D wastes to be segregated and stored at designated temporary storage area(s) on-site. <p>Scheduled/Hazardous Wastes</p> <ul style="list-style-type: none"> • Disposal of scheduled/hazardous wastes into water bodies is strictly prohibited. • Scheduled/hazardous wastes to be stored in containers which are compatible, durable and able to prevent spillage and leakage. • The storage area to be built away from water bodies. • Scheduled/hazardous waste containers to be clearly labelled with date generation, contact details of waste generator and waste characteristics. • Bunded storage area containing scheduled/hazardous wastes to be designed, constructed and maintained adequately to prevent spillage or leakage and to be sheltered or roofed or covered with suitable material. • Scheduled/hazardous waste management to be carried out by trained personnel. • An accurate and up-to-date inventory of scheduled/hazardous wastes to be prepared and kept for a period of three years. • The hazardous wastes to be disposed off at a secured landfill or facility approved by the local government. • PPE to be provided for the personnel handling the hazardous wastes. • Emergency spill kits to be provided on-site to facilitate clean-up. Contaminated materials to be treated as hazardous wastes. <p>Municipal Solid Waste</p> <ul style="list-style-type: none"> • Adequate bins to be provided at strategic locations in Project site. • Waste to be disposed off at the Tibar Landfill. • Regular housekeeping at workers quarters and construction site. • Prohibition of open burning of solid waste. <p>Sewage</p> <ul style="list-style-type: none"> • Provision of temporary sanitary facilities at strategic locations within working area(s). • Regular desludging and maintenance of sanitary facilities. 	\$20,000	<ul style="list-style-type: none"> • No sampling required. However, site inspection will be conducted: <table border="1"> <thead> <tr> <th>Component</th> <th>Observation</th> <th>Inspection Location</th> <th>Compliance</th> </tr> </thead> <tbody> <tr> <td>Solid Waste Management</td> <td> <ul style="list-style-type: none"> • General cleanliness. • Number of bins provided and adequacy. </td> <td> <ul style="list-style-type: none"> • At base camp, site office and active work areas. </td> <td>Decree Law No.26/2012 Environmental Basic Law Article 39.</td> </tr> <tr> <td>Biomass and Spoil Management</td> <td> <ul style="list-style-type: none"> • Condition of stockpile area(s). • BMPs implemented. </td> <td> <ul style="list-style-type: none"> • At designated stockpile areas. </td> <td>-</td> </tr> <tr> <td>Hazardous/ Scheduled Waste Management</td> <td> <ul style="list-style-type: none"> • Waste disposal at designated scheduled waste disposal area. • Visual inspection of storage condition. • Signs of oil spill. </td> <td> <ul style="list-style-type: none"> • At storage areas for scheduled wastes. • At active work areas. </td> <td>Decree Law No. 26/2012 Environmental Basic Law, Article 42.</td> </tr> <tr> <td>Sanitation Facilities</td> <td> <ul style="list-style-type: none"> • Adequacy of toilet facilities. • Treatment system installed with effluent discharge limits: <ul style="list-style-type: none"> (i) Biochemical Oxygen Demand (BOD): 50 mg/L (ii) TSS: 100 mg/L </td> <td> <ul style="list-style-type: none"> • At the base camp and site office. </td> <td> <ul style="list-style-type: none"> • Decree Law No. 26/2012 Environmental Basic Law, Article 41. • Malaysian Sewerage Industry Guidelines. </td> </tr> </tbody> </table>	Component	Observation	Inspection Location	Compliance	Solid Waste Management	<ul style="list-style-type: none"> • General cleanliness. • Number of bins provided and adequacy. 	<ul style="list-style-type: none"> • At base camp, site office and active work areas. 	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Table 1.8.2: Summary of Potential Significant Environmental Impacts and Mitigation Measures during Operational Phase

Project Activity	Potential Significant Environmental Impact	Mitigation Measures	Mitigation Cost (USD)	Sampling Location/ Monitoring Parameters/ Limits	Monitoring Frequency/ Responsibility	Mitigation Responsibility																																																																																																											
<ul style="list-style-type: none"> Project operations Maintenance of the golf course and landscape features Maintenance of lakes Maintenance of infrastructure, utilities and facilities 	<p>Water Pollution</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Wastewater from operational activities will be the main source of water pollution. Brine from desalination plant may impact the sea organisms. <p>Golf Course Development</p> <ul style="list-style-type: none"> Fertiliser and pesticide runoff in large amounts could leach and cause eutrophication of the lakes. <p>Hospital Development</p> <ul style="list-style-type: none"> Hospital wastewater discharge without treatment will be a main concern as it contains antibiotic-resistant bacteria (ARB). Discharging harmful chemicals (i.e. x-ray contrast agents, disinfectants, etc.) will impact the aquatic ecosystem adversely. 	<p>Water Pollution</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Regular maintenance and inspection of all piping and wastewater treatment systems. Monitoring of sewage treatment plants' (STPs) effluent quality and performance. <p>Golf Course Development</p> <ul style="list-style-type: none"> Implement pest management. Proper selection and use of chemicals with low leaching potential index and without organochlorines. Limit applications of fertilisers and pesticides and to ensure there is no direct release into water bodies. Record periods of fertilising, pest and weed control activities. Training given to employees on fertiliser and pesticide applications. Proper storage and management of pesticides and fertilisers. Provide only enough irrigation water to a depth just below the root system to minimise leaching. Select suitable turf grass to minimise application of fertilisers, pesticides and water. Use of weed-free plants. Conduct groundwater and surface water quality monitoring. <p>Hospital Development</p> <ul style="list-style-type: none"> Conduct regular maintenance and inspection of hospital wastewater storage and piping system. Provision of a hospital wastewater treatment plant, if necessary. 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Lead ⁽ⁱⁱⁱ⁾ (Pb)	Up to 25 µg/L																																																	
Chromium ⁽ⁱⁱⁱ⁾ (Cr)	50 µg/L																																																	
Mercury ⁽ⁱⁱⁱ⁾ (Hg)	1.0 µg/L																																																	
Nitrate ⁽ⁱⁱⁱ⁾ (NO ₃ ⁻)	50 µg/L																																																	
Total Pesticide ⁽ⁱⁱⁱ⁾	0.50 µg/L																																																	
Parameter ⁽ⁱ⁾	Limits																																																	
Selenium ⁽ⁱⁱⁱ⁾ (Se)	10 µg/L																																																	
Sulphate ^(iv)	250 mg/L																																																	
Total Coliform ^(iv)	0 MPN/100 mL																																																	
Manganese ^(iv) (Mn)	0.1 mg/L																																																	
Zinc ^(iv) (Zn)	3 mg/L																																																	
Iron ^(iv) (Fe)	0.3 mg/L																																																	
Conductivity ^(iv)	-																																																	
Chloride ^(iv)	250 mg/L																																																	
<p>Air Pollution</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Increased number of vehicles will produce more gaseous emissions. Sewage treatment plant (STP) failure may cause odours. <p>Hospital Development</p> <ul style="list-style-type: none"> Proper disposal of clinical wastes needed. 	<p>Air Pollution</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Maintain green buffer areas between the residential areas as natural air filters. Implement traffic control. Ensure frequent monitoring of STPs to prevent odours. Ensure good solid waste management and housekeeping practices at all times. <p>Hospital Development</p> <ul style="list-style-type: none"> Proper management of clinical waste. 	\$10,000	<ul style="list-style-type: none"> No sampling required. 	<ul style="list-style-type: none"> Quarterly inspection by PP for one year only for the indemnity period 	<ul style="list-style-type: none"> PP 																																													
<p>Noise Level</p> <ul style="list-style-type: none"> Increased noise from traffic and tourist activities. 	<p>Noise Level</p> <ul style="list-style-type: none"> Impose speed limits to all vehicles to/from the Project site. Implement traffic control. PP to keep a complaints log book and take action immediately. 	\$5,000	<ul style="list-style-type: none"> No sampling required. 	<ul style="list-style-type: none"> Quarterly inspection by PP for one year only for the indemnity period 	<ul style="list-style-type: none"> PP 																																													

Project Activity	Potential Significant Environmental Impact	Mitigation Measures	Mitigation Cost (USD)	Sampling Location/ Monitoring Parameters/ Limits	Monitoring Frequency/ Responsibility	Mitigation Responsibility																																														
<ul style="list-style-type: none"> Project operations Maintenance of the golf course and landscape features Maintenance of lakes Maintenance of infrastructure, utilities and facilities (cont'd)	<p>Marine Ecology Integrated Mixed Development</p> <ul style="list-style-type: none"> Sewage contamination may have detrimental effects on the coral reefs. Microalgal blooms in the sea may affect marine and human lives. Hypersaline water from the desalination plant may affect corals and disrupt the osmotic balance of marine flora and fauna, if the discharge pipeline is too short for proper mixing with seawater. <p>Golf Course Development</p> <ul style="list-style-type: none"> Usage of fertilisers and pesticides may pollute groundwater and lake water. <p>Hospital Development</p> <ul style="list-style-type: none"> Toxic chemicals and clinical wastes may poison marine flora and fauna if leaked to the sea. 	<p>Marine Ecology Integrated Mixed Development</p> <ul style="list-style-type: none"> Regularly maintain and inspect the STPs to prevent leakages and functional failures. Brine to be discharged at a location far from coral reefs. Regular marine ecology monitoring. <p>Golf Course Development</p> <ul style="list-style-type: none"> Implement integrated pest management measures, similar to the construction phase. Minimise use of fertilisers, pesticides and water. <p>Hospital Development</p> <ul style="list-style-type: none"> Toxic chemicals to be treated in a designated wastewater treatment plant. Clinical solid wastes to have pre-treatment. 	\$5,000	<p>Marine Ecology</p> <ul style="list-style-type: none"> Marine ecology monitoring points: <table border="1" style="margin-left: 40px;"> <thead> <tr> <th colspan="2">Coral Reef</th> <th colspan="2">Phytoplankton and Zooplankton</th> </tr> <tr> <th>Points</th> <th>Coordinates</th> <th>Points</th> <th>Coordinates</th> </tr> </thead> <tbody> <tr> <td>T1</td> <td>S 8.55743° E 125.50452°</td> <td>B1</td> <td>S8.54759° E125.51584°</td> </tr> <tr> <td>T2</td> <td>S 8.55678° E 125.50447°</td> <td>B2</td> <td>S8.55638° E125.50647°</td> </tr> <tr> <td>T3</td> <td>S 8.55722° E 125.50043°</td> <td>B3</td> <td>S8.55572° E125.48918°</td> </tr> <tr> <td>T4</td> <td>S 8.55588° E 125.50070°</td> <td></td> <td></td> </tr> <tr> <td>T5</td> <td>S 8.55450° E 125.48945°</td> <td></td> <td></td> </tr> <tr> <td>T6</td> <td>S 8.55477° E 125.48993°</td> <td></td> <td></td> </tr> <tr> <td>T7</td> <td>S 8.55547° E 125.49722°</td> <td></td> <td></td> </tr> <tr> <td>T8</td> <td>S 8.55527° E 125.49807°</td> <td></td> <td></td> </tr> </tbody> </table> <ul style="list-style-type: none"> The components to analyse during monitoring are: <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Marine Component</th> <th>Analysis/Observation⁽ⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Phytoplankton and Zooplankton</td> <td> <ul style="list-style-type: none"> Density. Species Diversity. </td> </tr> <tr> <td>Coral Reef</td> <td> <ul style="list-style-type: none"> Percentage cover of live corals, dead coral, rock, sand and rubble. Observation on coral bleaching, broken or damaged corals. </td> </tr> </tbody> </table> <ul style="list-style-type: none"> There are no standard limits for biological components. However, when carrying out marine resources management, the following have to be complied with: <ol style="list-style-type: none"> UNTAET Regulation 2000/19 on Protected Places. Draft Decree Law on Biodiversity dated March 2012. National Biodiversity Strategy and Action Plan (2011 – 2012). 	Coral Reef		Phytoplankton and Zooplankton		Points	Coordinates	Points	Coordinates	T1	S 8.55743° E 125.50452°	B1	S8.54759° E125.51584°	T2	S 8.55678° E 125.50447°	B2	S8.55638° E125.50647°	T3	S 8.55722° E 125.50043°	B3	S8.55572° E125.48918°	T4	S 8.55588° E 125.50070°			T5	S 8.55450° E 125.48945°			T6	S 8.55477° E 125.48993°			T7	S 8.55547° E 125.49722°			T8	S 8.55527° E 125.49807°			Marine Component	Analysis/Observation ⁽ⁱ⁾	Phytoplankton and Zooplankton	<ul style="list-style-type: none"> Density. Species Diversity. 	Coral Reef	<ul style="list-style-type: none"> Percentage cover of live corals, dead coral, rock, sand and rubble. Observation on coral bleaching, broken or damaged corals. 	<ul style="list-style-type: none"> Half yearly monitoring by EnvMC for one year only for the indemnity period 	<ul style="list-style-type: none"> PP
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<p>Terrestrial Ecology Integrated Mixed Development</p> <ul style="list-style-type: none"> Human-wildlife conflicts. Lights at night throughout the development may disturb nocturnal wildlife. <p>Golf Course Development</p> <ul style="list-style-type: none"> Chemical pollution from fertilisers and pesticides usage may contaminate groundwater and lake water. 	<p>Terrestrial Ecology Integrated Mixed Development</p> <ul style="list-style-type: none"> Signboards to be placed to warn and/or inform visitor on the existence of wildlife. Hunting, poaching and disturbing local wildlife are prohibited. Reforestation of hillslopes. <p>Golf Course Development</p> <ul style="list-style-type: none"> Oversee turf maintenance and management such as mowing, soil aeration, topdressing with sand, and dethatching of the turf root zone. 	\$10,000	<ul style="list-style-type: none"> No sampling required. When carrying out terrestrial ecology management, the following have to be complied with: <ol style="list-style-type: none"> UNTAET Regulation 2000/19 on Protected Places. UNTAET Regulation 2000/17 on the Prohibition of Logging Operations and the Export of Wood from East Timor. Draft Decree Law on Biodiversity dated March 2012. Draft Decree Law on Forest Management, Draft 6. Draft Decree Law on Biodiversity dated March 2012. Forestry Sector Policy Goal Objective and Strategy. 	<ul style="list-style-type: none"> Half yearly inspection by EnvMC for one year only for the indemnity period 	<ul style="list-style-type: none"> PP 																																															
<p>Lake Ecology</p> <ul style="list-style-type: none"> Water pollutants from partially treated effluent, pesticides and fertilisers may be harmful to aquatic organisms in the lakes causing eutrophication. 	<p>Lake Ecology</p> <ul style="list-style-type: none"> Maintain the efficient functions of the mechanical aeration system to aid water circulation and oxygenation. Implement mitigation measures and BMPs for water quality. 	\$5,000	<ul style="list-style-type: none"> No sampling required. When carrying out lake resources management, the following have to be complied with: <ol style="list-style-type: none"> UNTAET Regulation 2000/19 on Protected Places. Draft Decree Law on Biodiversity dated March 2012. National Biodiversity Strategy and Action Plan (2011 – 2012). 	<ul style="list-style-type: none"> Half yearly inspection by EnvMC for one year only for the indemnity period 	<ul style="list-style-type: none"> PP Golf Course Superintendent 																																															

Project Activity	Potential Significant Environmental Impact	Mitigation Measures	Mitigation Cost (USD)	Sampling Location/ Monitoring Parameters/ Limits	Monitoring Frequency/ Responsibility	Mitigation Responsibility
<ul style="list-style-type: none"> Project operations Maintenance of the golf course and landscape features Maintenance of lakes Maintenance of infrastructure, utilities and facilities (cont'd)	<p>Infrastructure and Utilities Integrated Mixed Development</p> <ul style="list-style-type: none"> Increased traffic. Demand for electricity and water may increase during operations of the Project. Municipal waste will be disposed off at Tibar Landfill. <p>Golf Course Development</p> <ul style="list-style-type: none"> Need for golf course irrigation water. <p>Hospital Development:</p> <ul style="list-style-type: none"> Clinical wastes need to be incinerated and the ash disposed off to Tibar Landfill. 	<p>Infrastructure and Utilities Integrated Mixed Development</p> <ul style="list-style-type: none"> Maintain STPs for efficient treatment of sewage and sullage. Upgrade the internal permanent road network wherever necessary. Provisions of waste disposal bins. Proper collection and disposal of residual oil and grease. <p>Golf Course Development</p> <ul style="list-style-type: none"> Composting of green waste. <p>Hospital Development</p> <ul style="list-style-type: none"> Proper disposal of clinical waste. 	\$5,000	<ul style="list-style-type: none"> No sampling required. 	<ul style="list-style-type: none"> Half yearly inspection by EnvMC for one year only for the indemnity period 	<ul style="list-style-type: none"> PP Contractor
	<p>Tourism</p> <ul style="list-style-type: none"> Disruption to the birds and other avians by golf course activities and visitors to the lakes. Possible eutrophication of Lakes B and C from the golf course fertiliser runoff. Disruption to small fishing vessels by tourist boats and services. Coral bleaching may occur if there are excessive leached pesticides and toxic chemicals. 	<p>Tourism</p> <ul style="list-style-type: none"> Sea and vessel traffic to be managed by the local authorities with the assistance of PP. Berthing and anchoring of vessels to be demarcated clearly away from rich coral areas. Adequate provisions of tourist facilities (e.g. toilets, bathing areas and waste bins). Post signages and enforce strictly the prohibition to collect corals and marine life. Maintain the reforested hillslopes to provide more habitats for resting and breeding of terrestrial fauna. Proper irrigation management to maintain the golf course. 	\$10,000	<ul style="list-style-type: none"> No sampling required. 	<ul style="list-style-type: none"> Half yearly inspection by EnvMC for one year only for the indemnity period 	<ul style="list-style-type: none"> PP

Project Activity	Potential Significant Environmental Impact	Mitigation Measures	Mitigation Cost (USD)	Sampling Location/ Monitoring Parameters/ Limits	Monitoring Frequency/ Responsibility	Mitigation Responsibility																																																								
<ul style="list-style-type: none"> Project operations Maintenance of the golf course and landscape features Maintenance of lakes Maintenance of infrastructure, utilities and facilities (cont'd)	<p>Waste Generation</p> <p>Municipal Solid Waste</p> <ul style="list-style-type: none"> Poor management produces leachate, odour and generation of disease vectors. Garbage can attract pests and scavengers. <p>Scheduled/Hazardous Waste</p> <ul style="list-style-type: none"> Impact on water quality, aquatic life and occupational health. <p>Green Waste</p> <ul style="list-style-type: none"> Leachates from decomposing green wastes may affect aquatic life if leached into the lakes. <p>Sewage</p> <ul style="list-style-type: none"> Mainly generated from integrated mixed development. Poses problems to water quality and public health if the STPs fail. <p>Clinical Waste</p> <ul style="list-style-type: none"> May cause pathogenic/infectious diseases. Safety concerns due to sharps (from medical instruments). Improper chemical waste management may result in hazards to workers, public and patients. 	<p>Waste Generation</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Disposal of scheduled/hazardous wastes into drainage and sewerage systems is prohibited. Hazardous wastes generated to be stored properly with clear labelling for final disposal at a secured landfill or any facility approved by the local authority. <p>Golf Course Development</p> <ul style="list-style-type: none"> Green waste to be collected, composted and used as soil conditioners for golf course maintenance. <p>Hospital Development</p> <ul style="list-style-type: none"> Hazardous wastes to be stored in clearly marked waste bins with plastic liners. Sharps to be disposed off in puncture-proof containers, whilst chemical liquid wastes can be placed in amber disposal containers compatible with their hazardous characteristics. All containers containing hazardous wastes to be labelled appropriately with symbol of waste type and weight. PPE such as gloves, masks and appropriate footwear to be provided for personnel handling clinical wastes. General waste from hospital can be incinerated and disposed off at Tibar Landfill through usual waste collection. 	\$10,000	<p>Solid Waste and Hazardous/Scheduled Waste</p> <ul style="list-style-type: none"> No sampling required. However, site inspection will be conducted: <table border="1"> <thead> <tr> <th>Component</th> <th>Observation</th> <th>Inspection Location</th> <th>Compliance</th> </tr> </thead> <tbody> <tr> <td>Solid Waste Management</td> <td> <ul style="list-style-type: none"> General cleanliness. Number of bins provided and adequacy. </td> <td> <ul style="list-style-type: none"> At base camp, site office and active work areas. </td> <td>Decree Law No.26/2012 Environmental Basic Law Article 39.</td> </tr> <tr> <td>Hazardous/Scheduled Waste Management</td> <td> <ul style="list-style-type: none"> Waste disposal at designated scheduled waste disposal area. Visual inspection of storage condition. Signs of oil spill. </td> <td> <ul style="list-style-type: none"> At storage areas for scheduled wastes. At active work areas. </td> <td>Decree Law No. 26/2012 Environmental Basic Law, Article 42.</td> </tr> </tbody> </table> <p>Sewage</p> <ul style="list-style-type: none"> Sample to be collected at the discharge point of treated effluent. Parameters to be analysed: <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Temperature</td> <td>-</td> <td>Oil and grease (O&G)</td> <td>0.04 mg/L</td> </tr> <tr> <td>Ammoniacal Nitrogen (AN)</td> <td>0.3 mg/L</td> <td>Total Suspended Solid (TSS)</td> <td>50 mg/L</td> </tr> <tr> <td>Biochemical Oxygen Demand (BOD)</td> <td>3 mg/L</td> <td>Total Coliform</td> <td>5,000 count/100 mL</td> </tr> <tr> <td>Chemical Oxygen Demand (COD)</td> <td>25 mg/L</td> <td>Faecal Coliform</td> <td>400 count/100 mL</td> </tr> <tr> <td>Dissolved Oxygen (DO)</td> <td>5 – 7 mg/L</td> <td>Salinity</td> <td>-</td> </tr> <tr> <td>pH</td> <td>6 – 9</td> <td>Lead (Pb)</td> <td>0.05 mg/L</td> </tr> <tr> <td></td> <td></td> <td>Zinc (Zn)</td> <td>5 mg/L</td> </tr> <tr> <td></td> <td></td> <td>Copper (Cu)</td> <td>0.02 mg/L</td> </tr> <tr> <td></td> <td></td> <td>Nitrate (NO₃)</td> <td>7 mg/L</td> </tr> <tr> <td></td> <td></td> <td>Phosphorus</td> <td>0.2 mg/L</td> </tr> </tbody> </table> <p>Note: (i) Parameters shown in the table above are for water quality after treatment. (ii) Limits values shown in the table above are adopted from Class IIB of NWQS for Malaysia.</p>	Component	Observation	Inspection Location	Compliance	Solid Waste Management	<ul style="list-style-type: none"> General cleanliness. Number of bins provided and adequacy. 	<ul style="list-style-type: none"> At base camp, site office and active work areas. 	Decree Law No.26/2012 Environmental Basic Law Article 39.	Hazardous/Scheduled Waste Management	<ul style="list-style-type: none"> Waste disposal at designated scheduled waste disposal area. Visual inspection of storage condition. Signs of oil spill. 	<ul style="list-style-type: none"> At storage areas for scheduled wastes. At active work areas. 	Decree Law No. 26/2012 Environmental Basic Law, Article 42.	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Temperature	-	Oil and grease (O&G)	0.04 mg/L	Ammoniacal Nitrogen (AN)	0.3 mg/L	Total Suspended Solid (TSS)	50 mg/L	Biochemical Oxygen Demand (BOD)	3 mg/L	Total Coliform	5,000 count/100 mL	Chemical Oxygen Demand (COD)	25 mg/L	Faecal Coliform	400 count/100 mL	Dissolved Oxygen (DO)	5 – 7 mg/L	Salinity	-	pH	6 – 9	Lead (Pb)	0.05 mg/L			Zinc (Zn)	5 mg/L			Copper (Cu)	0.02 mg/L			Nitrate (NO ₃)	7 mg/L			Phosphorus	0.2 mg/L	<ul style="list-style-type: none"> Quarterly inspection by EnvMC for one year only 	<ul style="list-style-type: none"> STP Operator Golf Course Superintendent
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Table 1.8.3: Mitigation Measures for Socio-economic Impacts

Socio-economic Impact	Mitigation Measures
<ul style="list-style-type: none"> • Relocation could cause some psychological impacts among the affected villagers. • Disruption in social relationships amongst relocated villagers and with the communities in the new area. • Potential public health and safety issue among the workers and local community from: (i) air and noise pollution, (ii) insufficient living accommodation, poor sanitation and inadequate waste disposal facilities in Project area. • Social conflicts due to influx of migrant workers: (i) competition of jobs among locals and migrant workers; (ii) social ills, such as drugs and alcohol abuses. 	<p><u>Stakeholder Meeting</u></p> <ul style="list-style-type: none"> • Establish a Community Relations Committee at the Suco level to act as a communication channel between the PP and the local community. <p><u>Employment Opportunities</u></p> <ul style="list-style-type: none"> • Job preference given to the local population. • A local “labour desk” shall be set up at the Project site or contractors’ offices to facilitate employing local labour during the construction phase. Locals are also encouraged to fill in clerical and managerial jobs if they are qualified with the right training related to hotel management and the tourism industries. <p><u>Public Health and Safety</u></p> <ul style="list-style-type: none"> • The Community Relations Committee can incorporate awareness campaigns taken jointly on precautionary measures to take related to safety and health. • Local residents shall be alerted to any change in traffic routes and diversion, pedestrian access, etc., wherever and whenever necessary. • Support facilities and infrastructure shall be adequately provided at the construction site to ensure acceptable living conditions of the workers. <p><u>Promoting Economic Linkage</u></p> <ul style="list-style-type: none"> • There should be a deliberate attempt to promote an economic link between the Project and the local community level. This will ensure that they form an integral component in the entire developmental process of the local economy. • Examples of economic integration with the local economy include purchasing local products (raw materials such as sand, etc. during the construction phase, and local produce such as vegetables, etc. during both phases). This will help grow the local economy and decrease unemployment. • Providing continuous training for semi-skilled and skilled jobs to the local youths. • The Community Relations Committee to help find workers to work in the hotel and the tourism-related business. • Small tourism-related business can be undertaken by the local population.

1.9 GOVERNING PARAMETERS

- The governing parameters are best reflected in the Environmental Performance Indicators (EPIs) on the status of the components in line with all relevant environmental requirements by the NDPCEI and other regulatory agencies.
- **Table 1.9.1** provides the key EPIs for the Project and their targeted compliance criteria.

Table 1.9.1: EPIs and Targeted Compliance Criteria

Key Performance Indicator	Targeted Compliance Criteria	Application																																														
		Construction Phase	Operational Phase																																													
Marine and Lake Water Quality	(i) Class 2 of the Malaysia Marine Water Quality Criteria and Standards (MWQCS)	✓	✓																																													
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Groundwater Quality (cont'd)	(ii) Malaysian Drinking Water Quality Standard	X	✓ • Compliance limit for groundwater quality: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits</th> </tr> </thead> <tbody> <tr> <td>Selenium (Se)</td> <td>10 µg/L</td> </tr> <tr> <td>Sulphate</td> <td>250 mg/L</td> </tr> <tr> <td>Total Coliform</td> <td>0 MPN/100 mL</td> </tr> <tr> <td>Manganese (Mn)</td> <td>0.1 mg/L</td> </tr> <tr> <td>Zin (Zn)</td> <td>3 mg/L</td> </tr> <tr> <td>Iron (Fe)</td> <td>0.3 mg/L</td> </tr> <tr> <td>Conductivity</td> <td>-</td> </tr> <tr> <td>Chloride</td> <td>250 mg/L</td> </tr> </tbody> </table> Source: Malaysia Environmental Quality Report (EQR) 2015, DOE, 2015.	Parameter ⁽ⁱ⁾	Limits	Selenium (Se)	10 µg/L	Sulphate	250 mg/L	Total Coliform	0 MPN/100 mL	Manganese (Mn)	0.1 mg/L	Zin (Zn)	3 mg/L	Iron (Fe)	0.3 mg/L	Conductivity	-	Chloride	250 mg/L
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(iii) Conditions of environmental license (if any)	X	✓																			
Erosion and Sedimentation	(i) Erosion and Sediment Control Plan (ESCP)	TSS: 50 mg/L	X																		
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Air Quality	(i) World Health Organisation (WHO) Air Quality Guidelines	✓ • Compliance limit for air quality: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>PM_{2.5}</td> <td>25 µg/m³ over an averaging time of 24 hour (99th percentile)</td> </tr> <tr> <td>PM₁₀</td> <td>50 µg/m³ over an averaging time of 24 hour (99th percentile)</td> </tr> </tbody> </table>	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	PM _{2.5}	25 µg/m ³ over an averaging time of 24 hour (99 th percentile)	PM ₁₀	50 µg/m ³ over an averaging time of 24 hour (99 th percentile)	X												
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Key Performance Indicator	Targeted Compliance Criteria	Application						
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Noise	(i) WHO Guidelines Values for Community Noise in Specific Environments	✓ • Compliance limit for noise: <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>L_{eq}</td> <td>outdoor living area environment category with a limit of L_{Aeq} of 55 dB or 50 dB during day and evening with a time base of 16 hours</td> </tr> </tbody> </table>	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	L _{eq}	outdoor living area environment category with a limit of L _{Aeq} of 55 dB or 50 dB during day and evening with a time base of 16 hours	X	
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(ii) Conditions of environmental license (if any)	✓	X						
Waste Management	(i) <u>Solid Waste Management</u> : Decree Law No.26/2012 Environmental Basic Law Article 39	✓	✓					
	(ii) <u>Hazardous/Scheduled Waste Management</u> : Decree Law No. 26/2012 Environmental Basic Law, Article 42	✓	✓					
	(iii) <u>Sewage (for temporary facility)</u> : (a) Decree Law No. 26/2012 Environmental Basic Law, Article 41. (b) Malaysian Sewerage Industry Guidelines, SPAN, 2009.	✓ • Compliance limit for treated sewage quality: <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits</th> </tr> </thead> <tbody> <tr> <td>Biochemical Oxygen Demand (BOD)</td> <td>50 mg/L</td> </tr> <tr> <td>Total Suspended Solid (TSS)</td> <td>100 mg/L</td> </tr> </tbody> </table> Note: Adopted from Malaysian Sewerage Industry Guidelines.	Parameter ⁽ⁱ⁾	Limits	Biochemical Oxygen Demand (BOD)	50 mg/L	Total Suspended Solid (TSS)	100 mg/L
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Key Performance Indicator	Targeted Compliance Criteria	Application																																			
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	(v) Conditions of Environmental License (if any)	✓	✓																																		

Key Performance Indicator	Targeted Compliance Criteria	Application	
		Construction Phase	Operational Phase
Biodiversity	(i) UNTAET Regulation 2000/19 on Protected Places	✓	X
	(ii) Decree Law No.26/2012 Environmental Basic Law, Article 27	✓	X
	(iii) UNTAET Regulation No.2000/17 on the Prohibition of Logging Operations and the Export of Wood from East Timor	✓	✓
	(iv) Draft Decree Law on Biodiversity, dated March 2012	✓	✓
	(v) Draft Decree Law on Forest Management, draft 6	✓	✓
	(vi) National Biodiversity Strategy and Action Plan (2011 – 2012)	✓	✓
	(vii) Forestry Sector Policy Goal Objective and Strategy	✓	X
	(viii) Conditions of environmental license (if any)	✓	✓

1.10 MONITORING AND AUDITING PROGRAMME

1.10.1 Monitoring Programme

- An environmental monitoring programme for each developmental phase is provided together with its duration for monitoring, sampling methods and parameters. The details of the monitoring programme are in **Tables 1.10.1 and 1.10.2** for the construction and operational phases respectively.
- The monitoring locations for significant environment impact at each phase are shown in **Figures 1.10.1 – 1.10.3**.

1.10.2 Auditing Requirements

- Environmental audits provide a measure of the how the environmental is being protected. It should be conducted half yearly during the construction phase and half yearly (for one year only) during the operational phase.

Table 1.10.1: Environmental Monitoring and Surveillance during Construction Phase

Environmental Components	Procedures/ Methodology	Parameters to be Analysed/ Limits	Compliance Requirements	Proposed Monitoring Locations	Action by Responsible Parties/ Report Submission	Sampling Frequency																																																																																																											
Water quality	<ul style="list-style-type: none"> To be carried out by trained field personnel. Grab samples to be taken. Samples analysed in an accredited laboratory. Sampling and analytical methods shall follow the latest edition of "Standard Methods for the Examination of Water and Wastewater" or equivalent. 	<p>Ambient Water Quality (for Tasi Tolu Lakes)</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameter⁽ⁱ⁾</th> <th colspan="3">Limits (Baseline)⁽ⁱⁱ⁾</th> </tr> <tr> <th>Lake A (LW3)</th> <th>Lake B (LW2)</th> <th>Lake C (LW1)</th> </tr> </thead> <tbody> <tr> <td>Temperature</td> <td>37.0</td> <td>37.8</td> <td>36.5</td> </tr> <tr> <td>Total Suspended Solid (TSS)</td> <td>23</td> <td>66</td> <td>31</td> </tr> <tr> <td>Dissolved Oxygen (DO)</td> <td>6.3</td> <td>4.7</td> <td>5.1</td> </tr> <tr> <td>pH</td> <td>7.99</td> <td>8.48</td> <td>8.40</td> </tr> <tr> <td>Salinity</td> <td>35.0</td> <td>48.7</td> <td>50.2</td> </tr> <tr> <td>Conductivity</td> <td>41</td> <td>51</td> <td>54</td> </tr> <tr> <td>Oil and Grease (O&G)</td> <td>ND (<0.5)</td> <td>ND (<0.5)</td> <td>ND (<0.5)</td> </tr> <tr> <td>Phenol</td> <td>ND (<1.0)</td> <td>ND (<1.0)</td> <td>ND (<1.0)</td> </tr> <tr> <td>Faecal Coliform</td> <td>Absent</td> <td>Absent</td> <td>Absent</td> </tr> <tr> <td>Mercury (Hg)</td> <td>ND (<0.8)</td> <td>ND (<0.8)</td> <td>ND (<0.8)</td> </tr> <tr> <td>Cadmium (Cd)</td> <td>ND (<2.0)</td> <td>ND (<2.0)</td> <td>ND (<2.0)</td> </tr> <tr> <td>Chromium (VI) (Cr⁶⁺)</td> <td>ND (<5.0)</td> <td>ND (<5.0)</td> <td>ND (<5.0)</td> </tr> <tr> <td>Copper (Cu)</td> <td>24</td> <td>28</td> <td>12</td> </tr> <tr> <td>Arsenic (As)</td> <td>ND (<1.0)</td> <td>ND (<1.0)</td> <td>ND (<1.0)</td> </tr> <tr> <td>Lead (Pb)</td> <td>ND (<10.0)</td> <td>18.7</td> <td>ND (<10.0)</td> </tr> <tr> <td>Zinc (Zn)</td> <td>150</td> <td>42</td> <td>18</td> </tr> <tr> <td>Cyanide (CN)</td> <td>ND (<10.0)</td> <td>ND (<10.0)</td> <td>ND (<10.0)</td> </tr> <tr> <td>Ammonia</td> <td>64.0</td> <td>64.4</td> <td>35.5</td> </tr> <tr> <td>Nitrite (NO₂⁻)</td> <td>69.3</td> <td>135</td> <td>69.7</td> </tr> <tr> <td>Nitrate (NO₃⁻)</td> <td>361</td> <td>140</td> <td>283</td> </tr> <tr> <td>Total Phosphorus</td> <td>ND (<90)</td> <td>104</td> <td>282</td> </tr> <tr> <td>Turbidity</td> <td colspan="3" style="text-align: center;">-</td> </tr> <tr> <td>Phosphate⁽ⁱⁱⁱ⁾</td> <td colspan="3" style="text-align: center;">75 µg/L</td> </tr> </tbody> </table> <p>Note: (i) Parameters shown in the table above are for ambient lake water quality. (ii) Limits values shown in the table above to be comply with the baseline findings. (iii) Limits values shown in the table above are adopted from Class 2 of Malaysia Marine Water Quality Criteria and Standards (MWQCS).</p>	Parameter ⁽ⁱ⁾	Limits (Baseline) ⁽ⁱⁱ⁾			Lake A (LW3)	Lake B (LW2)	Lake C (LW1)	Temperature	37.0	37.8	36.5	Total Suspended Solid (TSS)	23	66	31	Dissolved Oxygen (DO)	6.3	4.7	5.1	pH	7.99	8.48	8.40	Salinity	35.0	48.7	50.2	Conductivity	41	51	54	Oil and Grease (O&G)	ND (<0.5)	ND (<0.5)	ND (<0.5)	Phenol	ND (<1.0)	ND (<1.0)	ND (<1.0)	Faecal Coliform	Absent	Absent	Absent	Mercury (Hg)	ND (<0.8)	ND (<0.8)	ND (<0.8)	Cadmium (Cd)	ND (<2.0)	ND (<2.0)	ND (<2.0)	Chromium (VI) (Cr ⁶⁺)	ND (<5.0)	ND (<5.0)	ND (<5.0)	Copper (Cu)	24	28	12	Arsenic (As)	ND (<1.0)	ND (<1.0)	ND (<1.0)	Lead (Pb)	ND (<10.0)	18.7	ND (<10.0)	Zinc (Zn)	150	42	18	Cyanide (CN)	ND (<10.0)	ND (<10.0)	ND (<10.0)	Ammonia	64.0	64.4	35.5	Nitrite (NO ₂ ⁻)	69.3	135	69.7	Nitrate (NO ₃ ⁻)	361	140	283	Total Phosphorus	ND (<90)	104	282	Turbidity	-			Phosphate ⁽ⁱⁱⁱ⁾	75 µg/L			<ul style="list-style-type: none"> As the lake water quality will take some time to stabilise even with rehabilitation measures, it is recommended that the lake water shall comply with the baseline water quality during construction phase. Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> Points: <table border="1"> <thead> <tr> <th colspan="2">Lake Water Sampling</th> </tr> </thead> <tbody> <tr> <td>LW1:</td> <td>S8.56623° E125.51079°</td> </tr> <tr> <td>LW2:</td> <td>S8.56587° E125.50720°</td> </tr> <tr> <td>LW3:</td> <td>S8.56198° E125.49990°</td> </tr> </tbody> </table> 	Lake Water Sampling		LW1:	S8.56623° E125.51079°	LW2:	S8.56587° E125.50720°	LW3:	S8.56198° E125.49990°	<ul style="list-style-type: none"> Indication of non-compliance by EnvMC. Follow-up actions by EO for non-compliance. Monitoring report submission to PP, MC and NDPCEI. 	<ul style="list-style-type: none"> Quarterly monitoring by EnvMC
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Marine ecology	<ul style="list-style-type: none"> To be carried out by trained field personnel. Samples shall be analysed in a laboratory except for coral reefs. 	<p>Marine Ecology</p> <ul style="list-style-type: none"> No specific compliance limits/standard for marine ecology monitoring. The monitored marine components will be benchmarked against the baseline findings. <table border="1"> <thead> <tr> <th>Marine Component</th> <th>Analysis/Observation⁽ⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Phytoplankton and Zooplankton</td> <td> <ul style="list-style-type: none"> Density. Species diversity. </td> </tr> <tr> <td>Coral Reef</td> <td> <ul style="list-style-type: none"> Percentage cover of live corals, dead coral, rock, sand and rubble. Observation on coral bleaching, broken or damaged corals. </td> </tr> </tbody> </table> <p>Note: (i) Items shown in the table above are for marine ecology during monitoring.</p>	Marine Component	Analysis/Observation ⁽ⁱ⁾	Phytoplankton and Zooplankton	<ul style="list-style-type: none"> Density. Species diversity. 	Coral Reef	<ul style="list-style-type: none"> Percentage cover of live corals, dead coral, rock, sand and rubble. Observation on coral bleaching, broken or damaged corals. 	<ul style="list-style-type: none"> Compare with baseline findings for phytoplankton and zooplankton (Section 6.15: Marine Ecology). Compare with baseline findings for coral reef (refer EIS Report Section 6.12: Corals). 	<ul style="list-style-type: none"> Points: <table border="1"> <thead> <tr> <th colspan="2">Phytoplankton and Zooplankton</th> </tr> </thead> <tbody> <tr> <td>B1:</td> <td>S8.54759° E125.51584°</td> </tr> <tr> <td>B2:</td> <td>S8.55638° E125.50647°</td> </tr> <tr> <td>B3:</td> <td>S8.55572° E125.48918°</td> </tr> <tr> <th colspan="2">Coral Reef Sampling</th> </tr> <tr> <td>T1:</td> <td>S 8.55743° E 125.50452°</td> </tr> <tr> <td>T2:</td> <td>S 8.55678° E 125.50447°</td> </tr> <tr> <td>T3:</td> <td>S 8.55722° E 125.50043°</td> </tr> <tr> <td>T4:</td> <td>S 8.55588° E 125.50070°</td> </tr> <tr> <td>T5:</td> <td>S 8.55450° E 125.48945°</td> </tr> <tr> <td>T6:</td> <td>S 8.55477° E 125.48993°</td> </tr> <tr> <td>T7:</td> <td>S 8.55547° E 125.49722°</td> </tr> <tr> <td>T8:</td> <td>S 8.55527° E 125.49807°</td> </tr> </tbody> </table>	Phytoplankton and Zooplankton		B1:	S8.54759° E125.51584°	B2:	S8.55638° E125.50647°	B3:	S8.55572° E125.48918°	Coral Reef Sampling		T1:	S 8.55743° E 125.50452°	T2:	S 8.55678° E 125.50447°	T3:	S 8.55722° E 125.50043°	T4:	S 8.55588° E 125.50070°	T5:	S 8.55450° E 125.48945°	T6:	S 8.55477° E 125.48993°	T7:	S 8.55547° E 125.49722°	T8:	S 8.55527° E 125.49807°	<ul style="list-style-type: none"> Indication of low or exceedance levels of organisms. Monitoring report submission to PP, MC and NDPCEI. 	<ul style="list-style-type: none"> Half yearly by EnvMC
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Waste management	<ul style="list-style-type: none"> Visual inspection on mode and efficiency of disposal. 	<p>Site Condition</p> <ul style="list-style-type: none"> General cleanliness. Number of bins provided and adequacy. 	<ul style="list-style-type: none"> Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> At base camp, site office and active work areas. 	<ul style="list-style-type: none"> Indication of application, effectiveness, efficiency of the management practices. Monitoring report submission to PP, MC and NDPCEI. 	<ul style="list-style-type: none"> Daily inspection by EO of Contractor. 																																
Biomass and spoil management	<ul style="list-style-type: none"> Visual inspection on stockpile management. 	<p>Site Condition</p> <ul style="list-style-type: none"> Condition of stockpile area(s). BMPs implemented. 	<ul style="list-style-type: none"> Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> At designated stockpile areas. 	<ul style="list-style-type: none"> Monitoring report submission to PP, MC and NDPCEI. 	<ul style="list-style-type: none"> Quarterly inspection by EnvMC. 																																
Scheduled waste management	<ul style="list-style-type: none"> Visual inspection on mode and efficiency of storage and disposal. 	<ul style="list-style-type: none"> Waste disposal at designated scheduled waste disposal area. Visual inspection of storage condition. Signs of oil spill. 	<ul style="list-style-type: none"> Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> At storage areas for scheduled wastes. At active work areas. 																																		
Sanitation facilities	<ul style="list-style-type: none"> Visual inspection and ensure no direct discharge of untreated wastewater into open areas or waters. 	<p>Site Condition</p> <ul style="list-style-type: none"> Adequacy of toilet facilities. Treatment system installed with effluent discharge limits: <ul style="list-style-type: none"> (i) Biochemical Oxygen Demand (BOD): 50 mg/L (ii) TSS: 100 mg/L 	<ul style="list-style-type: none"> Malaysian Sewerage Industrial Guidelines. Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> At the base camp and site office. 																																		

Environmental Components	Procedures/ Methodology	Parameters to be Analysed/ Limits	Compliance Requirements	Proposed Monitoring Locations	Action by Responsible Parties/ Report Submission	Sampling Frequency
Safety and health	<ul style="list-style-type: none"> Visual inspection. 	<ul style="list-style-type: none"> Personal protective equipment (PPE) use. Hoarding condition. Safety signage. Toolbox training log. Vector control programme. Emergency Response Plan (ERP). 	<ul style="list-style-type: none"> Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> Throughout Project site. 	<ul style="list-style-type: none"> Indication of application, effectiveness, efficiency of the management practices. Monitoring report submission to PP, MC and NDPCEI. 	<ul style="list-style-type: none"> Daily inspection by EO of Contractor. Quarterly inspection by EnvMC.
Housekeeping	<ul style="list-style-type: none"> Visual inspection. 	<p>Site Condition</p> <ul style="list-style-type: none"> Proper domestic waste disposal method. Presence of vectors. 	<ul style="list-style-type: none"> Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> At the base camp and site office. 		

Note: PP: Project Proponent; MC: Main Contractor; NDPCEI: National Directorate of Pollution Control and Environmental Impact; EO: Environmental Officer; EnvMC: Environmental Monitoring Consultant.

Table 1.10.2: Environmental Monitoring and Surveillance during Operational Phase (One Year Indemnity Period)

Environmental Components	Procedures/ Methodology	Parameters to be Analysed/ Limits	Compliance Requirements	Proposed Monitoring Locations	Action by Responsible Parties/ Report Submission	Sampling Frequency																																																																																																											
Water quality	<ul style="list-style-type: none"> To be carried out by trained field personnel. Grab samples to be taken. Samples analysed in an accredited laboratory. Sampling and analytical methods shall follow the latest edition of "Standard Methods for the Examination of Water and Wastewater" or equivalent. 	<p>Ambient Water Quality (for Tasi Tolu Lakes)</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameter⁽ⁱ⁾</th> <th colspan="3">Limits (Baseline)⁽ⁱⁱ⁾</th> </tr> <tr> <th>Lake A (LW3)</th> <th>Lake B (LW2)</th> <th>Lake C (LW1)</th> </tr> </thead> <tbody> <tr><td>Temperature</td><td>37.0</td><td>37.8</td><td>36.5</td></tr> <tr><td>Total Suspended Solid (TSS)</td><td>23</td><td>66</td><td>31</td></tr> <tr><td>Dissolved Oxygen (DO)</td><td>6.3</td><td>4.7</td><td>5.1</td></tr> <tr><td>pH</td><td>7.99</td><td>8.48</td><td>8.40</td></tr> <tr><td>Salinity</td><td>35.0</td><td>48.7</td><td>50.2</td></tr> <tr><td>Conductivity</td><td>41</td><td>51</td><td>54</td></tr> <tr><td>Oil and Grease (O&G)</td><td>ND (<0.5)</td><td>ND (<0.5)</td><td>ND (<0.5)</td></tr> <tr><td>Phenol</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Faecal Coliform</td><td>Absent</td><td>Absent</td><td>Absent</td></tr> <tr><td>Mercury (Hg)</td><td>ND (<0.8)</td><td>ND (<0.8)</td><td>ND (<0.8)</td></tr> <tr><td>Cadmium (Cd)</td><td>ND (<2.0)</td><td>ND (<2.0)</td><td>ND (<2.0)</td></tr> <tr><td>Chromium (VI) (Cr⁶⁺)</td><td>ND (<5.0)</td><td>ND (<5.0)</td><td>ND (<5.0)</td></tr> <tr><td>Copper (Cu)</td><td>24</td><td>28</td><td>12</td></tr> <tr><td>Arsenic (As)</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Lead (Pb)</td><td>ND (<10.0)</td><td>18.7</td><td>ND (<10.0)</td></tr> <tr><td>Zinc (Zn)</td><td>150</td><td>42</td><td>18</td></tr> <tr><td>Cyanide (CN)</td><td>ND (<10.0)</td><td>ND (<10.0)</td><td>ND (<10.0)</td></tr> <tr><td>Ammonia</td><td>64.0</td><td>64.4</td><td>35.5</td></tr> <tr><td>Nitrite (NO₂⁻)</td><td>69.3</td><td>135</td><td>69.7</td></tr> <tr><td>Nitrate (NO₃⁻)</td><td>361</td><td>140</td><td>283</td></tr> <tr><td>Total Phosphorus</td><td>ND (<90)</td><td>104</td><td>282</td></tr> <tr><td>Turbidity</td><td></td><td>-</td><td></td></tr> <tr><td>Phosphate⁽ⁱⁱⁱ⁾</td><td></td><td>75 µg/L</td><td></td></tr> </tbody> </table> <p>Note: (i) Parameters shown in the table above are for ambient lake water quality. (ii) Limits values shown in the table above to comply with the baseline findings. (iii) Limits values shown in the table above are adopted from Class 2 of Malaysia Marine Water Quality Criteria and Standards (MWQCS).</p>	Parameter ⁽ⁱ⁾	Limits (Baseline) ⁽ⁱⁱ⁾			Lake A (LW3)	Lake B (LW2)	Lake C (LW1)	Temperature	37.0	37.8	36.5	Total Suspended Solid (TSS)	23	66	31	Dissolved Oxygen (DO)	6.3	4.7	5.1	pH	7.99	8.48	8.40	Salinity	35.0	48.7	50.2	Conductivity	41	51	54	Oil and Grease (O&G)	ND (<0.5)	ND (<0.5)	ND (<0.5)	Phenol	ND (<1.0)	ND (<1.0)	ND (<1.0)	Faecal Coliform	Absent	Absent	Absent	Mercury (Hg)	ND (<0.8)	ND (<0.8)	ND (<0.8)	Cadmium (Cd)	ND (<2.0)	ND (<2.0)	ND (<2.0)	Chromium (VI) (Cr ⁶⁺)	ND (<5.0)	ND (<5.0)	ND (<5.0)	Copper (Cu)	24	28	12	Arsenic (As)	ND (<1.0)	ND (<1.0)	ND (<1.0)	Lead (Pb)	ND (<10.0)	18.7	ND (<10.0)	Zinc (Zn)	150	42	18	Cyanide (CN)	ND (<10.0)	ND (<10.0)	ND (<10.0)	Ammonia	64.0	64.4	35.5	Nitrite (NO ₂ ⁻)	69.3	135	69.7	Nitrate (NO ₃ ⁻)	361	140	283	Total Phosphorus	ND (<90)	104	282	Turbidity		-		Phosphate ⁽ⁱⁱⁱ⁾		75 µg/L		<ul style="list-style-type: none"> As the lake water quality will take some time to stabilise even with rehabilitation measures, it is recommended that the lake water shall be complied with the baseline water quality during the first three years of operational phase. Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> Points: <table border="1"> <thead> <tr><th colspan="2">Lake Water Sampling</th></tr> </thead> <tbody> <tr><td>LW1:</td><td>S8.56623° E125.51079°</td></tr> <tr><td>LW2:</td><td>S8.56587° E125.50720°</td></tr> <tr><td>LW3:</td><td>S8.56198° E125.49990°</td></tr> </tbody> </table> 	Lake Water Sampling		LW1:	S8.56623° E125.51079°	LW2:	S8.56587° E125.50720°	LW3:	S8.56198° E125.49990°	<ul style="list-style-type: none"> Indication of non-compliance by EnvMC. Follow-up actions by golf course superintendent for lake water for non-compliance. Follow-up actions by PP for the Lakes and coastal water non-compliance. Monitoring report submission to PP and NDPCEI. 	<ul style="list-style-type: none"> Quarterly by EnvMC for one year only for the indemnity period.
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Environmental Components	Procedures/ Methodology	Parameters to be Analysed/ Limits	Compliance Requirements	Proposed Monitoring Locations	Action by Responsible Parties/ Report Submission	Sampling Frequency																																				
Sewage effluent	<ul style="list-style-type: none"> To be carried out by trained field personnel. Grab samples to be taken. Samples analysed in an accredited laboratory. Sampling and analytical methods shall follow the latest edition of "Standard Methods for the Examination of Water and Wastewater" or equivalent. 	<p>Effluent Quality (for Reuse)</p> <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Temperature</td> <td>-</td> </tr> <tr> <td>Ammoniacal Nitrogen (AN)</td> <td>0.3 mg/L</td> </tr> <tr> <td>Biochemical Oxygen Demand (BOD)</td> <td>3 mg/L</td> </tr> <tr> <td>Biochemical Oxygen Demand (COD)</td> <td>25 mg/L</td> </tr> <tr> <td>Dissolved Oxygen (DO)</td> <td>5 – 7 mg/L</td> </tr> <tr> <td>pH</td> <td>6 – 9</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Oil and grease (O&G)</td> <td>0.04 mg/L</td> </tr> <tr> <td>Total Suspended Solid (TSS)</td> <td>50 mg/L</td> </tr> <tr> <td>Total Coliform^(iv)</td> <td>5,000 count/100 mL</td> </tr> <tr> <td>Faecal Coliform</td> <td>400 count/100 mL</td> </tr> <tr> <td>Salinity</td> <td>-</td> </tr> <tr> <td>Lead (Pb)</td> <td>0.05 mg/L</td> </tr> <tr> <td>Zinc (Zn)</td> <td>5 mg/L</td> </tr> <tr> <td>Copper (Cu)</td> <td>0.02 mg/L</td> </tr> <tr> <td>Nitrate (NO₃⁻)</td> <td>7 mg/L</td> </tr> <tr> <td>Phosphorus</td> <td>0.2 mg/L</td> </tr> </tbody> </table> <p>Note: (i) Parameters shown in the table above are for water quality after treatment. (ii) Limits values shown in the table above are adopted from Class IIB of NWQS from Malaysia.</p>	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Temperature	-	Ammoniacal Nitrogen (AN)	0.3 mg/L	Biochemical Oxygen Demand (BOD)	3 mg/L	Biochemical Oxygen Demand (COD)	25 mg/L	Dissolved Oxygen (DO)	5 – 7 mg/L	pH	6 – 9	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Oil and grease (O&G)	0.04 mg/L	Total Suspended Solid (TSS)	50 mg/L	Total Coliform ^(iv)	5,000 count/100 mL	Faecal Coliform	400 count/100 mL	Salinity	-	Lead (Pb)	0.05 mg/L	Zinc (Zn)	5 mg/L	Copper (Cu)	0.02 mg/L	Nitrate (NO ₃ ⁻)	7 mg/L	Phosphorus	0.2 mg/L	<ul style="list-style-type: none"> Treated Sewage for Reuse: Class IIB of the National Water Quality Standard (NWQS) for Malaysia. 	<ul style="list-style-type: none"> Discharge points of treated effluent. 	<ul style="list-style-type: none"> Indication of non-compliance by EnvMC. Follow-up actions by STP operator for non-compliance. Monitoring report submission to PP and NDPCEI. 	<ul style="list-style-type: none"> Quarterly by EnvMC for one year only for the indemnity period.
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Note: PP: Project Proponent; NDPCEI: National Directorate of Pollution Control and Environmental Impact; EnvMC: Environmental Monitoring Consultant.

1.11 REPORTING REQUIREMENTS

- Environmental reporting to document each work phase, includes:
 - (i) Reporting on environmental monitoring and site inspection – for internal use to provide feedbacks to the PP, MC, Environmental Management Team (EMT) and Emergency Response Team (ERT).
 - (ii) Reporting on environmental monitoring and site inspection – for external use to NDPCEI for their information.
- **Table 1.11.1** shows the environmental reporting for construction, operational and deactivation/decommissioning phases. Details can be referred to **Chapter 11**.

Table 1.11.1: Reporting Requirements according to Project Development

Developmental Phase	Internal	External
Construction	<ul style="list-style-type: none"> • Daily site inspection checklist by EO of the contractor. • Monthly environmental report by EO of the contractor. • Quarterly environmental report by EnvMC. • Environmental auditing report, half yearly by EnvA. • Implementation period: throughout the construction phase. 	<ul style="list-style-type: none"> • <u>Half Yearly Environmental Monitoring Report</u>. • The EnvMC shall compile and interpret the results for incorporation into the Report for submission to the NDPCEI as per requirements in Article 33 of the Decree-Law No.5/2011 on Environmental Licensing Law (ELL).
Operation (one year only for the indemnity period)	<ul style="list-style-type: none"> • Daily site inspection checklist by EO of the contractor. • Monthly environmental report by EO of the contractor. • Quarterly environmental report by EnvMC. • Environmental auditing report, half yearly by EnvA. • Implementation period: for one year only. 	<ul style="list-style-type: none"> • <u>Yearly Environmental Monitoring Report</u>. • The EnvMC shall compile and interpret the results for incorporation into the Report for submission to the NDPCEI as per requirements in Article 33 of ELL.

1.12 RESPONSIBILITIES FOR MITIGATION AND MONITORING

- During Project development, an Environmental Management Team (EMT) shall be established to ensure the mitigation measures contained in the EMP, are carried out accordingly.
- **Table 1.12.1** shows a list of EMT members and the details can be referred to in **Chapter 12** of this EMP.

Table 1.12.1: EMT Members at Each Developmental Phase

Developmental Phase	EMT Members
Construction	<ul style="list-style-type: none"> • Pelican Paradise Holdings (Timor-Leste) or PP • Project Manager (PM) appointed by PP • Main Contractor (MC) • Sub-contractors (SC) • Safety, Health and Environmental (SHE) Manager and Environmental Officer (EO) appointed by the MC • Environmental Monitoring Consultant (EnvMC) appointed by the PP
Operation	<ul style="list-style-type: none"> • PP assisted by PM • Golf Course Superintendent assisted by maintenance supervisor • STP Operator • EnvMC

1.13 EMERGENCY RESPONSE PLAN

- The emergency response plan (ERP) for the Project for each phase is shown in **Table 1.13.1**. The details are in **Chapter 13** of this EMP.

Table 1.13.1: Emergency Response Plan for each Project Developmental Phase

Developmental Phase	Emergency Scenarios
Construction	<ul style="list-style-type: none"> • Serious accidents involving injury • Fatal accidents • Fire or explosions • Oil and hazardous materials spills on land and sea • Structure collapse
Operation	<ul style="list-style-type: none"> • Wastewater overflow • Serious accidents involving injury • Fatal accidents • Fire or explosion

1.14 DECOMMISSIONING PLAN OR CLOSURE REPORT

- As the Project is an integrated mixed resort development project that has a foreseeable long term operational life; and not a project (i.e. mining projects) that has a closure phase, no decommissioning plan is required.

1.15 CAPACITY DEVELOPMENT AND TRAINING

- Training programmes are required to create competency, capability and skills in environmental management throughout Project implementation.
- The training programmes shall include, but not limited to:

- (i) Briefing on the environmental license and the environmental management process to create awareness.
- (ii) On-site scheduled wastes management training.
- (iii) Environmental pollution control.
- (iv) Environmental management and protection.

1.16 PUBLIC CONSULTATION

- The main objectives of public consultation are to inform the stakeholders regarding the Project and to seek their perceptions/comments on the Project .
- For the formal consultation, a total of 16 group discussions had been conducted from September to October 2016 and two public consultations on 12 January 2017 and 18 January 2018.
- For the informal consultation, a questionnaire survey and informal consultations, were carried out on 12 – 13 October 2016 at 11 settlements located within the 3-km Zone of Impact (ZOI).
- The main concerns from the stakeholders were:
 - (i) Accessibility to the St Paul's Holy House, which is usually used for celebration events.
 - (ii) Impact(s) on air, noise and marine water quality during the construction phase of Project.
 - (iii) Socio-economic issues, e.g. livelihood, job opportunities, etc.
- During the public consultations, the concerns from the stakeholders were:
 - (i) Concerns over the future direction of socio-economic development, when there is an influx of workers who may not share the same culture and history as the locals.
 - (ii) Needed to clarify on water sufficiency for the proposed golf course and public parks.
 - (iii) Concerns over electricity demand of the Project.
 - (iv) Concerns over the conversion of Lake A to freshwater as the lake is an important area for bird migration and an area of great importance to the citizens of Timor-Leste.
 - (v) The relocation/resettlement of the residents within the Project site.
 - (vi) The effects of construction on the disruption/disturbance of the surrounding habitats.
 - (vii) Suggested all participants involved in the public workshop to form a committee to supervise the Project development.
- All comments/view/issues received from public consultation activities were taken into account in the EIS and EMP Study.
- The questionnaire surveys showed that most of the respondents supported the development on the expectations of income benefits and employment.

- The overall findings showed that the majority of the stakeholders were in favour of the Project development, as it could boost and attract investments as well as create job opportunities. They recommended that the Project give priority of employment to the local workers, and the training be given to strengthen their working skills.
- They recommended that stakeholders involved in the first public consultation should be invited in all future consultations.
- Public consultation is also recommended during the construction phase as part of the EMP of the Project. It shall focus on the adequacy of the mitigation measures in the development progress.

1.17 COMPLAINT AND GRIEVANCE MECHANISM

- Based on the public consultations, a complaint and grievance mechanism (CGM) has been proposed in the EMP. It comprises three tiers of resolutions, to be established by the PP through the environmental management team (EMT) for construction and operational phases.
- The structure of CGM shall consist of members of the EMT during construction and operational phases, which will chair the CGM with representatives from:
 - (i) Two representatives from the Community Relations Committee (one each from Suco Tibar and Suco Comoro).
 - (ii) One representative from the National Directorate of Pollution Control and Environmental Impact (NDPCEI).
 - (iii) One representative from the Department of Environmental Impact Assessment.
- The details of the CGM for different levels of resolution are provided in **Chapter 17**.

1.18 WORK PLAN AND IMPLEMENTATION SCHEDULE

- The work plan and implementation schedule of the pre-construction, construction and operational phases are shown in **Table 1.18.1**. Construction works could overlap.

Table 1.18.1: Work Plan and Schedule

Development Phase	Description of Work	Working Period
Pre-construction	<ul style="list-style-type: none"> • Preparation of PD, TOR, EIS and EMP. 	<ul style="list-style-type: none"> • One year. • Detailed work schedule is in Table 18.1.1 in Chapter 18: Environmental Work Plan and Implementation Schedule.

Development Phase	Description of Work	Working Period
Construction	<p><u>Work Plan and Implementation</u></p> <ul style="list-style-type: none"> • Site preparation. • Land clearing and earthwork. • Structural construction work. • Final furnishing. <p><u>Environmental Monitoring</u></p> <ul style="list-style-type: none"> • Soil erosion. • Water quality. • Air quality. • Noise level. • Ecology. • Site inspection. 	<ul style="list-style-type: none"> • A total of six years. • Details of work plan and implementation schedule are shown in Table 18.2.1 and environmental monitoring schedule in Tables 18.2.2 (a) to (b) of Chapter 18.
Operation	<p><u>Environmental Monitoring</u></p> <ul style="list-style-type: none"> • Water quality. • Treated effluent. • Ecology. 	<ul style="list-style-type: none"> • One year. • Detailed environmental monitoring schedule is shown in Table 18.3.1 of Chapter 18.

1.19 MITIGATION COST ESTIMATES

- Sufficient budget allocation shall be allocated for undertaking all environmental protection and monitoring works by the PP. The overall estimated environmental budget for the construction and operational phases are summarised in Table 1.19.1.

Table 1.19.1: Overall Estimated Environmental Budget for the Project Development

Developmental Phase	No.	Environmental Management Plan (EMP) Activities	Cost (USD)
Construction	1.	Mitigation Measure for Impact on Geomorphology and Geology	\$100,000
	2.	Soil Erosion and Sedimentation Control Measure	\$20,000
	3.	Water Quality Control Measure	\$30,000
	4.	Air Quality Control Measure	\$50,000
	5.	Mitigation Measure for Impact on Hydrology	\$10,000
	6.	Noise Control Measure	\$100,000
	7.	Ecological Management (Marine, Terrestrial and Lake)	\$550,000
	8.	Mitigation Measure for Impact on Infrastructure and Utilities	\$10,000
	9.	Mitigation Measure for Impact on Landuse	\$5,000
	10.	Mitigation Measure for Impact on Tourism	\$5,000
	11.	Mitigation Measure for Impact on Traffic	\$1,000
	12.	Waste Management	\$20,000
Sub-total			\$901,000
Operation	1.	Water Quality Control Measure	\$20,000
	2.	Air Quality Control Measure	\$10,000
	3.	Noise Control Measure	\$5,000
	4.	Ecological Management (Marine, Terrestrial and Lake)	\$20,000
	5.	Mitigation Measure for Impact on Infrastructure and Utilities	\$5,000

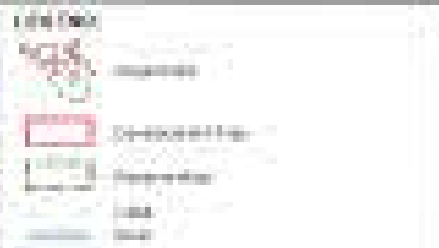
Developmental Phase	No.	Environmental Management Plan (EMP) Activities	Cost (USD)
	6.	Mitigation Measure for Impact on Tourism	\$10,000
	7.	Waste Management	\$10,000
Sub-total			\$80,000
Grand Total			\$981,000

1.20 REVIEW OF EMP

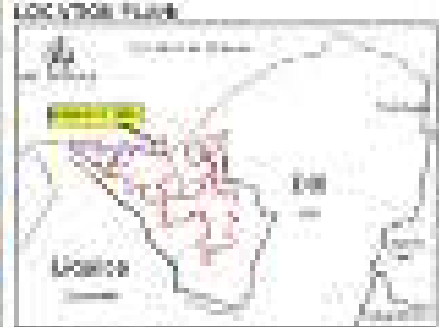
- The EMP shall be reviewed by the NDPCEI and the environmental consultants based on the following:
 - (i) Significant environmental incidents that need follow-up actions.
 - (ii) When there is a need to improve performance in an area of environmental impact.
 - (iii) Periodical actions that are needed for longer time frames such as for five years or more.
 - (iv) Environmental quality standards and requirements that have been amended, upgraded and adopted by NDPCEI.
 - (v) Changing of construction methods, design or sites of construction works.
- The details to review the EMP during construction and operational phases can be referred to in **Chapter 20**.

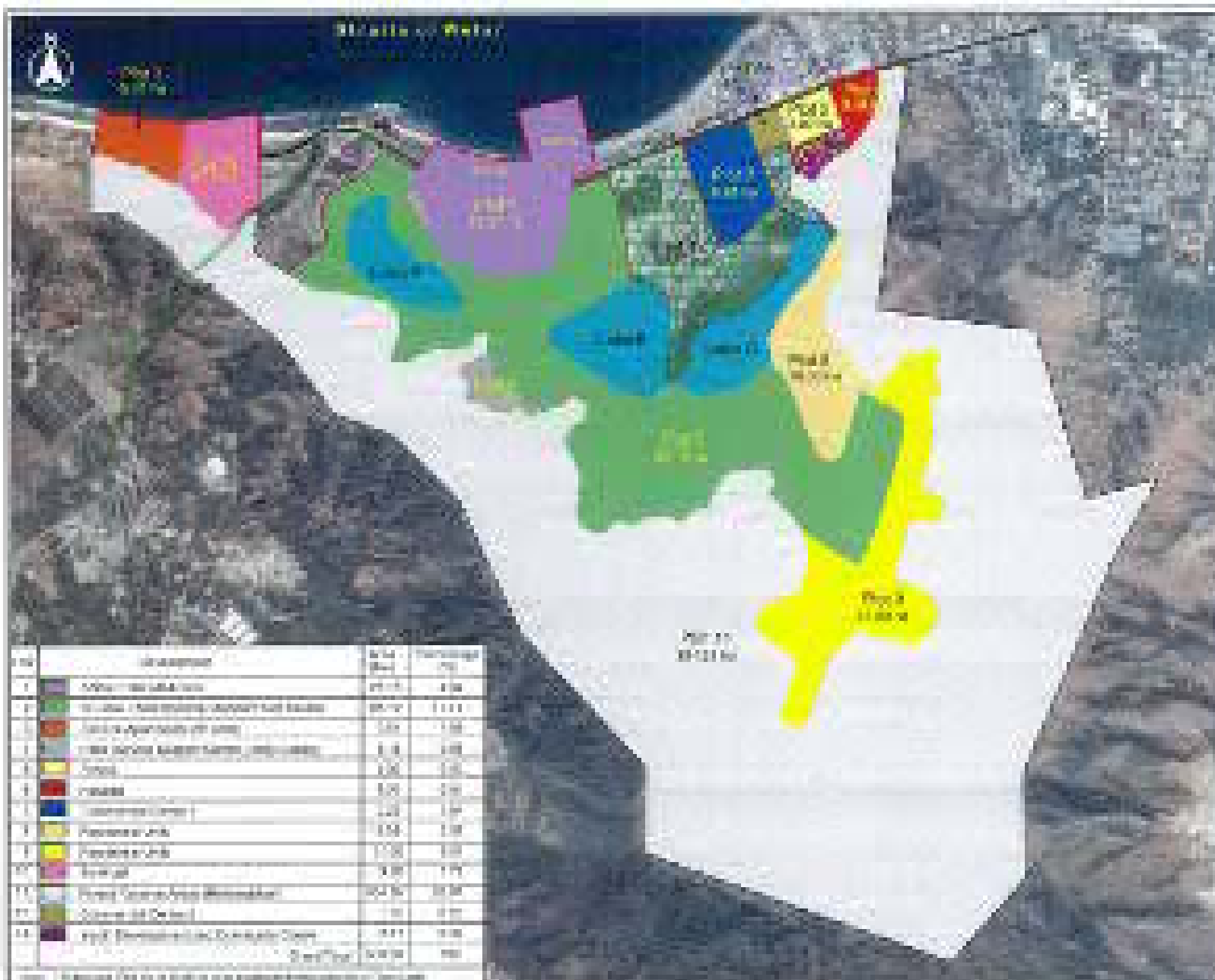
1.21 NON-TECHNICAL SUMMARY

- A non-technical summary of the EMP is presented for **Chapters 2 – 20** to enable non-technical readers to have a clear understanding of the environmental management aspects of this Project (see **Chapter 21: Non-Technical Summary of the EMP**).

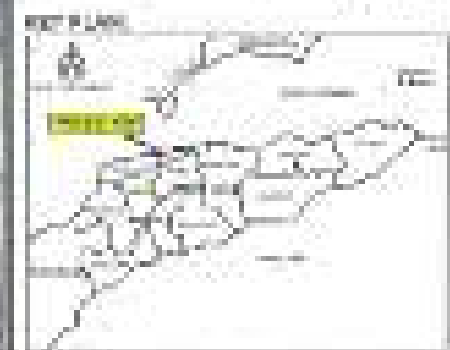


DATA SOURCE:
 The digital elevation model (DEM) data used in this study was obtained from the National Institute of Statistics (NIS) of Timor-Leste. The data was collected using a GPS surveying system on 21 March 2017.





PROJECT LOCATION
 12, Sunda Bu. 15th, Avenue, Dept. of Culture, WTC
 Jakarta, Indonesia 10110
 25, Jalan Kuningan, Kuningan, Jakarta
 10140, Indonesia



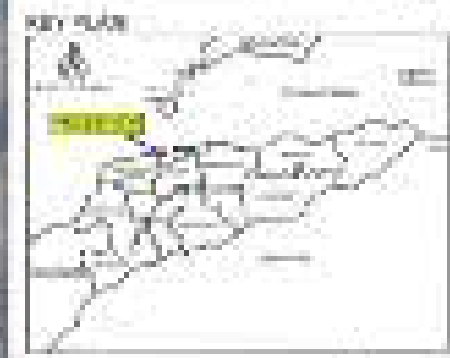
No	Description	Area (m ²)	Percentage (%)
1	Environment Area	2775	4.26
2	Reserve Area	2579	3.83
3	Proposed Site	125	1.87
4	Proposed Site	125	1.87
5	Proposed Site	125	1.87
6	Proposed Site	125	1.87
7	Proposed Site	125	1.87
8	Proposed Site	125	1.87
9	Proposed Site	125	1.87
10	Proposed Site	125	1.87
11	Proposed Site	125	1.87
12	Proposed Site	125	1.87
13	Proposed Site	125	1.87
14	Proposed Site	125	1.87
15	Proposed Site	125	1.87
16	Proposed Site	125	1.87
17	Proposed Site	125	1.87
18	Proposed Site	125	1.87
19	Proposed Site	125	1.87
20	Proposed Site	125	1.87
21	Proposed Site	125	1.87
22	Proposed Site	125	1.87
23	Proposed Site	125	1.87
24	Proposed Site	125	1.87
25	Proposed Site	125	1.87
26	Proposed Site	125	1.87
27	Proposed Site	125	1.87
28	Proposed Site	125	1.87
29	Proposed Site	125	1.87
30	Proposed Site	125	1.87
31	Proposed Site	125	1.87
32	Proposed Site	125	1.87
33	Proposed Site	125	1.87
34	Proposed Site	125	1.87
35	Proposed Site	125	1.87
36	Proposed Site	125	1.87
37	Proposed Site	125	1.87
38	Proposed Site	125	1.87
39	Proposed Site	125	1.87
40	Proposed Site	125	1.87
41	Proposed Site	125	1.87
42	Proposed Site	125	1.87
43	Proposed Site	125	1.87
44	Proposed Site	125	1.87
45	Proposed Site	125	1.87
46	Proposed Site	125	1.87
47	Proposed Site	125	1.87
48	Proposed Site	125	1.87
49	Proposed Site	125	1.87
50	Proposed Site	125	1.87



LEGEND

- Proposed
- Development Area
- Infrastructure
- Road
- Water
- Low Watermarking (1:1000) - 2011
- High Watermarking (1:1000) - 2011
- Low Watermarking (1:500) - 2011
- High Watermarking (1:500) - 2011
- Landmark and Infrastructure Control (1:500) - 2011

DATA SOURCE:
 1) Google Earth Pro, November 2010
 2) Aerial Photo, December 2010

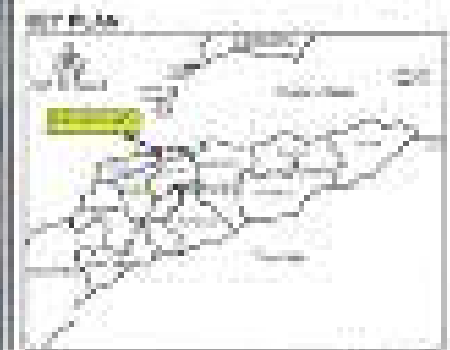


Point	Coordinates	
	Longitude (Easting)	Latitude (Northing)
10000	500000	1000000
10001	500000	1000001
10002	500001	1000000
10003	500001	1000001
10004	500002	1000000
10005	500002	1000001
10006	500003	1000000
10007	500003	1000001
10008	500004	1000000
10009	500004	1000001
10010	500005	1000000
10011	500005	1000001
10012	500006	1000000
10013	500006	1000001



- LEGENDA**
- Project Site
 - Boundary of land
 - Boundary of water
 - Road
 - River
 - Environmental Sensitive Point (ES-1 - 100%)
 - Environmental Sensitive Point (ES-2 - 100%)
 - Environmental Sensitive Point (ES-3 - 100%)
 - Environmental Sensitive Point (ES-4 - 100%)

DATA SOURCE:
 1. Google Earth Map, imagery date: 08/06/2016
 2. Indonesia map, November 2015



Point	Coordinates	
	Latitude (U)	Longitude (E)
DA-001	8.11187°	122.11181°
DA-002	8.00010°	122.00009°
DA-003	8.00010°	122.00010°
DA-004	8.11187°	122.11181°
DA-005	8.00010°	122.00009°
DA-006	8.11187°	122.11181°

PT. SANGIHA PULUPATI
 PT. SANGIHA PULUPATI
 PT. SANGIHA PULUPATI

ENVIRONMENTAL MANAGEMENT PLAN
 FOR PROPOSED MELAN PAULUPATI DEVELOPMENT
 1. DAS-142, TOLU, TIMOR-LESTE



PROPOSED MELAN PAULUPATI DEVELOPMENT
 1. DAS-142, TOLU, TIMOR-LESTE

Scale: 1:40000
 Date: FEB. 2017
 Page: 1/40

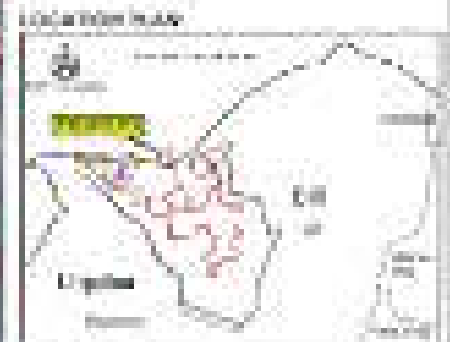


Straits of Water

Point	Coordinates	
	Latitude (N)	Longitude (E)
T1	8.08000°	101.70000°
T2	8.08000°	101.80000°
T3	8.08000°	101.90000°
T4	8.08000°	102.00000°
T5	8.08000°	102.10000°
T6	8.08000°	102.20000°
T7	8.08000°	102.30000°
T8	8.08000°	102.40000°

- LEGEND:**
- Development Area
 - Other Areas
 - Forest
 - Road
 - Canal
 - Canal Boundary (T1-T8)

AREA BOUNDARY:
 T1 (North East) to T8 (South West) along the Straits of Water, East of the Main Canal.



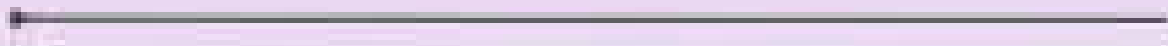
CAUTION: ENVIRONMENTAL MANAGEMENT PLAN
 FROM PROPOSED DEVELOPMENT PROJECTS IN DEVELOPMENT
 TEBERAN-PAH TOLLA, TERENGGANU



Project No: EPD/TER/2011/01
 Date: 12/12/2011
 Page No: 1 of 1
 Author: [Name]

Chapter 2

Project Proponent



CHAPTER 2: PROJECT PROPONENT

2.1 PROJECT PROPONENT

- The Project Proponent (PP) is Pelican Paradise Holdings Timor-Leste (PPHTL). The principal contact persons in the PPHTL for this Environmental Management Plan (EMP) are:

Pelican Paradise Holdings Timor-Leste

Suite 333B, Timor Plaza
Rua Presidente Nicolau Lobato
Comoro, Dom Aleixo
Dili, Timor Leste

Tel: +670 7310 7777

Email: enquiries@pelican-paradise.com

Website: www.pelican-paradise.com

Attn: Mr Ravi Kathiravelu (Director)

Dr Jeremiah Chan Kin Meng (Executive Director)

2.2 EXPERIENCE OF THE PROJECT PROPONENT

(a) Project Proponent

- Pelican Paradise Holdings Timor-Leste (PPHTL) was incepted and led by Datuk Dr Edward Ong who has a proven and noteworthy track record as a developer and hotel operator.
- As an accomplished contractor and developer, Datuk Dr Edward Ong through his OCK Group in Singapore, had completed numerous well-known projects in Singapore of which the Singapore General Hospital, Regency Park Condominium, etc. are good examples. Furthermore, the Group's operations have also covered many big projects in Malaysia, Burma and the Commonwealth of Northern Mariana Islands (Saipan and Guam). The list of his major projects is in **Table 2.2.1**.
- In the mid-90s, Datuk Dr Ong started the Sutera Harbour Resort Project; both as the founder and developer of the resort that was designed as a world-class resort along the coastal belt of Kota Kinabalu, Sabah. This is now an iconic coastal resort in Sabah, offering two 5-star hotels that are complemented by a 27-hole golf course and a 104-berth marina.
- Datuk Dr Ong started on a new journey of faith with a passionate challenge to develop the Timor-Leste integrated mixed development (the Project) in Dili, comprising hotels and commercial areas, golf course, hillside residences, education facilities, youth facilities and hospital. His compelling aim is to create at least 1,500 jobs and more business opportunities for the local communities during the construction phase and similar opportunities during the operational phase to lessen the unemployment situation besetting Timor-Leste. The emphasis on

facilities for youth development, education and health is part of his furtherance in corporate social responsibilities *in lieu* of the lack of opportunities in the country. He hopes that the local communities will benefit greatly from the Project that will eventually raise their standard of living and alleviating poverty in the country that he has come to appreciate, love and value dearly.

Table 2.2.1: Past Projects by Project Proponent

No.	Past Project	Description
Hotel & Resorts		
1.	<p>Sutera Harbour Resort</p> <ul style="list-style-type: none"> • Magellan Sutera Harbour • Pacific Sutera Harbour • Sutera Harbour Golf and Country Club • Sutera Harbour Marina and Country Club 	<p>Datuk Dr Edward Ong is the founder and developer of Sutera Harbour Resort, Kota Kinabalu. He is currently major shareholder and sits on the board of directors.</p> <ul style="list-style-type: none"> • A magnificent 5-star resort with 456 suites complete with a world class spa and facilities. • It has international convention facilities that can easily accommodate 1,200 people. • A luxurious 5-star hotel with 500 rooms. • It has 10 multipurpose and multi-sized meeting rooms including a ballroom for 700 people. • A 27-hole championship golf course designed by Graham March that has won numerous awards of distinction. • 104 berth marine. • Other facilities include a cinema, bowling alley, kids club, fitness centre with Jacuzzi and sauna, billiards room, Olympic sized pool, badminton courts, squash courts and tennis courts.
2.	<p>Sutera Sanctuary Lodges</p> <ul style="list-style-type: none"> • Sutera Sanctuary Lodges Manukan Island Resort • Sutera Sanctuary Lodges at Kinabalu Park 	<p>Datuk Dr Edward Ong and his team currently manage the Sutera Sanctuary Lodges. The Sutera Sanctuary Lodges consist of luxury villas on Manukan Island, Kinabalu Park and Poring Hot Springs.</p> <p>A luxury private island resort with:</p> <ul style="list-style-type: none"> • Single storey Hillside Chalets • Double storey Hillside Chalets • Single storey Beachside Chalets • Double storey Beachside Chalets <p>A UNESCO World Heritage Site with various types of luxury villas</p>
Condominium/Apartments		
1.	Harbour View Towers	30-storey condominium towers in Singapore.
2.	Regency Park	A luxurious condominium project in Singapore consisting of a 25-storey tower and three 4-storey apartment blocks with pool and club facilities.
3.	Grace Garden, Grace Ville and Grace Square	Development in Kota Kinabalu, Malaysia.

No.	Past Project	Description
Civil Works		
1.	Tunnelling Works	3.6 km of tunnelling works for the Orchard Mass Rapid Transit (MRT) including the civil works for the Orchard MRT station in Singapore.
2.	Water & Sewerage Works	<ul style="list-style-type: none"> • 3.7 km sewer line and pump house in Guam. • 12.2 km of water line in Rota. • In Micronesia, a total of 52 km of water lines with ancillary facilities were laid by Datuk Dr Ong through the OCK group.
Shopping Complexes		
1.	Adelphi Shopping Centre and Offices	10-storey complex with five levels of basement (Singapore).
2.	Sultan Plaza	9-storey shopping and entertainment complex (Singapore).
Industrial Complexes		
1.	Industrial Complexes	Numerous factories and industrial complexes have been completed. One of the completed projects is the Richfield Industrial Centre in Singapore.
Hospital		
1.	Singapore General Hospital	This was a \$150 million dollar project consisting of eight blocks of buildings.

(b) Management Team

- The management team of the Timor-Leste Project will be led by Mr Ravi Kathiravelu, a well-known hotelier in the hospitality industry.
- Mr Ravi Kathiravelu was formerly the General Manager at Magellan Sutera Harbour, who led the team to win numerous Hospitality Asia Platinum Awards in 2014 and many other accolades in previous years. Currently, he is holding the position as General Manager for Sutera Sanctuary Lodges.

Chapter 3

Environmental Consultants

CHAPTER 3: ENVIRONMENTAL CONSULTANTS

3.1 ENVIRONMENTAL CONSULTANTS

- Asia Pacific Environmental Consultants Sdn Bhd (ASPEC) is the Lead Environmental Consultant to prepare the Project Document (PD), Terms of Reference (TOR), Environmental Impact Statement (EIS) and the Environmental Management Plan (EMP).
- ASPEC is a professional environmental consultancy firm established in 1991 in Malaysia and is managed by a core group of highly qualified and experienced specialists in the fields of natural and environmental sciences, hydrology, water resources and water chemistry as well as landuse, socio-economics, ecology and geographical information systems. To date, ASPEC has completed over 200 Environmental Impact Assessments (EIAs), EMPs, Environmental Management Reports (EMR), Environmental Management Compliance Plan (EMCP) as well as carried out many projects on environmental monitoring, auditing and integrated river basin and water resources management studies. It has work experiences in East Asian, Association of Southeast Asian Nations (ASEAN) and southern African countries.

ASIA PACIFIC ENVIRONMENTAL CONSULTANTS SDN BHD (ASPEC)

30-2, Jalan 9/ 125D
Taman Desa Petaling
57100 Kuala Lumpur
Malaysia

Tel: +603 9057 4392

Fax: +603 9057 3943

E-mail: Lkspec@gmail.com

Website: www.aspec.com.my

Attn: Dr Low Kwai Sim, FASc (Director)

Dr Jamie Chong Li Yean (Executive Director)

Table 3.1.1: Qualifications, Designation and Tasks of Key Personnel

Consultant	Qualification, Designation and Task
Dr Low Kwai Sim, FASc	(i) Qualification: Ph.D. Hydrology, University of Hull, U.K.; B.A. (Hons) Geography, Universiti Malaya, M'sia (ii) Designation: Environmental Specialist and Hydrologist (iii) Task: <ul style="list-style-type: none"> • Overall coordination of the study. • Carry out the scoping exercises and public consultation with government officers and all other relevant agencies to prepare the PD, the TOR, the EIS and the EMP. • Carry out the environmental assessment through inputs in hydrology, water quality and soil erosion. • Final follow-ups after the EIS and EMP process.

Consultant	Qualification, Designation and Task
Dr Jamie Chong Li Yean	(i) Qualification: Ph.D. Chemical Engineering, University of Nottingham, U.K.; B.Eng. (Hons) Chemical Engineering, University of Nottingham, U.K. (ii) Designation: Air and Noise Modelling Specialist (iii) Task: <ul style="list-style-type: none"> • Conduct studies on air and noise quality and carry out modelling exercises to predict various scenarios as required for the Project site, to eventually provide the best mitigation measures to overcome any adverse problems that may arise during the construction and operations of the Project.
Dr C. N. Chong	(i) Qualification: Ph.D. Chemistry, Australian National University, Australia; B.Sc. Chemistry, University of New Brunswick, Canada (ii) Designation: Chemistry Specialist (iii) Task: <ul style="list-style-type: none"> • Review and provide specialist inputs to assess the water chemistry of the three lakes and seawater.
Datin Zaharah Bt Hj Mahmud	(i) Qualification: M.A. Geography, Universiti Malaya, M'sia; B.A. (Hons) Geography, Universiti Malaya, M'sia (ii) Designation: Landuse Specialist (iii) Task: <ul style="list-style-type: none"> • Conduct studies on the existing and committed landuse of the Project site based on various official and non-official reports pertaining to the area. • Select and input the information and data in the format required for the EIS and EMP Reports, based on landuse compatibility scenarios before and after construction of the Project. • Review the landuse in the adjacent areas including perception analysis regarding the Project.
Puan Sri Prof Dr Jahara Yahaya	(i) Qualification: Ph.D Fisheries Economics, Universiti Malaya, M'sia; M.A. Agriculture Economics, University of London, U.K.; B.A. (Hons) Rural Development, Universiti Malaya, M'sia (ii) Designation: Socio-Economist (iii) Task: <ul style="list-style-type: none"> • Evaluate the existing socio-economic conditions of the communities for baseline within and surrounding the Project. • Define and examine the socio-economic impacts of the Project on the communities directly affected by the Project. • Carry out the socio-economic surveys. • Recommend measures to reduce any negative impacts on the communities living in the vicinity of the Project area.
Prof John Kuna Raj	(i) Qualification: Ph.D Engineering Geology, Universiti Malaya, M'sia; M.Sc. Geomorphology, International Institute for Aerial Survey & Earth Sciences, Netherlands; B.Sc. (Hons) Geology, Universiti Malaya, M'sia (ii) Designation: Geologist (iii) Task: <ul style="list-style-type: none"> • Evaluate the existing geology within and surrounding the Project. • Define and examine the geological impacts of the Project. • Recommend measures to reduce any negative impacts.

Consultant	Qualification, Designation and Task
Phinie Heng Lee Lee	(i) Qualification: M.Eng. Environmental Technology Management, Universiti Putra Malaysia, M'sia; B.Sc. (Hons) Environmental Technology, Universiti Sains Malaysia, M'sia (ii) Designation: Erosion and Sediment Specialist (iii) Task: <ul style="list-style-type: none"> • Assist in overall coordination of the study. • Assist in scoping exercises and public consultations with government officers and all other relevant agencies to prepare the PD, the TOR, the EIS and the EMP. • Assist in follow-ups after the EIS and EMP process. • Assess the existing and potential erosion and sedimentation of the Project site. • Prescribe best management practices, structural and non-structural for their abatement as mitigation measures.
Kervin Chong Sim Chung	(i) Qualification: M.Sc. Aquaculture and Sea Farming, Universiti Sabah Malaysia, M'sia; B.Sc. (Hons) Marine Science, Universiti Sabah Malaysia, M'sia (ii) Designation: Terrestrial and Marine Ecologist (iii) Task: <ul style="list-style-type: none"> • Examine and provide terrestrial and marine biota and inventorise their ecosystems. • Assist to identify the types of corals and marine habitats in the coastal waters in front of the Project site. • Define their impacts and risks to them with the implementation of the Project. • Compilation and analysis of data. • Provide mitigations and rehabilitation measures if required.
Lye Pooi San	(i) Qualification: B.Sc (Hons) Environmental Science, Universiti Kebangsaan Malaysia, M'sia (ii) Designation: Water Quality Specialist (iii) Task: <ul style="list-style-type: none"> • Review and interpret all data and information pertaining to water quality and water chemistry on the riverine and marine ecosystems. • Determine the potential impacts of the Project on the water quality of the lakes and seawater.
Assistant Consultants	
Cheong Jie Ning	(i) Qualification: B.Sc (Hons) Environmental Science, Universiti Kebangsaan Malaysia, M'sia (ii) Designation: Landuse and Traffic Assessor (iii) Task: <ul style="list-style-type: none"> • Assist in scoping exercises and public consultations with government officers and all other relevant agencies to prepare the PD, the TOR, the EIS and the EMP. • Assist in follow-ups after the EIS and EMP process. • Assist in conducting the landuse and traffic surveys. • Compilation and analysis of data.

Consultant	Qualification, Designation and Task
Nureni Kase	(i) Qualification: M.A. Urban Geography, Universiti Malaya, M'sia; B.A. (Hons) Geography, Urban Studies and Planning, Universiti Malaya, M'sia (ii) Designation: Socio-economics and Tourism Assessor (iii) Task: <ul style="list-style-type: none"> • Assist in carrying out the socio-economic and tourism surveys. • Compilation and analysis of data.
Goh Chin Hui	(i) Qualification: B.Sc (Hons) Environmental Science, Universiti Kebangsaan Malaysia, M'sia (ii) Designation: Ecology Assessor (Aquatic) (iii) Task: <ul style="list-style-type: none"> • Assist to carry out the marine ecology surveys. • Compilation and analysis of data.
Steven Wong Siew Por	(i) Qualification: B.Sc (Hons) Environmental Management, Monash University, M'sia (ii) Designation: Ecology Assessor (Terrestrial) (iii) Task <ul style="list-style-type: none"> • Conduct marine (coral survey) and terrestrial ecology surveys (bird, herpetofauna and mammal survey). • Compilation and analysis of data.
Pang See Min	(i) Qualification: B.Sc (Hons) Environmental Science, Universiti Sabah Malaysia, M'sia (ii) Designation: Air Quality Assessor (iii) Task <ul style="list-style-type: none"> • Assist to carry out air quality assessment. • Compilation and analysis of data.
Tong Poh Ying	(i) Qualification: M.Eng Safety, Health and Environment, Universiti Malaya, M'sia; B.Sc (Hons) Environmental Science, Universiti Kebangsaan Malaysia, M'sia (ii) Designation: Environmental Management Plan (EMP) Coordinator (iii) Task <ul style="list-style-type: none"> • Preparation of EMP and incorporation of mitigation measures and regulations into the EMP.
Johan Ngeow Kin Voon	(i) Qualification: M.Sc Hydrology, Water Quality, Water Resources Management and Soil Erosion Studies, Universiti Putra Malaysia, M'sia; B.Sc. (Hons) Environmental Science, Universiti Putra Malaysia, M'sia (ii) Designation: Field Supervisor (iii) Task <ul style="list-style-type: none"> • Supervise the baseline monitoring team in conducting field sampling (air, noise and water).
Wan Nor 'Afifah Binti Wan Mohammad Nor	(i) Qualification: B.Sc (Hons) Environmental Health and Safety, Universiti Teknologi MARA, M'sia (ii) Designation: Health and Water Quality Assessor (iii) Task <ul style="list-style-type: none"> • Assist to carry out water quality assessment. • Compilation and analysis of data.

Consultant	Qualification, Designation and Task
Bryan How Fuh Yuan	(i) Qualification: B.Sc (Hons) Environmental Science, Monash University Clayton, Australia (ii) Designation: Traffic and Tourism Assessor (iii) Task <ul style="list-style-type: none"> • Assist to carry out traffic and tourism survey. • Compilation and analysis of data.
Norlaila binti Kamaruddin	(i) Qualification: B.Sc (Hons) Surveying Science and Geomatics, Universit Teknologi MARA, M'sia (ii) Designation: Geographic Information System (GIS) Specialist (iii) Task <ul style="list-style-type: none"> • Prepare all information and maps in GIS format.

Chapter 4

Description of the Project

CHAPTER 4: DESCRIPTION OF THE PROJECT

4.1 IDENTIFICATION OF PROJECT

- **Nature of the Project:** The Project is an integrated mixed resort development comprising two hotels, an 18-hole golf course, residential housing, commercial areas, a hospital, a school, youth development and community centre, nature and forest areas.
- **Size of the Project:** The Project covers 563.04 ha, excluding the lands earmarked for a national public park, belonging to and will be developed by the Government of the Democratic Republic of Timor-Leste (DRTL).
- **Location:** The proposed development straddles Post Administration Dom Aleixo, Municipality of Dili, and Post Administration Bazartete, Municipality of Liquica. It is located ~2 km southwest of Presidente Nicolau Lobato International Airport and 8 km from the capital, Dili.
- The Project area is identified by Global Positioning System (GPS) readings given in **Table 4.1.1** and shown in **Figure 4.1.1**.

Table 4.1.1: Project Boundary Coordinates

Boundary Point	Coordinates	
	Latitude (°)	Longitude (°)
1	S8.554446	E125.516236
2	S8.562661	E125.515302
3	S8.563319	E125.520584
4	S8.568247	E125.524703
5	S8.581586	E125.520381
6	S8.584323	E125.517962
7	S8.580791	E125.507756
8	S8.569097	E125.501453
9	S8.559511	E125.489082
10	S8.556161	E125.489312

4.2 CATEGORY OF THE PROJECT

4.2.1 Category of Project

- The National Directorate of Pollution Control and Environmental Impact (NDPCEI), has categorised the **Proposed Pelican Paradise Development, Tibar-Tasi Tolu, Timor-Leste** (hereinafter known as 'the Project'), under Category A, vide letter [ref: 353/DNCPIA/XXII/2016 dated 20 December 2016]. This means that it must undergo an environmental assessment process that includes the preparation of an Environmental Impact Statement (EIS) and Environmental Management Plan (EMP), which is the subject of this submission.

- The developmental components for assessment are grouped as shown below:

Development Component	Area (ha)	Decree-Law No.5/2011 – Environmental Licensing Law	
		Related Annex	Related Sector Criteria
5-Star Hotel (Plot 1) 2 nd Hotel (Plot 10)	27.15 9.68	Annex 1	<u>Sector X: Tourism (No 2):</u> Construction and expansion of hotels ≥100 rooms or ≥10 ha
18-Hole Championship Standard Golf Course (Plot 2)	98.19	Annex 1	<u>Sector X: Tourism (No 4):</u> Golf Course ≥10 ha
Service Apartments (Plot 3)	5.91	Annex 1	<u>Sector X: Tourism (No 3):</u> Construction of apartments and tourist apartment along the sea coast ≥100 locations
Commercial Centres (Plots 7 and 13)	10.80	Annex 1	<u>Sector VI: Civil Construction (No 2):</u> Commercial units of a size for a commercial centre ≥2 ha
Residential Units (Plots 8 and 9)	45.56	Annex 1	<u>Sector VI: Civil Construction (No 3):</u> Construction of multi-story building and apartments ≥2 ha
School, Youth Development and Community Centre (Plots 5 and 14)	5.17	Annex 1	<u>Sector VI: Civil Construction (No 3):</u> Construction of multi-story building and apartments ≥2 ha
Hotel Service Support Centre (Utility Centre) with Sewage Treatment Plant (Plot 4)	3.16	Annex 2	<u>Sector VII: Sanitation (No 2):</u> Wastewater Treatment Stations, <10,000 families/ eq.
Hospital (Plot 6)	3.04	Annex 1	<u>Sector VII: Sanitation (No 6):</u> Hospital ≥100 rooms
Forest Reserve Areas (Plot 11)	354.38	Annex 1	<u>Sector XII: Location Factor (No 1):</u> Sensitive or valuable ecosystem (beaches, mangroves, coral reef, protected area, marine areas) including the three saltwater lakes <u>Sector XII: Location Factor (No 2):</u> Unique and valuable landscape <u>Sector XII: Location Factor (No 3):</u> Archaeological and/or historic site <u>Sector XII: Location Factor (No 5):</u> Geographically sensitive area

4.2.2 Legal Requirements

- The legislations governing this EIS and EMP process are the Decree Law No.26/2012 on Environmental Basic Law; and the Decree-Law No.5/2011 on Environmental Licensing Law (ELL) under Article 5, wherein it is also required to submit a Project Document (PD) and the Terms of Reference (TOR) for approval before proceeding to submit the EIS and EMP.
- The PD and the TOR have been satisfactorily done and approved by the NDPCEI and Ministry of Commerce, Industry and Environment (MCIE) vide letters Ref.: 353/DNCPIA/XII/2016 dated 20 December 2016 and Ref.: 407/Gab.MCIA/III/2017 dated 6 March 2017 respectively (attached in **Appendices 4-A and 4-B**).

4.2.3 Environmental Assessment and Approval Process

- **Legislation:** Regulatory approval for developmental projects, such as this Project, is undertaken by the National Directorate of Pollution Control and Environmental Impact (NDPCEI) under the Decree-Law No.5/2011 on Environmental Licensing Law (ELL) that outlines the environmental licensing system for public and private projects likely to produce environmental impacts. The licensing system comprising procedures, roles and responsibilities, is shown in **Figure 4.2.1**.
- **Project Document (PD):** The draft PD was submitted to the NDPCEI on 4 November 2016 for review. The Final PD was submitted on 16 December 2016 and approved by NDPCEI on 20 December 2016 (**Appendix 4-A**). The Project has been classified as Category A project for which a Terms of Reference (TOR) has to be prepared for review by the NDPCEI (see **Figure 4.2.1**).
- **Terms of Reference (TOR):** The Draft TOR was submitted to the MCIE on 30 December 2016 and a Public Consultation with the relevant stakeholders was conducted on 12 January 2017 (refer **Chapter 13: Public Consultation and Information Disclosure** and **Appendix 13-B**). The technical comments regarding the Draft TOR were forwarded by MCIE to the PP, vide letter dated 19 January 2017 [Ref: 306/Gab. MCIA/I/2017]. The Final TOR was submitted on 30 January 2017 and approved by MCIE on 6 March 2017 vide letter Ref.: 407/Gab.MCIA/III/2017 (**Appendix 4-B**).
- **Draft EIS and EMP:** To comply with the Decree-Law No.5/2011 on Environmental Licensing Law and the TOR Approval letter (**Appendix 4-B**), the Draft EIS and EMP had been submitted to NDPCEI on 24 August 2017. A Public Consultation with the relevant stakeholders on the Draft EIS and EMP, was conducted on 18 January 2018. The concerns and comments from the stakeholders can be referred to in Chapter 13: Public Consultations, and in **Appendix 13-C**.
- The technical comments, from the General Directorate of Environment (DGE), Vice Ministry of Development for Housing, Spatial Planning and Environment (VMDHSPE), on the Draft EIS and EMP were forwarded to the Project Proponent (PP), vide letter dated 26 February 2018 [Ref: 64/DGA-MDHOA/II/2018, **Attachment 3** in Preamble].
- **Final EIS and EMP:** The response to concerns/comments from the Public Consultation and the General Directorate of Environment had been incorporated

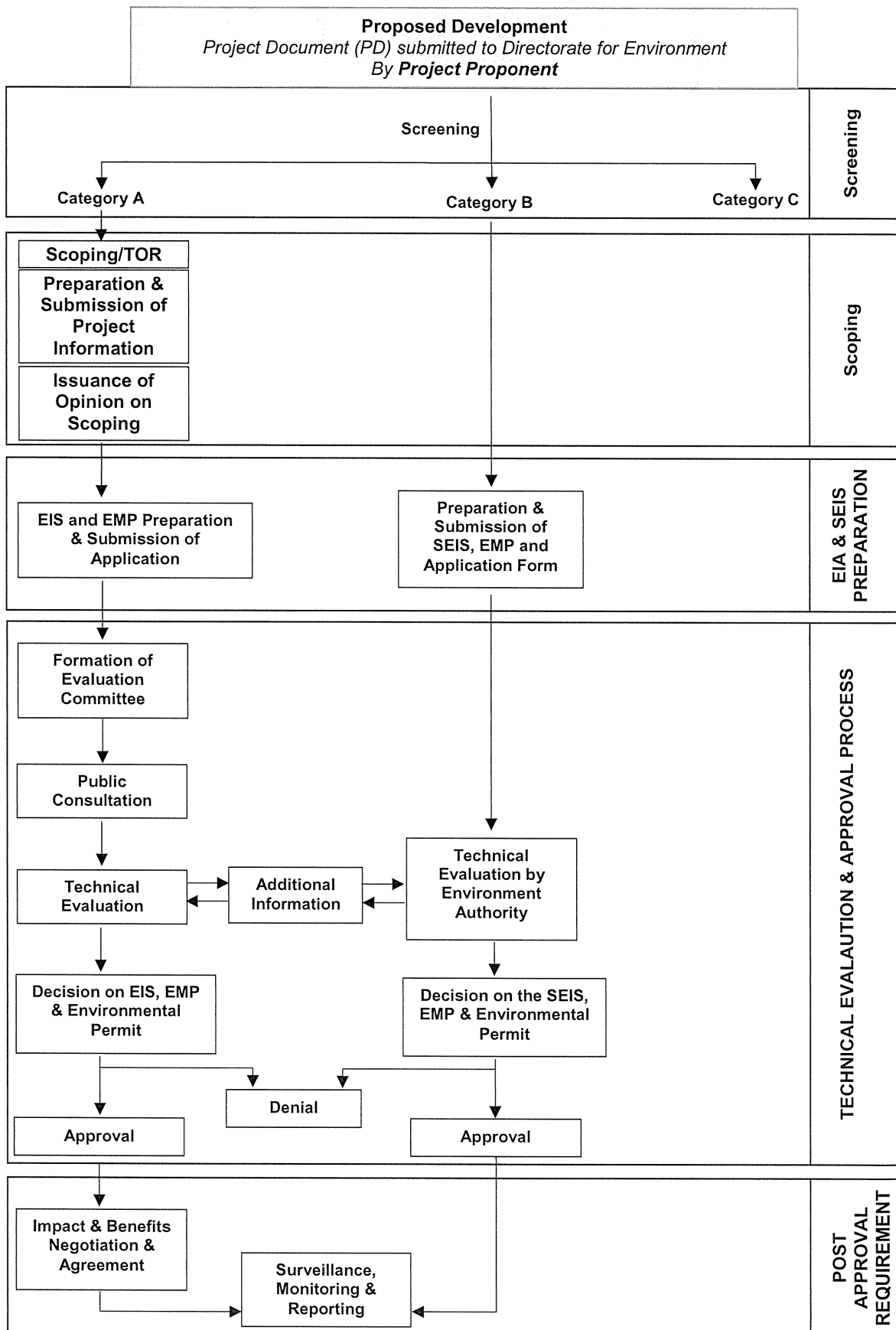
in this Final EIS and EMP. This Final EIS and EMP will be resubmitted to VMDHSPE, DGE, DNAC, DNPRB and NDPCEI.

- **Environmental License:** An Environmental License will be issued to the PP after the approval of the EIS and EMP. The License is likely to contain conditions of consent, requirements to implement the mitigation and monitoring measures embodied in the EIS and EMP.

4.2.4 Objectives and Contents of the EIS and EMP

- Under Article 7 of the *Regulation on the Detailed Requirements for the TOR, EIS and EMP for Environmental Assessment*, the main objective of an EIS is to satisfy the legislative requirements to address the potential impacts deemed relevant at different phases of Project development as per the approved TOR: for the pre-construction, construction and operational phases.
- Under Article 9 of the above said regulation, the main objective of the EMP is to ensure that the mitigations for negative impacts and enhancement of the positive impacts, are carried out effectively throughout the various phases of Project development: pre-construction, construction and operational phases.
- The general contents are elaborated on in the main text following closely Article 7 Annex 4 for the EIS; and Article 9 Annex 6 for the EMP; and the approved TOR.
- The contents under Article 7 of the EIS (to quote from Article 7 for EIS of the *Regulation on the Detailed Requirements for the TOR, EIS and EMP for Environmental Assessment*, are as follows:
 - (i) *Information about the proposed project.*
 - (ii) *Baseline information about the environmental, social and economic conditions in the area of the proposed project.*
 - (iii) *Information on the potential impacts of the project.*
 - (iv) *Information on the proposed measures to avoid, reduce or compensate any significant negative impacts.*
 - (v) *Information on the main alternatives considered by the Project Proponent (PP), and the reasons for making his choice.*
 - (vi) *The public consultations that have taken place so far, and the results of such consultations.*
 - (vii) *Outline of the information required for the EMP.*
 - (viii) *A non-technical summary.*

Figure 4.2.1: Timor-Leste Environmental Assessment and Licensing Process



4.3 BRIEF DESCRIPTION OF THE PROJECT

- Below is a descriptive sequence of the Project, which starts with the planning design concept leading to its inception for development.

4.3.1 Planning Design Concept

- The planning and developmental concept is based on the Project Masterplan (**Figure 4.3.1**) advocating the following eco-friendly planning aspirations:
 - (i) Creation of a unique urban resort presence in close proximity to the sea with a golf course and parks and with a focus on green technology in the building designs.
 - (ii) Provisions of high-end good service facilities to complement the resort and the commercial hub.
 - (iii) Installation of smart urban technology that includes broadband cables, international communication, intelligent security and green strategies for energy and water savings.
 - (iv) Emphasis on a green environment to complement the Tasi Tolu Lakes; conservation of water; reforestation of hilly degraded forests; recycling of stormwater for irrigation in the golf course; and preserving the coastal environment.
 - (v) Provisions of capacity building and training leading towards more job and business opportunities for the benefit of the local communities.

- From the conceptual aspirations, the planning design guidelines are:

(a) Good Access

- (i) Fast and efficient access to and from the Project with easy linkages to public roads, to the surrounding areas in the Post Administration and Municipalities of Dili and Liquica.
- (ii) Ease of movement within and around the Project site itself, with efficient transport to places of recreation, community centres, places of worship and parks.
- (iii) Clear pedestrian walkways amidst a landscaped environment.

(b) Efficient and Sustainable Use of Natural Resources

- (i) Smart use of topographical features with geotechnical considerations in Project development.
- (ii) Harmonisation of Project with local climate, traditions, culture and the surrounding environment.
- (iii) Use of renewable energy such as solar power as much as possible.
- (iv) Proper maintenance of integrated facilities such as drainage, and sewage and sullage treatment systems.
- (v) Utilisation of rainwater for non-potable purposes such as for golf course irrigation and other components in the Project.
- (vi) Enhance the Tasi Tolu Lakes for aesthetics and lake ecology.
- (vii) Improved potential use of groundwater and water from small streams for portable purposes.

(c) Economic, Social and Cultural Interactions

- (i) Provide employment opportunities through resort-centric types of businesses.
- (ii) Use of telecommunication technology to support the development of localised knowledge and service-based businesses.
- (iii) Promote closer community interactions through physical terrain designs such as people-friendly parks and landscapes.
- (iv) Provide adequate facilities and amenities for tourists, local communities and the public by creating vibrant centres for recreation and leisure activities including golfing, yachting and nature clubs and community facilities.

(d) Urban and Environmental Enrichment

- (i) Provide a peaceful and serene environment for work and leisure.
- (ii) Create an environment to maximise enrichment in living with nature.
- (iii) Maximise the use of natural assets of the environment such as lakes and green areas.
- (iv) Provide a landscape with open spaces to serve multiple functions for recreation, ecology and aesthetics.
- (v) Minimise earthworks and platforming to preserve the natural topography of the land.
- (vi) Utilise the natural contours and depressions for small water retentions and/or wetlands to create a cool green environment.

(e) Sufficient Utilities and Amenities

- (i) Maintain the efficiencies of infrastructure, utilities and amenities in line with world-class standards.
- (ii) Linkage to all Information Technology (IT).

4.3.2 Description of Components in the Project

- The Project entails the development of a number of components that collectively will make the area into a mixed urban enclave. **Figure 4.3.2** shows the detailed layout of the Project.
- The Project can be separated into four major components as shown in **Figures 4.3.1 to 4.3.2**.
 - (i) Commercial component: comprises an 18-hole golf course, two hotels, service apartments, residential units and commercial centres.
 - (ii) Institutional component: comprises a youth development and community centre, a school and a hospital.
 - (iii) Natural and environmental component: comprises parks and hill areas, which will be reforested.
 - (iv) Infrastructure and utility component: comprises a utility centre, sewage treatment plants and water recycling plant, etc.

- As shown in **Table 4.3.1**, the Project site of 563.04 ha reserved for the environmental component (62.94%), the largest component; followed commercial (26.95%); residential development (8.09%); institutional (1.46%) and infrastructure and utilities (0.56%).
- The whole Project area is divided into 14 plots of development of which Plot 12 (the public park), belongs to and will be developed by the Government. The built-up developmental density is less than 25 – 30% of the total land area, which is low. The rest of the land is for the golf course and forested areas excluding the public park in Plot 12. If included, the developmental density is even lower, at about 20%.

Table 4.3.1: Developmental Components

Plot	Development	Area (Ha)	Percentage (%)	Estimated Project Cost (USD)
1	5-Star Hotel (464-room)	27.15	4.82	310,000,000
2	18-Hole Championship Standard Golf Course	98.19	17.44	18,000,000
3	Service Apartments (117 units)	5.91	1.05	90,000,000
4	Hotel Service Support Centre (Utility Centre)	3.16	0.56	Included in no.1
5	School	3.00	0.53	20,000,000
6	Hospital	3.04	0.54	60,000,000
7	Commercial Centre 1	9.25	1.64	60,000,000
8	Residential Units	14.56	2.58	25,000,000
9	Residential Units	31.00	5.51	25,000,000
10	2 nd Hotel	9.68	1.72	80,000,000
11	Forest Reserve Areas (Reforestation)	354.38	62.94	1,500,000
13	Commercial Centre 2	1.55	0.28	15,000,000
14	Youth Development and Community Centre	2.17	0.39	6,000,000
	Grand Total	563.04	100	710,500,000

Source: Pelican Paradise Holdings (Timor-Leste), 17 March 2017.

Note: *Public park (Plot 12) of 58.80 ha will be developed by the authority in Timor-Leste.

(a) Commercial Development

- The commercial development consists of a 464-room 5-star hotel with accompanying 13 villas, an 18-hole championship standard golf course, service apartments, residential units and commercial areas (**Table 4.3.2**). A second hotel will be added at a later stage possibly after the expansion of the Presidente Nicolau Lobato International Airport. The main objective of the commercial and business development is to create vibrancy, vitality, colour, dynamism and life within the Project and the surrounding areas of the Municipalities of Dili and Liquica.

Table 4.3.2: Commercial Development Components

No.	Development	Development Plot	Area (Ha)	Percentage (%)
1.	5-Star Hotel (464-room)	1	27.15	4.82
2.	18-Hole Championship Standard Golf Course	2	98.19	17.44
3.	Service Apartments (117 units)	3	5.91	1.05
4.	Commercial Centre 1	7	9.25	1.64
5.	Residential Units	8	14.56	2.58
6.	Residential Units	9	31.00	5.51
7.	2 nd Hotel	10	9.68	1.72
8.	Commercial Centre 2	13	1.55	0.28
Total			197.29	35.04

Source: Pelican Paradise Holdings (Timor-Leste), 17 March 2017.

(i) 5-Star Hotel (Plot 1)

- A total area of 27.15 ha has been allocated for the 5-star hotel including the 13 hotel villas as part of the hotel complex (**Figure 4.3.3**). This hotel will be the first international 5-star hotel in Timor-Leste, comprising 464 rooms, with accompanying 13 villas, six restaurants/cafés, a grand ballroom with a capacity of 1,300 persons. This ballroom can be partitioned to three smaller function rooms if needed.
- There will be a multi-function exhibition and convention hall located adjacent to the ballroom that provides flexibility for space extensions. It can hold all national, regional and international conventions and conferences that are presently lacking in Timor-Leste.
- The hotel will overlook the beautiful sandy beaches and clear blue seas with the backdrop against the ranges of hills in the background. The hotel will offer a unique hospitality experience whilst embracing the beauty of the Timorese landscape in a simple yet elegant setting.
- As part of the 5-star hotel, there is a floating jetty (6.05 ha) located at the northern section of the hotel fronting the Straits of Wetar. This waterfront area synergises with the commercial areas, and is designed for food and beverage outlets and a sea sports recreation centre to service the hotel requirements and the tourists.
- The proposed hotel is located 10 minutes by car from the Presidente Nicolau Lobato International Airport and approximately 15 minutes from Dili town. As most of the coastal developments are focused around Dili, this will be the first development located at the western side of the Presidente Nicolau Lobato International Airport towards the future new port at Tibar Bay.

(ii) 2nd Hotel (Plot 10)

- The 2nd hotel, covering 9.68 ha, is located on Plot 10 adjacent to Plot 3. This is a 4-star hotel, which will be developed pending the completion of the Presidente Nicolau Lobato International Airport expansion project, when it is foreseen that the tourism industry will expand exponentially once there is good access for the tourists. The details of this 2nd hotel have yet to be finalised.

(iii) 18-Hole Golf Course (Plot 2)

- This golf course is designed as a world-class 18-hole championship standard golf course covering a total area of 98.19 ha. It will be built surrounding the three Tasi Tolu Lakes and adjacent to the 5-star hotel (Plot 1) and residential units (Plots 8 and 9). **Figure 4.3.4** shows the layout plan and perspective of the golf course.

Golf Course Design

- As the land is flat, the golf course architects will be raising the tees, greens and fairways above the current seasonal lake flooding levels to render interesting 3D shapes into the land for a challenging golf. This will be carefully integrated with all the site elements and Project components surrounding the golf course.
- The philosophy of Kruse Golf's design is along the classic principles of golf course architecture. Holes are designed with wide fairways in a strategic way, which can be fun and enjoyable for the standard golfer, but still challenging for the lower handicap player to score well. An efficient use of hazards (water, bunkers, rough) is there to reward strategic play and not penalise the poorer golfer. At the same time the width will provide the better players a choice of play angles and risk reward type shots setting up for the approach shot to the green.
- **Routing:** The routing of the course has been done to create 18 very interesting and distinctly different and memorable golf holes. A balance of left to right and right to left doglegs and orientation of holes, means that holes will be played very differently with the prevailing winds and offer a great mix of shots. A study of the natural land shapes and dimensions has dictated green, fairway and tee locations. There is an interesting mix of terrain offering gentle uphill shots, downhill shots and shots playing over water hazards of wetlands and lakes.
- **Greens:** Greens will comprise a variety of sizes and orientated at different angles depending on the strategy and preferred approach shots. They will gently undulate in shape and the shapes will tie in harmoniously with the surrounding landforms.
- **Bunkers:** Bunkers will be large sand-faced bunkers akin to classic bunkering of courses such as Royal Melbourne, Augusta National and Cypress Point. Bunkers will have a distinct vertical lip to help define them and provide shadow line for striking and imposing appearance. Great

emphasis will be placed on the development of appealing and intricate patterns of sand-faced bunkers as part of the visual appeal of each hole and the development of its strategy.

- **Grass:** A hybrid warm season grass will be used on the greens for superior putting speed. Fairways and short roughs to be a warm season hybrid grass types also with a level of saline tolerance – likely to be a Paspalum variety or a Bermuda. The irrigation system has been designed not to overthrow into the long roughs or landscape areas – a “hard edge system”. The intent of this approach is to conserve precious water and to prevent the roughs getting too thick and lush and become the frustration of golfers.
- **Course Landscape:** The landscape of the course is of most importance and will use natural systems and an ecological approach. The golf course architects have gone to great measures to ensure that existing vegetation is protected and “no go zones” will be created at the beginning of construction to protect any existing landscape. The intent is to use all local plant species that exist on-site for course landscape so that it looks natural and be a part of nature from day one. Restoration of saline wetlands including mangrove species will be done. The approach here involves salvaging any possible plant materials during clearing and creating an on-site nursery.
- The philosophy and intent of the golf course landscape to use local plant species throughout the golf course will be an ecological approach that will restore the biodiversity of both flora and fauna to the site. The design allows for a large scale of ecological landscape restoration including:
 - (a) Mangrove and saline wetland restoration.
 - (b) Ephemeral wetland restoration and creation.
 - (c) Sedge and grassland establishment.
 - (d) Reafforestation of the lower hillsides and gullies.
- A programme of plant procurement will involve the propagation of many plant species for the golf course. Much planting works will be tied to the wet season timing; however the course irrigation supply will allow for watering in the dry season for plant establishment.
- **Fairways and Short Roughs:** Fairways and short roughs will be planted with ‘warm season’ grasses to be determined. The refined finishing and high level of maintenance of these areas will provide a stark and attractive contrast of both texture and colour with the preserved natural landscape in the outer roughs.
- **Irrigation:** Water supply for the golf course in the long-term will be a combination of harvested catchment yield, some of treated wastewater, and possibly a mix of fresh and sea water. Bores may also supplant this supply. A designated water storage pond will be used to receive the various supplies of water before it is pumped onto the course. There will be a separate mainline for the greens to allow for controlled application of

fresh water independent of the tees and fairways, which may have a mix of saline, treated effluent or fresh water depending on the season.

- A significant feature in the golf course is the smart use of the Tasi Tolu Lakes in its natural setting as water retention areas for water storage, forming part of the golf course features. There will be zero discharge from the area and leached fertilisers will be retained within the Tasi Tolu Lakes where the water can be used partially to irrigate the golf course.
- With proper attention to detail in its design, construction and management, this golf course should become a course that the nation of Timor-Leste can be most proud of. It will be a fine test of golf, a memorable and challenging course and hopefully one of Asia's finest.

Turf Irrigation

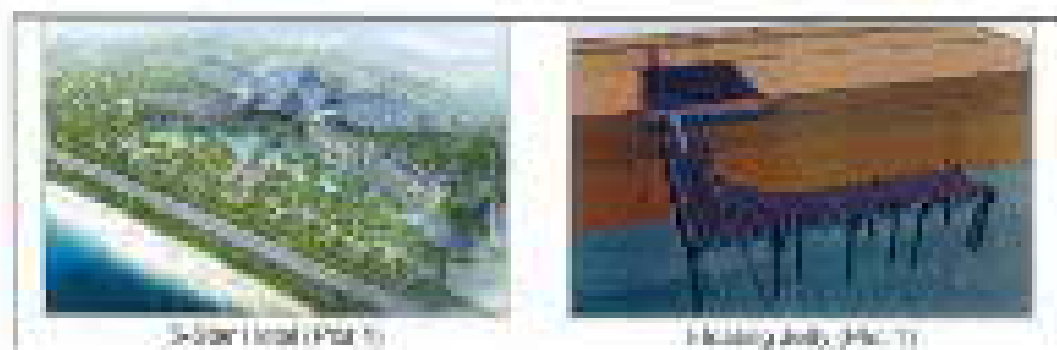
- The key principle behind the design of the golf course is for it to source its own water from the Project site for turf irrigation purposes. The golf course will not use any potable town water in its irrigation. The golf course water supply will come from three key sources:
 - (a) Stormwater Harvesting – A distinct dry season and wet season will require the harvesting runoff from both within the golf course, associated development and the surrounding landforms. Currently, this water runs off into the existing saline lakes or to the sea. The Project intends to harvest and store (in ponds and lakes) most of the harvested water so as to have sufficient water to irrigate the turf in the dry season.
 - (b) Treated Wastewater – The golf course will also have the potential to use treated wastewater that will come from the hotels, residential and commercial areas.
 - (c) Saline Water – The golf course turf types will have a degree of salt water tolerance and in periods of extreme dry weather, this will allow the flexibility of irrigating with a mixture of fresh and saline water so as to supplement the irrigation supply.
- **Water Conservation:** The use of the latest irrigation technologies with computer controlled valve in head sprinklers will mean water is precisely applied to turf surfaces only, and not wasted onto non-turf areas. Watering will take place at night to minimise evaporation and maximise infiltration into the turf root zone. These methods will ensure healthy turf growth and at the same time, conserve water.
- **Water Filtration and Nutrient Removal:** Turfgrass helps remove silt and nutrients from the water. The role of the golf course both turf and landscape revegetated areas (including seasonal streams and ponds), will be to filter suspended particles from the water to minimise silt and fine soil particles from entering the three lakes. Various small ponds around the golf course will also help to slow down storm flows, and when planted with aquatic plant species, will also perform a nutrient uptake role.

Earthworks and Soils

- The golf course has been laid out to make the best use of the local terrain and topography with many holes using the base of the hills or the higher ground to the southern part of the site. There are also holes in the lower areas adjoining to the saltwater lakes. These holes will require for the platform to be raised above natural sea level to ensure the operation of golf is not affected by seasonal rains and to ensure drainage to the golf course from flooding is not to a minimum. There is also a need to keep the turf root zone above any saline water table in order for the turf grass to successfully grow.
- In the process of preparing the earthworks on site, all materials will be sourced on site. Topsoil and silt are a precious resource and these will be stripped off and stockpiled for reuse on the course once the bulk earthwork construction is done.
- At the end of the bulk earthworks, the main trunk drainage will be installed. The role of the drainage channel will be to collect stormwater run-off from (i) within the course, (ii) from surrounding fields and (iii) from associated development (i.e. roads, roads, retail shops, etc.). The drainage system has been carefully designed along with retention ponds for harvesting stormwater for irrigation purposes.
- Once stripping of the platform is done for the golf course, a final top dressing and top layer of sand (sourced off site) will be applied to create a sand dressing profile for the golf course turf.

(b) Service Apartments (Plot 3)

- Three blocks of high-rise service apartments of six storeys each with a total of 117 units, will be constructed at Plot 3 covering 5.6m ha. It is strategically located near the North (i.e. west) of S¹ road, facing the Service of Water. When completed, the service apartments will be the only high-rise service apartments in Tirana, etc.
- Figure 4.3.5 shows the proposed layout plan of the service apartments, while the perspectives are provided below.



3-D view (total) (Plot 3)

3-D view (detail) (Plot 3)



Figure 4.3.4 Conceptual view of the design for all the subject to developments

(iv) Commercial Centre 1 and 2 (Plots 7 and 10)

- A total 0.25 ha of commercial centre 1 is planned adjacent to the main access road from Pura Terra Santa. The location is strategic as it has direct access to/from the major road linkages east and west of Dill and Banta to other well-served from Dill.
- The commercial centre will house a shopping centre, shop lots for retail of products related to the tourism and service sectors such as electronic goods, high-end restaurants, and offices for tourism and marine agencies, banks, etc. The details of the commercial centre have yet to be finalized.
- Commercial centre 2 of 1.55 ha will be developed later to complement commercial centre 1.

(v) Residential Units (Plots 8 and 9)

- Plots 8 (14.55 ha) and 9 (31.00 ha) comprise a total of 321 units of high-end large plot type 3 residential plots, located on the higher terrain areas eastward to the lake, and (b) Plot 10 (204 ha).
- These high-end homes will be built according to the format to provide a panoramic view of the 18-hole golf course, the public park as well as the beauty of water, with a front view of the hotel (in Plot 7).
- Figure 4.3.5 shows the layout plan of the deluxe residential units, while a perspective is shown below.



Figure 4.3.5 Perspective view of the design for all the subject to developments

(b) Institutional Components (Plots 5, 6 and 14)

- The institutional components (Table 4.3.3 and Figures 4.3.7 – 4.3.9) in the three Plots can give the following:
 - (i) **School:** A total area of 300 ha land, covering Plot 5 is reserved and designated for a public school able to accommodate 1,000 students (Figure 4.3.7).
 - (ii) **Youth development and community centre:** The youth development and community centre (Plot 14) of 217 ha of land (Figure 4.3.8), is reserved as a hub for human resource development and skills training. The intent is to provide leadership training to youths to enable them to become effective facilitators to provide relevant services to the community.
 - (iii) **Hospital:** An international class hospital has been proposed on Plot 6 covering 304 ha (Figure 4.3.9), adjacent to the school/youth development and community centre (Plots 5 and 14) northeast of the Project site. The hospital is designed to tentatively accommodate 200 beds to cater for both the local and expatriate community.

Table 4.3.3: Institutional Development Components

No.	Development Component	Development Plan	Area (Ha)	Percentage (%)
I	School	5	300	0.50
II	Hospital	6	304	0.54
III	Youth Development and Community Centre	14	217	0.30
		Total	821	1.00

Source: Project Proponent working paper (2016), IT/Dev/2017



Figure 4.3.8: Perspective View of Youth Development and Community Centre

Notes: A perspective view of the design that will be subject to an approval.

(c) National and International Components

(i) Public Park (Plot 12)

- The public park, covering 60,20 ha, will be a national public park to be developed by the Government. The TP has proposed various design perspectives of the national public park for the consideration of the Government of Timor-Leste.

- The design comprises perspectives of a national museum cum commemorative plaza, garden of forgiveness, ceremonial parade square, war heroes' memorial, playground, multipurpose lawn, national green, local clubs with stadium (NSR), etc. The public park will likely become the most important national heritage and iconic site in the country and a focal point for all national celebrations. It will be an important tourist site in future. This national component will be developed by parties to be decided by the Government of Timor-Leste.



Figure 4.1: Perspective view of Public Park

Source: A perspective view of the design for will be a input to stakeholders.

(ii) Forest Reserve Areas (Plot 11)

- The range of hills is part of the Project area covering 354.55 ha, forming a backdrop to the Project site. They are important as they form the vital freshwater source areas for the small first and second order streams that drain into the main river in the Project site. For the reasons and amongst others, these hill areas are classified as sensitive in this ESI study as they will be reforested to capture rainwater and discharge to streams to maintain the flow of water and funding in the Project area, especially during the dry season.

(iii) Infrastructure and Utilities

- The 3-12 hospital centre (Plot 4) is located at the golf course boundary area as shown in Figure 4.3.2. It will support and service the hotels and golf course areas (Table 4.3.4).
- The hotel service support centre (HSSC) houses all the essential services such as waste treatment plant, steam boiler plant, aircond plant, general central laundry, sewage treatment plant (STP), desalination plant, etc. (see Figures 4.3.12 (a) – (f)). The second makeup tank, domestic water tanks and the second (AC) chillers are located on the roof of the utility building. Freshwater tanks and membrane bioreactor (MBR) tanks are located under the building. The HSSC is strategically located at the foothills south of the 5-star hotel.
- A system of connecting external roads will be built by contract at this component within the Project and to connect the Project to Rua Tercia Seara through a signalized junction.

Table 4.3.4: Components within Utility Centre (Plot 4)

No.	Component	Area (m ²)	Layout Reference
1	Hotel Housekeeping Warehouse & Maintenance Depot	1,180.00	Figure 4.3.10 (c)
2	Hotel Service Support Centre (HSSC) (Laundry Plant , Aircond Plant, Water Plant, Desalination Plant, Sewage Treatment Plant, Power Substation)	3,203.70	Figure 4.3.10 (b)
3	Gold Course Maintenance and Workshop	1,484.80	Figure 4.3.10 (d)
4	Central Garbage Collection Building	694.82	Figure 4.3.10 (e)
5	Hotel Plant Nursery	3,547.00	Figure 4.3.10 (f)
6	Golf Course Turf & Plant Nursery	7,730.00	Figure 4.3.10 (f)
	Total	17,840.32*	-

Source: R.E. Morris & Company, 21 November 2016.

Note: *The total area does not include the acreage of the service road and open space within the utilities centre.

4.3.3 Supporting Facilities

- The supporting facilities for the whole Project development include some of the components located within the utility centre (Plot 4).

(a) Electricity Demand and Supply

- Demand:** The maximum projected demand for electricity for the Project is 29,098 kW (Table 4.3.5).

Table 4.3.5: Electrical Load Breakdown

No.	Component	Connected Load (kW)	Peak Load (kW)	Maximum Demand (kW)
1	5-Star Hotel	7,789	5,224	4,189
2	Hotel Service Support Centre	960	864	691
3	Serviced Apartment	2,618	2,088	1,857
4	School	1,581	1,054	878
5	Hospital	3,326	2,218	1,848
6	Youth Development and Community Centre	1,350	1,080	432
7	Public Park	1,465	1,025	308
8	Golf Course	1,455	582	408
9	Commercial Centre 1	14,719	12,182	10,151
10	Residential	9,856	6,702	4,692
11	2 nd Hotel	3,872	2,341	1,830
12	Commercial Centre 2	3,266	2,268	1,814
	Grand Total	52,257	37,628	29,098

- Supply:** The current electricity system in Dili is operated by the national electricity agency “*Electricidade de Timor-Leste*” (EDTL). Electricity supply will be made

available through the proposed main intake station for connection to the Project development area.

- To meet all the electricity demands, two EDTL 20 kV main intake stations will be built, one each at the northeast and northwest of the Project site (Plots 10 and 14) to facilitate electricity provisions. A 4MW Solar PV power supply farm will also be established at the west of Plot 11 (**Figure 4.3.11**).
- Thirteen substations will be built for distribution of electricity supply to the consumers for the whole Project (**Figure 4.3.11**).

(b) Water Supply

- **Demand:** The development will require 7.251 MLD of potable water (**Table 4.3.6**). The water sources and storage in the Project are shown in **Table 4.3.7**.

Table 4.3.6: Daily Water Demand for the Development

Phase of Development	Water Demand (m ³ /day)	Water Demand (MLD)
Phase 1 inclusive Plots 1 (jetty only) and 3	236	0.236
Phase 2 inclusive Plots 1, 2, 4, 8, 9 & 10	3,471	3.471
Phase 3 inclusive Plots 5, 6, 7, 13 & 14	3,476	3.476
Plot 12*	68	0.068
Total	7,251	7.251

Note: *Plot 12 (public park) will be developed by the authority in Timor-Leste.

Table 4.3.7: Water Storage for the Development

No.	Water Source	Storage Location	Plot	Capacity/ Area	Usage
1.	Government water supply	Storage Tank	Plot 8	400 m ³	Portable Water
		Pump House & Suction Tank	Plot 8	200 m ³	Portable Water
2.	Water Plant	HSSC	Plot 4	600 m ³	Portable Water
3.	Stormwater RO Plant	HSSC	Plot 4	1,000 m ³ /day	Portable Water
4.	Stormwater Runoff	Lake D	Plot 2	32,240 m ²	Irrigation. Use of recycled water
		Lake E	Plot 2	11,221 m ²	Irrigation
		Lake F	Plot 2	15,255 m ²	Irrigation
		Lake G	Plot 2	4,387 m ²	Irrigation
		Lake H	Plot 2	2,442 m ²	Irrigation
		Lake I	Plot 2	577 m ²	Irrigation

No.	Water Source	Storage Location	Plot	Capacity/ Area	Usage
		Lake1	Plot 9	12,400 m ²	Irrigation
		Lake 2	Plot 9	12,375 m ²	Irrigation
5.	MBR-RO	HSSC	Plot 4	500 m ³ /day	Recycle to feed cooling tower
		Hillside Villas/ Residences	Plot 8	300 m ³ /day	
		Hotel 2	Plot 10	100 m ³ /day	
6.	Desalination Plant (SWRO)	HSSC	Plot 4	1,000 m ³ /day	Portable Water

- **Supply:** The Dili water supply comes from three treatment plants fed by intakes from the Bemori, Benmauc and Maioa Rivers as well as eight borehole sources at Comoro, Kuiuhun and Heraii.
- There is a shortage of treated water in Dili due to issues of power supply, chemicals for water treatment, turbidity and low flows in the rivers during the dry season and heavy rainfall in the wet season, and a high degree of leakage in the old reticulation system. As such, storage reservoirs are needed for water supply during the dry months with prolonged periods of low river flows.
- There is already a main pipeline along Rua Terra Santa in front of the Project site (**Figure 4.3.12**). The Project will have three connecting pipelines to this main pipeline in future – one in the eastern residential area (Plots 8 & 9), another in the middle Project site, east of the proposed 5-star hotel (Plot 1), and the last one, east of the proposed 2nd hotel (Plot 10). Water will be reticulated from these three connecting pipes to the various components within the Project.
- Stormwater runoff from the range of hills will be collected by cut-off drains and the water will be channelled to lakes/reservoirs, golf lakes, etc. (**Figure 4.3.13**).

(c) Desalination to Augment Water Shortage

- Desalination is one of the options proposed to augment potable and non-potable water when the area suffers from prolonged drought for half of the year. Although groundwater is also considered, it may be difficult to abstract due to seawater intrusions and hence a desalination plant has been proposed.
- Desalination removes dissolved minerals from seawater and brackish water. A number of technologies have been developed for desalination, including reverse osmosis (RO), distillation, electro-dialysis and vacuum freezing. Although various methods can be used to desalinate seawater, thermal (evaporative) and reverse osmosis (membrane based) are the two most matured and commonly used technologies.
- In this Project, the proposed desalination plant is located in the HSSC [**Figure 4.3.7 (b)**]. Seawater (directly pumped from offshore intakes) will be fed to the desalination plant to produce 1,000 m³/day for eight hours per day using solar power. The solar panels will be mounted on Lake A's surface to reduce surface water evaporation.

- The desalinated water may be used in its pure form (e.g. for make-up water in steam boiler plant) or it may be mixed with less pure or recycled water for irrigation or other uses. The desalination plant is designed to ensure a very low intake water rate so that marine life will not be affected adversely at its inlet and outlet.
- At the desalination plant, fine particles will be removed during initial screening before the water passes through the RO membrane from the inlet. Once converted, the water from the desalination plant will be treated. The seawater concentrate will be discharged back into the sea through an underground and then undersea pipeline east of Dili Rock or near to the floating jetty. Both discharge options are now under consideration.
- The concentrate (or brine) is saltier than seawater but it will quickly revert back to seawater standard concentrations once discharged within a short distance, by dilution from the vast expanse of seawater. The discharge is through the discharge nozzles, which act as diffusers slowly releasing the brine. The placement of the discharge pipeline and outfall will be much further offshore so as not to contaminate the intake, and to ensure fast and adequate dilution to avoid any hyper-saline conditions that could affect marine life.

(d) Sewerage Facilities

- **Design Capacity:** The Project will involve the construction of three STPs located, one each (i) within the utility centre (Plot 4), (ii) residential units (Plot 8) and (iii) 2nd hotel (Plot 10) [Table 4.3.8 and Figure 4.3.14 (a)].
- They have a total design capacity of 2,250 m³/day for the whole development.

Table 4.3.8: STP Locations and Capacity

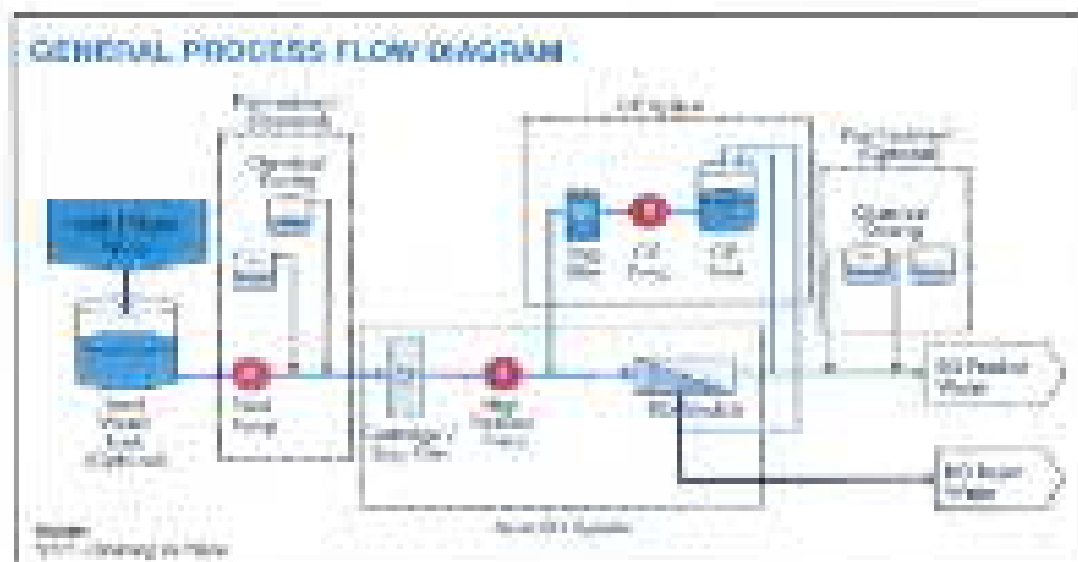
No.	STP Location	Sewage Catchment	Design Capacity (m ³ /day)	
			Sewage MBR	MBR-RO
1.	HSSC at Utility Centre (Plot 4)	5-star Hotel	1,000	500
2.	Utility Plot at Residential Units (Plot 8)	Residential Units, School, Youth Development and Community Centre, and Hospital	1,000	300
3.	Utility Plot at 2 nd Hotel (Plot 10)	Service Apartment and 2 nd Hotel	250 (expandable to 1,000)	100 (expandable to 300)

- **Sewage Treatment System:** The proposed three STPs will use the MBR system, which combines conventional biological treatment and membrane filtration process for biodegradation of organic pollutants in wastewater [Figures 4.3.14 (b) – (c)]. MBR technology is selected as it can support much higher biomass through effective aerobic biological treatment, generating less sludge with longer retention time.
- An overview of the MBR STP process flow is shown below. Pre-treatment involves influent flowing in for screening and equalisation. Coarse screen blocks followed

By this system used for recovering all the large particles, if particles become will be used to facilitate the wastewater flow and its components before the wastewater is pumped to the next treatment process.



- During treatment, most of the dissolved Oxygen Demand (DOD), Chemical Oxygen Demand (COD) and suspended solids in the wastewater would be removed by the membrane bioreactor process. The effluent is cleaned and contains almost no suspended solids, which is then allowed to be discharged to retention ponds or for further polishing for reuse.
- A sludge dewatering such plant system will be deployed to strip to the produced sludge for sludge drying. The dewatered and/or dried sludge can be used as fertilizers after stabilization or sent for incineration or disposed off to help in landscaping.
- The MBR effluent water can be further improved with the RO systems to produce reusable water for more applications such as to feed the second cooling towers and as boiler feed water, as well as other non-potable usage (e.g. cleaning toilets). The surplus MBR effluent water will be stored in retention pond for irrigation purposes.
- The final effluent materials will go into another stream to pass it into rock filter, which is good for plants and turf. Hence, there is zero discharge to the sewage system in this. An overview of the MBR RO process flow is shown below:



(e) Solid Waste Management

- A central garbage collection building has been designated west of the utility centre (Plot 4). All municipal solid wastes including garden wastes within the Project site are collected and stored at the central garbage collection building and disposed off at the Tibar Landfill, located about 4 km southwest of the Project site. Garden wastes will be collected and decomposed as fertilisers for the gardens and parks. Waste decomposer will be utilised to decompose food waste into fertilisers.

(f) Tele-communication

- The whole development will need ~1,200 to 1,500 direct lines. The tele-communication system will be connected through manholes associated with four-way underground ducts along an access road to various building blocks. Voice and data will be transported through fibre-optic or copper wiring, which will be available to all the buildings in the development and access road.

(g) Jetty (Plot 1)

- A substantial amount of construction materials and equipment will be brought into the Project site by barges. The existing Port of Dili is congested with a shortage of storage space that could delay the construction works. Moreover, the road leading to the Project site is very busy and narrow that will cause a lot of congestion and inconvenience to the population in Dili. Because of this, a floating jetty [**Figures 4.3.15 (a) – (b)**] is planned at the Project site (Plot 1) for unloading the construction materials and equipment.
- This floating jetty will be located northeast of the 5-star hotel (Plot 1) in front of St Paul's Holy House. When construction ends, this jetty will be upgraded to connect to the scenic waterfront recreational areas with food and beverage outlets and a sea sports recreation centre.
- Due to its iconic location, the jetty will blend in with the hotel and golf & country club environment during the operational phase. The jetty is intended to float with the rise and ebb of the tides; an experience by itself, and is unobtrusive to the eye.
- The floating jetty is "L-shaped" with a jetty head of 120 m long × 20 m wide, and an access jetty of 100 m long × 20 m wide. The jetty will have two operational areas capable of berthing 10,000 DWT container vessels and 5,000 DWT barges. An inner berth will be capable of berthing 2,000 DWT vessels. The floating jetty will be held in place by vertical steel piles with steel/teflon guides to allow the jetty to float up and down with the tide.

4.3.4 Reforestation Scheme

- The forest reserve areas (Plot 11), mainly the surrounding range of hills, are green from January to April each year during the rainy season. During the dry season, the area becomes parched and the landscape turns dry and dusty brown. Over the years with logging and deforestation, the hills are devoid of many trees facing the windward side. Only stunted trees, grasses and shrubs are found. The single peak monsoonal season does very little to help in natural reforestation.

- The flood plains of the Project site have hardly any trees of significance. Apart from the area in which infrastructure will be built on and the golf course area, Pelican Paradise Holdings (Timor-Leste) plans to reforest the hills as demarcated in the Masterplan (**Figure 4.3.1**).
- The difficulty in reforestation is the weathered Alieu soils with low organic matters and hardly any natural subsurface water storage and soil moisture. The small ephemeral streams emanating from the hills have very little freshwater even during the wet season. This makes reforestation of the hills difficult.
- The advantages of reforestation, besides increasing the water source areas, include the following:
 - (i) Create a green environment.
 - (ii) Create green areas to counter the heat island effect and to lower the high temperature in the dry season.
 - (iii) Bring back flora and fauna to the Project site.
 - (iv) Beautify the site.
 - (v) Environmental enhancement and protection.
 - (vi) To be an example of a 'green' development.
- Pelican Paradise Holdings (Timor-Leste) will engage with the Forestry Department and the landscape architects to explore the indigenous flora of Timor-Leste to reforest the area accordingly. Part of the reforestation is also to ensure that there is sufficient water to sustain the greenery in the Project throughout the year.

4.3.5 Lake Rehabilitation

- The Tasi Tolu Lakes, which were formerly bay areas that have been isolated when the coastal sand spit naturally enclosed the low-lying bay, have salinity much higher than the sea. The highly saline lakes are already in an anoxic condition that contains high amounts of organic matter, low dissolved oxygen (DO), and semi-eutrophicated, which are detrimental to aquatic lifeforms. The near absence of water weeds and food within and around the Tasi Tolu Lakes are also discouraging the local and migratory birds to rest and breed in the area. As such, the PP has decided to rehabilitate the lakes.
- Except for Lake A, the rehabilitation of the Tasi Tolu Lakes B and C will be carried out by the Governmental authorities as they are under the jurisdiction of the Governmental authorities in the public park. The PP however, through the consulting engineers, has proposed the method to rehabilitate the saline lakes.

(a) Tasi Tolu Lake A

- Lake A covers an area of 64,000 m². Lake A is located inside the golf course west of the hotel and will be preserved as a saltwater lake. The lake covers an area of 64,000 m² and the sides of the lake will be raised to match the levels of the golf course. The lake bottom will be excavated to RL-3.80 at the deepest section making the lake 5.0 m deep. The lake level will rise and fall with the tide (sea) but the depth of water will never be less than 3 m.

- Lake A can store 220,000 m³ of water. A total of 10 air stations comprising five units each of bottom diffusers will be needed to keep the lake aerated and oxygenated. This will help maintain the DO level and balance the BOD, Phosphorous and Nitrogen in the lake. Refer to **Figures 4.3.16 (a) and (b)** for the water circulation.
- A seawater inlet will be installed to allow inwards flow of seawater from the sea to Lake A as the tide rises and falls. A similar pipe will allow water to overflow from Lake A to Lake B and thus discharge to the sea [**Figure 4.3.16 (b)**].
- To restore the lake ecosystem, fish stocking will be carried out and suitable plants and mangroves will be planted at the lake perimeters (details refer to **Section 9.10**).

(b) Tasi Tolu Lake B

- Lake B will be preserved as a saline lake without lining. Presently, the lake has a surface area of 130,000 m² with a maximum depth of -15 m. This depth will be raised to -12 m. The Lake will be restored through destratification of the lake waters using bottom aeration as well as circulating fresh seawater into the lake and channelling the contaminated salt water back to the sea [**Figure 4.3.16 (c)**].
- Destratification would be achieved by positioning groups of air diffusers to produce minute air bubbles to (i) increase dissolved oxygen in the lower layers of the water and (ii) to churn the bottom water upwards, which in turn will draw the top oxygenated water layer to the bottom, in a circular motion. To do this, 30 air stations, each comprising five units of bottom diffusers, will have to be installed and running 24 hours daily. The lake will be filled with gravel to create a flat lake bottom platform for positioning the air stations. There will be one water jet shooting water 30 m high at 79.6 m³/hr installed to promote aeration, and as a striking feature of the lake, as shown in **Figure 4.3.16 (d)**. Once the lake has been restored into a healthy state, destratification has to be continued as and when required in lake management.
- A lake overflow will be installed at the north of the lake to discharge overflows to the open sea via the HDPE pipe culvert to the west of the public park (Plot 12). An HDPE flap valve will be installed at the outfall to stop seawater flowing back to the lake. This pipe is normally dry and water only flow through from the lake to the sea during extreme rainfall.
- To restore the lake ecosystem, fish stocking will be carried out and suitable plants and mangroves will be planted at the lake perimeters to create wetlands for the fishlings to breed and the birds to roost (details refer to **Section 9.10**).

(c) Tasi Tolu Lake C

- Lake C covers a surface area of 120,000 m² with a varying depth up to 5 m. It will be preserved as a saline lake without lining [**Figure 4.3.16 (c)**]. Lake C can store 400,000 m³ of water. A total of 12 air stations comprising five units of bottom diffusers will be needed to keep the lake healthy by aeration to maintain a balance of DO, BOD, Phosphorous and Nitrogen in the lake.

- A seawater inlet will be installed alongside the commercial centre 2 (western side) to allow exchange of seawater between the sea and the lake as the tide rises and falls. This pipe culvert is normally full of water where fishes can live in the culvert and migrate to the lakes. Fish traps can be installed in the culvert to allow fishes to swim to the lake but cannot exit from the lake.
- The culvert will feed fresh seawater to a pumphouse supplying 6,000 m³/day north of Lake C. One water jet shooting 30 m high at 79.6 m³/hr will be installed to promote further aeration and as a feature of the lake. The seawater will flow from an opening of 14.5 m wide from Lake C to Lake B, and thence, discharge back to the sea as shown in **Figure 4.3.16 (d)**.
- To restore the lake ecosystem, fish stocking will be carried out and suitable plants and mangroves will be planted at the lake perimeters (details refer to **Section 9.10**).

4.3.6 Developmental Phases

- The Project will be developed in three phases within six years (**Table 4.3.9** and **Figure 4.3.17**). The 2nd hotel will be developed based on the growth of the tourism industry and the expansion of the Presidente Nicolau Lobato International Airport, which will bring in a larger number of foreign tourists. The developmental components will likely overlap with the phases.
- As the Project is big, there could be unforeseen circumstances arising during development which may cause a delay in construction works. Any delays will be notified to the NDPCEI.

Table 4.3.9: Project Developmental Timeline

Phasing	Development Plot/ Component	2017	2018	2019	2020	2021	2022	2023
Phase 1	Plot 1 – Jetty							
	Plot 3 – Service Apartment		■					
	Plot 10 – 2 nd Hotel (earthworks only)		■					
Phase 2	Plot 1 – 5-Star Hotel		■					
	Plot 2 – 18-Hole Golf Course		■					
	Plot 4 – Utility Centre		■					
	Plots 8 & 9 – Residential Units (infrastructure works)*		■					
Phase 3	Plot 5 – School							
	Plot 6 – Hospital							
	Plot 7 & 13 – Commercial Centre 1 & 2				■			
	Plot 10 – 2 nd Hotel				■			
	Plot 14 – Youth Development and Community Centre				■			
	Plot 11 – Forest Reserve Areas (Reforestation)				■			

Note: * Earth fill materials will be obtained from Plots 8 and 9 and other component parcels of land.

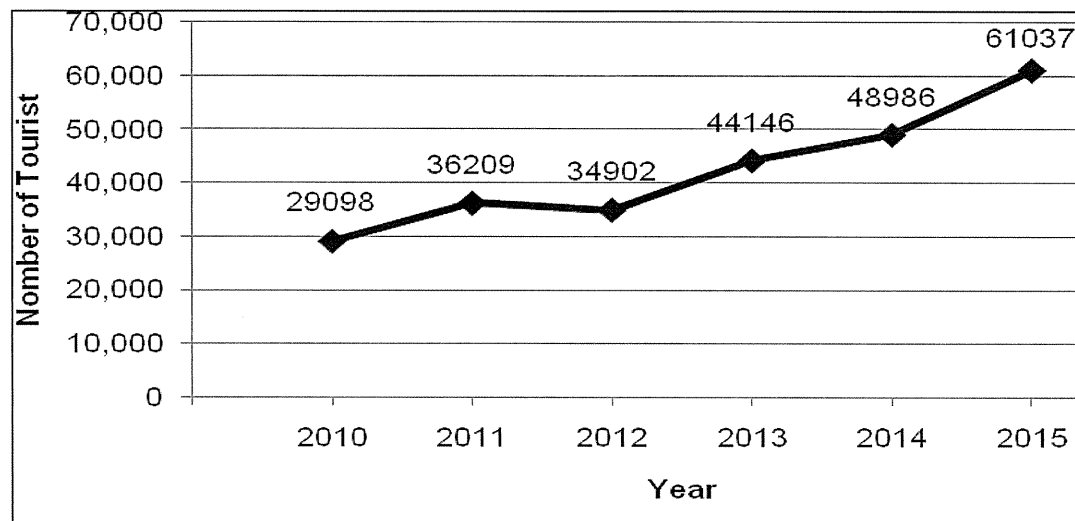
4.4 JUSTIFICATION AND NEED FOR PROJECT

- The need to develop the Project is altruistically predicated on a number of strategic factors underpinning the scope of works as follows:
 - (i) Promote tourism activities in Timor-Leste.
 - (ii) Integrated development planning and future growth.
 - (iii) Socio-economic development.
 - (iv) Conserve and rehabilitate the environment.

4.4.1 Promote Tourism Activities in Timor-Leste

- Tourism is scoped as one of the major activities that will promote strong socio-economic growth in Timor-Leste. The total number of in-coming tourists and visitors (mainly foreign) is low although it showed yearly increments (**Figure 4.4.1**). This is seen as a positive factor for the local tourism industry and the economy since the country has the carrying capacity to take in more tourists. The development of the Project will be a strong pull factor to attract more tourists to the country.

Figure 4.4.1: Total Number of Tourist Arrivals (2010 to 2015)



Source: National Directorate of Tourism Enterprise, Activities and Products, 2016.

- In tandem with the above, adequate and quality accommodation will be required to cater for the short- and long-staying tourists. Quality accommodation is grossly lacking in Timor-Leste. The 5-star hotel in the Project will add a total of 464 quality hotel rooms and 13 hotel villas to the present stock of hotel units and accommodation in the country. This number of units will be increased later with the construction of 2nd hotel and residential units to expand the accommodation sector.
- The Project will help enlarge the economy when demands for related tourism facilities and services are also increased. Chief among these are services to cater for local, regional and international conferences, conventions, meetings and exhibitions, which presently are sorely lacking and limited. Adding to the opportunities in business and employment available to the people of Timor-Leste, are the foreseeable expansion of the food and cottage industries and transportation sectors to cater to the tourists, all of which are destined to increase the multiplier effects and increase the overall Gross Domestic Product (GDP) of the country.

4.4.2 Integrated Development Planning and Future Growth

- **Development planning:** Timor-Leste in the last 10 years has positioned itself for economic and developmental expansion after a period of consolidation in its politico-economic history. In terms of the environment, it has come up with very stringent legislations to ensure that the environment, its major natural asset, is not unduly compromised. The EIA process is therefore one of the tools to guide its future growth through a sustainable environment.
- **Integrated development:** The Project is largely an integrated mixed developmental project with a focus on tourism and conventions. Conceptually, it plans to integrate the developmental components of resort facilities, commercial, residential and recreational areas in an urban setting, seamlessly with environmental conservation as a basis to develop the Project. The Project will serve as a model that internalises modern technologies and innovations to

maximise the limiting resources such as water through best management practices in water usage and wastewater management within an area that is well-known for its coastal and marine environmental assets.

- **Future prospects:** There will be many more projects to come in future in Timor-Leste by other investors and developers besides this Project, which so far, is the largest in the country. What is foreseen is that all future projects will likely be looking at this Project as a benchmark in terms of its designs and plans that integrate development with the environment to benefit the population and the country.

4.4.3 Socio-Economic Development

- **Confidence building:** Timor-Leste needs investors to help develop the country. This Project is slated to inject an estimated USD710 million directly to the development based on the preliminary developmental costs, and indirectly into the local economy. This will help immediately to boost the confidence of other future investors who are looking for opportunities to invest but are looking for someone to lead the way to start first. This Project will thus create a snow-ball effect, boosting the confidence of many other investors to bring in development that will be beneficial to the country's economy.
- **Employment:** In terms of employment, the Project has the propensity to generate more than 1,500 jobs in both its construction and operational phases. Most of these jobs created are in the service sectors such as hotels, service apartments, recreational areas, infrastructure, hospital, utilities and the golf course. This will be a significant boost to the local employment scenario, which presently, is low and jobs are scarce as seen in the Timor-Leste Labour Force Survey 2013 (General Directorate of Statistic, 2014).
- **Timor-Leste Labour Force Survey 2013 (by GDS, 2014):** Based on the survey, there is a large group of human resource that can be tapped from, in the country. The ratio between employment to active working population (those who can and are able to work) was only 27.3% amongst the age group of 15 years and above, in 2013. Using this information as a guide to fast forward to 2016, the implication is that unemployment and under-employment will remain very high; and if nothing is done, the trend may persist.
- **Table 4.4.1** showed a comparison of the employment scenario between 2010 and 2013, where there was not much change amongst the working age group, but the disparity in the number of employed versus unemployed seemed to have widened considerably to 23,400 in 2013 from 9,000 in 2010. Ameliorating this, the Project will be able to absorb a lot of this available labour by providing them with gainful employment during the construction and operational phases.

Table 4.4.1: Employment Statistic in Timor-Leste (2010 and 2013)

Year	Working-age Population ^(a)	Labour Force ^(b)	Employment ^(c)	Unemployment ^(d)	Inactive
2010 ⁽ⁱ⁾	627,000	261,000	252,000	9,000	366,000
2013 ⁽ⁱⁱ⁾	696,200	213,200	189,800	23,400	483,000

Source: (i) Timor-Leste Labour Force Survey 2010, National Directorate of Statistics, 2011.

(ii) Timor-Leste Labour Force Survey 2013, General Directorate of Statistics, 2014.

Note:

(a) The population of Timor-Leste that age ranging from 15 to 64 years old.

(b) The Timor-Leste working-age population (15 – 64 years of age) that engages actively in the labour market, either by working or looking for works.

(c) The employed population in the labour force.

(d) The unemployed population in the labour force.

- From the above survey, it also appears that the types of jobs in the job market and the opportunities available are very narrow for the employable youths, who mostly had secondary education (42.1% of the youth labour force). There are very few industrial and resource-based industries in the country to-date to widen this job band to absorb them. Hence most of the jobs available are in the informal service sectors with few job choices. Tertiary education is attained by only 1.4% amongst the population, who are obviously more employable and earn higher wages in the job spectrum.
- As indicated above, the Project will provide gainful employment to at least 1,500 employable persons or more, in both phases of development, or about ~6.4% of the 23,400 unemployed group. This is moderately high, especially when this future employed group in turn will generate other needed services when more money is seeped into the local and national economy in an escalating cycle of opportunities. The employable group will most probably be absorbed in administration, hotel catering and services, tourism product development, advertising, internal and external transportation services, repair and maintenance works.
- **Skills training:** To lessen the issue of a mismatch between employment and education as highlighted in the survey, the Project will provide job training through the youth development and community centre slated for construction on Plot 14 of the Project. Much of the training however will be on-the-job training related to hotel catering, administration and the services trade.
- The PP has proposed for a youth development and community centre within the Project site, where under-privileged, unskilled, semi-skilled, unemployed and under-employed persons will be given various forms of assistance to improve their employment opportunities and livelihood. These include skill training and practical work to allow them to earn their own living in future, or to work in the Project. Eventually the overall unemployment rate in the country will be reduced slowly but surely.
- **Spin-off effects:** The jobs created by this Project will be at all levels. There is an employment assurance agreement between the PP and the Government that preferences will be given to the locals in Timor-Leste. This future large working population will indirectly spin-off other job opportunities as well, such as the food and retail services to cater to the needs of the workers, and collectively, the livelihood of the whole local community will improve.

4.4.4 Conserve and Rehabilitate the Environment

- **Physical improvements:** The developmental design has taken into consideration the existing terrain and land attributes to minimise cut and fill and to maintain the natural environment as much as possible. The configuration of the three Tasi Tolu Lakes will be improved for aesthetic reasons to blend in seamlessly with the golf course, the public park and the other components in the Project. Water storages will be used to harvest rainwater and from stream flows. Desalination has also been planned to augment water supplies. Re-foresting the bare areas will also be one of the main activities to re-create a natural sustainable water source area for freshwater capture. All these activities are measures incorporated into the planning designs to sustain and save water and to enhance the environment.
- **Reforestation:** The Project will feature a reforestation programme of the largely denuded hill areas to re-create an environment suitable for a water source area. *Inter alia* to this, the reforestation programme is also intended to improve the faunal population by providing food and shelter for their habitation.
- **Experiences gained:** The experiences gained will be invaluable to those involved in developing this large integrated mixed development Project. They will be able to help manage all other future development in Timor-Leste. The local government officials, counterparts and stakeholders including the workers will gain through transfer of knowledge and technology towards better management of the environment.

4.5 PROPONENT'S ENDORSEMENT OF EMP

I hereby declare that the entire EMP Report is the product of the qualified Environmental 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 at the material time, and that I have not withheld or distorted any material facts. I agree and I undertake the responsibility to implement all the mitigation measures described in the EMP Report.

Name of Project Proponent : Dr Jeremiah Chan Kin Meng

Designation : Executive Director

Signature :  **Date** : 17/4/2018

Company's stamp :

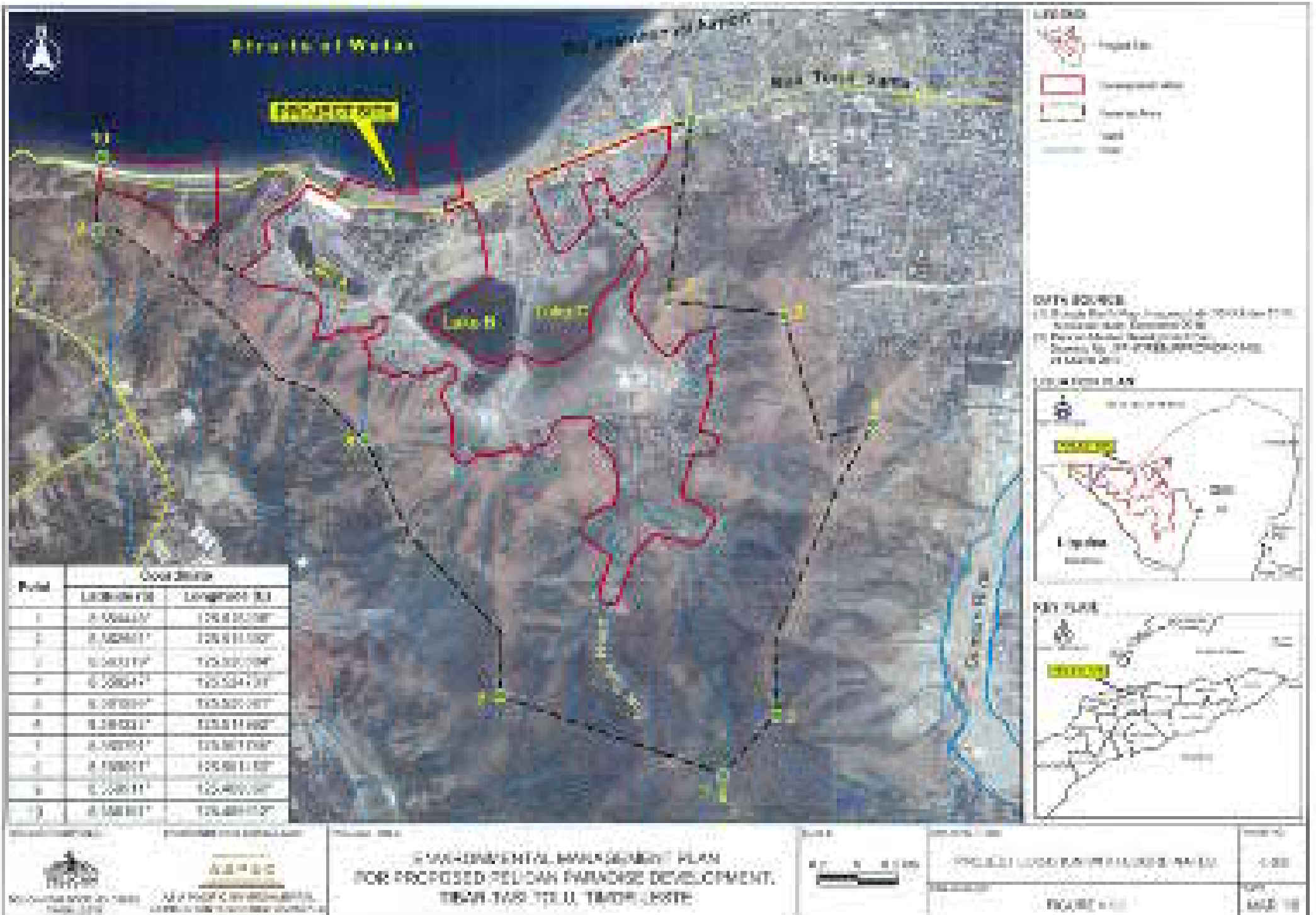
Pelican Paradise Holdings Timor-Leste

Suite 333B Timor Plaza
Dua Rua de Leste, Dili, Timor-Leste

4.6 STRUCTURE OF EMP

The structure of the EMP Report is shown in the Table below.

Chapter/ Title	Focus
Chapter 1: Executive Summary	Provides a summary of the key findings and conclusions of the EMP.
Chapter 2: Project Proponent	Information on the PP.
Chapter 3: Environmental Consultants	Information on the Environmental Consultant.
Chapter 4: Description of the Project	Overall description of the Project concept, development phases, components and infrastructure as well as Project phasing and need for the Project.
Chapter 5: Legal Requirement	Statutory requirements for the EMP.
Chapter 6: Institutional Roles and Responsibilities	Describes the roles and responsibilities of the relevant institutions involved in different phases of the Project development.
Chapter 7: Summary of Impacts	Summarises the potential environmental impacts that were identified in all phase of the Project development.
Chapter 8: Proposed Mitigation Measures	Outlines the mitigation measures and best management practices (BMPs) required to reduce or eliminate the impacts arise from each phase of the Project.
Chapter 9: Governing Parameters	Provides the environmental standards and plans that govern in monitoring direct and indirect environmental changes resulting from the Project.
Chapter 10: Monitoring and Auditing Programmes	Outlines the environmental and auditing programmes for the Project development.
Chapter 11: Reporting Requirements	Outlines the requirements in different type of environmental reporting during each phase of the Project development.
Chapter 12: Responsibilities for Mitigation and Monitoring	Describes the roles and responsibilities of the personnel in Environmental Management Team (EMT) for the implementation of mitigation measures and the monitoring programme.
Chapter 13: Emergency Plan	Details the procedures to cope with general emergency situations in the construction and operational phases of the Project.
Chapter 14: Decommissioning Plan	As the Project is an integrated mixed development that has a foreseeable long-term operational life, no decommissioning plan is required.
Chapter 15: Capacity Development and Training	Proposed basic environmental training programmes to create competency and capability of relevant staff in environmental management throughout Project implementation.
Chapter 16: Public Consultation and Information Disclosure	This Chapter describes the public participation activities.
Chapter 17: Complaints and Grievances Mechanism	Outlines the complaints and grievances mechanism (CGM) to voice and resolve social and environmental concerns linked to the Project development.
Chapter 18: Work Plan and Implementation Schedule	Provides the work plan and implementation schedule for all phases of Project development.
Chapter 19: Cost Estimates	Emphasises that sufficient budget should be allocated for undertaking the environmental protection and monitoring works.
Chapter 20: Review of EMP	Outlines the procedure to amend or update the EMP, if required, through the Project development.
Chapter 21: Non-Technical Summary	Summarises the key findings of the EMP in simple language.



LEGEND

- Project Site
- Development Area
- Canal Area
- Road
- Water

DATA SOURCE

- 1) Google Earth Pro, Imagery as of 10/01/2018
- 2) Melbourne City Council GIS
- 3) Melbourne Water, Imagery as of 10/01/2018

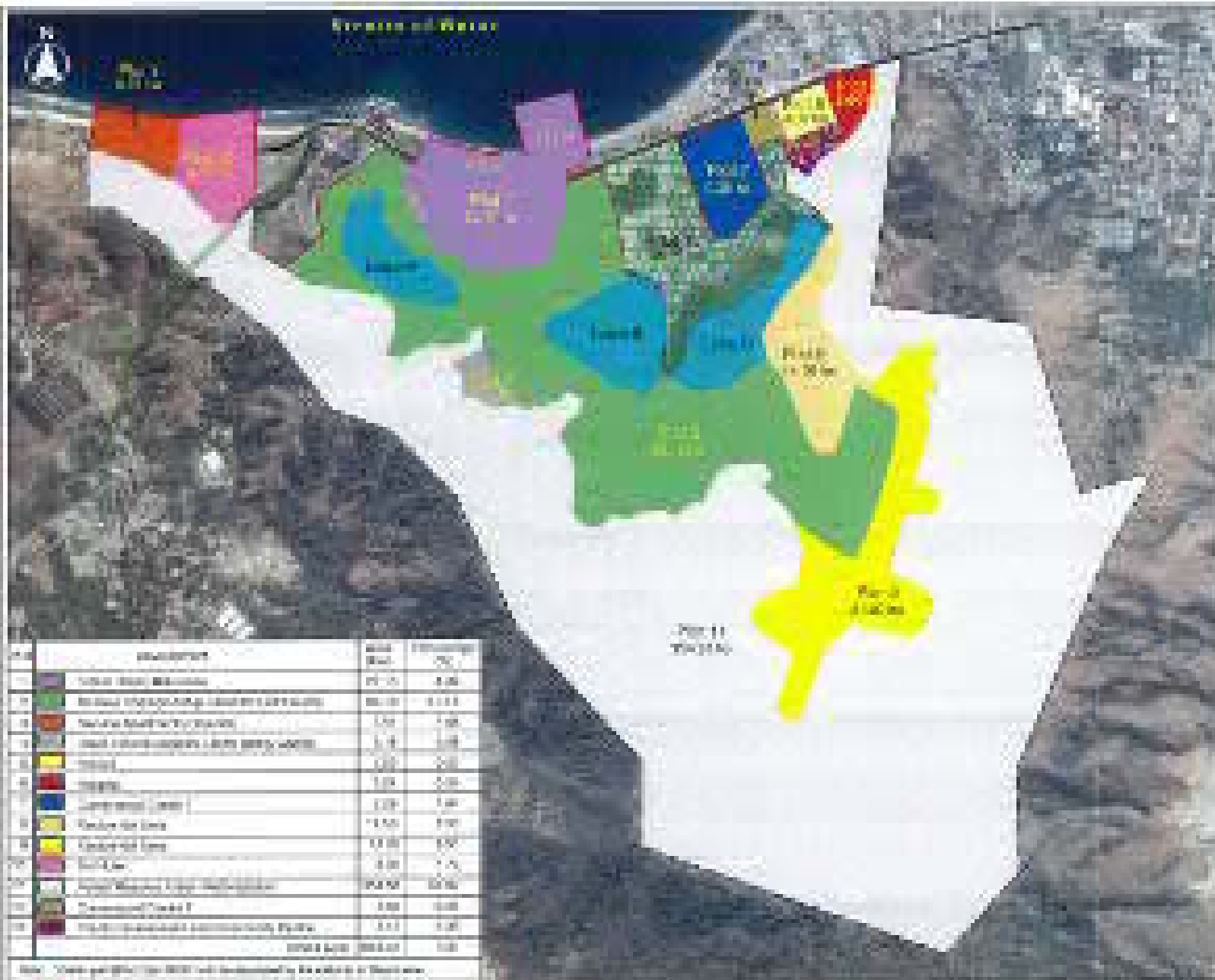
LOCAL AREA MAP



KEY PLAN



Point	Coordinate (UTM)	
	Longitude (E)	Latitude (N)
1	506443.7	7068113.0
2	506461.7	7068113.0
3	506471.7	7068070.0
4	506471.7	7068044.3
5	506470.0	7068000.0
6	506422.7	7068113.0
7	506354.7	7068113.0
8	506301.7	7068113.0
9	506251.7	7068000.0
10	506251.7	7068113.0



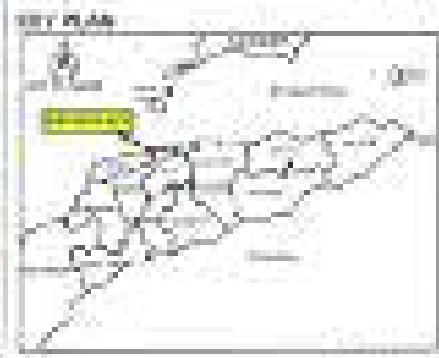
LEGEND

- Boundaries
- Development Area
- Reserve Area
- Water
- Forest
- Proposed Main Road

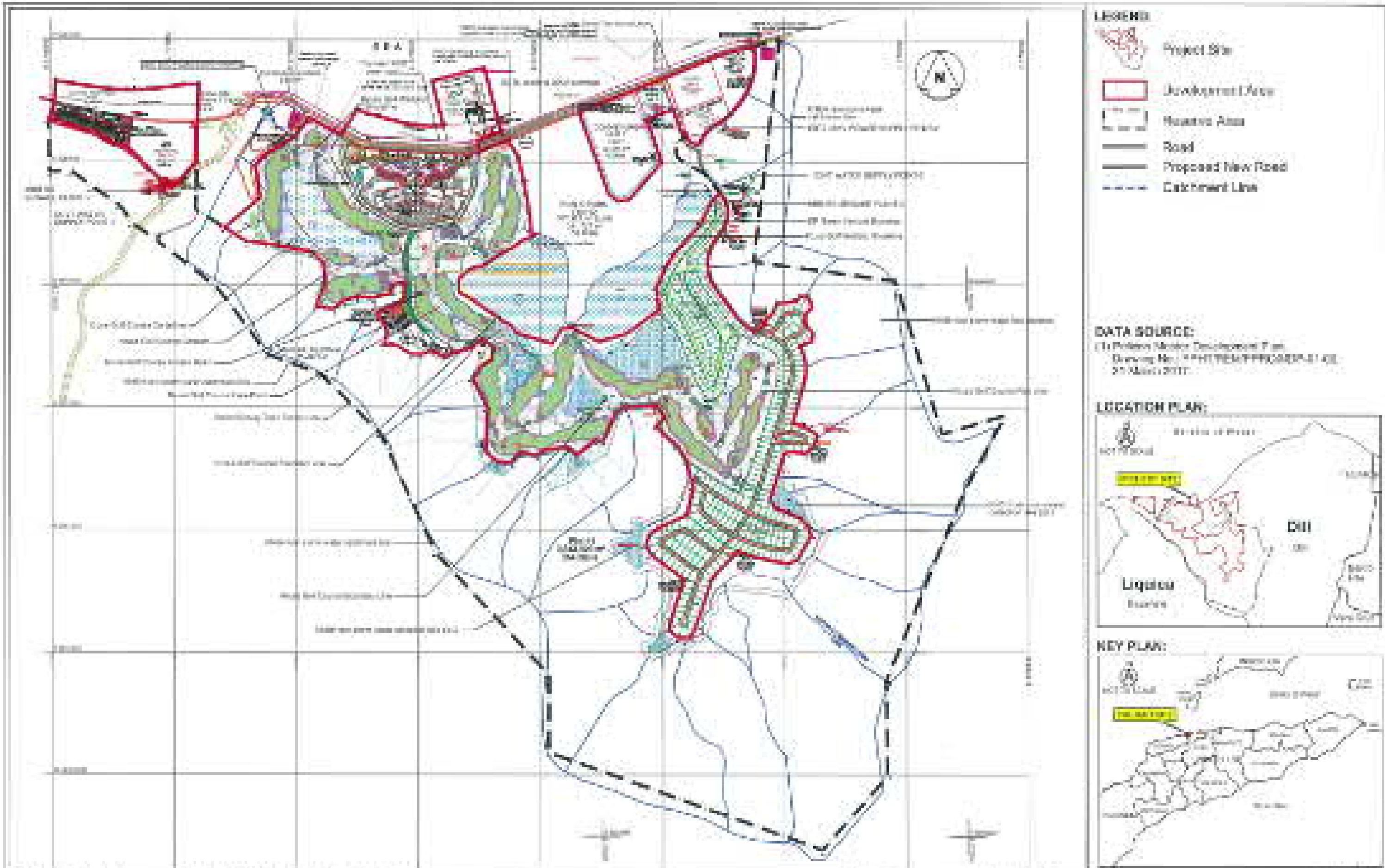
DATE REVISION



1. 01/01/2011 - Initial Design

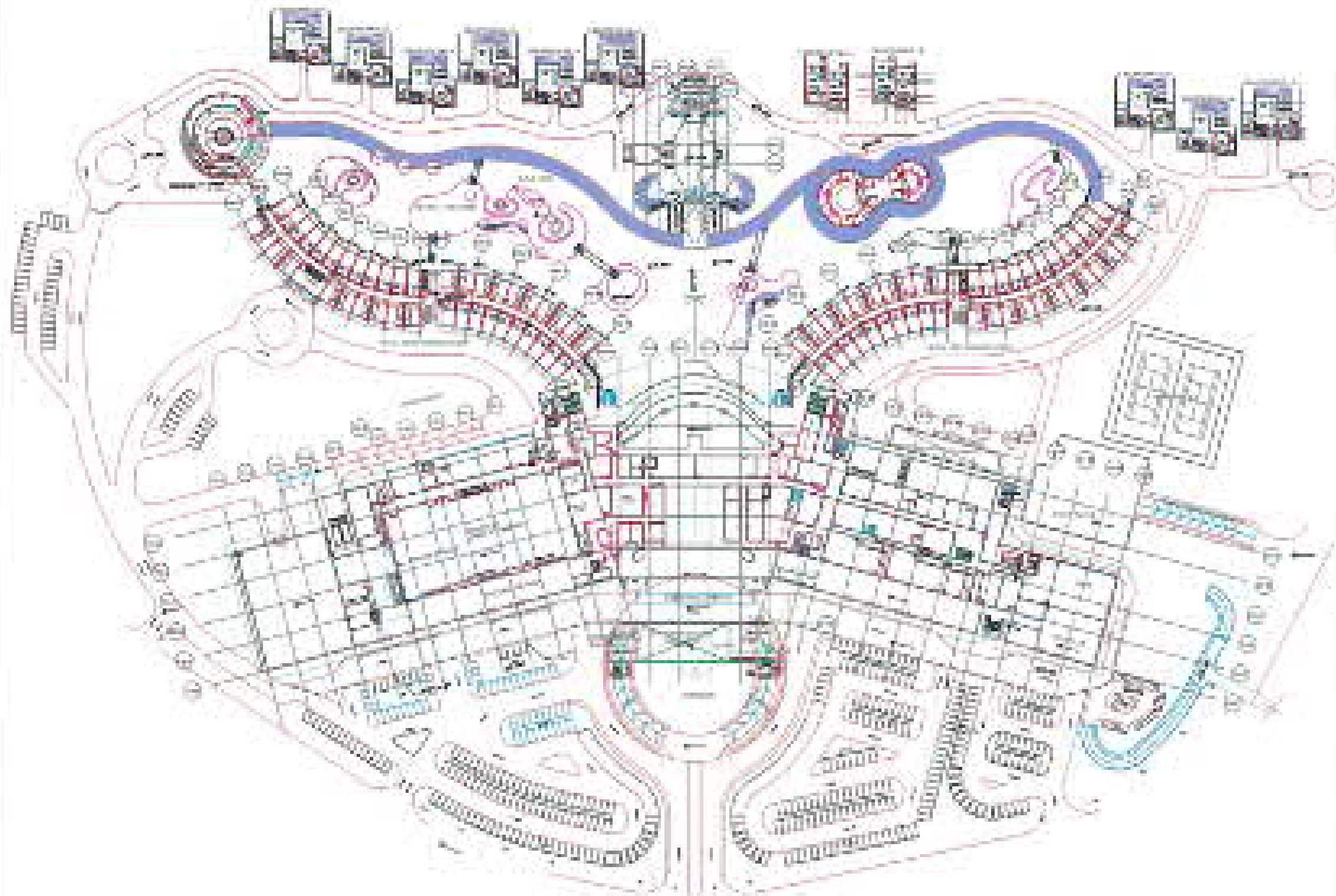
2. 01/01/2011 - Final Design



NO	DESCRIPTION	AREA (M ²)	PERCENTAGE (%)
1	Total Site Area	100.00	100.00
2	Forest (including existing reserves)	30.00	30.00
3	Water (including existing reserves)	10.00	10.00
4	Public Area (including existing reserves)	10.00	10.00
5	Forest	10.00	10.00
6	Water	10.00	10.00
7	Public Area	10.00	10.00
8	Development Area	10.00	10.00
9	Reserve Area	10.00	10.00
10	Proposed Main Road	10.00	10.00
11	Proposed Main Road	10.00	10.00
12	Proposed Main Road	10.00	10.00
13	Proposed Main Road	10.00	10.00
14	Proposed Main Road	10.00	10.00
15	Proposed Main Road	10.00	10.00
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25	Proposed Main Road	10.00	10.00
26	Proposed Main Road	10.00	10.00
27	Proposed Main Road	10.00	10.00
28	Proposed Main Road	10.00	10.00
29	Proposed Main Road	10.00	10.00
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55	Proposed Main Road	10.00	10.00
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72	Proposed Main Road	10.00	10.00
73	Proposed Main Road	10.00	10.00
74	Proposed Main Road	10.00	10.00
75	Proposed Main Road	10.00	10.00
76	Proposed Main Road	10.00	10.00
77	Proposed Main Road	10.00	10.00
78	Proposed Main Road	10.00	10.00
79	Proposed Main Road	10.00	10.00
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81	Proposed Main Road	10.00	10.00
82	Proposed Main Road	10.00	10.00
83	Proposed Main Road	10.00	10.00
84	Proposed Main Road	10.00	10.00
85	Proposed Main Road	10.00	10.00
86	Proposed Main Road	10.00	10.00
87	Proposed Main Road	10.00	10.00
88	Proposed Main Road	10.00	10.00
89	Proposed Main Road	10.00	10.00
90	Proposed Main Road	10.00	10.00
91	Proposed Main Road	10.00	10.00
92	Proposed Main Road	10.00	10.00
93	Proposed Main Road	10.00	10.00
94	Proposed Main Road	10.00	10.00
95	Proposed Main Road	10.00	10.00
96	Proposed Main Road	10.00	10.00
97	Proposed Main Road	10.00	10.00
98	Proposed Main Road	10.00	10.00
99	Proposed Main Road	10.00	10.00
100	Proposed Main Road	10.00	10.00



<p>PROJECT INFORMATION:</p>  <p>PELICAN PARADISE PELIKAN PARADISE TERBUKA</p>	<p>ENVIRONMENTAL CONSULTANT:</p>  <p>ASPEC NON PROFIT ENVIRONMENTAL ORGANISASI SENI DAN KREATIF</p>	<p>PROJECT TITLE:</p> <p>ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED PELICAN PARADISE DEVELOPMENT, TIRAN-TASE TOLU, TIMOR-LESTE</p>	<p>SCALE:</p> <p>NOT TO SCALE</p>	<p>DRAWING TITLE:</p> <p>PROJECT LAYOUT PLAN</p> <p>DRAWING NO.:</p> <p>FIGURE 4.3.2</p>	<p>NOTED:</p> <p>4-96</p> <p>DATE:</p> <p>MAR '18</p>
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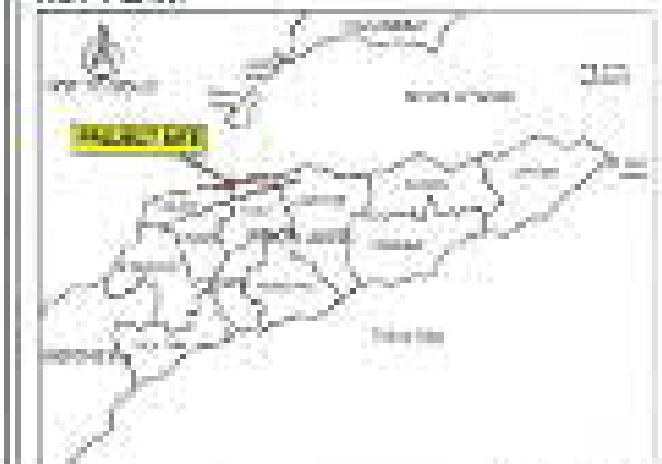
DATA SOURCE:

City Planning No. 4/03/2011 Overall 1st Storey Plan
 K.S. Murni S. Gunary, October 2010

LOCATION PLAN:



KEY PLAN:



PROJECT REPORT

ENVIRONMENTAL CONSULTANT

PROJECT TITLE

SCALE

SOURCE FILE

FIGURE NO.



PELICAN PARADISE DEVELOPMENT
 TIMOR-LESTE

ASPEC

ARCHITECTURAL ENVIRONMENTAL
 CONSULTANTS (AMEND) 0028743

**ENVIRONMENTAL MANAGEMENT PLAN
 FOR PROPOSED PELICAN PARADISE DEVELOPMENT,
 IBAI-TASI TOLU, TIMOR-LESTE**

NOT TO SCALE

HOTEL LAYOUT PLAN

4-58

FIGURE

FIGURE 4.3.3

DATE

MAR '18



LEGEND:



-  Project Site
-  Development Area
-  Reserve Area

DATA SOURCE:
 (1) Drawing No. 07/PLANNING/001, Pelican Master Development Plan
 (2) Pelican International Golf Course Course Layout, R. L. Moore & Company, November 2010.



LEGEND:

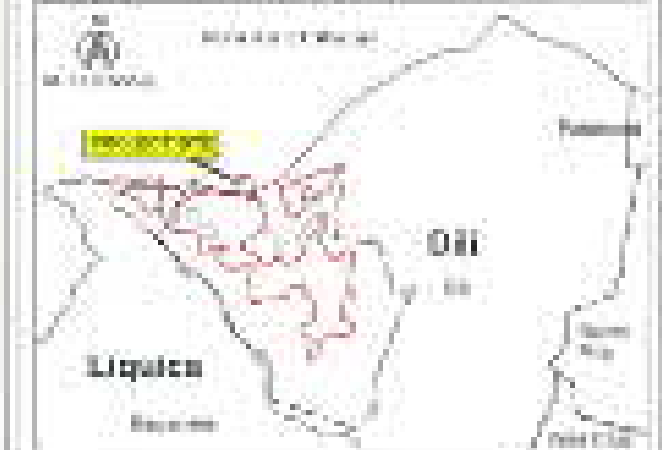
-  Road
-  Water
-  Project Site
-  Development Area
-  Reserve Area
-  Water
-  Land
-  Water
-  Water
-  Water
-  Water

<p>PROJECT PROPONENT</p>  <p>PELICAN PELICAN PARADISE HOLDINGS TIMOR-LESTE</p>	<p>ENVIRONMENTAL CONSULTANT</p>  <p>ASPEC KUSA PRINCIPAL ENGINEERING & ARCHITECTURE LINDA L. TWIS BSN, INC. (2008) LLC</p>	<p>PROJECT TITLE</p> <p>ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED PELICAN PARADISE DEVELOPMENT, TIBAR-TASI TOLU, TIMOR-LESTE</p>	<p>SCALE</p> <p>NOT TO SCALE</p>	<p>DEVELOPMENT</p> <p>GOLF COURSE LAYOUT PLAN</p> <p>DRAWING NO.</p> <p>FIGURE 4.3.4</p>	<p>SCALE</p> <p>A-00</p> <p>DATE</p> <p>MAY '18</p>
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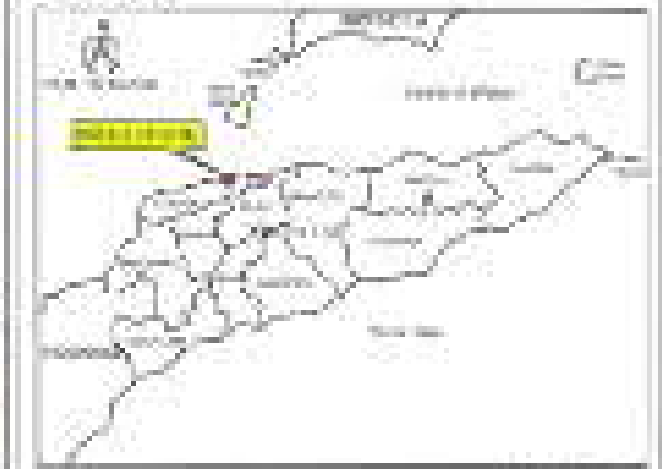





DATA SOURCE:
 City Drawing No. JAC 11-0004-00, Site Development Plan,
 P.C. Wong & Company, 2016

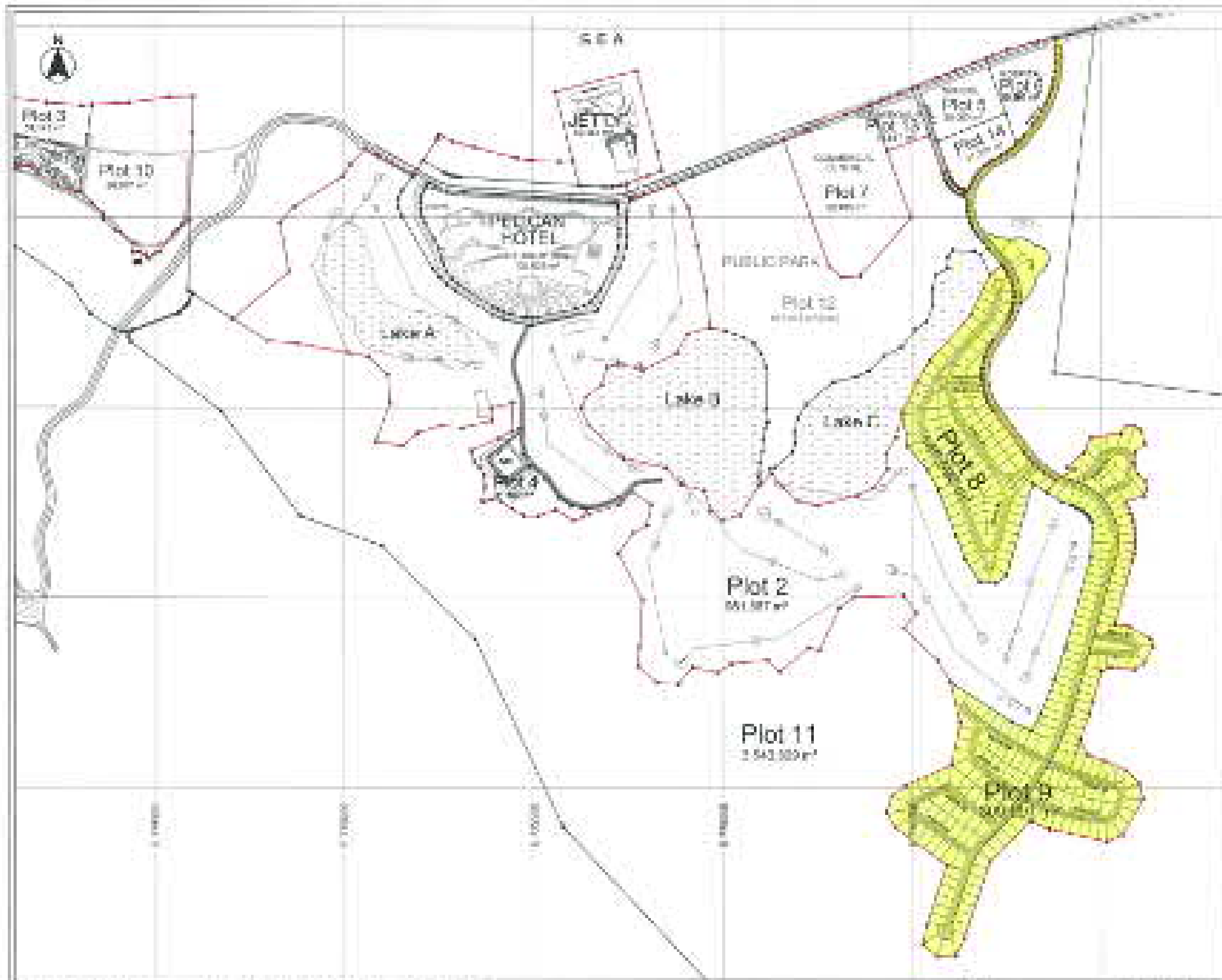
LOCATION PLAN



KEY PLAN



<p>PROJECT PROPOSER:  PELICAN TIMOR-LESTE'S RELIABLE CONSULTANT</p>	<p>ENVIRONMENTAL CONSULTANT:  ASPEC KEMENTERIAN SUKSESAMAH LALU LINTAS DAN NEGARA CONSULTANTS SDA B-03-00007-01</p>	<p>PROJECT TITLE: ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED PELICAN PARADISE DEVELOPMENT, TIBAR-TASI TOLU, TIMOR-LESTE</p>	<p>SCALE: </p>	<p>DRAWN BY: SERVICE APARTMENTS LAYOUT PLAN DRAWING NO: FIGURE 4.3.5</p>	<p>PAGE NO: 4-38 DATE: 15 MAR 2018</p>
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LEGEND:

- Project Site
- Development Area
- Coastal Area

DATA SOURCE:
 (1) Drawing No. P104553000000000000
 Plot 8 & 9 Development Locality Plan
 Approved MHCD Edn 001, October 2016

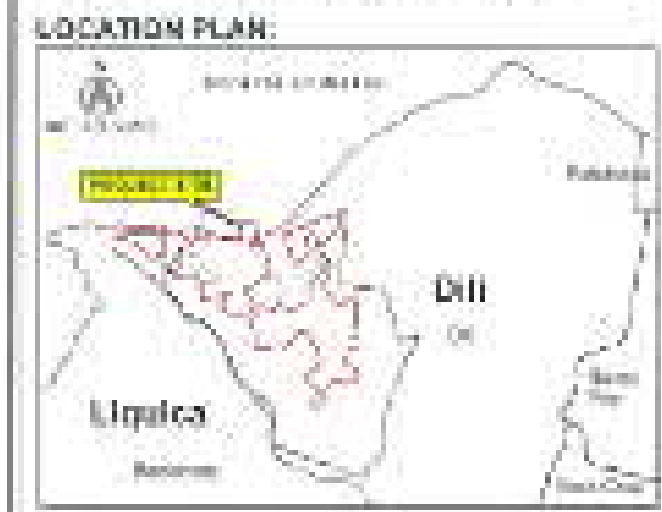


Figure 4.2.7: School Conceptual Plan



Source: Pelican Paradise Holdings/Timco-Latta, (2018)

Figure 14.19: Youth Development and Community Centre

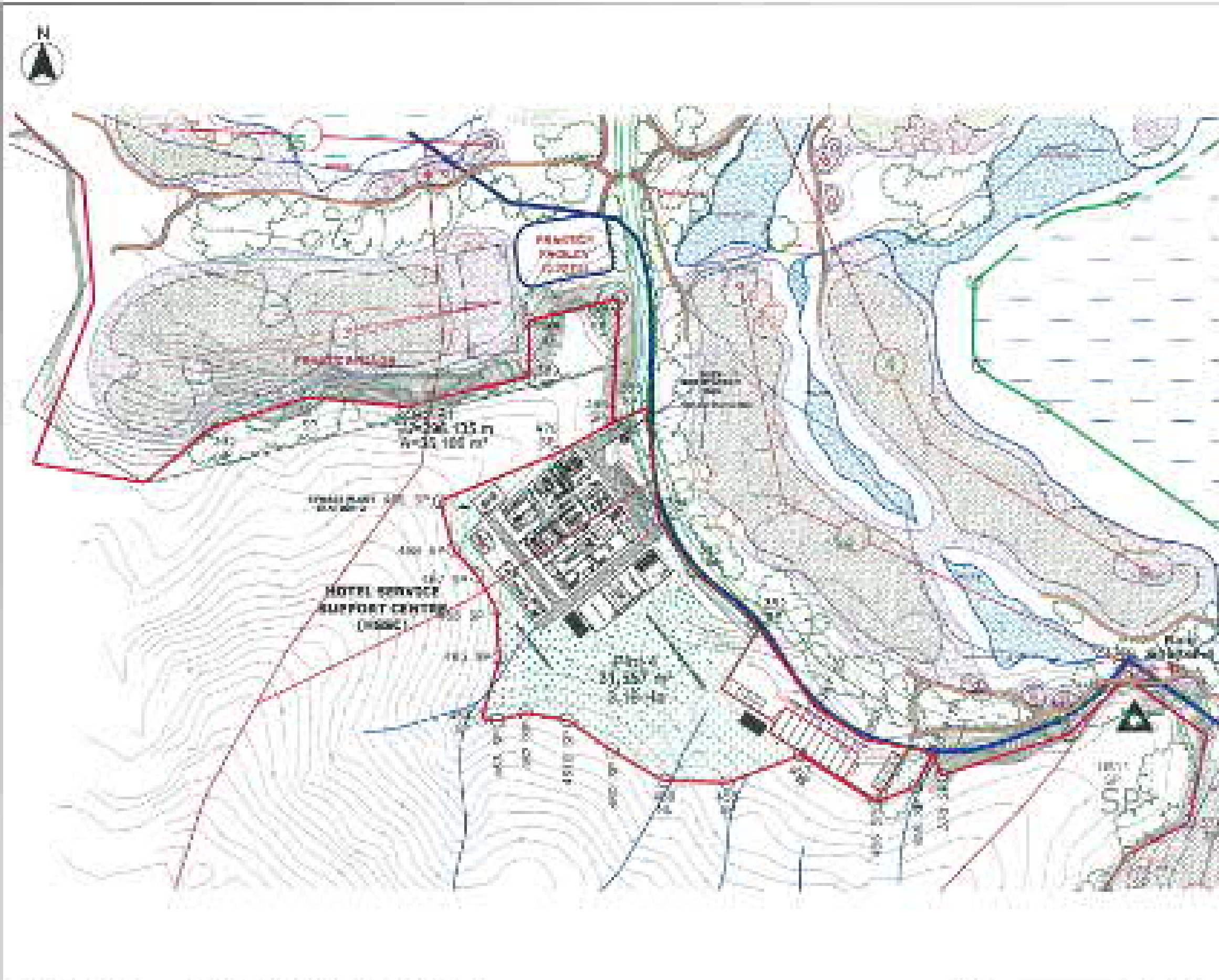


Source: Pelican Paradise Holdings (Pristi-Cara), 2016.

Figure 4.3.8: Hospital Conceptual Plan



Source: Falcon & Partners Holdings, Thailand Ltd., 2018



DATA SOURCE:
 (1) Drawing No. 89-40, 80M Hatched contour interval
 Hotel Service Support Centre, P.L. Moran & Company
 27 November 2018

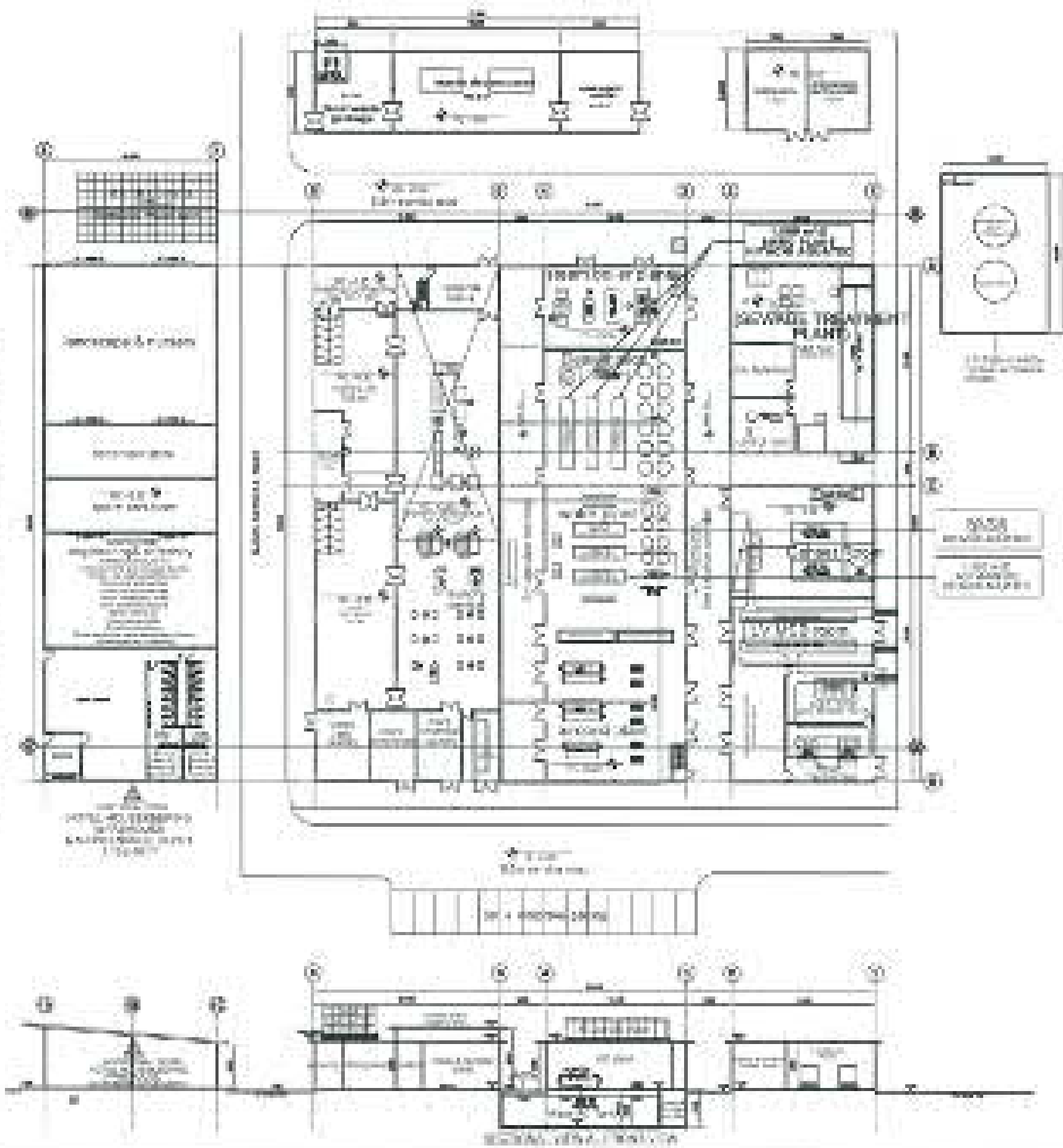


<p>PROJECT ORGANISATION:</p>  <p>PROJECT MANAGER: TRACY JONES</p>	<p>ENVIRONMENTAL CONSULTANT:</p>  <p>ASPEC 100A PACIFIC ENVIRONMENTAL CONSULTANTS SON 3 RD (226274)</p>	<p>PROJECT TITLE:</p> <p>ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED PELICAN PARADISE DEVELOPMENT, TIBAR-TASU TOLL, TIMOR-LESTE</p>	<p>SCALE:</p> <p>NOT TO SCALE</p>	<p>DRAWING TITLE:</p> <p>UTILITY CENTRE SITE LAYOUT</p> <p>DRAWING NO.:</p> <p>FIGURE 4.3.10 (a)</p>	<p>PAGE NO.:</p> <p>4-43</p> <p>DATE:</p> <p>MAR '18</p>
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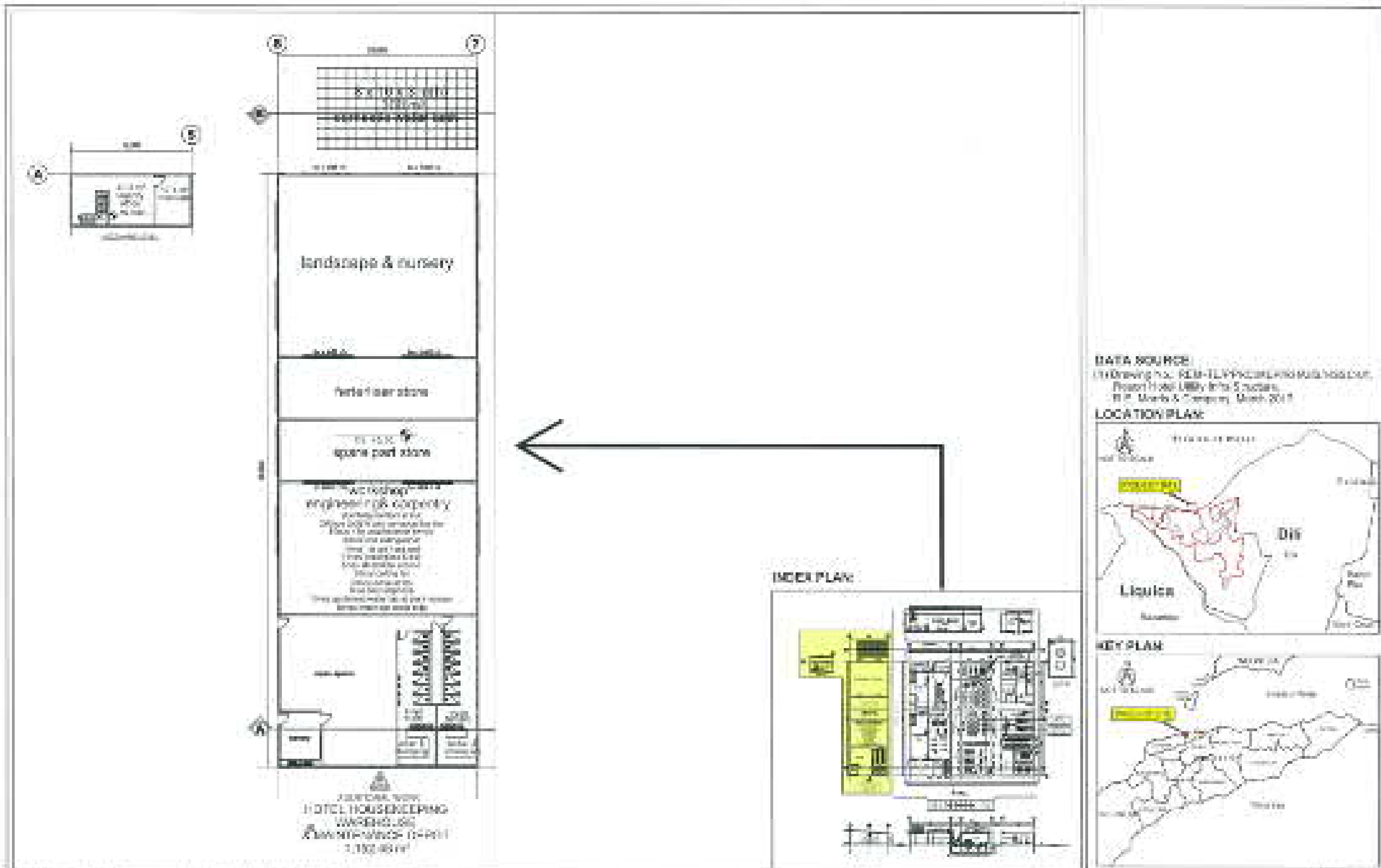
No.	Material	Quantity
1	Concrete Wall 24" Concrete Wall	7
2	Truss Beam	1
3	Wood subflooring 1/2" Ply	1
4	4" Plywood Subfloor 1/2" Ply	1
5	400 Trench Cover Sheet	1
6	400 Trench Cover Box	2
7	400 Trench Cover Machine	1
8	Truss Truss Machine	1
9	Truss Truss Machine	1
10	400 Trench Cover	1
11	400 Trench Cover	1
12	400 Trench Cover	1
13	400 Trench Cover	1
14	400 Trench Cover	1
15	400 Trench Cover	1
16	400 Trench Cover	1
17	400 Trench Cover	1
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46	400 Trench Cover	1
47	400 Trench Cover	1
48	400 Trench Cover	1
49	400 Trench Cover	1
50	400 Trench Cover	1

TABLE 4.10.10-1: SUMMARY OF MATERIALS FOR UTILITY CENTRE CONSTRUCTION



DATA SOURCE:
 (1) Drawing No. 1011 (PROPOSED UTILITY CENTRE)
 (2) Report No. 1011 (PROPOSED UTILITY CENTRE)
 (3) J.C. Harris & Company, Inc.

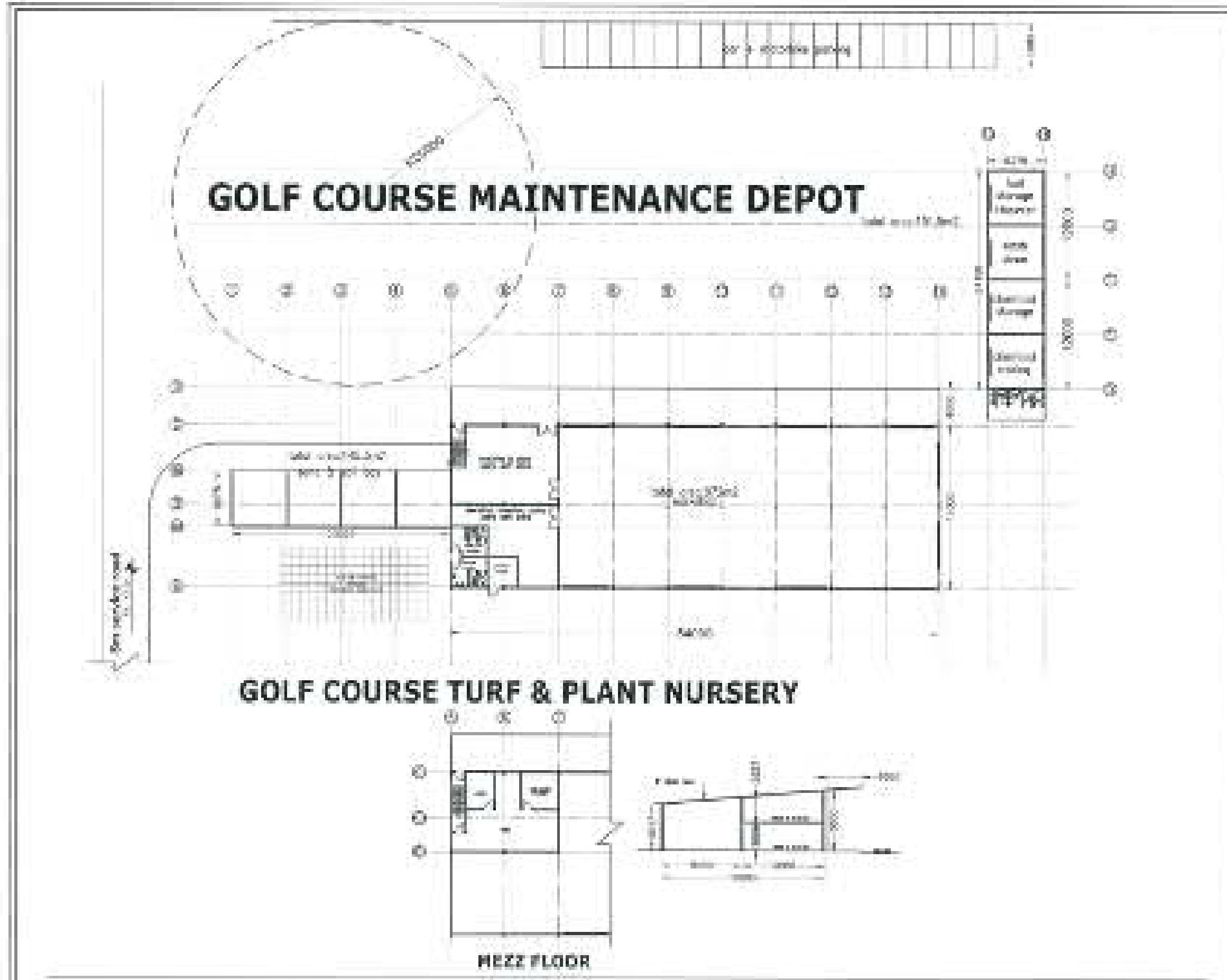




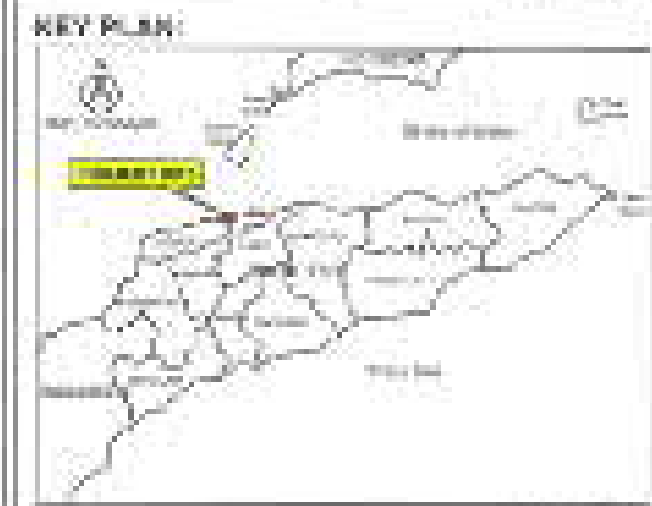
DATA SOURCE
 (1) Drawing no. PEM-ELP-P001 and P002, 10/04/07
 Project Hotel Liquea 8 to 5 rooms
 R.P. Mores & Company, March 2011

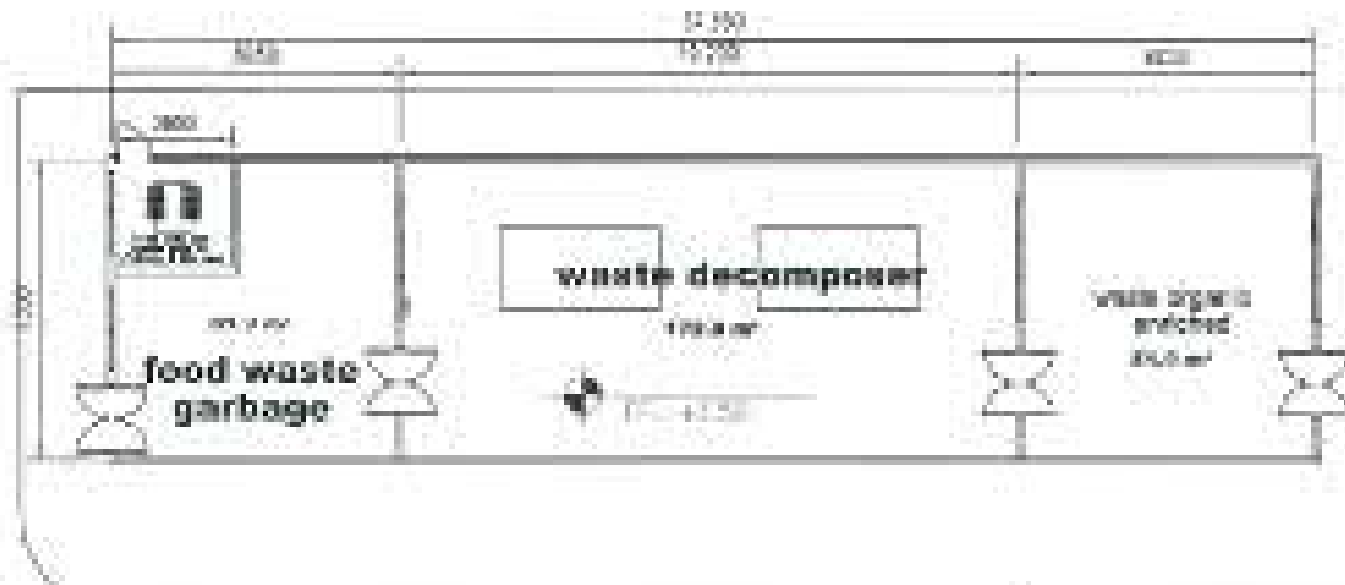


<p>PROJECT PROMOTER</p> <p>PELICAN HOTELS HOLDINGS MARIUT, STP</p>	<p>ENVIRONMENTAL CONSULTANT</p> <p>ASPEC ADVANCED ENVIRONMENTAL CONSULTANTS (PVT) LTD</p>	<p>PROJECT TITLE</p> <p>ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED PELICAN PARADISE DEVELOPMENT, TIBAR-TASI TOLU, TIMOR-LESTE</p>	<p>SCALE</p> <p>NOT TO SCALE</p>	<p>DRAWING TITLE</p> <p>LAYOUT OF HOTEL HOUSEKEEPING WAREHOUSE & MAIN EXCHANGE DEPOT</p> <p>DRAWING NO.</p> <p>FIGURE 4.3.15 (c)</p>	<p>FILE NO.</p> <p>4-05</p> <p>DATE</p> <p>MAR 16</p>
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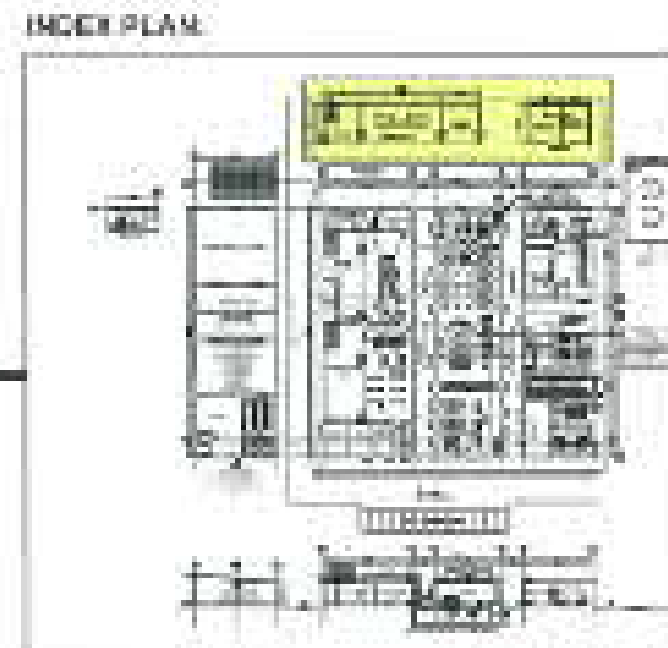


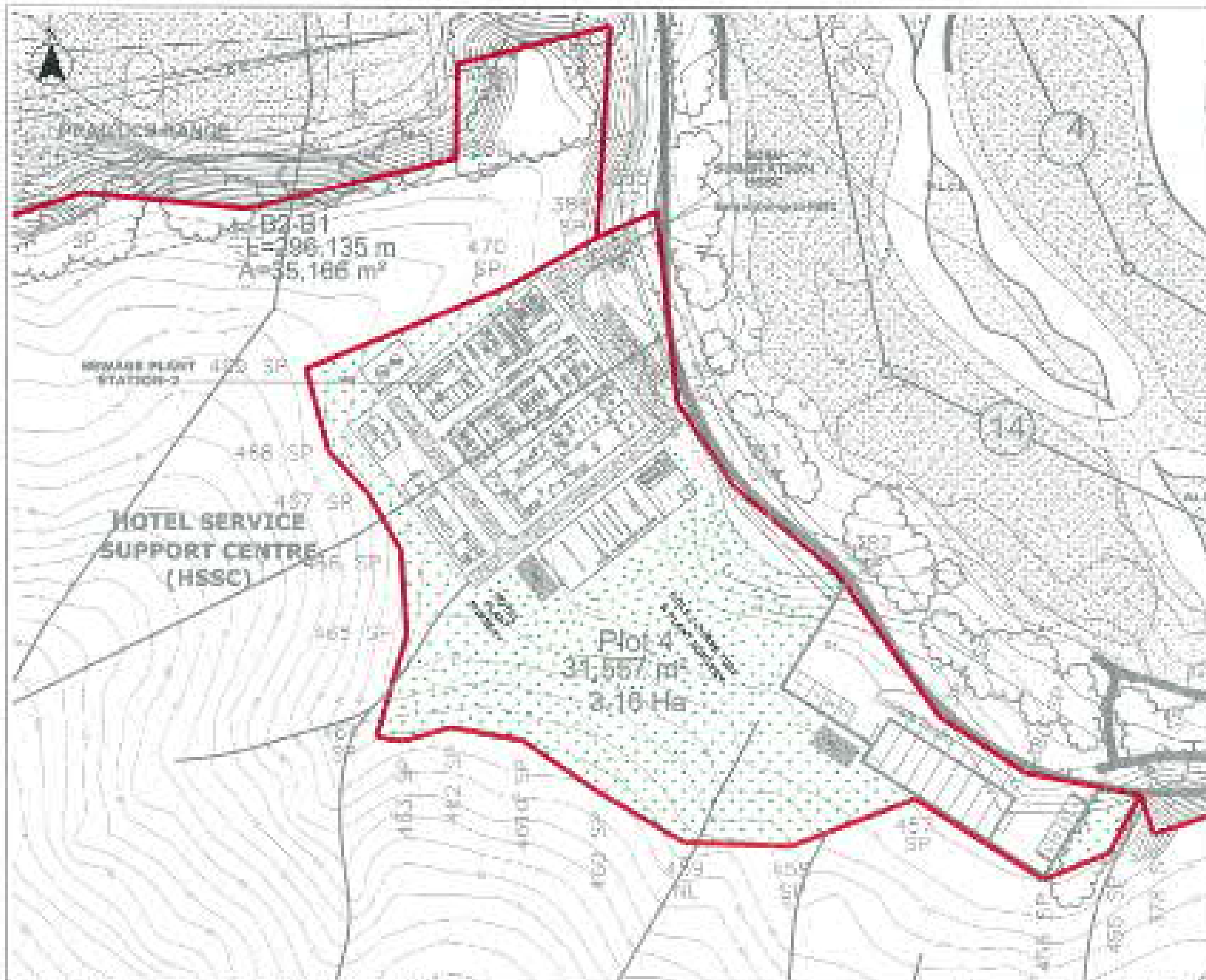
DATA SOURCE
 (1) Drawing No. PPRC/PP/01/01 - Golf Course Maintenance Workshop, Kuala Lumpur, Sel, November 2018.



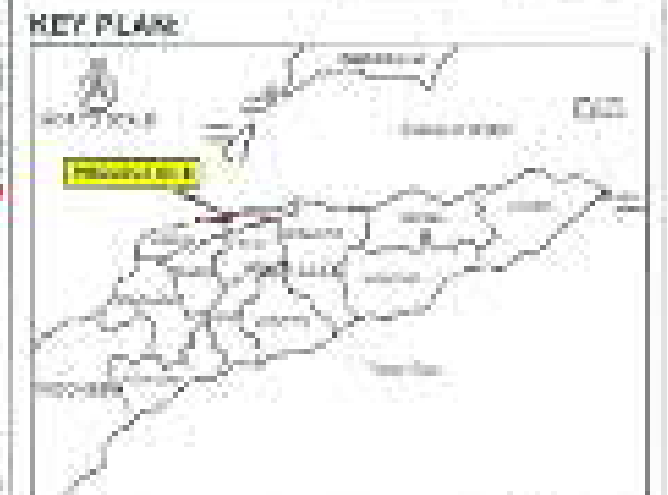


DATA SOURCE
 (1) Drawing No.: REAM/PTTC/MOPV/ BUS/MSD-01,
 Pelican Hotel (1000) Infra Structure,
 P.O. No. 1 & Company, March 2017.

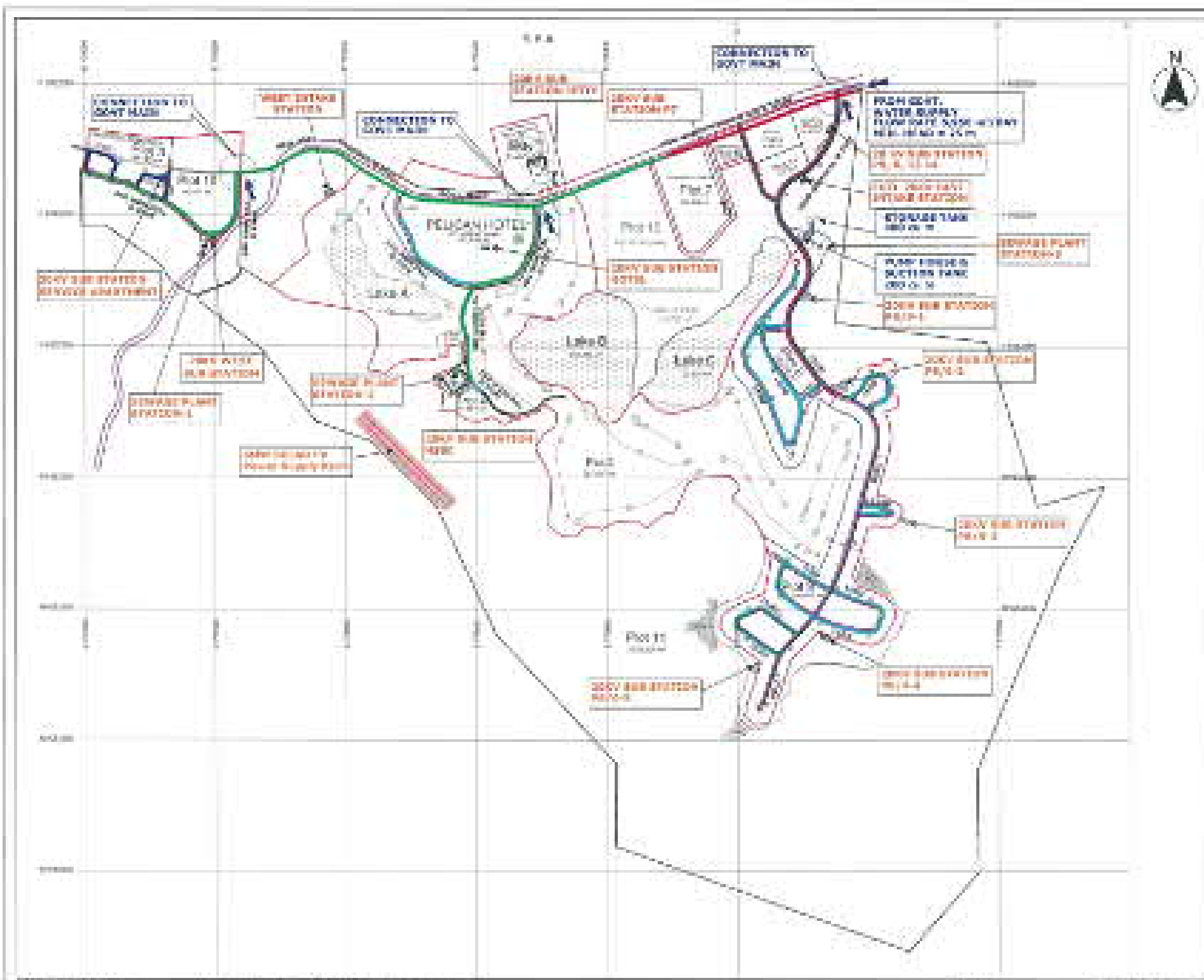




DATA SOURCE
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<p>PROJECT PROPOSER</p> <p>PELIKAN PARADISE RESORTS FACILITIES</p>	<p>ENVIRONMENTAL CONSULTANT</p> <p>ASIA PACIFIC ENVIRONMENTAL CONSULTANTS PTY LIMITED</p>	<p>PROJECT TITLE</p> <p>ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED PELIKAN PARADISE DEVELOPMENT, TIBAR-TABI TOLU, TIMOR-LESTE</p>	<p>SCALE</p> <p>NOT TO SCALE</p>	<p>DRAWING TITLE</p> <p>LAYOUT OF HOTEL PLANT NURSERY AND GOLF COURSE TURF & PLANT NURSERY</p> <p>FIGURE 4.3.10 (f)</p>	<p>REVISION</p> <p>4-45</p> <p>DATE</p> <p>19/07/18</p>
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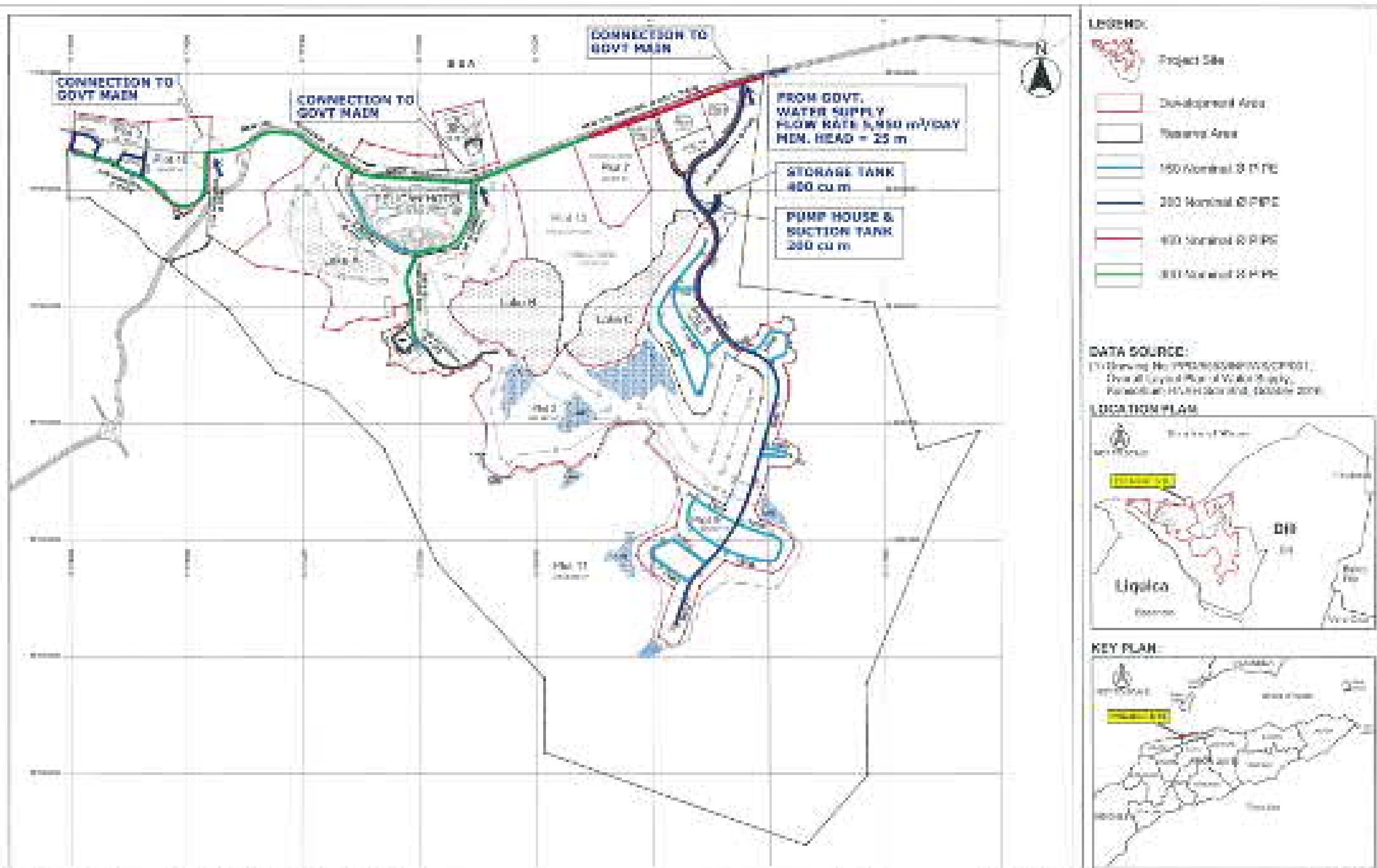
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- Reserve Area
- Road
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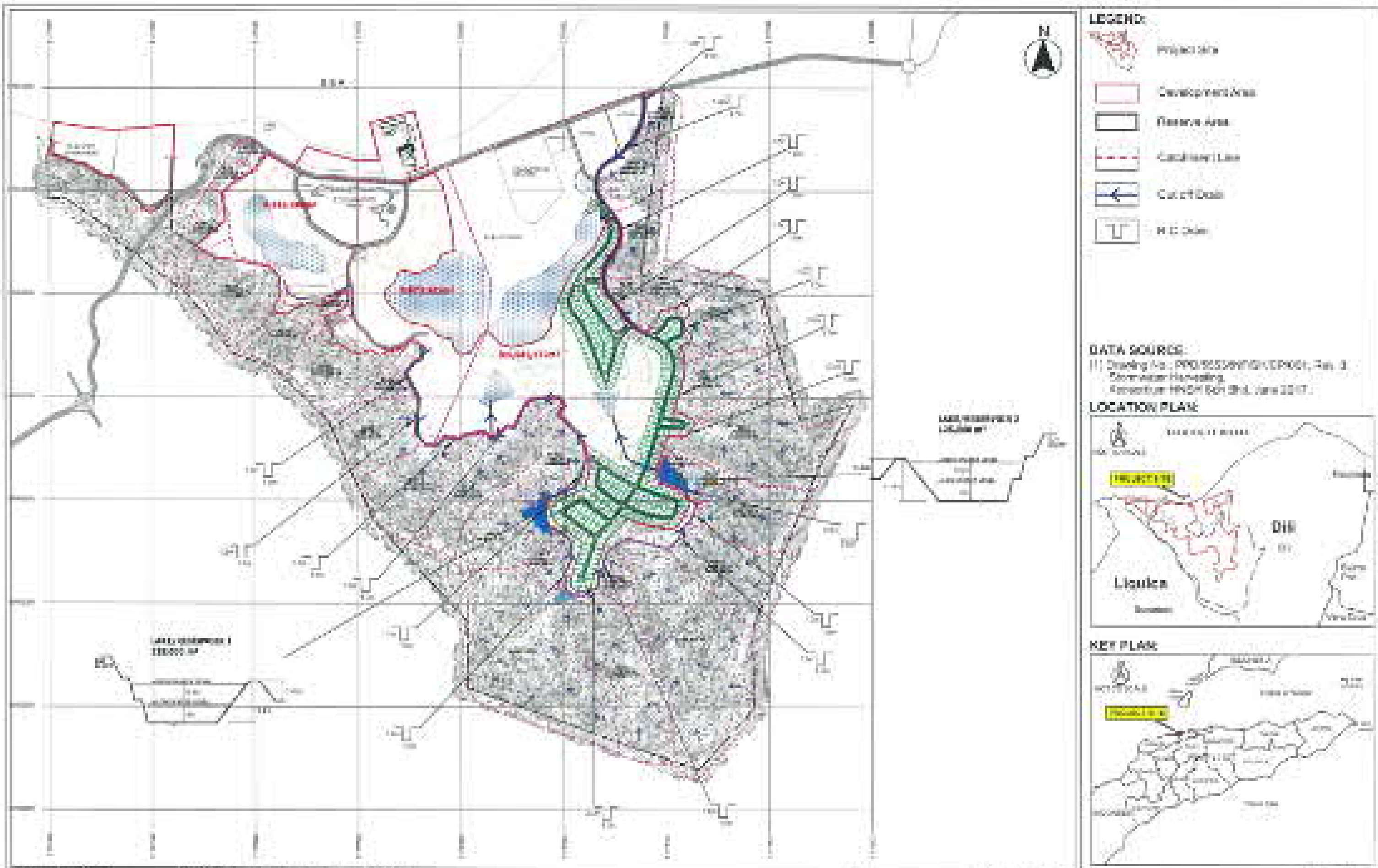
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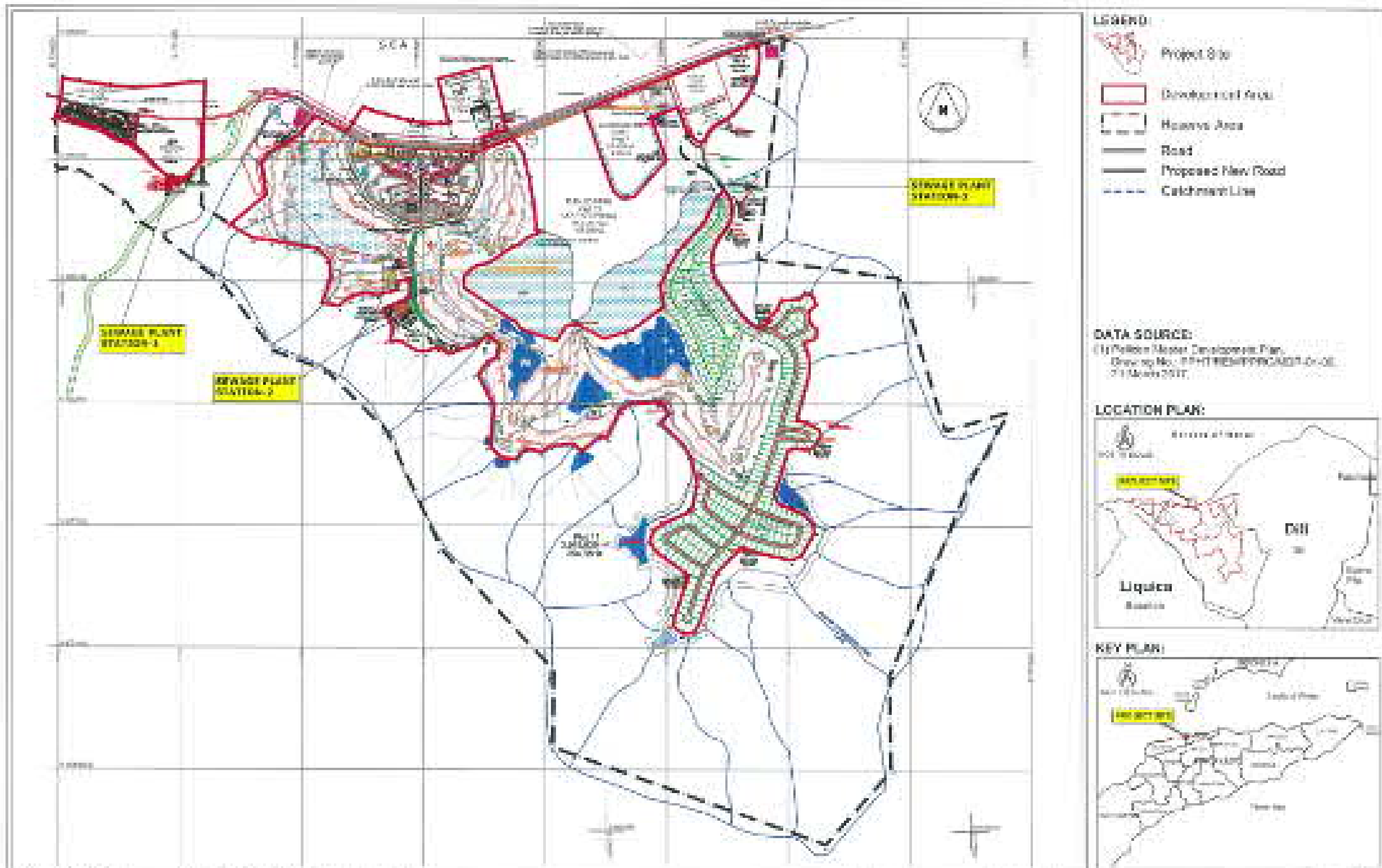
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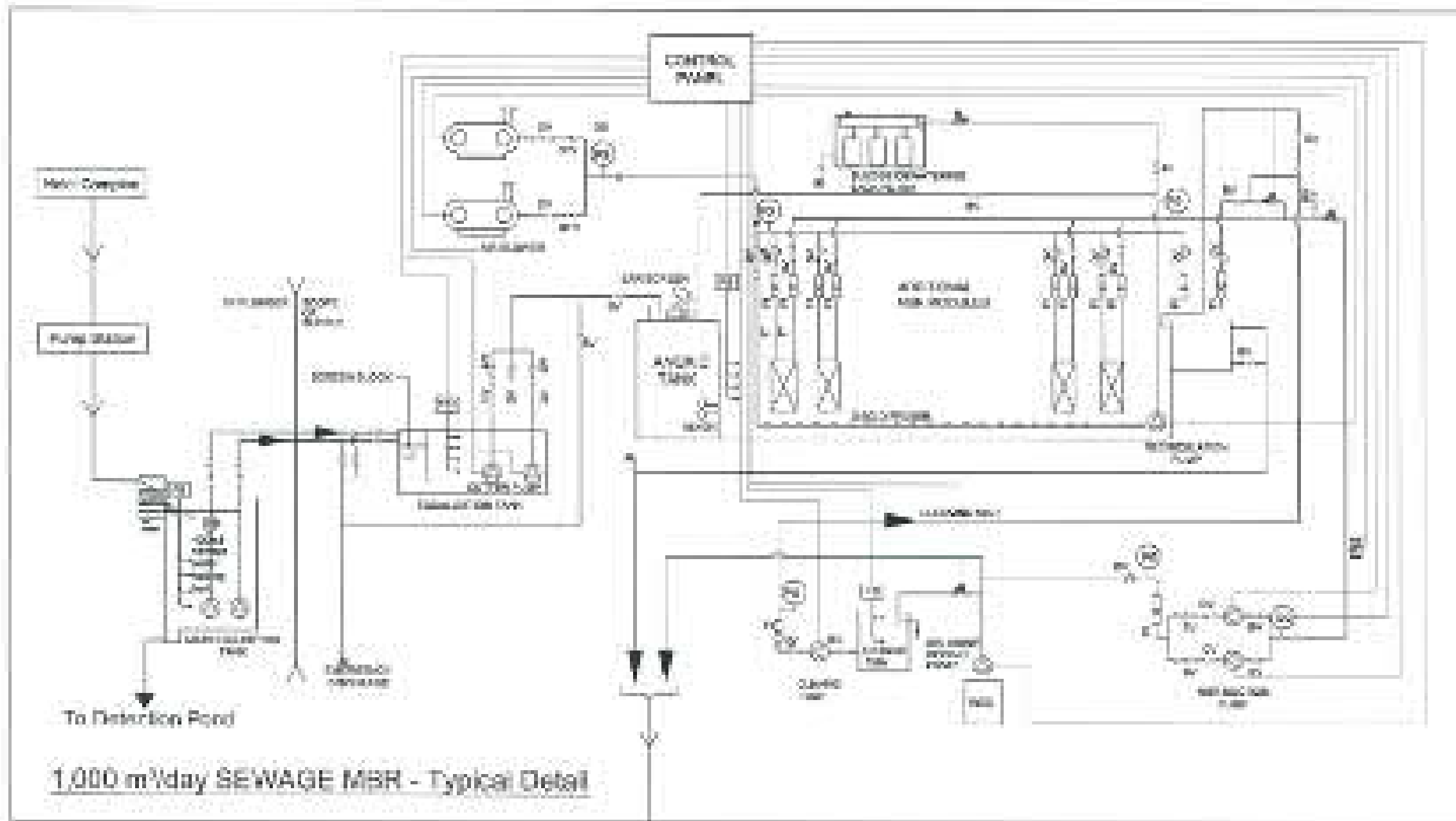
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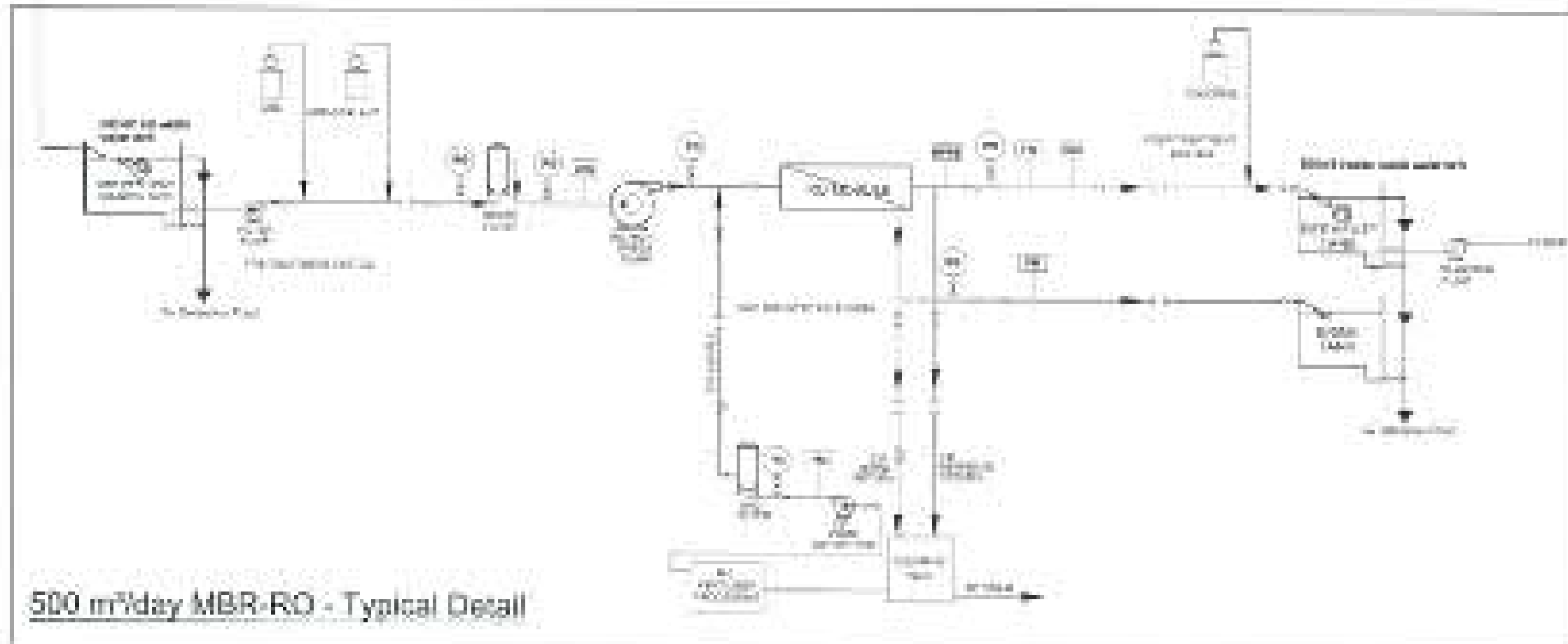
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DATA SOURCE:
 (1) Drawing No. EPC-TE-PROPOSED-PMSE-145-01,
 East-Timor M&S Services, K&L Work & Consulting,
 September 2017



<p>PROJECT WORKING ENVIRONMENTAL CONSULTANTS</p>	<p>ENVIRONMENTAL CONSULTANTS</p> <p>ASPEC</p> <p>ASIA PACIFIC ENVIRONMENTAL CONSULTANTS CONSULTANTS SOYUBHIO 22232741</p>	<p>PROJECT TITLE:</p> <p>ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED PELICAN PARADISE DEVELOPMENT, LIGUICA-TASITOLU, TIMOR-LESTE</p>	<p>SCALE:</p> <p>NOT TO SCALE</p>	<p>DRAWING TITLE:</p> <p>SEWAGE TREATMENT PLANT LAYOUT -MBR TYPICAL FLOW DIAGRAM</p> <p>FIGURE 4.3.14 (U)</p>	<p>FIGURE NO:</p> <p>4-03</p> <p>DATE:</p> <p>MAR 18</p>
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500 m³/day MBR-RO - Typical Detail

DATA SOURCE:

1) Drawing No. TCM-TC-PR-02, MAREK/MAK/010, Tasek Hotel, MSE Services, P. E. Morio & Company, November 2017.

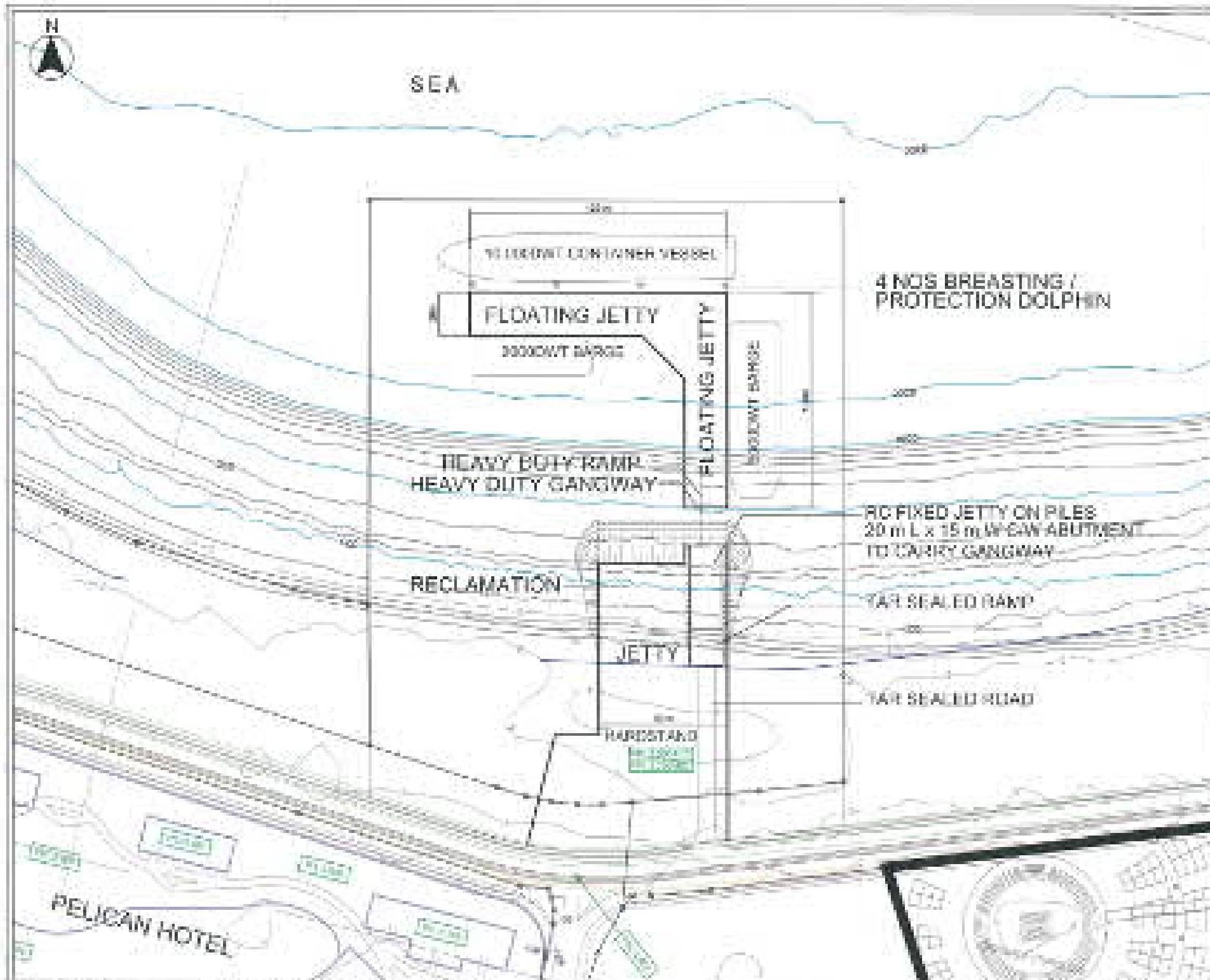
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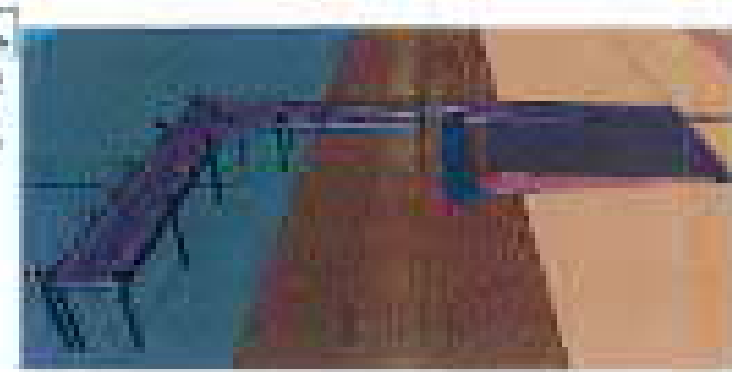
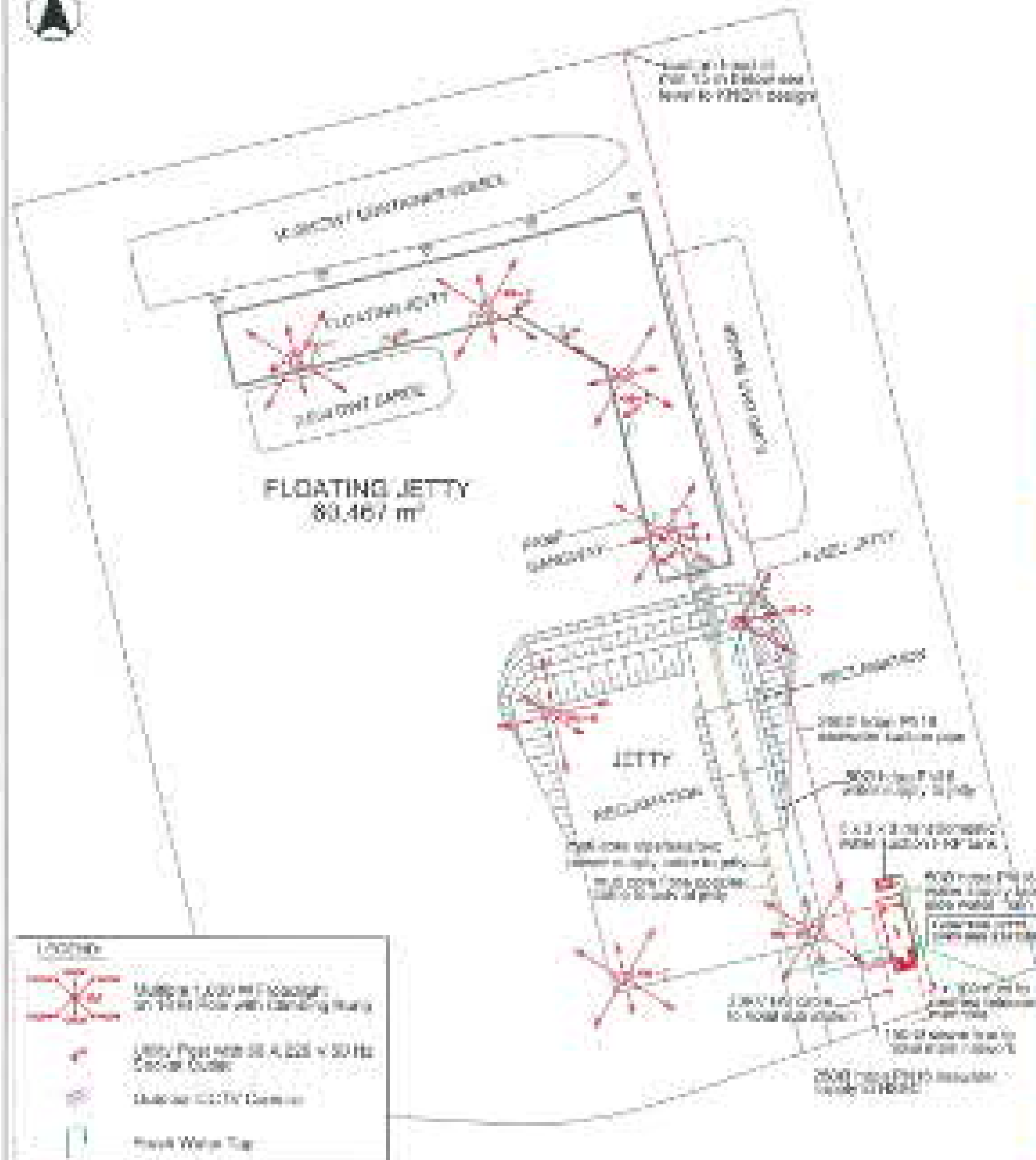
<p>PROJECT PROPOSER: PRIMOR PARADISE HOLDINGS TIMOR-LESTE</p>	<p>ENVIRONMENTAL CONSULTANT: ASPEC NATIONAL CONSULTANTS CONSULTANTS SDA 840 32282741</p>	<p>PROJECT TITLE: ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED FELICAN PARADISE DEVELOPMENT, TIBAN-TASI TOLU, TIMOR-LESTE</p>	<p>SCALE: NOT TO SCALE</p>	<p>DRAWING TITLE: SEWAGE TREATMENT PLANT LAYOUT - MBR-RO TYPICAL FLOW DIAGRAM</p> <p>FIGURE NO: FIGURE 4.3.14(a)</p>	<p>FIGURE NO: 4/34</p> <p>DATE: MAR '18</p>
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DATA SOURCE
 (1) Drawing No: PFD/5533/04/10/0001
 July, P.E. Moran & Company, January 2010.



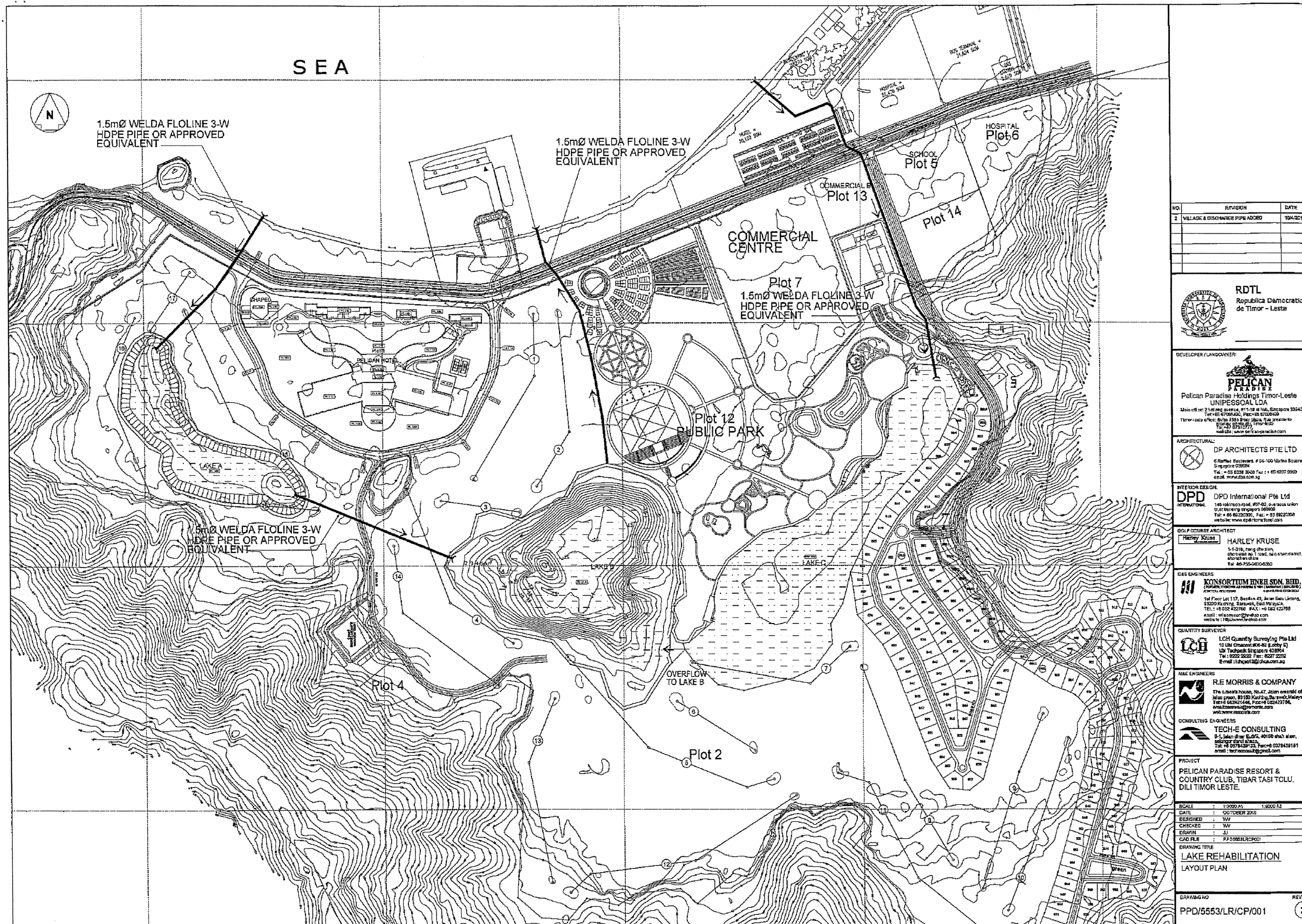
<p>PROJECT PROponent</p>  <p>PELICAN PARADISE HOLDINGS SPRUALETS</p>	<p>ENVIRONMENTAL CONSULTANT</p>  <p>ASPEC 25/11, P.O. BOX 107, PRAIRIE AVENUE CONSULTANTS-EDV 810-25232144</p>	<p>PROJECT TITLE</p> <p>ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED PELICAN PARADISE DEVELOPMENT, TIBAR-TASI TOLL, TIMOR-LESTE</p>	<p>SCALE</p> <p>NOT TO SCALE</p>	<p>DRAWING TITLE</p> <p>LAYOUT PLAN FOR FLOATING JETTY</p> <p>DRAWING NO.</p> <p>FIGURE 4.3.15.00</p>	<p>PAGE NO.</p> <p>4-55</p> <p>DATE</p> <p>MAR '16</p>
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DATA SOURCE
 (1) Drawing No: RES-TE-PPROJ-01-01
 Floating Jetty, P.C. Moran & Company,
 November 2018.



Figure 4.3.16 (a): Lake Rehabilitation for Lake A



NO.	REVISION	DATE
2	VILLAGE & DISCHARGE PIPE ADDED	20/4/2018

RDTL
República Democrática de Timor - Leste

DEVELOPER / LANDOWNER:
PELICAN
Pelican Paradise Holdings Timor-Leste
UNIPERSONAL LDA
Main office: 2nd floor, Avenida 11-18 at Vila, Dili, Timor-Leste 99000
Tel: +65 6228 3828 Fax: +65 6228 3828
Tibor-Leste office: 8th floor, 15th Street, Dili, Timor-Leste 99000
Tel: +65 6228 3828 Fax: +65 6228 3828
Website: www.pelicanparadise.com

ARCHITECTURAL:
DP ARCHITECTS PTE LTD
5 Raffles Boulevard, #04-100 Marina Square
Singapore 039594
Tel: +65 6228 3828 Fax: +65 6228 3828
Email: www.dparchitects.com.sg

INTERIOR DESIGN:
DPD International Pte Ltd
145 Robinson Road, #07-02, Singapore
Singapore 068008
Tel: +65 6228 3828 Fax: +65 6228 3828
Website: www.dpinterior.com.sg

DESIGN BY ARCHITECT:
Harley Kruse
1-1-018, Panglima
Dili, Timor-Leste 99000
Tel: +65 6228 3828 Fax: +65 6228 3828
Email: harley.kruse@dparchitects.com

DESIGN ENGINEERS:
KONSORTIUM HENH SDN. BHD.
KONSORTIUM HENH SDN. BHD.
1st Floor Lot 117, Selekta Hill, Jalan Selekta, 83200 Kluang, Johor, Malaysia
Tel: +60 7 622 8278 Fax: +60 7 622 8278
Email: info@konsortiumhenh.com
Website: www.konsortiumhenh.com

QUANTITY SURVEYOR:
LCH
LCH Quantity Surveying Pte Ltd
10 Ulu Chersonese Road, #04-01
Ulu Techpark, Singapore 639504
Tel: +65 6228 3828 Fax: +65 6228 3828
Email: lch@lchqs.com.sg

MEASUREMENT ENGINEERS:
R.E. MORRIS & COMPANY
The Lumbini House, No. 47, Jalan Amal, off
Jalan Pagar, 82100 Kluang, Johor, Malaysia
Tel: +60 7 622 8278 Fax: +60 7 622 8278
Email: info@remorris.com

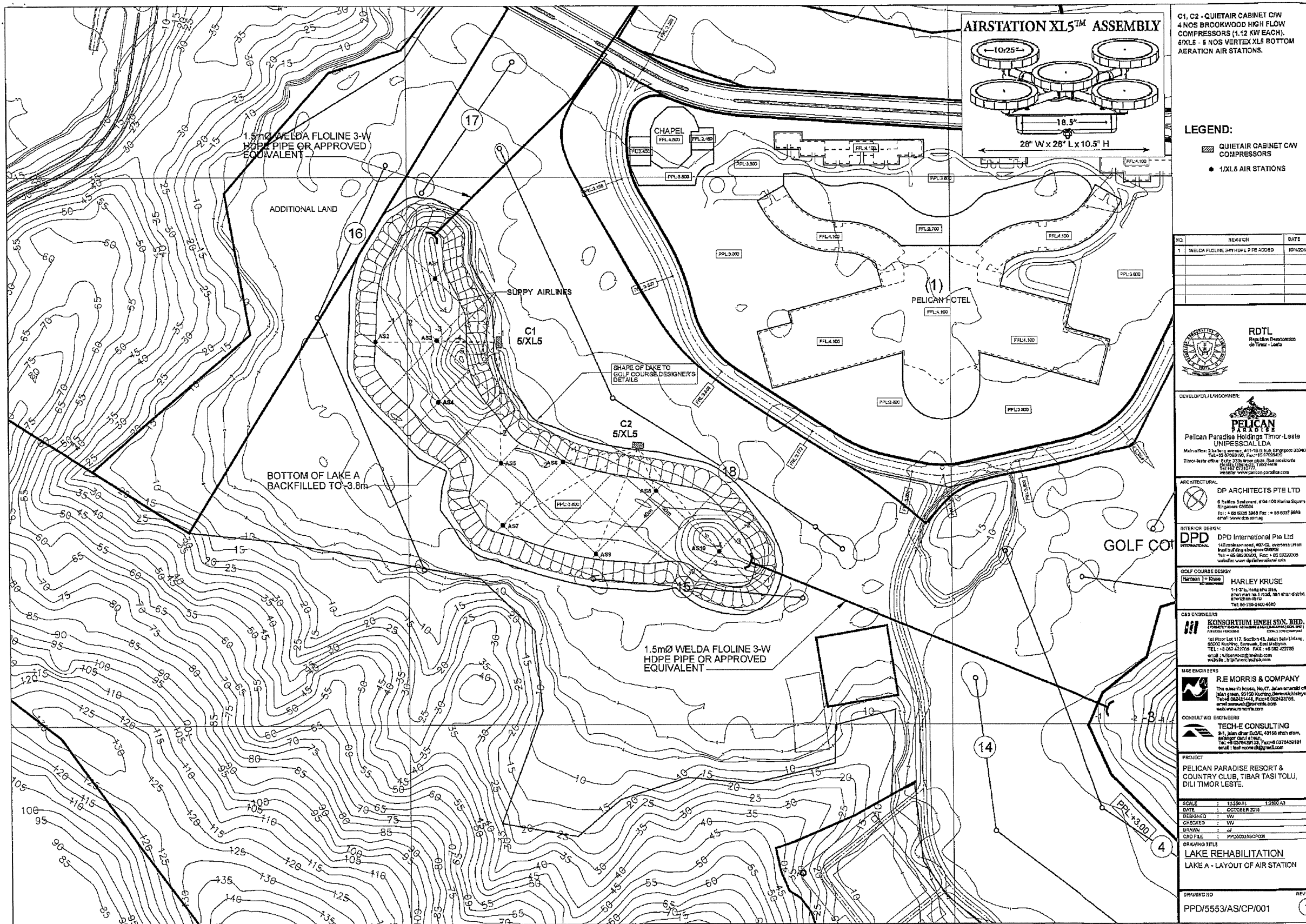
CONSULTING ENGINEERS:
TECH-E CONSULTING
81, Jalan 21 May, B.L.S. 40150 Shah Alam,
Selangor Darul Ehsan,
Tel: +60 3 4081 1111 Fax: +60 3 4081 1111
Email: tech-e@tech-e.com

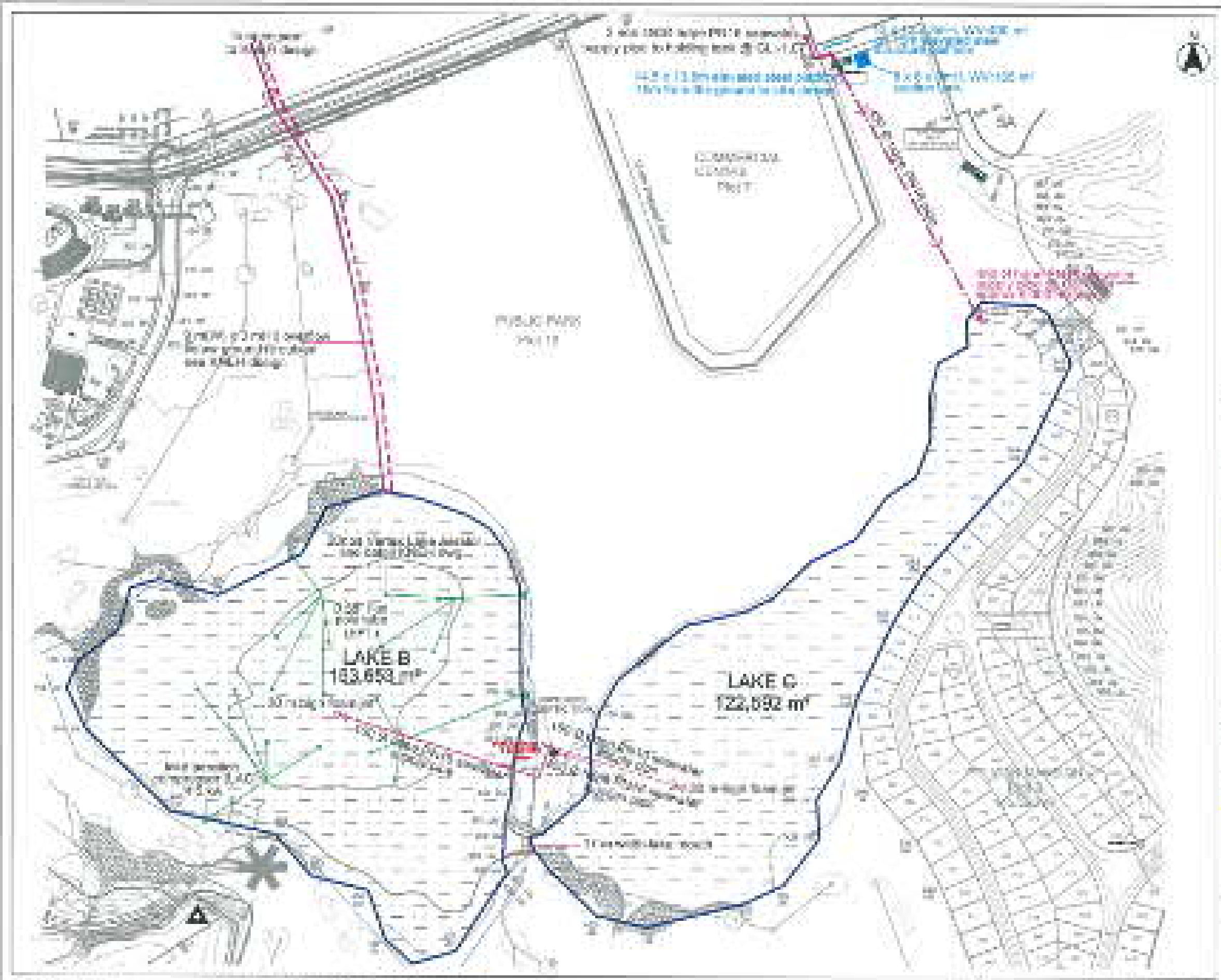
PROJECT:
PELICAN PARADISE RESORT & COUNTRY CLUB, TIBAR TASI TOLU, DILI TIMOR LESTE.

SCALE: 1:3000 A1, 1:6000 A3
DATE: 05/10/2018
DESIGNED: WW
CHECKED: WW
DRAWN: JJ
CAD FILE: P3/2018/LR/CP/001
DRAWING TITLE:
LAKE REHABILITATION LAYOUT PLAN

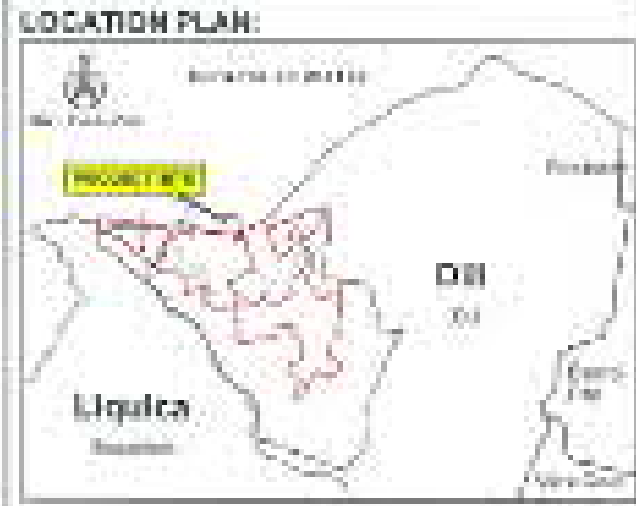
DRAWING NO. PPD/5553/LR/CP/001 REV. NO. 2

Figure 4.3.16 (b): Seawater Circulation for Lake A





DATA SOURCE:
 (1) Drawing No. TEM-100000000001
 Detailed layout design submitted to DT Architecture Pty Ltd
 November 2015.



**ENVIRONMENTAL MANAGEMENT PLAN
 FOR PROPOSED PELICAN PARADISE DEVELOPMENT,
 TIAR-TASI TOLLU, TIMOR-LESTE**



FIGURE 4.2.10 (G)
LAKE REHABILITATION FOR LAKE B AND LAKE C
MAR '16

Chapter 5

Legal Requirement

CHAPTER 5: LEGAL REQUIREMENT

5.1 INTRODUCTION

- This Chapter provides the relevant legislations, regulations and guidelines governing the Environmental Management Plan (EMP) for this Project to protect the environment.

5.2 THE CONSTITUTION AND ENVIRONMENTAL POLICY

- Under Section 139(3) on *Natural Resources* of the Constitution, there is a clear policy statement on the environment: “*The exploitation of the natural resources shall preserve the ecological balance and prevent destruction of ecosystem*”.
- Because of its historical background and depleting natural resources, there are strong compelling reasons for the Government of the Democratic Republic of Timor-Leste (DRTL) to preserve its natural resources from further unwarranted exploitation and environmental degradation. Since independence in 2002, the Government has addressed this issue through advocacy of Article 61 of the Constitution, as follows:
 - (i) *Everyone has the right to a humane, healthy and ecologically balanced environment and the duty to protect it and improve it for the benefit of the future generations.*
 - (ii) *The State shall recognise the need to preserve and rationalise natural resources.*
 - (iii) *The State should promote actions aimed at protecting the environment and safeguarding the sustainable development of the economy.*
- With a clear constitutional policy, all development projects classified as prescribed activities will have to take into consideration environmental conservation and sustainability. The policy itself is explicitly addressed in the Timor-Leste Strategic Development Plan (SDP) 2010 – 2030 to provide an environmental guide to protect and sustain the environment.
- **Reference to the Project:** The above policy underpins the Pelican Paradise Development Project in Timor-Leste.

5.3 LEGISLATIONS

5.3.1 Decree-Law No.26/2012 on Environmental Basic Law (EBL)

- The EBL or Environmental Framework Law provides a comprehensive framework to protect the environment in Timor-Leste. It is widely regarded as an over-arching legislation for environmental protection and sustainability.

- Articles 14, 15 and 16 hold the key information regarding the necessary instruments and procedures for environmental assessments; licensing; environmental standards; and environmental monitoring for Environmental Assessment (EA).
- **Reference to the Project:** The procedures have been followed judiciously in this Project (see **Chapter 7: Summary of Impacts** and **Chapter 8: Proposed Mitigation Measures** of this EMP Report).

5.3.2 **Decree-Law No.5/2011 on Environmental Licensing Law (ELL)**

- The ELL provides a system of environmental licensing for both public and private projects likely to generate environmental and social impacts.
- It is based on an assessment of the degree and significance of potential impacts of projects relating to their nature, size, technical characteristics and location.
- Through Article 4, the Decree categorises all development projects according to three categories of A, B and C, with each category having its specific EA-types of requirements and procedures.
- **Reference to the Project:** From the above Decree, this Project has been categorised as a **Category A** Project. Because of this, the Project Document (PD) [ref: 353/DNCPIA/XII/2016] and the Terms of Reference (TOR) [ref: 407/Gab.MCIA/III/2017] have since been submitted and approved by the National Directorate of Pollution Control and Environmental Impact (NDPCEI) and Ministry of Commerce, Industry and Environment (MCIE) respectively. Subsequently, the Draft Environmental Impact Statement (EIS) and EMP had been submitted to NDPCEI as required in above Decree. Public consultations have also been conducted (refer to **Chapter 16: Public Consultation and Information Disclosure**, in this EMP).

5.4 REGULATIONS AND GUIDELINES

5.4.1 **Guidelines on Ministerial Diploma on Regulation on Detailed Requirements for Screening, Scoping and the Terms of Reference, Environmental Impact Statements and Environmental Management Plans for Environmental Assessment**

- Though these guidelines are not formally adopted, they are currently used for development projects by the NDPCEI.
- They provide specific prerequisites for environmental screening and scoping; and requirements for submissions of the PD, TOR, EIS and EMPs in the EA process.
- **Reference to the Project:** Compliance has been achieved whereby specific procedural steps such as PD [ref: 353/DNCPIA/XII/2016] and TOR [ref: 407/Gab.MCIA/III/2017] were submitted and approved by the NDPCEI and MCIE respectively. The Draft EIS and EMP, conforming to the format of the said guidelines listed as Annex 6, had also been submitted to NDPCEI. The EIS accompanied with this EMP has been revised based on the technical comments from General Director of Environment (**Attachment 3** in Preamble).

5.4.2 Guidelines on Ministerial Diploma for Regulation on Status and Rules of Procedures for Evaluation Committee for Managing the Environmental Assessment Procedure for Category A Projects

- Similar to the Guidelines listed in **Section 5.4.1**, the guidelines, though not formally adopted, are currently being used by the NDPCEI.
- They detail the requirements regarding the status and rules of procedures for the Evaluation Committee in managing the EA procedures for Category A projects. The Evaluation Committee is set up by the NDPCEI to determine the veracity of the EMP after submission by the Project Proponent (PP).

5.4.3 Guidelines on Ministerial Diploma for Regulation on Impacts and Benefits Agreements

- These guidelines, though not formally adopted, are currently in use by the NDPCEI.
- **Reference to the Project:** They provide the requirements for impact and benefit agreements. The DRTL has leased the land to Pelican Paradise Holdings (Timor-Leste), the PP, since 2009. The Government will deliver the land free of all encumbrances for commencement of the Project development in 2017. The issue of resettlement of any persons living within the Project site and the resettlement plan are outside the scope of this EMP.

5.4.4 Ministerial Diploma for Regulation on the Public Consultation Procedures and Requirements during the Environmental Assessment Process

- These guidelines, though not formally adopted, are currently in use by the NDPCEI.
- They detail the requirements, procedures and requirements for public consultations during the EA process.
- **Reference to the Project:** Compliance has been achieved through public consultations during the PD and TOR stages of work (see **Chapter 16** of this EMP). A final consultation had been conducted after the submission concurrently of the Draft EIS and this EMP Report.

5.5 OTHER LEGISLATIONS: BIODIVERSITY AND PROTECTED AREAS LEGISLATIONS

- There are several legislations related to ecological protection that EIS and EMP have made reference to. These are:

5.5.1 UNTAET Regulation No.2000/19 on Protected Places

- Though being a subsidiary legislation, it is still in force and used by the Forestry Department.
- It defines 15 existing protected areas (Article 2.1) as well as areas that may be defined as areas of exceptional natural importance (Article 2.2).

- Articles 2.3 and 2.4 define prohibited activities within these areas. Furthermore, Sections 3 and 4 respectively provide protection for endangered terrestrial and aquatic ecology, while Section 5 provides protection for wetlands and mangrove areas. Lastly, Section 6 provides protection for historic, cultural and artistic sites for the people of Timor-Leste.
- **Reference to the Project:** All the sensitive areas within and surrounding the Project were reviewed for compliance (see **Chapter 7**).

5.5.2 UNTAET Regulation No.2000/17 on the Prohibition of Logging Operation and Export of Wood from East Timor

- This legislation specifies the prohibition of cutting and removal of logging of wood from the land in Timor-Leste (Section 2) as well as the prohibition of burning or any other destruction of forest.
- **Reference to the Project:** No large-scale logging will be carried out at the Project site since the site is mostly devoid of trees except at the hill areas, where there is a programme by the PP to reforest the area. Clearing of underbrush vegetation will be carried out at the golf course and other areas within the Project. Approval will be obtained from the authorities prior to logging to comply with the above regulations and the Draft Decree-Law on Forest Management, draft 6.

5.6 DRAFT DECREE-LAW ON BIODIVERSITY

- This Decree states that the preparation of strategic environmental assessment (SEA), EIS, EMP or any other EA by the project proponent must include assessment of potential impacts of the proposal on biodiversity and biological resources.
- It also details five requirements that must be included in the assessment found in Article 41 – Biodiversity Consideration in Environmental Assessment.
- These five requirements are as follows:
 - (i) Impacts on any natural ecosystems and habitats located within or near the proposed site, in particular the habitat of any protected species and critical habitat.
 - (ii) Impacts on any legally protected areas, as well as any areas under the subject of cultural or traditional protection mechanism such as *Tara Bandu*.
 - (iii) Impacts associated with invasive alien species on or near the proposed site.
 - (iv) The sustainability of any proposed use of biological resources.
 - (v) Proposed measures to avoid, minimise or mitigate identified impacts, and measures to offset or compensate for any affected biological resources and impacts on biodiversity.

- **Reference to the Project: Chapter 7** summarises the assessment of impacts on biodiversity based on the above requirements.

5.7 DRAFT DECREE-LAW ON FOREST MANAGEMENT, DRAFT 6

- The purpose of this Decree is to give credence to the State's constitutional obligations to conserve the natural resources of Timor-Leste while establishing the rights and procedures to promote community ownership and management of forest resources.
- It provides for sustainable use and management of forest resources of Timor-Leste to benefit all citizens.
- **Reference to the Project:** The range of hills covering 354.38 ha forms a backdrop to the Project site. The hills will remain relatively undeveloped as an important water source and reserve area that will be reforested to capture rainwater and atmospheric moisture to maintain the lakes and small streams in the Project area, especially for the dry season.

5.8 FISHERIES AND AQUACULTURE LEGISLATION

5.8.1 Decree-Law No.6/2004 on General Bases of the Legal Regime for the Management and Regulation of Fisheries and Aquaculture

- The main intent of this Decree is to establish principles and ground rules for the exploitation and regulation of fishing resources and aquaculture activities within the national waters and the high seas.
- It prohibits discharging of wastewaters originating from industrial or commercial activities into national waters if such wastewaters are likely to stun, poison or lead to destruction of fishing resources or any other aquatic species.
- **Reference to the Project:** This Project has opted for an environmentally-friendly zero discharge method; whereby on-site treated sewage effluent and wastewater will be recycled for potable and non-potable use within the Project. The residual sludge will be broken down and used as bio-fertilisers, for soil conditioners and planting mediums, following the green concept of recycle, reduce and reuse.

5.9 STANDARDS, GUIDELINES AND BEST MANAGEMENT PRACTICES

5.9.1 Environmental Management Standards and Guidelines

- Other than the guidelines on conducting EA mentioned in **Section 5.4**, the management standards and guidelines for environment, safety and health are largely found lacking in Timor-Leste.
- Some international standards and guidelines widely used in other countries have been adopted wherever relevant and necessary in the EIS and EMP.

(a) IFC Performance Standards on Environmental and Social Sustainability

- The Performance Standards on Environmental and Social Sustainability introduced by the International Finance Corporation (IFC) of World Bank (2012), provide guidance on how to identify risks and impacts on environmental and social aspects, as well as help to avoid, mitigate and manage impacts as a way to develop a project in a sustainable manner. The eight Performance Standards prescribed are.
 - (i) Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts.
 - (ii) Performance Standard 2: Labour and Working Conditions.
 - (iii) Performance Standard 3: Resource Efficiency and Pollution Prevention.
 - (iv) Performance Standard 4: Community Health, Safety and Security.
 - (v) Performance Standard 5: Land Acquisition and Involuntary Resettlement.
 - (vi) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.
 - (vii) Performance Standard 7: Indigenous Peoples.
 - (viii) Performance Standard 8: Cultural Heritage.
- **Reference to the Project:** Most of the above standards have been taken into consideration except for items (ii) and (v) as they are outside the scope of the EIS and EMP. The rest of the items have been seamlessly weaved into the EIS and EMP.

(b) World Bank Environmental, Health, and Safety General Guidelines (EHS Guidelines)

- The World Bank EHS Guidelines provide the effective management practices, performance levels and measures covering: environment; occupational health and safety; community health and safety; construction and operation.
- This EHS Guidelines suggested that every project should prevent or minimise environmental quality impacts by ensuring that the emission or pollutant concentrations comply with national legislated standards, or in their absence, internationally recognised sources, such as World Health Organisation (WHO) Guidelines.
- **Reference to the Project:** Most of the above have been taken into consideration in the EIS and EMP.

(c) EBRD and IFC Workers' Accommodation: Process and Standards

- This document, published by European Bank for Reconstruction and Development (EBRD) and IFC, provides the processes and standards in planning, constructing and operating worker housing facilities, which should be applied to the provision of workers' accommodation at different stages of the project.
- **Reference to the Project:** This has been taken into consideration in the EIS and EMP.

(d) WHO Guidelines for Community Noise

- These guidelines address the adverse health effects of noise. The health-based guidelines on community noise for example, serve as a basis for noise management.
- **Reference to the Project:** This has been taken into consideration in the EIS and this EMP (see **Chapters 7 and 8**).

(e) WHO Air Quality Guidelines

- This WHO Air Quality Guidelines are designed to offer guidance in reducing the health impacts of air pollution. Based on a review of the accumulated scientific evidence, the guideline values for the most common air pollutants, such as particulate matter, ozone, nitrogen dioxide, sulphur dioxide, are presented in this document.
- **Reference to the Project:** This has been taken into consideration in the EIS and this EMP (see **Chapters 7 and 8**).

5.9.2 Environmental Management Standards and Guidelines Proposed for the Project

- Environmental management standards and guidelines are not complete in Timor-Leste. Hence the Project will use the relevant standards from the Association of Southeast Asian Nations (ASEAN) or international countries for benchmarking the values for some environmental components, in particular, marine and lake water quality in the EIS and EMP for the construction and operational phases of the Project. This was agreed upon during our earlier discussions with officials from the NDPCEI.
- The environmental management standards and guidelines used in the Project for the EIS and EMP are given in **Table 5.9.1**.

Table 5.9.1: Reference of Legislations, Regulations, Guidelines and Standards in the EIS and EMP

Component	Legislations, Regulations, Standards and Guidelines			
	Timor-Leste/ WHO*/ World Bank*	Indonesia	Philippine	Malaysia
1. Environmental Quality				
(i) Ambient and Marine Water Quality	<p>Law and Regulation</p> <ul style="list-style-type: none"> Decree Law No. 26/2012 Environmental Basic Law, Article 24 and 35. <p>Standards and Guidelines</p> <ul style="list-style-type: none"> Not available yet. 	<p>Standards and Guidelines</p> <ul style="list-style-type: none"> Water Quality Criteria, under Government Regulation No 82/2001. 	<p>Standards and Guidelines</p> <ul style="list-style-type: none"> Water Quality Criteria for Conventional and Other Pollutants Affecting Aesthetics and exerting Oxygen Demand for Coastal and Marine Waters. 	<p>Standards and Guidelines</p> <ul style="list-style-type: none"> Malaysian Marine Water Quality Criteria and Standards. National Water Quality Standards.
(ii) Air Quality	<p>Law and Regulation</p> <ul style="list-style-type: none"> Decree Law No. 26/2012 Environmental Basic Law, Article 23 and 33. <p>Standards and Guidelines</p> <ul style="list-style-type: none"> WHO, Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide.# 	<p>Standards and Guidelines</p> <ul style="list-style-type: none"> Indonesia's National Ambient Air Quality Standards. 	<p>Standards and Guidelines</p> <ul style="list-style-type: none"> National Ambient Air Quality Guideline for Critical Pollutants. 	<p>Standards and Guidelines</p> <ul style="list-style-type: none"> Malaysian Ambient Air Quality Standards (MAAQS), DOE Notice 1/2015.
(iii) Noise Level	<p>Law and Regulation</p> <ul style="list-style-type: none"> Decree Law No. 26/2012 Environmental Basic Law, Article 36. <p>Standards and Guidelines</p> <ul style="list-style-type: none"> Guideline values for community noise in specific environments.# 	<p>Standards and Guidelines</p> <ul style="list-style-type: none"> Environmental Quality Standards for Ministerial Decree No.48/MENLH/ 11/1996 (1996) Noise Standards. 	<p>Standards and Guidelines</p> <ul style="list-style-type: none"> Environmental Quality Standards for Noise in General Areas, Rules & Regulations of National Pollution Control Commission (1978). 	<p>Standards and Guidelines</p> <ul style="list-style-type: none"> The Planning Guidelines for Environmental Noise Limits and Control, DOE 2007.
(iv) Effluent	<p>Law and Regulation</p> <ul style="list-style-type: none"> Decree Law No. 26/2012 Environmental Basic Law, Article 41. <p>Standards and Guidelines</p> <ul style="list-style-type: none"> Guidelines for the Safe Use of Wastewater, Excreta, and Greywater, Volume 2: Wastewater Use in Agriculture.# 	<p>Standards and Guidelines</p> <ul style="list-style-type: none"> Ministerial Decree No.52/MENLH/10/1995 (1995) Effluent Standard for Hotel. 	<p>Standards and Guidelines</p> <ul style="list-style-type: none"> Effluent Standards: Toxic and Other Deleterious Substances (Maximum Limits for the Protection of Public Health). Effluent Standards: Conventional and other Pollutants in Protected Waters Category I and II and Inland Water Class C. Effluent Standards: Conventional and Other Pollutants in Inland Waters Class D, Coastal Waters Class SC and SD and Other Coastal Water not yet Classified). 	<p>Standards and Guidelines</p> <ul style="list-style-type: none"> Malaysian Sewerage Industry Guidelines
(v) Solid Waste	<p>Law and Regulation</p> <ul style="list-style-type: none"> Decree Law No. 26/2012 Environmental Basic Law, Article 39. 	NN	NN	NN
(vi) Hazardous/Scheduled Waste	<p>Law and Regulation</p> <ul style="list-style-type: none"> Decree Law No. 26/2012 Environmental Basic Law, Article 42. <p>Standards and Guidelines</p> <ul style="list-style-type: none"> Chapter 1 of the World Bank Environmental, Health and Safety (EHS) Guidelines.* 	NN	NN	NN

Component	Legislations, Regulations, Standards and Guidelines			
	Timor-Leste/ WHO#/ World Bank*	Indonesia	Philippine	Malaysia
2. Health and Safety	<p>Law and Regulation</p> <ul style="list-style-type: none"> Decree Law No. 4/2012 Labour Code, Chapter III, Section IV. <p>Standards and Guidelines</p> <ul style="list-style-type: none"> Workers' Accommodation: Processes and Standards. A guidance note by IFC and EBRD. Chapters 2 and 4 of the World Bank Environmental, Health and Safety (EHS) Guidelines.* 	NN	NN	NN
3. Biodiversity	<p>Law and Regulation</p> <ul style="list-style-type: none"> UNTAET Regulation No.2000/19 on Protected Places. Decree Law No. 26/2012 Environmental Basic Law, Article 27. UNTAET Regulation No.2000/17 on the Prohibition of Logging Operations and the Export of Wood from East Timor. Draft Decree Law on Biodiversity, dated March 2012. Draft Decree Law on Forest Management, draft 6. <p>Strategic Plan</p> <ul style="list-style-type: none"> National Biodiversity Strategy and Action Plan (2011 – 2012). Forestry Sector Policy Goal Objective and Strategy. 	NN	NN	NN
4. Protection of Protected Areas and Other Sensitive Areas	<p>Law and Regulation</p> <ul style="list-style-type: none"> UNTAET Regulation No.2000/19 on Protected Places, Section 2. Draft Decree Law on Biodiversity, dated March 2012. <p>Strategic Plan</p> <ul style="list-style-type: none"> Timor-Leste Programme of Work on Protected Areas. <p>Standards and Guidelines</p> <ul style="list-style-type: none"> International Finance Corporation's Performance Standards on Environmental and Social Sustainability. 	NN	NN	NN
5. Protection of Vulnerable and Endangered Species	<p>Law and Regulation</p> <ul style="list-style-type: none"> UNTAET Regulation No.2000/19 on Protected Places, Section 3. Decree Law No. 26/2012 Environmental Basic Law, Article 28. 	NN	NN	NN
6. Fisheries and Aquaculture	<p>Law and Regulation</p> <ul style="list-style-type: none"> Decree Law 6/2004 General Basis of the Legal Regime for the Management and Regulation of Fisheries and Aquaculture. 	NN	NN	NN
7. Landuse Control	<p>Strategic Plan</p> <ul style="list-style-type: none"> Forestry Sector Policy Goal Objective and Strategy. 	NN	NN	NN

Note:  indicates the legislations, regulations, standards and guidelines that have been used in the EIA and EMP.

NN = Not necessary, as it is not applicable as legislation, regulation, standard or guidelines in Timor-Leste. The country already has these regulations and policies in place.

Chapter 6

Institutional Roles and Responsibilities

CHAPTER 6: INSTITUTIONAL ROLES AND RESPONSIBILITIES

6.1 INTRODUCTION

- Institutions play a vital role to ensure a smooth and environmentally sound development of the Project. The roles and responsibilities for all phases of development are provided in **Table 6.2.1**, which includes the roles of the Project Proponent (PP) and the Environmental Consultants.

6.2 ROLES, RESPONSIBILITIES AND JOB SPECIFICATION

Table 6.2.1: Institutional Roles and Responsibilities

Members	Roles and Responsibilities
Pre-construction Phase	
National Directorate of Pollution Control and Environmental Impact (NDPCEI)	<ul style="list-style-type: none"> • Forms part of the technical review committee that reviews the Environmental Impact Statement (EIS) and Environmental Management Plan (EMP) Reports according to project category. • Issues Environmental License for Project development.
Pelican Paradise Holdings Timor-Leste or Project Proponent (PP)	<ul style="list-style-type: none"> • Notification of intent to develop the Project to the NDPCEI. • Responsible for all aspects related to the development of the Project including environmental planning of the Project and its associated cost. • Delegation of task for conducting EIS and EMP to consultants or to an organisation (appointed by the PP). • Provide relevant information to EIS and EMP Consultants.
Asia Pacific Environmental Consultants Sdn Bhd (ASPEC)	<ul style="list-style-type: none"> • Tasked by the PP to conduct EIS and EMP of the Project. • Produce an EIS Report that is useful for decision-making purposes and pragmatic for environmental protection. • Tasked by the PP to prepare a detailed EMP that formulates mitigation measures that shall be made binding to all contractors during the construction phase of the Project. • Provide measures that shall be implemented during the operational and decommissioning phases.
Construction Phase	
National Directorate of Pollution Control and Environmental Impact (NDPCEI)	<ul style="list-style-type: none"> • Ensure the PP and the Main Contractor (MC) and his sub-contractors (SC) adhere to all environmental legislations and regulations. • Carry out site visits to observe the environmental status of the Project. • Review the monitoring reports submitted by Environmental Monitoring Consultant (EnvMC).
National Directorate of Land, Property and Cadastral Services	<ul style="list-style-type: none"> • Ensure that land acquisition, if any, is conducted according to relevant legislations, regulations and guidelines of the Government. • Provide assistance to the PP in resolving any conflicts of possession and ownership of property.

Members	Roles and Responsibilities
National Directorate of Roads, Bridges and Flood Control	<ul style="list-style-type: none"> • Ensure that there is a traffic management control system for safety purposes along the Rua Terra Santa when it is being upgraded. • Provide a signalised system at the junction from the Rua Terra Santa to the Project site. • Ensure that all necessary, if any, flood mitigation measures are implemented outside the boundary of the Project site.
National Directorate of Water and Sanitation	<ul style="list-style-type: none"> • Ensure the supply of sufficient water to the Project site. • Conduct regular sanitation inspections at the Project site (e.g. workers quarters, site office, etc.).
National Directorate of Aquaculture and Fisheries	<ul style="list-style-type: none"> • Ensure that the movement of barges/construction vessels adheres to coastal logistic routes so as not to affect the movement of any fishing vessels. • PP/MC shall notify the National Directorate on any oil spills or accidents occurring along the coastal areas of the Project site.
National Directorate of Sanitation Control and Environmental Health	<ul style="list-style-type: none"> • Ensure that the PP/MC implements sanitation facilities according to the relevant guidelines and procedures, if any. • Ensure scheduled waste management is carried out by the PP/MC.
Department of Policy and Strategic Planning	<ul style="list-style-type: none"> • Ensure that the hospital designs and plans are according to guidelines and regulations.
Suco Comoro and Tibar	<ul style="list-style-type: none"> • Provide assistance to both PP/MC to resolve any conflicts with the local communities arising from the Project.
Pelican Paradise Holdings (Timor-Leste) or PP	<ul style="list-style-type: none"> • Ensure that all the potential environmental impacts arising during earthworks and construction are addressed to the satisfaction of the NDPCEI and the relevant authorities or agencies mentioned above. • Ensure environmental mitigation measures are implemented in accordance with the Environmental License. • The PP's responsibilities shall, therefore, include but not limited to appointing the: <ul style="list-style-type: none"> (i) Main Contractor (MC). (ii) Sub-Contractors (SC) if they are not under the MC. (iii) Project Manager (PM). (iv) Set up an Environmental Management Team (EMT) unit for the Project. (v) Environmental Monitoring Consultant (EnvMC). (vi) Environmental Auditor (EnvA). • Ensure sufficient funds are allocated for implementation of mitigation measures; environmental monitoring works; site survey and investigation; and other environmental management-related activities. • Delegate to the PM to conduct regular site meetings (e.g. safety toolbox meetings) with the MC and Contractor's Safety, Health and Environmental (SHE) Manager and Environmental Officer (EO) on day-to-day environmental matters related to the Project. • Delegate to the PM as the main person in charge of operations during any emergency situations assisted by the Contractor's SHE Manager and EO. • The EO shall also monitor the day-to-day activities and all environmentally related matters at the Project site.

Members	Roles and Responsibilities
Main Contractor (MC)	<ul style="list-style-type: none"> • The MC and his appointed sub-contractors (SC), SHE Manager and EO must be committed to environmental protection during the course of the construction period. • Update and improve construction works based on upgraded designs to protect the environment if necessary, after notifications. • Ensure all mitigation measures are undertaken to the satisfaction of the NDPCEI, PM and the EnvMC and EnvA (appointed by the PP) for the Project. • Protect the environment (both on and off the Project site) and limit damage and nuisance to people, property and workers, of any water pollution, noise and dust during the construction period. • Make good any damages to the environment, in the process of construction, especially along the Rua Terra Santa and the beach. • Attend site inspections and audits together with the EnvMC and EnvA. • Make good any non-compliances issued by the EnvA and EnvMC within the given stipulated time period. • Maintain detailed records of major breakdowns and types of immediate mitigations used to protect the environment. • Prepare a daily site log book of site progress. • Ensure all staff attend induction training courses on environmental aspects and awareness coordinated by the SHE Manager or the EnvMC appointed by the PP. • Conduct regular meetings and training for staff of the SC to ensure that they are able and capable to implement the types of mitigation measures needed to abate any environmental disruptions.
Environmental Monitoring Consultant (EnvMC)	<ul style="list-style-type: none"> • Provide relevant professional advice and guidance pertinent to environmental management and monitoring. • Assist the PM and MC on the types of environmental mitigations appropriate for the area. • Carry out environmental monitoring once every three months (quarterly), as per conditions of service. • Prepare all environmental monitoring reports for submission to PP/MC monthly and NDPCEI half-yearly. • Assist to issue non-compliance reports (NCRs) to the MC and/or SC for them to make good any non-compliance. • Assist the MC and SC in providing environmental training. • Site inspection with the EnvA to verify any environmental matters on-site.
Environmental Auditor (EnvA)	<ul style="list-style-type: none"> • Carry out environmental audit half yearly. • Submit report to the PP and NDPCEI. • With the assistance of the EnvMC to issue NCRs for non-conformances and to recommend actions to rectify any environmental problems at the Project site.
Operational Phase	
National Directorate of Pollution Control and Environmental Impact (NDPCEI)	<ul style="list-style-type: none"> • Conduct site inspection with the PM, EO and EnvMC. • Review and assess the environmental monitoring reports submitted by the EnvMC. • Perform enforcement actions to respond to site non-compliances. • Ensure the PP and MC adhere to all stipulated regulations.
National Directorate of Water and Sanitation	<ul style="list-style-type: none"> • Ensure sufficient water supply is provided for Project operations. • Repair any damaged pipelines supplying water to the Project.

Members	Roles and Responsibilities
National Directorate of Forestry and Watershed Management	<ul style="list-style-type: none"> • Assist PP in the rehabilitation programme of the hills and wetland areas.
Pelican Paradise Holdings Timor-Leste or PP	<ul style="list-style-type: none"> • Ensure that all members of the EMT work closely to comply with the Environmental License. • Oversee the overall Project activities on-site. • Ensure continuous commitment to the Environmental Policy, objectives and targets. • Promote a high degree of environmental awareness amongst all workers on-site. • For the golf course, organise frequent site inspections on golf course irrigation with the golf course superintendent, who shall oversee to the environmental and maintenance aspects of the golf course. • Ensure the golf course superintendent conducts monthly inspection with golf course maintenance supervisor and quarterly site inspection with the EnvMC for a period of one year. • For the sewage treatment plant (STP), the STP operator shall oversee to the environmental aspects of the STP, and conduct weekly site inspection to ensure optimal performance of STP, and quarterly inspection by the EnvMC for a period of one year.
Environmental Monitoring Consultant (EnvMC)	<ul style="list-style-type: none"> • Conduct monitoring every three months (quarterly) for a period of one year only. • Prepare monitoring reports for submission to PP and NDPCEI.
Environmental Auditor (EnvA)	<ul style="list-style-type: none"> • Carry out environmental audit half yearly. • Submit audit reports to PP for a period of one year only. • Issue NCRs for non-conformances for actions to be taken to rectify any environmental problems at the Project site.

Chapter 7

Summary of Impacts

CHAPTER 7: SUMMARY OF IMPACTS

7.1 INTRODUCTION

- Potential environmental issues and impacts have been identified and mitigated in the Environmental Impact Statement (EIS) for the pre-construction, construction and operational phases of the Project.
- In the EIS, **Chapter 9: Impact Assessment and Mitigation Measures**, provided the impacts that were screened and scoped using the Rapid Impact Assessment Matrix (RIAM) for the cause-effect relationships between Project activities on the physical, ecological, economic, social and cultural environments for each phase of development. The significance of these potential impacts is then assessed in detail in the EIS, where mitigations have also been recommended to abate the negative impacts. A summary is provided below.

7.2 SUMMARY OF IMPACTS

- **Table 7.2.1** summarises the impacts for all phases of development based on the RIAM for the construction and operational phases. The significant potential impacts have been singled out for detail assessment in the EIS in **Chapter 9**, for which mitigation measures have also been recommended.
- The significant potential impacts have been summarised in **Tables 8.2.1 and 8.2.2**, of **Chapter 8: Proposed Mitigation Measures**.

Table 7.2.1: EIA Matrix for Project Activities and Impacts during All Phases of Project Development

Environmental Component	Project Development Phases		
	Pre-construction	Construction	Operational
Physical Environment			
Climate	N	N	N
Topography and Slope	N	-S2	N
Geomorphology and Geology	N	N	N
Soils	N	-S3	N
Water Quality	N	-S3	-S2
Air Quality	N	-S1	-S1
Hydrology and Drainage	N	-S2	N
Noise Levels	-S1	-S3	-S1
Ecological Environment			
Wetlands	N	-S2	N
Mangroves	N	-S1	+S2
Corals	N	-S2	N
Fisheries	N	-S2	N
Protected Areas and National Parks	N	-S1	+S2
Marine Ecology	N	-S2	-S1

Environmental Component	Project Development Phases		
	Pre-construction	Construction	Operational
Terrestrial Ecology	N	-S2	+S2
Coastal Beaches and Resources	N	-S2	N
Economical Environment			
Employment Sectors	+S1	+S3	+L2
Infrastructure and Utilities	N	N	+L2
Landuse	N	-S1	N
Use of Forests and Other Natural Resources	N	N	N
Fishery Resources	N	N	N
Agriculture	N	N	N
Tourism and Recreation	N	N	N
Other Industries	N	N	N
Social Environment			
Population and Communities	N	+S1	+L2
Health Profiles	N	-S1	N
Institutions, Schools and Health Facilities	N	N	N
Community Structures, Family Structures	N	N	N
Land Ownership	N	N	N
Common or Individual Right on Natural Resources	N	N	N
Traffic	-S1	-S1	-L1
Cultural Environment			
Cultural Heritage	N	N	N
Archaeological Sites	N	N	N
Historic Sites	N	-S1	+S2
Sacred Sites	N	-S1	+S2
Unique Landscape	N	-S1	+S3

Note: (S) – Short-term (L) – Long-term (+) – Beneficial (-) – Negative (1) – Little significant
(2) – Significant (3) – Very significant (N) – No impact

7.3 SOCIAL IMPACTS

- The social impact assessment (SIA) was conducted for all three phases of the development of the Project. Key issues from each phase were identified and mitigation measures were presented in **Chapter 10: Social Impact Assessment of EIS Report**, and summarised below:

Developmental Phase	Social Impact
Pre-construction Phase	<ul style="list-style-type: none"> • Relocation: There is an estimated 3,803 residents living in Kg 12 De Outubro. They will be resettled by the Government before construction starts. • Although all of them were aware that they would be relocated, relocation could create anxieties among the affected villagers. They could experience some psychological impacts such as: (i) from the need to be relocated; and (ii) from the trauma of having to adapt to the new location. • The social impact could include disruption in social relationships amongst relocated villagers and the communities in the new area.
Construction Phase	<ul style="list-style-type: none"> • Public Amenities and Services: The influx of migrant workers during the construction phase may add to additional demands for public utilities and amenities, which could exceed the current carrying capacity of these amenities and utilities to provide. If so, there will always be disruption to the communities, such as brown outs for electricity, insufficient water during the drought periods, etc. • Public Health and Safety: <ul style="list-style-type: none"> (i) Air pollution from construction activities may adversely impact on the health of residual communities still living within the site. (ii) Loud noises originating from heavy machinery will impact on the health and psychological well-being of construction workers and local residents. (iii) Potential risk of accidents to the local residents if they enter the site without permission. (iv) Influx of workers at the base camps will lead to overcrowding. (v) Insufficient living accommodation, poor sanitation and inadequate waste disposal facilities could pose potential health hazards to both workers and the local community. • Social Conflicts: <ul style="list-style-type: none"> (i) The influx of migrant workers may affect their local culture and way of life. This would probably lead to uneasiness and social tension between the local residents and the workers. (ii) Competition for jobs between locals and migrant labours. (iii) Social ills may occur such as drugs and alcohol abuses, petty crimes, and social disruptive behaviours.
Operational Phase	<ul style="list-style-type: none"> • Social Conflicts: Tranquillity and way of life of the local communities may be affected with the arrival of tourists, visitors and hotel employees. With the influx of "outsiders", most local residents believed that their norms, values and beliefs would be influenced or changed in the long-term.

Chapter 8

Proposed Mitigation Measures

CHAPTER 8: PROPOSED MITIGATION MEASURES

8.1 INTRODUCTION

- This Chapter outlines the mitigation measures based on **Chapter 9: Impact Assessment and Mitigation Measures** of the Environmental Impact Statement (EIS), and impacts summarised in **Chapter 7** of this Environmental Management Plan (EMP).
- The mitigation measures are for all phases of development: pre-construction, construction and operational phases.
- The monitoring programmes for all the phases of development are provided in **Chapter 10: Monitoring and Auditing Programmes** of this EMP.

8.2 MITIGATION MEASURES

Developmental Phase	Table
Pre-construction	No significant negative impact and hence, mitigation measure is not necessary
Construction	Table 8.2.1
Operation	Table 8.2.2

Table 8.2.1: Mitigation Measures during the Construction Phase

Project Activity	Potential Significant Environmental Impact	Mitigation Measures	Mitigation Cost (USD)	Sampling Location/ Monitoring Parameters/ Limits	Monitoring Frequency/ Responsibility	Mitigation Responsibility					
<ul style="list-style-type: none"> • Mobilisation by contractors • Labour recruitment • Setting up base camp and site office • Mobilisation of construction equipment and machinery • Construction of the jetty • Land clearing • Biomass removal • Demolition of remnant squatter houses • Earthwork and platform formation • Earthworks, sculpturing and shaping the golf course • General piling and structural works • Final finishing and landscape 	<p>Geology</p> <ul style="list-style-type: none"> • Disturbance to the natural slopes through excavations and other such activities may cause slope slumping and failure, depending on the local geological strikes and dips of the Alieu Formations at the site. 	<p>Geomorphology and Geology</p> <ul style="list-style-type: none"> • Spraying of shotcrete to control rock falls, surface erosion, progressive disintegration of exposed bedrock and infiltration of surface water into the rock cut. • Concrete buttresses to support overhanging rock blocks. • Potentially loose blocks to be secured by applying various reinforcement techniques such as the installation of dowels, rock bolts or rock anchors. • Removal of unstable rock areas and replacement with reinforced wall. • Surface water to be diverted away from the cut slopes. • Horizontal or inclined subsurface drains drilled into the slope cuts will reduce the groundwater level within and prevent build-up of excess water pressure. 	\$100,000	<ul style="list-style-type: none"> • No sampling required. 	<ul style="list-style-type: none"> • Weekly inspection by Environmental Officer (EO). 	<ul style="list-style-type: none"> • Contractor 					
	<p>Soil Erosion</p> <ul style="list-style-type: none"> • Soil erosion has been identified as important during earthworks and construction, which may affect water quality in the lakes and sea. 	<p>Soil Erosion and Sedimentation</p> <ul style="list-style-type: none"> • Minimise earthworks during the rainy season. • Implement best management practices (BMPs) in Erosion and Sediment Control Plan (ESCP). • Turfing to stabilise exposed areas. • Runoff control including earth drain, check dam, temporary berm drain and temporary slope drain to be constructed and well-maintained. • Erosion control including use of covers, such as plastic sheets, turfing and planting, buffer strips and surface roughening. • Sediment control includes building the long bund, check dams, silt fence, silt traps and wash trough to be constructed before commencement of the construction phase. • Monitoring total suspended solid (TSS) and turbidity at discharge points of silt traps. 	\$20,000	<ul style="list-style-type: none"> • Condition of stockpile area. • BMPs implemented. • Water to be sampled monthly at the outlets of silt traps. The parameters to be analysed and its limits are provided below: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Parameter</th> <th>Limits</th> </tr> </thead> <tbody> <tr> <td>Total Suspended Solid (TSS)</td> <td><50 mg/L</td> </tr> <tr> <td>Turbidity</td> <td><250 NTU</td> </tr> </tbody> </table>	Parameter	Limits	Total Suspended Solid (TSS)	<50 mg/L	Turbidity	<250 NTU	<ul style="list-style-type: none"> • Daily inspection by Environmental Officer (EO). • Monthly discharge sampling by Environmental Officer (EO). • Quarterly inspection by Environmental Monitoring Consultant (EnvMC).
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Piling works at proposed jetty to be carried out carefully to minimise sediment plume effect. Manage all chemicals, fuel, machine oil and scheduled wastes on-site within proper storage spaces. Adequate construction and domestic waste bins to be provided. All solid wastes to be disposed off at a designated waste disposal area within the Project site before being taken to a designated landfill. Waste segregation to be carried out and clearly labelled. Prohibit disposal of waste generated on-site into drains and the lakes. Temporary sanitary facilities to be provided at the base camp(s), site office and other strategic locations within the working area(s) and to be de-sludged regularly. Kitchens or canteens to be fitted with oil and grease traps with regular maintenance. All scheduled wastes to be managed properly e.g. collected in durable containers with proper labels for neutralisation or treatment. Conduct regular water quality monitoring. 	\$30,000	<p>Ambient Water Quality (for Tasi Tolu Lakes)</p> <ul style="list-style-type: none"> Water sampling points: <p style="text-align: center;">Lake Saltwater Sampling</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Points</th> <th>Coordinates</th> </tr> </thead> <tbody> <tr> <td>LW1 (Lake C)</td> <td>S8.56623° E125.51079°</td> </tr> <tr> <td>LW2 (Lake B)</td> <td>S8.56587° E125.50720°</td> </tr> <tr> <td>LW3 (Lake A)</td> <td>S8.56198° E125.49990°</td> </tr> </tbody> </table> <ul style="list-style-type: none"> As the lake water quality will take some time to stabilise with rehabilitation, it is recommended that the lake water shall be complied with the baseline water quality as shown below. Monitoring parameters/limits (baseline): <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Parameter⁽ⁱ⁾</th> <th colspan="3">Limits (Baseline)⁽ⁱⁱ⁾</th> </tr> <tr> <th>Lake A (LW3)</th> <th>Lake B (LW2)</th> <th>Lake C (LW1)</th> </tr> </thead> <tbody> <tr><td>Temperature</td><td>37.0</td><td>37.8</td><td>36.5</td></tr> <tr><td>Total Suspended Solid (TSS)</td><td>23</td><td>66</td><td>31</td></tr> <tr><td>Dissolved Oxygen (DO)</td><td>6.3</td><td>4.7</td><td>5.1</td></tr> <tr><td>pH</td><td>7.99</td><td>8.48</td><td>8.40</td></tr> <tr><td>Salinity</td><td>35.0</td><td>48.7</td><td>50.2</td></tr> <tr><td>Conductivity</td><td>41</td><td>51</td><td>54</td></tr> <tr><td>Oil and Grease (O&G)</td><td>ND (<0.5)</td><td>ND (<0.5)</td><td>ND (<0.5)</td></tr> <tr><td>Phenol</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Faecal Coliform</td><td>Absent</td><td>Absent</td><td>Absent</td></tr> <tr><td>Mercury (Hg)</td><td>ND (<0.8)</td><td>ND (<0.8)</td><td>ND (<0.8)</td></tr> <tr><td>Cadmium (Cd)</td><td>ND (<2.0)</td><td>ND (<2.0)</td><td>ND (<2.0)</td></tr> <tr><td>Chromium (VI) (Cr⁶⁺)</td><td>ND (<5.0)</td><td>ND (<5.0)</td><td>ND (<5.0)</td></tr> <tr><td>Copper (Cu)</td><td>24</td><td>28</td><td>12</td></tr> <tr><td>Arsenic (As)</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Lead (Pb)</td><td>ND (<10.0)</td><td>18.7</td><td>ND (<10.0)</td></tr> <tr><td>Zinc (Zn)</td><td>150</td><td>42</td><td>18</td></tr> <tr><td>Cyanide (CN)</td><td>ND (<10.0)</td><td>ND (<10.0)</td><td>ND (<10.0)</td></tr> <tr><td>Ammonia</td><td>64.0</td><td>64.4</td><td>35.5</td></tr> <tr><td>Nitrite (NO₂⁻)</td><td>69.3</td><td>135</td><td>69.7</td></tr> <tr><td>Nitrate (NO₃⁻)</td><td>361</td><td>140</td><td>283</td></tr> <tr><td>Total Phosphorus</td><td>ND (<90)</td><td>104</td><td>282</td></tr> <tr><td>Turbidity</td><td colspan="3" style="text-align: center;">-</td></tr> <tr><td>Phosphate⁽ⁱⁱⁱ⁾</td><td colspan="3" style="text-align: center;">75 µg/L</td></tr> </tbody> </table> <p>Note:</p> <p>(i) Parameters shown in the table above are analysed for ambient lake water quality. 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	<p>Hydrology and Drainage</p> <ul style="list-style-type: none"> • Localised ponding may occur because of earthworks and rehabilitation of the lakes. 	<p>Hydrology</p> <ul style="list-style-type: none"> • Provide temporary drainage systems to divert high flows to detention ponds or the lakes when they are yet to be rehabilitated. • Silt traps and earth drains to be constructed before earthwork commencement. 	\$10,000	<ul style="list-style-type: none"> • No sampling required. 	<ul style="list-style-type: none"> • Weekly inspection by Environmental Officer (EO). 	<ul style="list-style-type: none"> • Contractor 														

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	<p>Lake Ecology</p> <ul style="list-style-type: none"> • Excavated materials from Lakes A and C may contain heavy metals. • Lake rehabilitation will improve the aesthetic value of the Project area. 	<p>Lake Ecology</p> <ul style="list-style-type: none"> • Implement all mitigation measures proposed for soil erosion and water quality • Re-stocking the lakes with appropriate organisms and fish to restore the ecological balance. 	-	<ul style="list-style-type: none"> • No sampling required, already covered under ambient water quality. • Limits in terms of lake management are not provided as no limits were seen in the following laws and regulation (however compliance will be based on it): <ul style="list-style-type: none"> (i) UNTAET Regulation 2000/19 on Protected Places. (ii) Decree Law No. 26/2012 Environmental Basic Law, Article 27. (iii) Draft Decree Law on Biodiversity dated March 2012. (iv) National Biodiversity Strategy and Action Plan (2011 – 2012). 	• Half yearly inspection by EnvMC.	• Contractor
	<p>Infrastructure and Utilities</p> <ul style="list-style-type: none"> • Road damage and congestion due to heavy equipment, construction materials transport. • Increase demand for electricity and potable water. 	<p>Infrastructure and Utilities</p> <ul style="list-style-type: none"> • Repair damaged roads immediately. • Place proper signage to inform other road users of construction occurring ahead. • Regular road cleaning of spilled dirt to be carried out at the roads. • Impose maximum load limit. 	\$10,000	• No sampling required.	• Monthly inspection by Environmental Officer (EO).	• Contractor • PP
	<p>Landuse</p> <ul style="list-style-type: none"> • Increased pressures on existing infrastructure and services especially at the northeast quadrant (NEQ) of Zone of Impact (ZOI). • Possible difficulties of access to religious, recreational or residential houses, will cause distress. 	<p>Landuse</p> <ul style="list-style-type: none"> • Ensure good traffic management at all times. • Rapid response to mishaps, accidents, damage to property and even road rage. • Provide alternative transport routes if needed. • Provision of alternative ingress/egress for scheduled entry to religious, recreational and residential houses. 	\$5,000	• No sampling required.	• Monthly inspection by Environmental Officer (EO).	• Contractor • PP
<ul style="list-style-type: none"> • Mobilisation by contractors • Labour recruitment • Setting up base camp and site office • Mobilisation of construction equipment and machinery • Construction of the 	<p>Tourism</p> <ul style="list-style-type: none"> • Disruptions to tourist areas. 	<p>Tourism</p> <ul style="list-style-type: none"> • Provision of alternative entries into the religious and tourist sites if needed (e.g. St Paul's Holy House and the Pope Monument) because of heavier traffic flow causing congestions. • Provide areas for sea vessels to anchor and berth away from dive spots, and areas of active works for the jetty. • Signages, sea buoys, routing and markers for construction vessels to be provided. • Implement BMPs for air, noise, ecology and land and sea traffic to reduce the general impact on the land and marine environmental quality, so as not to disrupt the tourists using the beach and dive areas. 	\$5,000	• No sampling required.	• Monthly inspection by Environmental Officer (EO).	• Contractor • PP

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jetty • Land clearing • Biomass removal • Demolition of remnant squatter houses • Earthwork and platform formation • Earthworks, sculpturing and shaping the golf course • General piling and structural works • Final finishing and landscape (Cont'd)	<u>Traffic</u> • Occasional traffic congestion. • Higher risk of traffic accidents.	<u>Traffic</u> • Plan, schedule and control trips of road loaders, tractors, etc. to avoid peak road hours. • Positioning flagmen at suitable locations to indicate traffic diversion, if any. • Minimum of two flagmen at suitable locations or temporary traffic lights to be installed to control traffic movement.	\$1,000	• No sampling required.	• Monthly inspection by Environmental Officer (EO).	• Contractor

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They are also hazards in working areas, and have to be disposed off properly. <p>Scheduled/Hazardous Wastes</p> <ul style="list-style-type: none"> Water pollution may occur if discharged directly into water bodies. Workers may be exposed via direct contact due to improper handling or storage. <p>Municipal Solid Wastes</p> <ul style="list-style-type: none"> Improper management of wastes may lead to water pollution, odour and public health impacts. Uncollected solid waste may attract pest/scavengers. Open burning may trigger air pollution and health problems. <p>Sewage</p> <ul style="list-style-type: none"> Untreated sewage may contaminate runoff and water bodies. Faecal coliform contained in sewage may spread water-borne diseases to humans. 	<p>Waste Generation</p> <p>Biomass</p> <ul style="list-style-type: none"> Generally sold if there is commercial value. Unsold biomass to be stored on-site at designated stockpile areas to decompose naturally. Burning of biomass is prohibited. <p>Spoils</p> <ul style="list-style-type: none"> Excess spoils to be used for landscaping and reforestation works. <p>Construction and Demolition (C&D) Wastes</p> <ul style="list-style-type: none"> All C&D wastes to be segregated and stored at designated temporary storage area(s) on-site. <p>Scheduled/Hazardous Wastes</p> <ul style="list-style-type: none"> Disposal of scheduled/hazardous wastes into water bodies is strictly prohibited. Scheduled/hazardous wastes to be stored in containers which are compatible, durable and able to prevent spillage and leakage. The storage area to be built away from water bodies. Scheduled/hazardous waste containers to be clearly labelled with date generation, contact details of waste generator and waste characteristics. Bunded storage area containing scheduled/hazardous wastes to be designed, constructed and maintained adequately to prevent spillage or leakage and to be sheltered or roofed or covered with suitable material. Scheduled/hazardous waste management to be carried out by trained personnel. An accurate and up-to-date inventory of scheduled/hazardous wastes to be prepared and kept for a period of three years. The hazardous wastes to be disposed off at a secured landfill or facility approved by the local government. PPE to be provided for the personnel handling the hazardous wastes. Emergency spill kits to be provided on-site to facilitate clean-up. Contaminated materials to be treated as hazardous wastes. <p>Municipal Solid Waste</p> <ul style="list-style-type: none"> Adequate bins to be provided at strategic locations in Project site. Waste to be disposed off at the Tibar Landfill. Regular housekeeping at workers quarters and construction site. Prohibition of open burning of solid waste. <p>Sewage</p> <ul style="list-style-type: none"> Provision of temporary sanitary facilities at strategic locations within working area(s). Regular desludging and maintenance of sanitary facilities. 	\$20,000	<p>No sampling required. However, site inspection will be conducted:</p> <table border="1"> <thead> <tr> <th>Component</th> <th>Observation</th> <th>Inspection Location</th> <th>Compliance</th> </tr> </thead> <tbody> <tr> <td>Solid Waste Management</td> <td> <ul style="list-style-type: none"> General cleanliness. Number of bins provided and adequacy. </td> <td> <ul style="list-style-type: none"> At base camp, site office and active work areas. </td> <td>Decree Law No.26/2012 Environmental Basic Law Article 39.</td> </tr> <tr> <td>Biomass and Spoil Management</td> <td> <ul style="list-style-type: none"> Condition of stockpile area(s). 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Biomass and Spoil Management	<ul style="list-style-type: none"> Condition of stockpile area(s). BMPs implemented. 	<ul style="list-style-type: none"> At designated stockpile areas. 	-																							
Hazardous/ Scheduled Waste Management	<ul style="list-style-type: none"> Waste disposal at designated scheduled waste disposal area. Visual inspection of storage condition. Signs of oil spill. 	<ul style="list-style-type: none"> At storage areas for scheduled wastes. At active work areas. 	Decree Law No. 26/2012 Environmental Basic Law, Article 42.																							
Sanitation Facilities	<ul style="list-style-type: none"> Adequacy of toilet facilities. Treatment system installed with effluent discharge limits: <ul style="list-style-type: none"> (i) Biochemical Oxygen Demand (BOD): 50 mg/L (ii) TSS: 100 mg/L 	<ul style="list-style-type: none"> At the base camp and site office. 	<ul style="list-style-type: none"> Decree Law No. 26/2012 Environmental Basic Law, Article 41. Malaysian Sewerage Industry Guidelines. 																							

Table 8.2.2: Mitigation Measures during the Operational Phase

Project Activity	Potential Significant Environmental Impact	Mitigation Measures	Mitigation Cost (USD)	Sampling Location/ Monitoring Parameters/ Limits	Monitoring Frequency/ Responsibility	Mitigation Responsibility																																																																																																											
<ul style="list-style-type: none"> Project operations Maintenance of the golf course and landscape features Maintenance of lakes Maintenance of infrastructure, utilities and facilities 	<p>Water Pollution</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Wastewater from operational activities will be the main source of water pollution. Brine from desalination plant may impact the sea organisms. <p>Golf Course Development</p> <ul style="list-style-type: none"> Fertiliser and pesticide runoff in large amounts could leach and cause eutrophication of the lakes. <p>Hospital Development</p> <ul style="list-style-type: none"> Hospital wastewater discharge without treatment will be a main concern as it contains antibiotic-resistant bacteria (ARB). Discharging harmful chemicals (i.e. x-ray contrast agents, disinfectants, etc.) will impact the aquatic ecosystem adversely. 	<p>Water Pollution</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Regular maintenance and inspection of all piping and wastewater treatment systems. Monitoring of sewage treatment plants' (STPs) effluent quality and performance. <p>Golf Course Development</p> <ul style="list-style-type: none"> Implement pest management. Proper selection and use of chemicals with low leaching potential index and without organochlorines. Limit applications of fertilisers and pesticides and to ensure there is no direct release into water bodies. Record periods of fertilising, pest and weed control activities. Training given to employees on fertiliser and pesticide applications. Proper storage and management of pesticides and fertilisers. Provide only enough irrigation water to a depth just below the root system to minimise leaching. Select suitable turf grass to minimise application of fertilisers, pesticides and water. Use of weed-free plants. Conduct groundwater and surface water quality monitoring. <p>Hospital Development</p> <ul style="list-style-type: none"> Conduct regular maintenance and inspection of hospital wastewater storage and piping system. Provision of a hospital wastewater treatment plant, if necessary. Provision of an on-site incinerator for clinical wastes. 	\$20,000	<p>Ambient Water Quality (for Tasi Tolu Lakes)</p> <ul style="list-style-type: none"> Water sampling points: <p style="text-align: center;">Lake Saltwater Sampling</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Points</th> <th>Coordinates</th> </tr> </thead> <tbody> <tr> <td>LW1 (Lake C)</td> <td>S8.56623° E125.51079°</td> </tr> <tr> <td>LW2 (Lake B)</td> <td>S8.56587° E125.50720°</td> </tr> <tr> <td>LW3 (Lake A)</td> <td>S8.56198° E125.49990°</td> </tr> </tbody> </table> <ul style="list-style-type: none"> As the lake water quality will take some time to stabilise even with rehabilitation measures, it is recommended that the lake water shall be complied with the baseline water quality during the first three years of the operational phase. Monitoring parameters/limits (baseline): <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Parameter⁽ⁱ⁾</th> <th colspan="3">Limits (Baseline)⁽ⁱⁱ⁾</th> </tr> <tr> <th>Lake A (LW3)</th> <th>Lake B (LW2)</th> <th>Lake C (LW1)</th> </tr> </thead> <tbody> <tr><td>Temperature</td><td>37.0</td><td>37.8</td><td>36.5</td></tr> <tr><td>Total Suspended Solid (TSS)</td><td>23</td><td>66</td><td>31</td></tr> <tr><td>Dissolved Oxygen (DO)</td><td>6.3</td><td>4.7</td><td>5.1</td></tr> <tr><td>pH</td><td>7.99</td><td>8.48</td><td>8.40</td></tr> <tr><td>Salinity</td><td>35.0</td><td>48.7</td><td>50.2</td></tr> <tr><td>Conductivity</td><td>41</td><td>51</td><td>54</td></tr> <tr><td>Oil and Grease (O&G)</td><td>ND (<0.5)</td><td>ND (<0.5)</td><td>ND (<0.5)</td></tr> <tr><td>Phenol</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Faecal Coliform</td><td>Absent</td><td>Absent</td><td>Absent</td></tr> <tr><td>Mercury (Hg)</td><td>ND (<0.8)</td><td>ND (<0.8)</td><td>ND (<0.8)</td></tr> <tr><td>Cadmium (Cd)</td><td>ND (<2.0)</td><td>ND (<2.0)</td><td>ND (<2.0)</td></tr> <tr><td>Chromium (VI) (Cr⁶⁺)</td><td>ND (<5.0)</td><td>ND (<5.0)</td><td>ND (<5.0)</td></tr> <tr><td>Copper (Cu)</td><td>24</td><td>28</td><td>12</td></tr> <tr><td>Arsenic (As)</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Lead (Pb)</td><td>ND (<10.0)</td><td>18.7</td><td>ND (<10.0)</td></tr> <tr><td>Zinc (Zn)</td><td>150</td><td>42</td><td>18</td></tr> <tr><td>Cyanide (CN)</td><td>ND (<10.0)</td><td>ND (<10.0)</td><td>ND (<10.0)</td></tr> <tr><td>Ammonia</td><td>64.0</td><td>64.4</td><td>35.5</td></tr> <tr><td>Nitrite (NO₂⁻)</td><td>69.3</td><td>135</td><td>69.7</td></tr> <tr><td>Nitrate (NO₃⁻)</td><td>361</td><td>140</td><td>283</td></tr> <tr><td>Total Phosphorus</td><td>ND (<90)</td><td>104</td><td>282</td></tr> <tr><td>Turbidity</td><td colspan="3" style="text-align: center;">-</td></tr> <tr><td>Phosphate⁽ⁱⁱⁱ⁾</td><td colspan="3" style="text-align: center;">75 µg/L</td></tr> </tbody> </table> <p>Note:</p> <p>(i) Parameters shown in the table above are for ambient lake water quality.</p> <p>(ii) Limits values shown in the table above to be comply with the baseline findings.</p> <p>(iii) Limits value for phosphate is adopted from Class 2 of Malaysia Marine Water Quality Criteria and Standards (MWQCS).</p>	Points	Coordinates	LW1 (Lake C)	S8.56623° E125.51079°	LW2 (Lake B)	S8.56587° E125.50720°	LW3 (Lake A)	S8.56198° E125.49990°	Parameter ⁽ⁱ⁾	Limits (Baseline) ⁽ⁱⁱ⁾			Lake A (LW3)	Lake B (LW2)	Lake C (LW1)	Temperature	37.0	37.8	36.5	Total Suspended Solid (TSS)	23	66	31	Dissolved Oxygen (DO)	6.3	4.7	5.1	pH	7.99	8.48	8.40	Salinity	35.0	48.7	50.2	Conductivity	41	51	54	Oil and Grease (O&G)	ND (<0.5)	ND (<0.5)	ND (<0.5)	Phenol	ND (<1.0)	ND (<1.0)	ND (<1.0)	Faecal Coliform	Absent	Absent	Absent	Mercury (Hg)	ND (<0.8)	ND (<0.8)	ND (<0.8)	Cadmium (Cd)	ND (<2.0)	ND (<2.0)	ND (<2.0)	Chromium (VI) (Cr ⁶⁺)	ND (<5.0)	ND (<5.0)	ND (<5.0)	Copper (Cu)	24	28	12	Arsenic (As)	ND (<1.0)	ND (<1.0)	ND (<1.0)	Lead (Pb)	ND (<10.0)	18.7	ND (<10.0)	Zinc (Zn)	150	42	18	Cyanide (CN)	ND (<10.0)	ND (<10.0)	ND (<10.0)	Ammonia	64.0	64.4	35.5	Nitrite (NO ₂ ⁻)	69.3	135	69.7	Nitrate (NO ₃ ⁻)	361	140	283	Total Phosphorus	ND (<90)	104	282	Turbidity	-			Phosphate ⁽ⁱⁱⁱ⁾	75 µg/L			<ul style="list-style-type: none"> Quarterly monitoring by EnvMC for one year only for the indemnity period 	<ul style="list-style-type: none"> PP
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<ul style="list-style-type: none"> Project operations Maintenance of the golf course and landscape features Maintenance of lakes Maintenance of infrastructure, utilities and facilities (Cont'd)	<p>Water Pollution</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Wastewater from operational activities will be the main source of water pollution. Brine from desalination plant may impact the sea organisms. <p>Golf Course Development</p> <ul style="list-style-type: none"> Fertiliser and pesticide runoff in large amounts could leach and cause eutrophication of the lakes. <p>Hospital Development</p> <ul style="list-style-type: none"> Hospital wastewater discharge without treatment will be a main concern as it contains antibiotic-resistant bacteria (ARB). Discharging harmful chemicals (i.e. x-ray contrast agents, disinfectants, etc.) will impact the aquatic ecosystem adversely. 	<p>Water Pollution</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Regular maintenance and inspection of all piping and wastewater treatment systems. Monitoring of sewage treatment plants' (STPs) effluent quality and performance. <p>Golf Course Development</p> <ul style="list-style-type: none"> Implement pest management. Proper selection and use of chemicals with low leaching potential index and without organochlorines. Limit applications of fertilisers and pesticides and to ensure there is no direct release into water bodies. Record periods of fertilising, pest and weed control activities. Training given to employees on fertiliser and pesticide applications. Proper storage and management of pesticides and fertilisers. Provide only enough irrigation water to a depth just below the root system to minimise leaching. Select suitable turf grass to minimise application of fertilisers, pesticides and water. Use of weed-free plants. Conduct groundwater and surface water quality monitoring. <p>Hospital Development</p> <ul style="list-style-type: none"> Conduct regular maintenance and inspection of hospital wastewater storage and piping system. Provision of a hospital wastewater treatment plant, if necessary. Provision of an on-site incinerator for clinical wastes. 	(Cont'd)	<p>Groundwater Quality</p> <ul style="list-style-type: none"> Groundwater Water sampling points: <table border="1"> <thead> <tr> <th>Points</th> <th>Coordinates</th> </tr> </thead> <tbody> <tr> <td>GW1</td> <td>S8.55891° E125.50387°</td> </tr> <tr> <td>GW2</td> <td>S8.55854° E125.49889°</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Monitoring parameters/limits: <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits</th> </tr> </thead> <tbody> <tr> <td>Enterococcus⁽ⁱⁱ⁾</td> <td>0 Number/100 mL</td> </tr> <tr> <td>Arsenic⁽ⁱⁱⁱ⁾ (As)</td> <td>10 µg/L</td> </tr> <tr> <td>Copper⁽ⁱⁱⁱ⁾ (Cu)</td> <td>2.0 µg/L</td> </tr> <tr> <td>Cadmium⁽ⁱⁱⁱ⁾ (Cd)</td> <td>5.0 µg/L</td> </tr> <tr> <td>Lead⁽ⁱⁱⁱ⁾ (Pb)</td> <td>Up to 25 µg/L</td> </tr> <tr> <td>Chromium⁽ⁱⁱⁱ⁾ (Cr)</td> <td>50 µg/L</td> </tr> <tr> <td>Mercury⁽ⁱⁱⁱ⁾ (Hg)</td> <td>1.0 µg/L</td> </tr> <tr> <td>Nitrate⁽ⁱⁱⁱ⁾ (NO₃⁻)</td> <td>50 µg/L</td> </tr> <tr> <td>Total Pesticide⁽ⁱⁱⁱ⁾</td> <td>0.50 µg/L</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits</th> </tr> </thead> <tbody> <tr> <td>Selenium⁽ⁱⁱⁱ⁾ (Se)</td> <td>10 µg/L</td> </tr> <tr> <td>Sulphate^(iv)</td> <td>250 mg/L</td> </tr> <tr> <td>Total Coliform^(iv)</td> <td>0 MPN/100 mL</td> </tr> <tr> <td>Manganese^(iv) (Mn)</td> <td>0.1 mg/L</td> </tr> <tr> <td>Zinc^(iv) (Zn)</td> <td>3 mg/L</td> </tr> <tr> <td>Iron^(iv) (Fe)</td> <td>0.3 mg/L</td> </tr> <tr> <td>Conductivity^(iv)</td> <td>-</td> </tr> <tr> <td>Chloride^(iv)</td> <td>250 mg/L</td> </tr> </tbody> </table> <p>Note:</p> <p>(i) Parameters shown in the table above are for groundwater quality.</p> <p>(ii) Sourced from Attachment I, Part A1, Microbiological Parameters of the Decree-Law No.5/2009, Licensing Regulations, Sale and Quality of Drinking Water.</p> <p>(iii) Sourced from Attachment I, Part B2. Chemical Parameters of the Decree-Law No.5/2009, Licensing Regulations, Sale and Quality of Drinking Water.</p> <p>(iv) Malaysia Environmental Quality Report (EQR) 2015, DOE, 2015.</p>	Points	Coordinates	GW1	S8.55891° E125.50387°	GW2	S8.55854° E125.49889°	Parameter ⁽ⁱ⁾	Limits	Enterococcus ⁽ⁱⁱ⁾	0 Number/100 mL	Arsenic ⁽ⁱⁱⁱ⁾ (As)	10 µg/L	Copper ⁽ⁱⁱⁱ⁾ (Cu)	2.0 µg/L	Cadmium ⁽ⁱⁱⁱ⁾ (Cd)	5.0 µg/L	Lead ⁽ⁱⁱⁱ⁾ (Pb)	Up to 25 µg/L	Chromium ⁽ⁱⁱⁱ⁾ (Cr)	50 µg/L	Mercury ⁽ⁱⁱⁱ⁾ (Hg)	1.0 µg/L	Nitrate ⁽ⁱⁱⁱ⁾ (NO ₃ ⁻)	50 µg/L	Total Pesticide ⁽ⁱⁱⁱ⁾	0.50 µg/L	Parameter ⁽ⁱ⁾	Limits	Selenium ⁽ⁱⁱⁱ⁾ (Se)	10 µg/L	Sulphate ^(iv)	250 mg/L	Total Coliform ^(iv)	0 MPN/100 mL	Manganese ^(iv) (Mn)	0.1 mg/L	Zinc ^(iv) (Zn)	3 mg/L	Iron ^(iv) (Fe)	0.3 mg/L	Conductivity ^(iv)	-	Chloride ^(iv)	250 mg/L	<ul style="list-style-type: none"> Quarterly monitoring by EnvMC for one year only for the indemnity period 	<ul style="list-style-type: none"> PP
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	<p>Air Pollution</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Increased number of vehicles will produce more gaseous emissions. Sewage treatment plant (STP) failure may cause odours. <p>Hospital Development</p> <ul style="list-style-type: none"> Proper disposal of clinical wastes needed. 	<p>Air Pollution</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Maintain green buffer areas between the residential areas as natural air filters. Implement traffic control. Ensure frequent monitoring of STPs to prevent odours. Ensure good solid waste management and housekeeping practices at all times. <p>Hospital Development</p> <ul style="list-style-type: none"> Proper management of clinical waste. 	\$10,000	<ul style="list-style-type: none"> No sampling required. 	<ul style="list-style-type: none"> Quarterly inspection by PP for one year only for the indemnity period 	<ul style="list-style-type: none"> PP 																																												
	<p>Noise Level</p> <ul style="list-style-type: none"> Increased noise from traffic and tourist activities. 	<p>Noise Level</p> <ul style="list-style-type: none"> Impose speed limits to all vehicles to/from the Project site. Implement traffic control. PP to keep a complaints log book and take action immediately. 	\$5,000	<ul style="list-style-type: none"> No sampling required. 	<ul style="list-style-type: none"> Quarterly inspection by PP for one year only for the indemnity period 	<ul style="list-style-type: none"> PP 																																												

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<ul style="list-style-type: none"> Project operations Maintenance of the golf course and landscape features Maintenance of lakes Maintenance of infrastructure, utilities and facilities (cont'd)	<p>Marine Ecology Integrated Mixed Development</p> <ul style="list-style-type: none"> Sewage contamination may have detrimental effects on the coral reefs. Microalgal blooms in the sea may affect marine and human lives. Hypersaline water from the desalination plant may affect corals and disrupt the osmotic balance of marine flora and fauna, if the discharge pipeline is too short for proper mixing with seawater. <p>Golf Course Development</p> <ul style="list-style-type: none"> Usage of fertilisers and pesticides may pollute groundwater and lake water. <p>Hospital Development</p> <ul style="list-style-type: none"> Toxic chemicals and clinical wastes may poison marine flora and fauna if leaked to the sea. 	<p>Marine Ecology Integrated Mixed Development</p> <ul style="list-style-type: none"> Regularly maintain and inspect the STPs to prevent leakages and functional failures. Brine to be discharged at a location far from coral reefs. Regular marine ecology monitoring. <p>Golf Course Development</p> <ul style="list-style-type: none"> Implement integrated pest management measures, similar to the construction phase. Minimise use of fertilisers, pesticides and water. <p>Hospital Development</p> <ul style="list-style-type: none"> Toxic chemicals to be treated in a designated wastewater treatment plant. Clinical solid wastes to have pre-treatment. 	\$5,000	<p>Marine Ecology</p> <ul style="list-style-type: none"> Marine ecology monitoring points: <table border="1" style="margin-left: 40px;"> <thead> <tr> <th colspan="2">Coral Reef</th> <th colspan="2">Phytoplankton and Zooplankton</th> </tr> <tr> <th>Points</th> <th>Coordinates</th> <th>Points</th> <th>Coordinates</th> </tr> </thead> <tbody> <tr> <td>T1</td> <td>S 8.55743° E 125.50452°</td> <td>B1</td> <td>S8.54759° E125.51584°</td> </tr> <tr> <td>T2</td> <td>S 8.55678° E 125.50447°</td> <td>B2</td> <td>S8.55638° E125.50647°</td> </tr> <tr> <td>T3</td> <td>S 8.55722° E 125.50043°</td> <td>B3</td> <td>S8.55572° E125.48918°</td> </tr> <tr> <td>T4</td> <td>S 8.55588° E 125.50070°</td> <td></td> <td></td> </tr> <tr> <td>T5</td> <td>S 8.55450° E 125.48945°</td> <td></td> <td></td> </tr> <tr> <td>T6</td> <td>S 8.55477° E 125.48993°</td> <td></td> <td></td> </tr> <tr> <td>T7</td> <td>S 8.55547° E 125.49722°</td> <td></td> <td></td> </tr> <tr> <td>T8</td> <td>S 8.55527° E 125.49807°</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Marine Component</th> <th>Analysis/Observation⁽¹⁾</th> </tr> </thead> <tbody> <tr> <td>Phytoplankton and Zooplankton</td> <td> <ul style="list-style-type: none"> Density. Species Diversity. </td> </tr> <tr> <td>Coral Reef</td> <td> <ul style="list-style-type: none"> Percentage cover of live corals, dead coral, rock, sand and rubble. Observation on coral bleaching, broken or damaged corals. </td> </tr> </tbody> </table> <ul style="list-style-type: none"> The components to analyse during monitoring are: <p>There are no standard limits for biological components. However, when carrying out marine resources management, the following have to be complied with:</p> <ol style="list-style-type: none"> UNTAET Regulation 2000/19 on Protected Places. Draft Decree Law on Biodiversity dated March 2012. National Biodiversity Strategy and Action Plan (2011 – 2012). 	Coral Reef		Phytoplankton and Zooplankton		Points	Coordinates	Points	Coordinates	T1	S 8.55743° E 125.50452°	B1	S8.54759° E125.51584°	T2	S 8.55678° E 125.50447°	B2	S8.55638° E125.50647°	T3	S 8.55722° E 125.50043°	B3	S8.55572° E125.48918°	T4	S 8.55588° E 125.50070°			T5	S 8.55450° E 125.48945°			T6	S 8.55477° E 125.48993°			T7	S 8.55547° E 125.49722°			T8	S 8.55527° E 125.49807°			Marine Component	Analysis/Observation ⁽¹⁾	Phytoplankton and Zooplankton	<ul style="list-style-type: none"> Density. Species Diversity. 	Coral Reef	<ul style="list-style-type: none"> Percentage cover of live corals, dead coral, rock, sand and rubble. Observation on coral bleaching, broken or damaged corals. 	<ul style="list-style-type: none"> Half yearly monitoring by EnvMC for one year only for the indemnity period 	<ul style="list-style-type: none"> PP
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	<p>Terrestrial Ecology Integrated Mixed Development</p> <ul style="list-style-type: none"> Human-wildlife conflicts. Lights at night throughout the development may disturb nocturnal wildlife. <p>Golf Course Development</p> <ul style="list-style-type: none"> Chemical pollution from fertilisers and pesticides usage may contaminate groundwater and lake water. 	<p>Terrestrial Ecology Integrated Mixed Development</p> <ul style="list-style-type: none"> Signboards to be placed to warn and/or inform visitor on the existence of wildlife. Hunting, poaching and disturbing local wildlife are prohibited. Reforestation of hillslopes. <p>Golf Course Development</p> <ul style="list-style-type: none"> Oversee turf maintenance and management such as mowing, soil aeration, topdressing with sand, and dethatching of the turf root zone. 	\$10,000	<ul style="list-style-type: none"> No sampling required. When carrying out terrestrial ecology management, the following have to be complied with: <ol style="list-style-type: none"> UNTAET Regulation 2000/19 on Protected Places. UNTAET Regulation 2000/17 on the Prohibition of Logging Operations and the Export of Wood from East Timor. Draft Decree Law on Biodiversity dated March 2012. Draft Decree Law on Forest Management, Draft 6. Draft Decree Law on Biodiversity dated March 2012. Forestry Sector Policy Goal Objective and Strategy. 	<ul style="list-style-type: none"> Half yearly inspection by EnvMC for one year only for the indemnity period 	<ul style="list-style-type: none"> PP 																																														
	<p>Lake Ecology</p> <ul style="list-style-type: none"> Water pollutants from partially treated effluent, pesticides and fertilisers may be harmful to aquatic organisms in the lakes causing eutrophication. 	<p>Lake Ecology</p> <ul style="list-style-type: none"> Maintain the efficient functions of the mechanical aeration system to aid water circulation and oxygenation. Implement mitigation measures and BMPs for water quality. 	\$5,000	<ul style="list-style-type: none"> No sampling required. When carrying out lake resources management, the following have to be complied with: <ol style="list-style-type: none"> UNTAET Regulation 2000/19 on Protected Places. Draft Decree Law on Biodiversity dated March 2012. National Biodiversity Strategy and Action Plan (2011 – 2012). 	<ul style="list-style-type: none"> Half yearly inspection by EnvMC for one year only for the indemnity period 	<ul style="list-style-type: none"> PP Golf Course Superintendent 																																														

Project Activity	Potential Significant Environmental Impact	Mitigation Measures	Mitigation Cost (USD)	Sampling Location/ Monitoring Parameters/ Limits	Monitoring Frequency/ Responsibility	Mitigation Responsibility
<ul style="list-style-type: none"> • Project operations • Maintenance of the golf course and landscape features • Maintenance of lakes • Maintenance of infrastructure, utilities and facilities (cont'd)	<p>Infrastructure and Utilities Integrated Mixed Development</p> <ul style="list-style-type: none"> • Increased traffic. • Demand for electricity and water may increase during operations of the Project. • Municipal waste will be disposed off at Tibar Landfill. <p>Golf Course Development</p> <ul style="list-style-type: none"> • Need for golf course irrigation water. <p>Hospital Development:</p> <ul style="list-style-type: none"> • Clinical wastes need to be incinerated and the ash disposed off to Tibar Landfill. 	<p>Infrastructure and Utilities Integrated Mixed Development</p> <ul style="list-style-type: none"> • Maintain STPs for efficient treatment of sewage and sullage. • Upgrade the internal permanent road network wherever necessary. • Provisions of waste disposal bins. • Proper collection and disposal of residual oil and grease. <p>Golf Course Development</p> <ul style="list-style-type: none"> • Composting of green waste. <p>Hospital Development</p> <ul style="list-style-type: none"> • Proper disposal of clinical waste. 	\$5,000	<ul style="list-style-type: none"> • No sampling required. 	<ul style="list-style-type: none"> • Half yearly inspection by EnvMC for one year only for the indemnity period 	<ul style="list-style-type: none"> • PP • Contractor
	<p>Tourism</p> <ul style="list-style-type: none"> • Disruption to the birds and other avians by golf course activities and visitors to the lakes. • Possible eutrophication of Lakes B and C from the golf course fertiliser runoff. • Disruption to small fishing vessels by tourist boats and services. • Coral bleaching may occur if there are excessive leached pesticides and toxic chemicals. 	<p>Tourism</p> <ul style="list-style-type: none"> • Sea and vessel traffic to be managed by the local authorities with the assistance of PP. • Berthing and anchoring of vessels to be demarcated clearly away from rich coral areas. • Adequate provisions of tourist facilities (e.g. toilets, bathing areas and waste bins). • Post signages and enforce strictly the prohibition to collect corals and marine life. • Maintain the reforested hillslopes to provide more habitats for resting and breeding of terrestrial fauna. • Proper irrigation management to maintain the golf course. 	\$10,000	<ul style="list-style-type: none"> • No sampling required. 	<ul style="list-style-type: none"> • Half yearly inspection by EnvMC for one year only for the indemnity period 	<ul style="list-style-type: none"> • PP

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<ul style="list-style-type: none"> Project operations Maintenance of the golf course and landscape features Maintenance of lakes Maintenance of infrastructure, utilities and facilities (cont'd)	<p>Waste Generation</p> <p>Municipal Solid Waste</p> <ul style="list-style-type: none"> Poor management produces leachate, odour and generation of disease vectors. Garbage can attract pests and scavengers. <p>Scheduled/Hazardous Waste</p> <ul style="list-style-type: none"> Impact on water quality, aquatic life and occupational health. <p>Green Waste</p> <ul style="list-style-type: none"> Leachates from decomposing green wastes may affect aquatic life if leached into the lakes. <p>Sewage</p> <ul style="list-style-type: none"> Mainly generated from integrated mixed development. Poses problems to water quality and public health if the STPs fail. <p>Clinical Waste</p> <ul style="list-style-type: none"> May cause pathogenic/infectious diseases. Safety concerns due to sharps (from medical instruments). Improper chemical waste management may result in hazards to workers, public and patients. 	<p>Waste Generation</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Disposal of scheduled/hazardous wastes into drainage and sewerage systems is prohibited. Hazardous wastes generated to be stored properly with clear labelling for final disposal at a secured landfill or any facility approved by the local authority. <p>Golf Course Development</p> <ul style="list-style-type: none"> Green waste to be collected, composted and used as soil conditioners for golf course maintenance. <p>Hospital Development</p> <ul style="list-style-type: none"> Hazardous wastes to be stored in clearly marked waste bins with plastic liners. Sharps to be disposed off in puncture-proof containers, whilst chemical liquid wastes can be placed in amber disposal containers compatible with their hazardous characteristics. All containers containing hazardous wastes to be labelled appropriately with symbol of waste type and weight. PPE such as gloves, masks and appropriate footwear to be provided for personnel handling clinical wastes. General waste from hospital can be incinerated and disposed off at Tibar Landfill through usual waste collection. 	\$10,000	<p>Solid Waste and Hazardous/Scheduled Waste</p> <ul style="list-style-type: none"> No sampling required. However, site inspection will be conducted: <table border="1"> <thead> <tr> <th>Component</th> <th>Observation</th> <th>Inspection Location</th> <th>Compliance</th> </tr> </thead> <tbody> <tr> <td>Solid Waste Management</td> <td> <ul style="list-style-type: none"> General cleanliness. Number of bins provided and adequacy. </td> <td> <ul style="list-style-type: none"> At base camp, site office and active work areas. </td> <td>Decree Law No.26/2012 Environmental Basic Law Article 39.</td> </tr> <tr> <td>Hazardous/Scheduled Waste Management</td> <td> <ul style="list-style-type: none"> Waste disposal at designated scheduled waste disposal area. Visual inspection of storage condition. Signs of oil spill. </td> <td> <ul style="list-style-type: none"> At storage areas for scheduled wastes. At active work areas. </td> <td>Decree Law No. 26/2012 Environmental Basic Law, Article 42.</td> </tr> </tbody> </table> <p>Sewage</p> <ul style="list-style-type: none"> Sample to be collected at the discharge point of treated effluent. 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(ii) Limits values shown in the table above are adopted from Class IIB of NWQS for Malaysia.</p>	Component	Observation	Inspection Location	Compliance	Solid Waste Management	<ul style="list-style-type: none"> General cleanliness. Number of bins provided and adequacy. 	<ul style="list-style-type: none"> At base camp, site office and active work areas. 	Decree Law No.26/2012 Environmental Basic Law Article 39.	Hazardous/Scheduled Waste Management	<ul style="list-style-type: none"> Waste disposal at designated scheduled waste disposal area. Visual inspection of storage condition. Signs of oil spill. 	<ul style="list-style-type: none"> At storage areas for scheduled wastes. At active work areas. 	Decree Law No. 26/2012 Environmental Basic Law, Article 42.	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Temperature	-	Ammoniacal Nitrogen (AN)	0.3 mg/L	Biochemical Oxygen Demand (BOD)	3 mg/L	Chemical Oxygen Demand (COD)	25 mg/L	Dissolved Oxygen (DO)	5 – 7 mg/L	pH	6 – 9	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Oil and grease (O&G)	0.04 mg/L	Total Suspended Solid (TSS)	50 mg/L	Total Coliform	5,000 count/100 mL	Faecal Coliform	400 count/100 mL	Salinity	-	Lead (Pb)	0.05 mg/L	Zinc (Zn)	5 mg/L	Copper (Cu)	0.02 mg/L	Nitrate (NO ₃ ⁻)	7 mg/L	Phosphorus	0.2 mg/L	<ul style="list-style-type: none"> Quarterly inspection by EnvMC for one year only 	<ul style="list-style-type: none"> STP Operator Golf Course Superintendent
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8.3 PROPOSED MITIGATION MEASURES FOR SOCIAL IMPACTS

Socio-economic Impact	Mitigation Measures
<ul style="list-style-type: none"> • Relocation could cause some psychological impacts among the affected villagers. • Disruption in social relationships amongst relocated villagers and with the communities in the new area. • Potential public health and safety issue among the workers and local community from: (i) air and noise pollution, (ii) insufficient living accommodation, poor sanitation and inadequate waste disposal facilities in Project area. • Social conflicts due to influx of migrant workers: (i) competition of jobs among locals and migrant workers; (ii) social ills, such as drugs and alcohol abuses. 	<p><u>Stakeholder Meeting</u></p> <ul style="list-style-type: none"> • There is a call to establish a <u>Community Relations Committee</u> at the Suco level to act as a communication and liaison channel between the PP and the local community. • The rationale: <ul style="list-style-type: none"> (i) To involve locals during Project development. (ii) To increase their understanding and acceptance of the Project. (iii) To enable them to identify and highlight impacts and issues which are not immediately obvious to the PP. (iv) To build a trusting relationship between the PP and the stakeholders. <p><u>Employment Opportunities</u></p> <ul style="list-style-type: none"> • Preference given to the local population to fill in the jobs. • A local “labour desk” shall be set up at the Project site or contractors’ offices to facilitate employing local labour during the construction phase. • Locals are also encouraged to fill in clerical and managerial jobs if they are qualified with the right training related to hotel management and the tourism industries. <p><u>Public Health and Safety</u></p> <ul style="list-style-type: none"> • The Community Relations Committee can incorporate awareness campaigns taken jointly on precautionary measures to take related to safety and health. • Local residents shall be alerted to any change in traffic routes and diversion, pedestrian access, etc., wherever and whenever necessary. • Support facilities and infrastructure shall be adequately provided at the construction site to ensure acceptable living conditions of the workers. <p><u>Promoting Economic Linkage</u></p> <ul style="list-style-type: none"> • There should be a deliberate attempt to promote economic linkages at the local level. This will ensure that the Project forms an integral part of the entire developmental process of the local economy. • Examples of integrating the Project development with the local economy include purchasing local products (raw materials such as sand, etc. during the construction phase, and local produce such as vegetables, etc. during operational phase). • Providing continuous training for semi-skilled and skilled jobs to the local youths. • The Community Relations Committee to help find workers to work in the hotel and the tourism-related business. • Small tourism-related business can be undertaken by the local population.

Chapter 9

Governing Parameters

CHAPTER 9: GOVERNING PARAMETERS

9.1 INTRODUCTION

- This Chapter provides the governing or compliance parameters, criteria and environmental standards to monitor the direct and indirect change resulting from the construction and operations of the Project. It is based on the mitigation measures provided in **Chapter 8: Proposed Mitigation Measures** of this EMP.

9.2 ENVIRONMENTAL PERFORMANCE INDICATORS AND COMPLIANCE CRITERIA

- Environmental Performance Indicators (EPIs) are indicative of the status of the components to be assessed in line with the relevant environmental requirements by the National Directorate of Pollution Control and Environmental Impact (NDPCEI) and other regulatory agencies.
- Environmental standards and guidelines of Timor-Leste will be used wherever these are available. Where these are found lacking, standards from Association of Southeast Asian Nations (ASEAN) countries such as Malaysia, will be used. This was agreed upon during our earlier discussions with officials from the NDPCEI.
- **Table 9.2.1** provides the key EPIs for the Project and their targeted compliance criteria.

Table 9.2.1: EPIs and Targeted Compliance Criteria

Key Performance Indicator	Targeted Compliance Criteria	Application																																														
		Construction Phase	Operational Phase																																													
Marine and Lake Water Quality	(i) Class 2 of the Malaysia Marine Water Quality Criteria and Standards (MWQCS)	✓	✓																																													
		<ul style="list-style-type: none"> Compliance limit for marine and lake water quality: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Parameter⁽ⁱ⁾</th> <th style="text-align: center;">Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Temperature</td> <td>±2°C increase over maximum ambient</td> </tr> <tr> <td>Total Suspended Solid (TSS)⁽ⁱⁱⁱ⁾</td> <td>50 mg/L (25 mg/L) or ≤0% increase in seasonal average, whichever is lower</td> </tr> <tr> <td>Dissolved Oxygen (DO)</td> <td>5 mg/L</td> </tr> <tr> <td>pH</td> <td>-</td> </tr> <tr> <td>Salinity</td> <td>-</td> </tr> <tr> <td>Conductivity</td> <td>-</td> </tr> <tr> <td>Turbidity</td> <td>-</td> </tr> <tr> <td>Oil and grease (O&G)</td> <td>0.14 mg/L</td> </tr> <tr> <td>Phosphate</td> <td>75 µg/L</td> </tr> <tr> <td>Phenol</td> <td>10 µg/L</td> </tr> <tr> <td>Faecal Coliform⁽ⁱⁱⁱ⁾</td> <td>100 MPN/100 mL (70 MPN/100 mL)</td> </tr> <tr> <td>Mercury⁽ⁱⁱⁱ⁾ (Hg)</td> <td>0.16 (0.04) µg/L</td> </tr> <tr> <td>Cadmium⁽ⁱⁱⁱ⁾ (Cd)</td> <td>2 (3) µg/L</td> </tr> <tr> <td>Chromium (VI) (Cr⁶⁺)</td> <td>10 µg/L</td> </tr> <tr> <td>Copper (Cu)</td> <td>2.9 µg/L</td> </tr> <tr> <td>Arsenic⁽ⁱⁱⁱ⁾ (As)</td> <td>20 (3) µg/L</td> </tr> <tr> <td>Lead (Pb)</td> <td>8.5 µg/L</td> </tr> <tr> <td>Zinc (Zn)</td> <td>50 µg/L</td> </tr> <tr> <td>Cyanide (CN)</td> <td>7 µg/L</td> </tr> <tr> <td>Ammonia</td> <td>70 µg/L</td> </tr> <tr> <td>Nitrite (NO₂⁻)</td> <td>55 µg/L</td> </tr> <tr> <td>Nitrate (NO₃⁻)</td> <td>60 µg/L</td> </tr> </tbody> </table>		Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Temperature	±2°C increase over maximum ambient	Total Suspended Solid (TSS) ⁽ⁱⁱⁱ⁾	50 mg/L (25 mg/L) or ≤0% increase in seasonal average, whichever is lower	Dissolved Oxygen (DO)	5 mg/L	pH	-	Salinity	-	Conductivity	-	Turbidity	-	Oil and grease (O&G)	0.14 mg/L	Phosphate	75 µg/L	Phenol	10 µg/L	Faecal Coliform ⁽ⁱⁱⁱ⁾	100 MPN/100 mL (70 MPN/100 mL)	Mercury ⁽ⁱⁱⁱ⁾ (Hg)	0.16 (0.04) µg/L	Cadmium ⁽ⁱⁱⁱ⁾ (Cd)	2 (3) µg/L	Chromium (VI) (Cr ⁶⁺)	10 µg/L	Copper (Cu)	2.9 µg/L	Arsenic ⁽ⁱⁱⁱ⁾ (As)	20 (3) µg/L	Lead (Pb)	8.5 µg/L	Zinc (Zn)	50 µg/L	Cyanide (CN)	7 µg/L	Ammonia	70 µg/L	Nitrite (NO ₂ ⁻)	55 µg/L	Nitrate (NO ₃ ⁻)
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Groundwater Quality	(i) Decree-Law No.5/2009, Licensing Regulations, Sale and Quality of Drinking Water	X	✓																			
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(iii) Conditions of environmental license (if any)	X	✓																			
Erosion and Sedimentation	(i) Erosion and Sediment Control Plan (ESCP)	TSS: 50 mg/L	X																		
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Air Quality	(i) World Health Organisation (WHO) Air Quality Guidelines	✓	• Compliance limit for air quality: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>PM_{2.5}</td> <td>25 µg/m³ over an averaging time of 24 hour (99th percentile)</td> </tr> <tr> <td>PM₁₀</td> <td>50 µg/m³ over an averaging time of 24 hour (99th percentile)</td> </tr> </tbody> </table> X	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	PM _{2.5}	25 µg/m ³ over an averaging time of 24 hour (99 th percentile)	PM ₁₀	50 µg/m ³ over an averaging time of 24 hour (99 th percentile)												
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Key Performance Indicator	Targeted Compliance Criteria	Application							
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	(ii) Conditions of environmental license (if any)	✓	X						
Waste Management	(i) <u>Solid Waste Management</u> : Decree Law No.26/2012 Environmental Basic Law Article 39	✓	✓						
	(ii) <u>Hazardous/Scheduled Waste Management</u> : Decree Law No. 26/2012 Environmental Basic Law, Article 42	✓	✓						
	(iii) <u>Sewage (for temporary facility)</u> : (a) Decree Law No. 26/2012 Environmental Basic Law, Article 41. (b) Malaysian Sewerage Industry Guidelines, SPAN, 2009.	✓	X						
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Zinc (Zn)	5 mg/L																																				
Copper (Cu)	0.02 mg/L																																				
Nitrate (NO ₃ ⁻)	7 mg/L																																				
Phosphorus	0.2 mg/L																																				
(v) Conditions of Environmental License (if any)	✓	✓																																			

Key Performance Indicator	Targeted Compliance Criteria	Application	
		Construction Phase	Operational Phase
Biodiversity	(i) UNTAET Regulation 2000/19 on Protected Places	✓	X
	(ii) Decree Law No.26/2012 Environmental Basic Law, Article 27	✓	X
	(iii) UNTAET Regulation No.2000/17 on the Prohibition of Logging Operations and the Export of Wood from East Timor	✓	✓
	(iv) Draft Decree Law on Biodiversity, dated March 2012	✓	✓
	(v) Draft Decree Law on Forest Management, draft 6	✓	✓
	(vi) National Biodiversity Strategy and Action Plan (2011 – 2012)	✓	✓
	(vii) Forestry Sector Policy Goal Objective and Strategy	✓	X
	(viii) Conditions of environmental license (if any)	✓	✓

9.3 COMPLIANCE CRITERIA AND REQUIREMENTS

9.3.1 Water Quality Criteria

- **Marine Water Quality (Saline):** Compliance criteria for marine water quality shall abide by the Malaysian MWQCS. The limits for each parameter are in **Table 9.3.1**. The complete set of standards and guidelines are in **Appendix 9-A**.
- **Lake Water Quality (Saline):** During the construction and operational phases of the Project, the three Tasi Tolu Lakes will remain as saline lakes. With reference to the baseline taken in January 2017, the lakes are very much degraded. As the lake water quality will take some time to stabilise even with rehabilitation measures, the recommendation is:
 - (a) Lake water shall comply with the baseline water quality during the construction phase and first three years for the operational phase as an Interim Target 1;
 - (b) Thereafter to comply with the Malaysian MWQCS by the fourth year of the operational phase.
- The limits for each parameter are provided in **Table 9.3.2**.
- **Groundwater Quality (Freshwater):** The groundwater compliance criteria shall abide by the Decree-Law No.5/2009 Licensing Regulations, Sale and Quality of Drinking Water Attachment I Part A1 and Part B2 as well as the Malaysian Drinking Water Quality Standard. The limits for each parameter are provided in **Table 9.3.3**. The complete set of guidelines is in **Appendix 9-A**.

Table 9.3.1: Marine Water Quality Standards and Compliance Criteria

Standard	Parameters (units)	Limits	Developmental Phase
Class 2 of the Malaysian MWQCS	Temperature (°C)	≤2°C increase over maximum ambient	<ul style="list-style-type: none"> • Pre-construction (Baseline) • Construction Phase • Operational Phase
	Dissolved Oxygen (mg/L)	5	
	Total Suspended Solid (mg/L)	50 mg/L (25 mg/L) or ≤10% increase in seasonal average, whichever is lower	
	pH	-	
	Salinity	-	
	Conductivity	-	
	Turbidity	-	
	Oil and Grease (mg/L)	0.14	
	Mercury* (µg/L)	0.16 (0.04)	
	Cadmium (µg/L)	2(3)	
Class 2 of the Malaysian MWQCS	Chromium (VI) (µg/L)	10	<ul style="list-style-type: none"> • Pre-construction (Baseline) • Construction Phase • Operational Phase
	Copper (µg/L)	2.9	
	Arsenic (III)* (µg/L)	20(3)	
	Lead (µg/L)	8.5	
	Zinc (µg/L)	50	
	Cyanide (µg/L)	7	

Standard	Parameters (units)	Limits	Developmental Phase
	Ammonia (unionized) (µg/L)	70	
	Nitrite (NO ₂) (µg/L)	55	
	Nitrate (NO ₃) (µg/L)	60	
	Phosphate (µg/L)	75	
	Phenol (µg/L)	10	
	Faecal Coliform (MPN)	100 faecal coliform/ 100 mL & (70 faecal coliform/ 100mL)	

Source: Malaysia Environmental Quality Report (EQR) 2015, Department of Environment (DOE), 2016.

Note: Parenthesis indicates for coastal and marine water areas where seafood and human consumption is applicable.

Table 9.3.2: Marine Water Quality Standards and Compliance Criteria for Lakes A, B and C for Construction and Operational Phases

Parameters (units)	Class 2 of the Malaysian MWQCS	Baseline of Three Tasi Tolu Lakes			Construction Phase (~6 Years)	Operational Phase	
		Lake A	Lake B	Lake C		Interim Target 1 (First 3 Years)	Interim Target 2 (Year 4 onwards)
Temperature (°C)	≤2°C increase over maximum ambient	37.0	37.8	36.5	Maintain baseline water quality	Maintain baseline water quality	Complied with Class 2 MWQCS
Dissolved Oxygen (mg/L)	5	6.3	4.7	5.1			
Total Suspended Solid (mg/L)	50 mg/L (25 mg/L) or ≤10% increase in seasonal average, whichever is lower	23	66	31			
pH	-	7.99	8.48	8.40			
Salinity	-	35.00	48.7	50.2			
Conductivity	-	41	51	54			
Turbidity	-	-	-	-			
Oil and Grease (mg/L)	0.14	ND (<0.5)	ND (<0.5)	ND (<0.5)			
Mercury* (µg/L)	0.16 (0.04)	ND (<0.8)	ND (<0.8)	ND (<0.8)			
Cadmium (µg/L)	2(3)	ND (<2.0)	ND (<2.0)	ND (<2.0)			
Chromium (VI) (µg/L)	10	ND (<5.0)	ND (<5.0)	ND (<5.0)			
Copper (µg/L)	2.9	24	28	12			
Arsenic (III)* (µg/L)	20(3)	ND (<1.0)	ND (<1.0)	ND (<1.0)			
Lead (µg/L)	8.5	ND (<10)	18.7	ND (<10)			
Zinc (µg/L)	50	150	42	18			
Cyanide (µg/L)	7	ND (<10)	ND (<10)	ND (<10)			
Ammonia (unionized) (µg/L)	70	64	64.4	35.5			
Nitrite (NO ₂) (µg/L)	55	69.3	135	69.7			
Nitrate (NO ₃) (µg/L)	60	361	140	283			
Phosphate (µg/L)	75	ND (<90)	104	282			
Phenol (µg/L)	10	ND (<1.0)	ND (<1.0)	ND (<1.0)			
Faecal Coliform (MPN)	100 faecal coliform/ 100 mL & (70 faecal coliform/ 100mL)	Absent	Absent	Absent			

Source: Malaysia EQR 2015, DOE, 2016.

Note: Parenthesis indicates for coastal and marine water areas where seafood and human consumption is applicable.

Table 9.3.3 (a): Groundwater Standards and Compliance Criteria

Standard	Parameters (units)	Parameter Value	Notes	Development Phase
Decree-Law 5/2009, Licensing Regulations, Sale and Quality of Drinking Water	Enterococcus ⁽ⁱ⁾	0	Number/100mL	• Operational Phase
	Arsenic (µg/L As) [*]	10		
	Copper (µg/L Cu) [*]	2.0	Note 3	
	Cadmium (µg/L Cd) [*]	5.0		
	Lead (µg Pb/L) [*]	Up to 25	Note 3 and 4	
	Mercury (µg/L Hg) [*]	1.0		
	Chromium (µg/L Cr) [*]	50	Note 3	
	Nitrate (mg/L NO ₃) [*]	50		
	Pesticides total (µg/L) [*]	0.50	Note 6 and 8	
	Selenium (µg/L SE) [*]	10		
Malaysian Drinking Water Quality Standard for Groundwater	Sulphate (mg/L) ^a	250	-	• Operational Phase
	Total Coliform (MPN/100 mL) ^a	0		
	Manganese (mg/L) ^a	0.1		
	Zinc (mg/L) ^a	3		
	Iron (mg/L) ^a	0.3		
	Conductivity ^a	-		
	Chloride (mg/L) ^a	250		

Source: (i) Attachment I, Part A1, Microbiological Parameters of the Decree-Law No.5/2009, Licensing Regulations, Sale and Quality of Drinking Water.

* Attachment I, Part B2, Chemical Parameters of the Decree-Law No.5/2009, Licensing Regulations, Sale and Quality of Drinking Water.

a Malaysia EQR 2015, DOE, 2016.

Table 9.3.3 (b): Notes as Specified for Groundwater Chemical Criteria

Notes	Explanation
3	This value applies to samples collected from tap water intended for human consumption, using an adequate sampling method and collected in such a way as to be representative of the average monthly amount consumed by consumers.
4	The maximum parameter value for lead (Pb) concentrations will be 25 µg/L. Insofar as is possible, all necessary measures shall be taken to decrease the concentrations of lead in water intended for human consumption to 15 µg/L Pb.
6	Pesticides are understood to be the following: <ul style="list-style-type: none"> • Organic insecticides. • Organic herbicides. • Organic fungicides. • Organic nematocides. • Organic acaricides. • Organic algicides. • Organic rodenticides. • Organic controllers of viscous secretions. • Similar products are, namely, growth regulators and their metabolites, products causing significant degradation and reaction. • Only those pesticides whose presence is probable within a particular drinking water supply system need to be investigated.

Notes	Explanation
8	Total pesticides means the sum of all pesticides detected and quantified during water quality control procedures.

Source: Decree-Law No.5/2009 Licensing Regulations, Sale and Quality of Drinking Water, Democratic Republic of Timor-Leste (DRTL), 2009.

9.3.2 Air Quality

- The governing or compliance criteria for air quality shall abide by the WHO Air Quality Guideline (AQG) Values. The standard and guideline are in **Appendix 9-A**. The limit for each parameter is in **Table 9.3.4**.

Table 9.3.4: WHO Air Quality Guidelines Values

Pollutant	Averaging Time	AQG Value ($\mu\text{g}/\text{m}^3$)	Development Phase
PM _{2.5}	24 hour (99 th percentile)	25	Construction Phase
PM ₁₀	24 hour (99 th percentile)	50	

Source: WHO Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide, Global Update 2005, WHO, 2006.

9.3.3 Noise Level Criteria

- Noise levels generated during construction shall comply with the WHO Guideline Values for Community Noise in Specific Environments. The guidelines are in **Appendix 9-A**. The limits for specific criterion are in **Table 9.3.5**.

Table 9.3.5: WHO Guidelines for Community Noise in Specific Environments

Environment	Critical Health Effect(s)	L _{Aeq} (dB)	Time Base (hours)
Outdoor living area	Serious annoyance, day time and evening	55	16
	Moderate annoyance, day time and evening	50	

Source: Guidelines for Community Noise, WHO, 1999.

9.3.4 Waste Management Criteria

- Waste management governing criteria shall be differentiated into three categories of parameters: effluent, solid waste and hazardous/scheduled waste. Each of these categories has to abide by specific guidelines and/or regulations.

(a) Effluent

- The effluent management shall abide by the Decree Law No.26/2012 Environmental Basic Law, Article 41. Since, there is no compliance limits available in Timor-Leste; thus, the guidelines and standard from Malaysia will be used.

- During the construction phase, effluent discharge shall comply with the Malaysian Sewerage Industry Guidelines [National Water Services Commission (SPAN), 2009]. This can be found in **Appendix 9-A**. The limits for the parameters are in **Table 9.3.6**.
- Effluent that is being recycled and reused during the operational phase, shall abide by Class IIB (for recreational use with body contact) of the Malaysian NWQS, which is shown in **Appendix 9-A**. The limits for each criterion are provided in **Table 9.3.7**.

Table 9.3.6: Construction Effluent Discharge Limits

Parameter (units)	Limits
Biochemical Oxygen Demand (mg/L)	50
Suspended Solid	100

Source: Malaysian Sewerage Industry Guidelines, SPAN, 2009.

- Note:
- (i) Values are for discharge of sewage effluent into stagnant water bodies.
 - (ii) Stagnant water bodies refer to enclosed water bodies like lakes, ponds and slow-moving watercourses where dead zone occur.

Table 9.3.7: Operation Effluent Reuse Standard

Parameter (units)	Class II Limits of NWQS Malaysia
Temperature (°C)	-
Ammoniacal Nitrogen (AN) (mg/L)	0.3
Biochemical Oxygen Demand (BOD) (mg/L)	3
Chemical Oxygen Demand (COD) (mg/L)	25
Dissolved Oxygen (DO) (mg/L)	5 – 7
pH	6 – 9
Oil and Grease (O&G) (mg/L)	0.04
Total Suspended Solids (TSS) (mg/L)	50
Total Coliform (count/100 mL)	5,000
Feacal Coliform (count/100 mL)	40
Salinity	-
Lead (Pb) (mg/L)	0.05
Zinc (Zn) (mg/L)	0.5
Copper (Cu) (mg/L)	0.02
Nitrate (NO ₃ ⁻) (mg/L)	7
Phosphorus (mg/L)	0.2

Source: Malaysia EQR 2015, DOE, 2016.

(b) Solid Waste

- The solid waste management shall abide to the Decree Law No.26/2012 Environmental Basic Law, Article 39.

(c) Hazardous/Scheduled Waste

- The hazardous/scheduled waste management shall abide to the Decree Law No.26/2012 Environmental Basic Law, Article 42.

9.3.5 Biodiversity Compliance Criteria

- Biodiversity management shall comply with the following laws and regulations:
 - (i) UNTAET Regulation No.2000/19 on Protected Places.
 - (ii) Decree Law No.26/2012 Environmental Basic Law, Article 27.
 - (iii) UNTAET Regulation No.2000/17 on the Prohibition of Logging Operations and the Export of Wood from East Timor.
 - (iv) Draft Decree Law on Biodiversity, dated March 2012.
 - (v) Draft Decree Law on Forest Management, Draft 6.
- Compliance shall also be according to two separate documents:
 - (i) The National Biodiversity Strategy and Action Plan (2011 – 2012).
 - (ii) The Forestry Sector Policy Goal Objective and Strategy.

Chapter 10

Monitoring and Auditing Programme

CHAPTER 10: MONITORING AND AUDITING PROGRAMMES

10.1 MONITORING PROGRAMME

- Environmental monitoring and surveillance works shall start concurrently with construction works, focussing on ensuring the existing environment is not unduly degraded.
- Environmental monitoring works shall include the following:
 - (i) Establish an in-house monitoring programme and standard environmental operating procedures (SOP).
 - (ii) Field inspection with contractor(s).
 - (iii) Confirmation of field sampling locations.
 - (iv) Field sample/data collection and analysis.
 - (v) Data documentation.
 - (vi) Feedback of results.
- The monitoring programme shall be planned by the appointed Environmental Monitoring Consultant (EnvMC) three months prior to start of any construction. The monitoring reports shall cover, but are not limited to, the following:
 - (i) Environmental License and other legal requirements from the authorities.
 - (ii) Details on monitoring locations, sampling methodology, parameters and procedures for reporting.
 - (iii) Establishment of reporting procedures for non-compliances of best management practices (BMPs) on-site.
 - (iv) Recommend implementing corrective actions in non-compliances.
 - (v) Documentation and record keeping [e.g. communication and reporting procedures between government or regulatory agencies and the Project Proponent (PP)].
- The monitoring scope of work shall be clearly specified and conveyed to the site monitoring team with adequate monitoring budget allocated by the PP or contractors.
- The proposed monitoring programme for this Project is shown in **Tables 10.1.1 and 10.1.2** for the construction and operation respectively.
- The proposed monitoring locations are provided in **Figures 10.1.1 – 10.1.3**.
- Monitoring works shall be carried out throughout the construction phase and one year for the operational phase or indemnity phase.

Table 10.1.1: Environmental Monitoring and Surveillance during Construction Phase

Environmental Components	Procedures/ Methodology	Parameters to be Analysed/ Limits	Compliance Requirements	Proposed Monitoring Locations	Action by Responsible Parties/ Report Submission	Sampling Frequency																																																																																																				
Water quality	<ul style="list-style-type: none"> To be carried out by trained field personnel. Grab samples to be taken. Samples analysed in an accredited laboratory. Sampling and analytical methods shall follow the latest edition of "Standard Methods for the Examination of Water and Wastewater" or equivalent. 	Ambient Water Quality (for Tasi Tolu Lakes)			<ul style="list-style-type: none"> As the lake water quality will take some time to stabilise even with rehabilitation measures, it is recommended that the lake water shall comply with the baseline water quality during construction phase. Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> Points: <table border="1"> <thead> <tr> <th colspan="2">Lake Water Sampling</th> </tr> </thead> <tbody> <tr> <td>LW1:</td> <td>S8.56623° E125.51079°</td> </tr> <tr> <td>LW2:</td> <td>S8.56587° E125.50720°</td> </tr> <tr> <td>LW3:</td> <td>S8.56198° E125.49990°</td> </tr> </tbody> </table> Indication of non-compliance by EnvMC. Follow-up actions by EO for non-compliance. Monitoring report submission to PP, MC and NDPCEI. 	Lake Water Sampling		LW1:	S8.56623° E125.51079°	LW2:	S8.56587° E125.50720°	LW3:	S8.56198° E125.49990°	<ul style="list-style-type: none"> Quarterly monitoring by EnvMC 																																																																																											
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		<table border="1"> <thead> <tr> <th rowspan="2">Parameter⁽ⁱ⁾</th> <th colspan="3">Limits (Baseline)⁽ⁱⁱ⁾</th> </tr> <tr> <th>Lake A (LW3)</th> <th>Lake B (LW2)</th> <th>Lake C (LW1)</th> </tr> </thead> <tbody> <tr><td>Temperature</td><td>37.0</td><td>37.8</td><td>36.5</td></tr> <tr><td>Total Suspended Solid (TSS)</td><td>23</td><td>66</td><td>31</td></tr> <tr><td>Dissolved Oxygen (DO)</td><td>6.3</td><td>4.7</td><td>5.1</td></tr> <tr><td>pH</td><td>7.99</td><td>8.48</td><td>8.40</td></tr> <tr><td>Salinity</td><td>35.0</td><td>48.7</td><td>50.2</td></tr> <tr><td>Conductivity</td><td>41</td><td>51</td><td>54</td></tr> <tr><td>Oil and Grease (O&G)</td><td>ND (<0.5)</td><td>ND (<0.5)</td><td>ND (<0.5)</td></tr> <tr><td>Phenol</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Faecal Coliform</td><td>Absent</td><td>Absent</td><td>Absent</td></tr> <tr><td>Mercury (Hg)</td><td>ND (<0.8)</td><td>ND (<0.8)</td><td>ND (<0.8)</td></tr> <tr><td>Cadmium (Cd)</td><td>ND (<2.0)</td><td>ND (<2.0)</td><td>ND (<2.0)</td></tr> <tr><td>Chromium (VI) (Cr⁶⁺)</td><td>ND (<5.0)</td><td>ND (<5.0)</td><td>ND (<5.0)</td></tr> <tr><td>Copper (Cu)</td><td>24</td><td>28</td><td>12</td></tr> <tr><td>Arsenic (As)</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Lead (Pb)</td><td>ND (<10.0)</td><td>18.7</td><td>ND (<10.0)</td></tr> <tr><td>Zinc (Zn)</td><td>150</td><td>42</td><td>18</td></tr> <tr><td>Cyanide (CN)</td><td>ND (<10.0)</td><td>ND (<10.0)</td><td>ND (<10.0)</td></tr> <tr><td>Ammonia</td><td>64.0</td><td>64.4</td><td>35.5</td></tr> <tr><td>Nitrite (NO₂⁻)</td><td>69.3</td><td>135</td><td>69.7</td></tr> <tr><td>Nitrate (NO₃⁻)</td><td>361</td><td>140</td><td>283</td></tr> <tr><td>Total Phosphorus</td><td>ND (<90)</td><td>104</td><td>282</td></tr> <tr><td>Turbidity</td><td colspan="3">-</td></tr> <tr><td>Phosphate⁽ⁱⁱⁱ⁾</td><td colspan="3">75 µg/L</td></tr> </tbody> </table>					Parameter ⁽ⁱ⁾	Limits (Baseline) ⁽ⁱⁱ⁾			Lake A (LW3)	Lake B (LW2)	Lake C (LW1)	Temperature		37.0	37.8	36.5	Total Suspended Solid (TSS)	23	66	31	Dissolved Oxygen (DO)	6.3	4.7	5.1	pH	7.99	8.48	8.40	Salinity	35.0	48.7	50.2	Conductivity	41	51	54	Oil and Grease (O&G)	ND (<0.5)	ND (<0.5)	ND (<0.5)	Phenol	ND (<1.0)	ND (<1.0)	ND (<1.0)	Faecal Coliform	Absent	Absent	Absent	Mercury (Hg)	ND (<0.8)	ND (<0.8)	ND (<0.8)	Cadmium (Cd)	ND (<2.0)	ND (<2.0)	ND (<2.0)	Chromium (VI) (Cr ⁶⁺)	ND (<5.0)	ND (<5.0)	ND (<5.0)	Copper (Cu)	24	28	12	Arsenic (As)	ND (<1.0)	ND (<1.0)	ND (<1.0)	Lead (Pb)	ND (<10.0)	18.7	ND (<10.0)	Zinc (Zn)	150	42	18	Cyanide (CN)	ND (<10.0)	ND (<10.0)	ND (<10.0)	Ammonia	64.0	64.4	35.5	Nitrite (NO ₂ ⁻)	69.3	135	69.7	Nitrate (NO ₃ ⁻)	361	140	283	Total Phosphorus	ND (<90)	104	282	Turbidity	-			Phosphate ⁽ⁱⁱⁱ⁾	75 µg/L		
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<p>Note:</p> <p>(i) Parameters shown in the table above are for ambient lake water quality.</p> <p>(ii) Limits values shown in the table above to be comply with the baseline findings.</p> <p>(iii) Limits value for phosphate is adopted from Class 2 of Malaysia Marine Water Quality Criteria and Standards (MWQCS).</p>																																																																																																										

Environmental Components	Procedures/ Methodology	Parameters to be Analysed/ Limits	Compliance Requirements	Proposed Monitoring Locations	Action by Responsible Parties/ Report Submission	Sampling Frequency																																																												
Water quality (cont'd)	<ul style="list-style-type: none"> To be carried out by trained field personnel. Grab samples to be taken. Samples analysed in an accredited laboratory. Sampling and analytical methods shall follow the latest edition of "Standard Methods for the Examination of Water and Wastewater" or equivalent. (cont'd)	<p>Ambient Water Quality (for Coastal)</p> <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Temperature</td> <td>≤2°C increase over maximum ambient</td> </tr> <tr> <td>Total Suspended Solid (TSS)⁽ⁱⁱⁱ⁾</td> <td>50 mg/L (25 mg/L) or ≤0% increase in seasonal average, whichever is lower</td> </tr> <tr> <td>Dissolved Oxygen (DO)</td> <td>5 mg/L</td> </tr> <tr> <td>pH</td> <td>-</td> </tr> <tr> <td>Salinity</td> <td>-</td> </tr> <tr> <td>Total phosphorus</td> <td>-</td> </tr> <tr> <td>Conductivity</td> <td>-</td> </tr> <tr> <td>Turbidity</td> <td>-</td> </tr> <tr> <td>Oil and grease (O&G)</td> <td>0.14 mg/L</td> </tr> <tr> <td>Phosphate</td> <td>75 µg/L</td> </tr> <tr> <td>Phenol</td> <td>10 µg/L</td> </tr> <tr> <td>Faecal Coliform⁽ⁱⁱⁱ⁾</td> <td>100 MPN/100 mL (70 MPN/100 mL)</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Mercury⁽ⁱⁱⁱ⁾ (Hg)</td> <td>0.16 (0.04) µg/L</td> </tr> <tr> <td>Cadmium⁽ⁱⁱⁱ⁾ (Cd)</td> <td>2 (3) µg/L</td> </tr> <tr> <td>Chromium (VI) (Cr⁶⁺)</td> <td>10 µg/L</td> </tr> <tr> <td>Copper (Cu)</td> <td>2.9 µg/L</td> </tr> <tr> <td>Arsenic⁽ⁱⁱⁱ⁾ (As)</td> <td>20 (3) µg/L</td> </tr> <tr> <td>Lead (Pb)</td> <td>8.5 µg/L</td> </tr> <tr> <td>Zinc (Zn)</td> <td>50 µg/L</td> </tr> <tr> <td>Cyanide (CN)</td> <td>7 µg/L</td> </tr> <tr> <td>Ammonia</td> <td>70 µg/L</td> </tr> <tr> <td>Nitrite (NO₂⁻)</td> <td>55 µg/L</td> </tr> <tr> <td>Nitrate (NO₃⁻)</td> <td>60 µg/L</td> </tr> </tbody> </table> <p>Note: (i) Parameters shown in the table above are for ambient marine water quality. (ii) Limits values shown in the table above are adopted from Class 2 of Malaysia Marine Water Quality Criteria and Standards (MWQCS). (iii) MWQCS values in parenthesis are for coastal and marine water where seafood for human consumption is applicable.</p>	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Temperature	≤2°C increase over maximum ambient	Total Suspended Solid (TSS) ⁽ⁱⁱⁱ⁾	50 mg/L (25 mg/L) or ≤0% increase in seasonal average, whichever is lower	Dissolved Oxygen (DO)	5 mg/L	pH	-	Salinity	-	Total phosphorus	-	Conductivity	-	Turbidity	-	Oil and grease (O&G)	0.14 mg/L	Phosphate	75 µg/L	Phenol	10 µg/L	Faecal Coliform ⁽ⁱⁱⁱ⁾	100 MPN/100 mL (70 MPN/100 mL)	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Mercury ⁽ⁱⁱⁱ⁾ (Hg)	0.16 (0.04) µg/L	Cadmium ⁽ⁱⁱⁱ⁾ (Cd)	2 (3) µg/L	Chromium (VI) (Cr ⁶⁺)	10 µg/L	Copper (Cu)	2.9 µg/L	Arsenic ⁽ⁱⁱⁱ⁾ (As)	20 (3) µg/L	Lead (Pb)	8.5 µg/L	Zinc (Zn)	50 µg/L	Cyanide (CN)	7 µg/L	Ammonia	70 µg/L	Nitrite (NO ₂ ⁻)	55 µg/L	Nitrate (NO ₃ ⁻)	60 µg/L	<ul style="list-style-type: none"> Class 2 of Malaysia Marine Water Quality Criteria and Standards (MWQCS). Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> Points: <table border="1"> <thead> <tr> <th colspan="2">Coastal Water Sampling</th> </tr> </thead> <tbody> <tr> <td>SW1:</td> <td>S8.54759° E125.51584°</td> </tr> <tr> <td>SW2:</td> <td>S8.55638° E125.50647°</td> </tr> <tr> <td>SW3:</td> <td>S8.55572° E125.48918°</td> </tr> <tr> <td>SW4:</td> <td>S8.55505° E125.49918°</td> </tr> </tbody> </table> 	Coastal Water Sampling		SW1:	S8.54759° E125.51584°	SW2:	S8.55638° E125.50647°	SW3:	S8.55572° E125.48918°	SW4:	S8.55505° E125.49918°	<ul style="list-style-type: none"> Indication of non-compliance by EnvMC. Follow-up actions by EO for non-compliance. Monitoring report submission to PP, MC and NDPCEI. 	<ul style="list-style-type: none"> Quarterly monitoring by EnvMC.
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Noise	<ul style="list-style-type: none"> Measure at sensitive locations on A-weighted frequency in 16-hour averaging time period. Noise measurement shall be taken at the boundary of the respective sensitive areas. 	<p>Ambient Noise</p> <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>L_{eq}</td> <td>outdoor living area environment category with a limit of L_{Aeq} of 55 dB or 50 dB during day and evening with a time base of 16 hours</td> </tr> <tr> <td>L₁₀, L₅₀, L₉₀, L_{min}, L_{max}</td> <td>-</td> </tr> </tbody> </table> <p>Note: (i) Parameters shown in the table above are for ambient noise. (ii) Limits values shown in the table above are adopted from WHO Guideline Values for Community Noise in Specific Environments.</p>	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	L _{eq}	outdoor living area environment category with a limit of L _{Aeq} of 55 dB or 50 dB during day and evening with a time base of 16 hours	L ₁₀ , L ₅₀ , L ₉₀ , L _{min} , L _{max}	-	<ul style="list-style-type: none"> WHO Guidelines Values for Community Noise in Specific Environments. Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> Points: <table border="1"> <tr> <td>N1:</td> <td>S8.56014° E125.51417°</td> </tr> <tr> <td>N3:</td> <td>S8.55946° E125.49766°</td> </tr> <tr> <td>N5:</td> <td>S8.56853° E125.51466°</td> </tr> </table> 	N1:	S8.56014° E125.51417°	N3:	S8.55946° E125.49766°	N5:	S8.56853° E125.51466°	<ul style="list-style-type: none"> Indication of non-compliance by EnvMC. Follow-up actions by EO for non-compliance. Monitoring report submission to PP, MC and NDPCEI. 	<ul style="list-style-type: none"> Quarterly by EnvMC 																				
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Marine ecology	<ul style="list-style-type: none"> To be carried out by trained field personnel. Samples shall be analysed in a laboratory except for coral reefs. 	<p>Marine Ecology</p> <ul style="list-style-type: none"> No specific compliance limits/standard for marine ecology monitoring. The monitored marine components will be benchmarked against the baseline findings. <table border="1"> <thead> <tr> <th>Marine Component</th> <th>Analysis/Observation⁽ⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Phytoplankton and Zooplankton</td> <td> <ul style="list-style-type: none"> Density. Species diversity. </td> </tr> <tr> <td>Coral Reef</td> <td> <ul style="list-style-type: none"> Percentage cover of live corals, dead coral, rock, sand and rubble. Observation on coral bleaching, broken or damaged corals. </td> </tr> </tbody> </table> <p>Note: (i) Items shown in the table above are for marine ecology during monitoring.</p>	Marine Component	Analysis/Observation ⁽ⁱ⁾	Phytoplankton and Zooplankton	<ul style="list-style-type: none"> Density. Species diversity. 	Coral Reef	<ul style="list-style-type: none"> Percentage cover of live corals, dead coral, rock, sand and rubble. Observation on coral bleaching, broken or damaged corals. 	<ul style="list-style-type: none"> Compare with baseline findings for phytoplankton and zooplankton (Section 6.15: Marine Ecology). Compare with baseline findings for coral reef (refer EIS Report Section 6.12: Corals). 	<ul style="list-style-type: none"> Points: <table border="1"> <thead> <tr> <th colspan="2">Phytoplankton and Zooplankton</th> </tr> </thead> <tbody> <tr> <td>B1:</td> <td>S8.54759° E125.51584°</td> </tr> <tr> <td>B2:</td> <td>S8.55638° E125.50647°</td> </tr> <tr> <td>B3:</td> <td>S8.55572° E125.48918°</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Coral Reef</th> </tr> </thead> <tbody> <tr> <td>T1:</td> <td>S 8.55743° E 125.50452°</td> </tr> <tr> <td>T2:</td> <td>S 8.55678° E 125.50447°</td> </tr> <tr> <td>T3:</td> <td>S 8.55722° E 125.50043°</td> </tr> <tr> <td>T4:</td> <td>S 8.55588° E 125.50070°</td> </tr> <tr> <td>T5:</td> <td>S 8.55450° E 125.48945°</td> </tr> <tr> <td>T6:</td> <td>S 8.55477° E 125.48993°</td> </tr> <tr> <td>T7:</td> <td>S 8.55547° E 125.49722°</td> </tr> <tr> <td>T8:</td> <td>S 8.55527° E 125.49807°</td> </tr> </tbody> </table> 	Phytoplankton and Zooplankton		B1:	S8.54759° E125.51584°	B2:	S8.55638° E125.50647°	B3:	S8.55572° E125.48918°	Coral Reef		T1:	S 8.55743° E 125.50452°	T2:	S 8.55678° E 125.50447°	T3:	S 8.55722° E 125.50043°	T4:	S 8.55588° E 125.50070°	T5:	S 8.55450° E 125.48945°	T6:	S 8.55477° E 125.48993°	T7:	S 8.55547° E 125.49722°	T8:	S 8.55527° E 125.49807°	<ul style="list-style-type: none"> Indication of low or exceedance levels of organisms. Monitoring report submission to PP, MC and NDPCEI. 	<ul style="list-style-type: none"> Half yearly by EnvMC
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Waste management	<ul style="list-style-type: none"> Visual inspection on mode and efficiency of disposal. 	<p>Site Condition</p> <ul style="list-style-type: none"> General cleanliness. Number of bins provided and adequacy. 	<ul style="list-style-type: none"> Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> At base camp, site office and active work areas. 	<ul style="list-style-type: none"> Indication of application, effectiveness, efficiency of the management practices. Monitoring report submission to PP, MC and NDPCEI. 	<ul style="list-style-type: none"> Daily inspection by EO of Contractor. Quarterly inspection by EnvMC. 																																
Biomass and spoil management	<ul style="list-style-type: none"> Visual inspection on stockpile management. 	<p>Site Condition</p> <ul style="list-style-type: none"> Condition of stockpile area(s). BMPs implemented. 	<ul style="list-style-type: none"> Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> At designated stockpile areas. 																																		
Scheduled waste management	<ul style="list-style-type: none"> Visual inspection on mode and efficiency of storage and disposal. 	<ul style="list-style-type: none"> Waste disposal at designated scheduled waste disposal area. Visual inspection of storage condition. Signs of oil spill. 	<ul style="list-style-type: none"> Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> At storage areas for scheduled wastes. At active work areas. 																																		
Sanitation facilities	<ul style="list-style-type: none"> Visual inspection and ensure no direct discharge of untreated wastewater into open areas or waters. 	<p>Site Condition</p> <ul style="list-style-type: none"> Adequacy of toilet facilities. Treatment system installed with effluent discharge limits: <ul style="list-style-type: none"> (i) Biochemical Oxygen Demand (BOD): 50 mg/L (ii) TSS: 100 mg/L 	<ul style="list-style-type: none"> Malaysian Sewerage Industrial Guidelines. Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> At the base camp and site office. 																																		
Safety and health	<ul style="list-style-type: none"> Visual inspection. 	<ul style="list-style-type: none"> Personal protective equipment (PPE) use. Hoarding condition. Safety signage. Toolbox training log. Vector control programme. Emergency Response Plan (ERP). 	<ul style="list-style-type: none"> Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> Throughout Project site. 	<ul style="list-style-type: none"> Indication of application, effectiveness, efficiency of the management practices. Monitoring report submission to PP, MC and NDPCEI. 	<ul style="list-style-type: none"> Daily inspection by EO of Contractor. Quarterly inspection by 																																

Environmental Components	Procedures/ Methodology	Parameters to be Analysed/ Limits	Compliance Requirements	Proposed Monitoring Locations	Action by Responsible Parties/ Report Submission	Sampling Frequency
Housekeeping	<ul style="list-style-type: none"> Visual inspection. 	<u>Site Condition</u> <ul style="list-style-type: none"> Proper domestic waste disposal method. Presence of vectors. 	<ul style="list-style-type: none"> Conditions of Environmental License (if any). 	<ul style="list-style-type: none"> At the base camp and site office. 	NDPCEI.	EnvMC.

Note: PP: Project Proponent; MC: Main Contractor; NDPCEI: National Directorate of Pollution Control and Environmental Impact; EO: Environmental Officer; EnvMC: Environmental Monitoring Consultant.

Table 10.1.2: Environmental Monitoring and Surveillance during Operational Phase (One Year Indemnity Period)

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Sewage effluent	<ul style="list-style-type: none"> To be carried out by trained field personnel. Grab samples to be taken. Samples analysed in an accredited laboratory. Sampling and analytical methods shall follow the latest edition of "Standard Methods for the Examination of Water and Wastewater" or equivalent. 	<p>Effluent Quality (for Reuse)</p> <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Temperature</td> <td>-</td> <td>Oil and grease (O&G)</td> <td>0.04 mg/L</td> </tr> <tr> <td>Ammoniacal Nitrogen (AN)</td> <td>0.3 mg/L</td> <td>Total Suspended Solid (TSS)</td> <td>50 mg/L</td> </tr> <tr> <td>Biochemical Oxygen Demand (BOD)</td> <td>3 mg/L</td> <td>Total Coliform^(iv)</td> <td>5,000 count/100 mL</td> </tr> <tr> <td>Biochemical Oxygen Demand (COD)</td> <td>25 mg/L</td> <td>Faecal Coliform</td> <td>400 count/100 mL</td> </tr> <tr> <td>Dissolved Oxygen (DO)</td> <td>5 – 7 mg/L</td> <td>Salinity</td> <td>-</td> </tr> <tr> <td>pH</td> <td>6 – 9</td> <td>Lead (Pb)</td> <td>0.05 mg/L</td> </tr> <tr> <td></td> <td></td> <td>Zinc (Zn)</td> <td>5 mg/L</td> </tr> <tr> <td></td> <td></td> <td>Copper (Cu)</td> <td>0.02 mg/L</td> </tr> <tr> <td></td> <td></td> <td>Nitrate (NO₃⁻)</td> <td>7 mg/L</td> </tr> <tr> <td></td> <td></td> <td>Phosphorus</td> <td>0.2 mg/L</td> </tr> </tbody> </table> <p>Note: (i) Parameters shown in the table above are for water quality after treatment. (ii) Limits values shown in the table above are adopted from Class IIB of NWQS from Malaysia.</p>	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Temperature	-	Oil and grease (O&G)	0.04 mg/L	Ammoniacal Nitrogen (AN)	0.3 mg/L	Total Suspended Solid (TSS)	50 mg/L	Biochemical Oxygen Demand (BOD)	3 mg/L	Total Coliform ^(iv)	5,000 count/100 mL	Biochemical Oxygen Demand (COD)	25 mg/L	Faecal Coliform	400 count/100 mL	Dissolved Oxygen (DO)	5 – 7 mg/L	Salinity	-	pH	6 – 9	Lead (Pb)	0.05 mg/L			Zinc (Zn)	5 mg/L			Copper (Cu)	0.02 mg/L			Nitrate (NO ₃ ⁻)	7 mg/L			Phosphorus	0.2 mg/L	<ul style="list-style-type: none"> Treated Sewage for Reuse: Class IIB of the National Water Quality Standard (NWQS) for Malaysia. 	<ul style="list-style-type: none"> Discharge points of treated effluent. 	<ul style="list-style-type: none"> Indication of non-compliance by EnvMC. Follow-up actions by STP operator for non-compliance. Monitoring report submission to PP and NDPCEI. 	<ul style="list-style-type: none"> Quarterly by EnvMC for one year only for the indemnity period.
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Marine ecology	<ul style="list-style-type: none"> To be carried out by trained field personnel. Samples shall be analysed in a laboratory except for coral reefs. 	<p>Marine Ecology</p> <ul style="list-style-type: none"> No specific compliance limits/standard for the marine ecology monitoring. The monitored marine components will be compared to the baseline findings. <table border="1"> <thead> <tr> <th>Marine Component</th> <th>Analysis/Observation⁽ⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Phytoplankton and Zooplankton</td> <td> <ul style="list-style-type: none"> Density. Species Diversity. </td> </tr> <tr> <td>Coral Reef</td> <td> <ul style="list-style-type: none"> Percentage cover of live corals, dead coral, rock, sand and rubble. Observation on coral bleaching, broken or damaged corals. </td> </tr> </tbody> </table> <p>Note: (i) Items shown in the table above for corals are based on observations.</p>	Marine Component	Analysis/Observation ⁽ⁱ⁾	Phytoplankton and Zooplankton	<ul style="list-style-type: none"> Density. Species Diversity. 	Coral Reef	<ul style="list-style-type: none"> Percentage cover of live corals, dead coral, rock, sand and rubble. Observation on coral bleaching, broken or damaged corals. 	<ul style="list-style-type: none"> Compare with baseline findings for phytoplankton and zooplankton (Section 6.15: Marine Ecology). Compare with baseline findings for coral reef (refer EIS Report Section 6.12: Corals). 	<ul style="list-style-type: none"> Points: <table border="1"> <thead> <tr> <th colspan="2">Phytoplankton and Zooplankton</th> </tr> </thead> <tbody> <tr> <td>B1:</td> <td>S8.54759° E125.51584°</td> </tr> <tr> <td>B2:</td> <td>S8.55638° E125.50647°</td> </tr> <tr> <td>B3:</td> <td>S8.55572° E125.48918°</td> </tr> <tr> <th colspan="2">Coral Reef</th> </tr> <tr> <td>T1:</td> <td>S 8.55743° E 125.50452°</td> </tr> <tr> <td>T2:</td> <td>S 8.55678° E 125.50447°</td> </tr> <tr> <td>T3:</td> <td>S 8.55722° E 125.50043°</td> </tr> <tr> <td>T4:</td> <td>S 8.55588° E 125.50070°</td> </tr> <tr> <td>T5:</td> <td>S 8.55450° E 125.48945°</td> </tr> <tr> <td>T6:</td> <td>S 8.55477° E 125.48993°</td> </tr> <tr> <td>T7:</td> <td>S 8.55547° E 125.49722°</td> </tr> <tr> <td>T8:</td> <td>S 8.55527° E 125.49807°</td> </tr> </tbody> </table> 	Phytoplankton and Zooplankton		B1:	S8.54759° E125.51584°	B2:	S8.55638° E125.50647°	B3:	S8.55572° E125.48918°	Coral Reef		T1:	S 8.55743° E 125.50452°	T2:	S 8.55678° E 125.50447°	T3:	S 8.55722° E 125.50043°	T4:	S 8.55588° E 125.50070°	T5:	S 8.55450° E 125.48945°	T6:	S 8.55477° E 125.48993°	T7:	S 8.55547° E 125.49722°	T8:	S 8.55527° E 125.49807°	<ul style="list-style-type: none"> Indication of low or exceedance levels of organisms. Monitoring report submission to PP, MC and NDPCEI. 	<ul style="list-style-type: none"> Half yearly by EnvMC for one year only for the indemnity period. 												
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Note: PP: Project Proponent; NDPCEI: National Directorate of Pollution Control and Environmental Impact; EnvMC: Environmental Monitoring Consultant.



Straita of Water



- LEGEND**
- Private
 - International Airport
 - Marine area
 - Road
 - River
 - Urban water supply (water supply) (2011 - 2015)
 - Sewerage treatment (2011 - 2015)
 - Sewerage (Sewerage) (2011 - 2015)
 - Airport (Sewerage) (2011 - 2015)
 - Sewerage (Sewerage) (2011 - 2015)

DATA SOURCE
 1. Google Earth
 2. Department of Environment and Planning
 3. Department of Planning



Point	Coordinate	
	Latitude (S)	Longitude (E)
01	8°52'48"	101°12'18"
02	8°52'48"	101°12'18"
03	8°52'48"	101°12'18"
04	8°52'48"	101°12'18"
05	8°52'48"	101°12'18"
06	8°52'48"	101°12'18"
07	8°52'48"	101°12'18"
08	8°52'48"	101°12'18"
09	8°52'48"	101°12'18"
10	8°52'48"	101°12'18"
11	8°52'48"	101°12'18"
12	8°52'48"	101°12'18"

ENVIRONMENTAL MANAGEMENT PLAN
FOR PROPOSED POLYMER PIPELINE DEVELOPMENT,
TRUNK LINE (2011 - 2015), T.MOK-LATHI

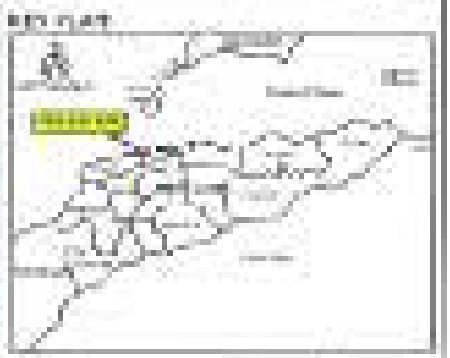
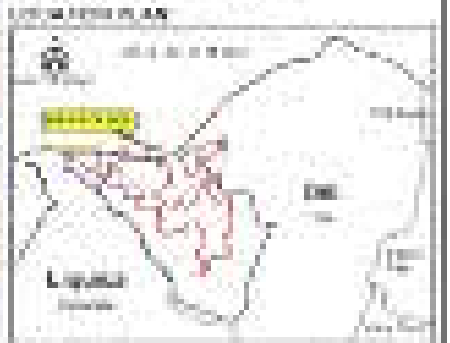


PROJECT NO. 10111	DATE: 10/11/2011
PROJECT TITLE: POLYMER PIPELINE DEVELOPMENT	SCALE: 1:5000
PROJECT NO. 10111	SCALE: 1:5000



- LEGEND**
- Boundaries
 - Development Area
 - State of Penang
 - Road
 - Canal
 - Lake Pinnal Sampling Station (1991 - 1992)
 - Sungai Pinang Sampling Station (1991 - 1992)
 - Conservation and Rehabilitation Sensitive (1992-2001 - 2002)
 - Conservation Sensitive (1992-2001 - 2002)

SCALE 1:50,000
 1:1 Large scale map, computer map and printed with
 AutoCAD, ArcView, Microsoft Office



Point	Coordinates	
	Latitude (N)	Longitude (E)
Point 1	5.4250°N	100.2500°E
Point 2	5.4250°N	100.2500°E
Point 3	5.4250°N	100.2500°E
Point 4	5.4250°N	100.2500°E
Point 5	5.4250°N	100.2500°E
Point 6	5.4250°N	100.2500°E
Point 7	5.4250°N	100.2500°E
Point 8	5.4250°N	100.2500°E



Straits of Wetar



- LEGEND**
- Development Area
 - Marine Area
 - Road
 - River
 - Coastal Boundary (100m)

DATA SOURCE:
 1) Google Earth Map Imagery dated 20 October 2010
 2) Aerial Photo, December 2011



Point	Coordinates	
	Latitude (N)	Longitude (E)
P1	1.88130°	102.88000°
P2	1.88040°	102.88040°
P3	1.88220°	102.88040°
P4	1.88330°	102.88020°
P5	1.88150°	102.88010°
P6	1.88040°	102.88010°
P7	1.88000°	102.88010°
P8	1.88000°	102.88000°

PROJECT DEVELOPER: **PT. PANGLOSS** (PANGLOSS DEVELOPMENT)

CONSULTANT: **APRI**
 ANTA PRIMA RANGKAP INDIKATIF
 SURVEILLANCE & MONITORING
 CONSULTANTS FOR INFRASTRUCTURE

**ENVIRONMENTAL MANAGEMENT PLAN
 FOR PROPOSED HELIPAD INFRASTRUCTURE DEVELOPMENT,
 TRANS-TASIS TOLL TMDR-SITE**



REVISION: 01

DATE: 15/11/2011

PROJECT NO: **TRANS-TASIS TOLL TMDR-SITE**

FILE NO: **EMMP-10**

Chapter 11

Reporting Requirements

CHAPTER 11: REPORTING REQUIREMENTS

11.1 INTRODUCTION

- Environmental reporting is an important tool for documenting each work phase. There shall be two types of reporting:
 - (i) Reporting on environmental monitoring and site inspection – for internal use to provide feedbacks to the Project Proponent (PP), Main Contractor (MC), Environmental Management Team (EMT) and Emergency Response Team (ERT).
 - (ii) Reporting on environmental monitoring and site inspection – for external use to the National Directorate for Pollution Control and Environmental Impact (NDPCEI) for their information.

11.2 CONSTRUCTION PHASE

11.2.1 Internal Environmental Monitoring Report

- The internal environmental monitoring and site inspection report will include:
 - (i) Locations of best management practices (BMPs) and a brief description of the BMPs.
 - (ii) Locations of non-structural BMPs or areas that will be inspected.
 - (iii) Site inspection checklist.
 - (iv) General information such as Project name, file number, etc. shall remain constant.
 - (v) Name of inspector.
- Monthly site inspection checklist – Checklist filled in during site inspection by the Environmental Officer (EO) of the MC and incorporated into the monthly environmental report. The MC shall keep a Daily Log Book for all the mitigations put in by them.
- Monthly environmental report – Prepared by the EO of the MC. Site issues of concern will be noted and recorded and the report shall be sent to the MC to address, via the Project Manager (PM) of the PP, with a copy to the Environmental Monitoring Consultant (EnvMC).
- Quarterly environmental report – A compilation of three monthly reports with site inspections and analysis done by the EnvMC quarterly for the PP and MC.
- Environmental auditing report – Half yearly by the Environmental Auditor (EnvA). Report will be sent to the PP, MC and the EnvMC.

- The quarterly report shall include the following:
 - (i) Results of scheduled monitoring and site.
 - (ii) Non-compliances at specific sites.
 - (iii) Recommendations for mitigations and corrective actions.
 - (iv) Time frame to resolve the non-compliances.
 - (v) Updates on any mitigation needed according to Project development as it progresses with time.

11.2.2 External Environmental Monitoring Report

- The submission of half-yearly environmental monitoring reports is required by the Decree-Law No.5/2011 on Environmental Licensing Law (ELL), Chapter X – Surveillance and Monitoring, Article 33 Duty Holder's Monitoring and Reporting.
- The half yearly environmental monitoring reports shall be made available to the NDPCEI and other relevant authorities. It will include the following:
 - (i) Lake and marine water quality monitoring report.
 - (ii) Quarterly air quality monitoring report.
 - (iii) Quarterly noise level monitoring report.
 - (iv) Half yearly marine ecology monitoring report.
 - (v) Half yearly coral reef monitoring report.
 - (vi) Non-compliance reports (NCRs) and actions taken.

11.3 OPERATIONAL PHASE

11.3.1 Internal Environmental Monitoring Report

- Internal environmental monitoring is for one year indemnity period. The quarterly monitoring will be carried out similar to the construction phase but with a focus on the rehabilitated lakes, the reforested hills, the sewage treatment plants (STPs) and the utility centre or hotel service support centre (HSSC) areas, the jetty and beaches.
- Regular site inspection on a daily basis of the STP and weekly shall be conducted by the STP operators to ensure that subsequent maintenance or repairing works are being carried out.
- The checklist includes:
 - (i) Locations of BMPs and a brief description of the BMPs.
 - (ii) Locations of structural and non-structural BMPs or areas that will be inspected.
 - (iii) Site inspection checklist.
 - (iv) General information such as Project name, file number, etc. shall remain constant.
 - (v) Name of inspector.
- Monthly site inspection checklist – Checklist filled in during site inspection by the STP operator and incorporated into the quarterly environmental report.

- Monthly environmental report – Prepared by the STP operator. Site issues of concern will be noted and recorded and the report shall be sent to the PP, with a copy to EnvMC.
- Quarterly environmental report – A compilation of three monthly reports with site inspections and analysis done by the EnvMC quarterly for the PP and operators.
- Environmental auditing report – Half yearly by the Environmental Auditor (EnvA). Report will be sent to the PP and the EnvMC.
- The environmental quarterly report shall include the following:
 - (i) Results of scheduled monitoring and site inspection over the three previous months.
 - (ii) Non-compliances found at site.
 - (iii) Recommendations for mitigations and corrective actions.
 - (iv) Time frame to resolve the non-compliances.
 - (v) Updates on any further mitigation needed.

11.3.2 External Environmental Monitoring Report

- The submission of yearly environmental monitoring reports is required by the Decree-Law No.5/2011 on Environmental Licensing Law (ELL), Chapter X – Surveillance and Monitoring, Article 33 Duty Holder's Monitoring and Reporting.
- The yearly environmental monitoring reports shall be made available to the NDPCEI and other relevant authorities. It will include the following:
 - (i) Quarterly treated STP effluent quality monitoring report.
 - (ii) Quarterly lake, marine water quality monitoring report.
 - (iii) Half yearly groundwater quality monitoring report.
 - (iv) Half yearly marine ecology monitoring report.
 - (v) Half yearly coral reef monitoring report.
 - (vi) NCRs and actions taken.

Chapter 12

Responsibilities for Mitigation and Monitoring

CHAPTER 12: RESPONSIBILITIES FOR MITIGATION AND MONITORING

12.1 INTRODUCTION

- This Chapter provides for the formation of an Environmental Management Team (EMT) by the Project Proposer (PP) to work closely with the Main Contractor (MC) to manage the environment during Project development. The organisational structure for each phase is illustrated in Figures 12.2.1 and 12.2.2
- The EMT shall ensure that the mitigation measures contained in the Environmental Management Plan (EMP) are carried out accordingly.
- The main responsibility of the EMT is to ensure that the MC implements all the best management practices (BMPs) that are compatible with the Environmental Licence, legislation, regulations and requirements at every stage of the works.
- Members of the EMT may change from time to time (such as when members resign or are redeployed), but the intent, purpose, functions and designation of work contained in the organisational structure shall not differ significantly in terms of environmental management and protection.
- As the EMP is an approved document, there will be changes and amendments to the EMP from time to time. Any change in technical plans will be documented and conveyed to the MC immediately by the PP through either the Project Management Team, technical engineers, or the Environmental Monitoring Consultants (EnvMC). The aim is to ensure that the MC and the subcontractors (SC) can make adjustments to environmental protection activities in relation to the Project works in accordance to the design and draw items.

12.2 CONSTRUCTION PHASE

- The EMT is responsible to oversee the overall mitigation measures and the monitoring programme as described in Chapter 8: Proposed Mitigation Measures and Chapter 10: Monitoring and Auditing Programmes respectively in the EMP.
- The EMT comprises the following members:
 - (i) Project Proposer (PP) with assistance from Project Manager (PM)
 - (ii) Main Contractor (MC)/Sub-contractor (SC)
 - (iii) Safety, Health and Environmental (SHE) Manager and/or Environmental Officer (EO) supported by MC.
 - (iv) Environmental Monitoring Consultant (EnvMC)
- Table 12.2.1 shows the roles and responsibilities for mitigation and monitoring during the construction phase of the Project, and illustrated in Figure 12.2.1.

- The State of Colorado's Oil, Public Goods and Environmental Impact (OGPEI) is a regulatory body and is not part of the EMT.
- The Environmental Justice (EJ) is an independent party appointed separately by the PP to audit the environmental of the site. The EJCA has no direct monitoring activities in the Project and is not part of the EMT.

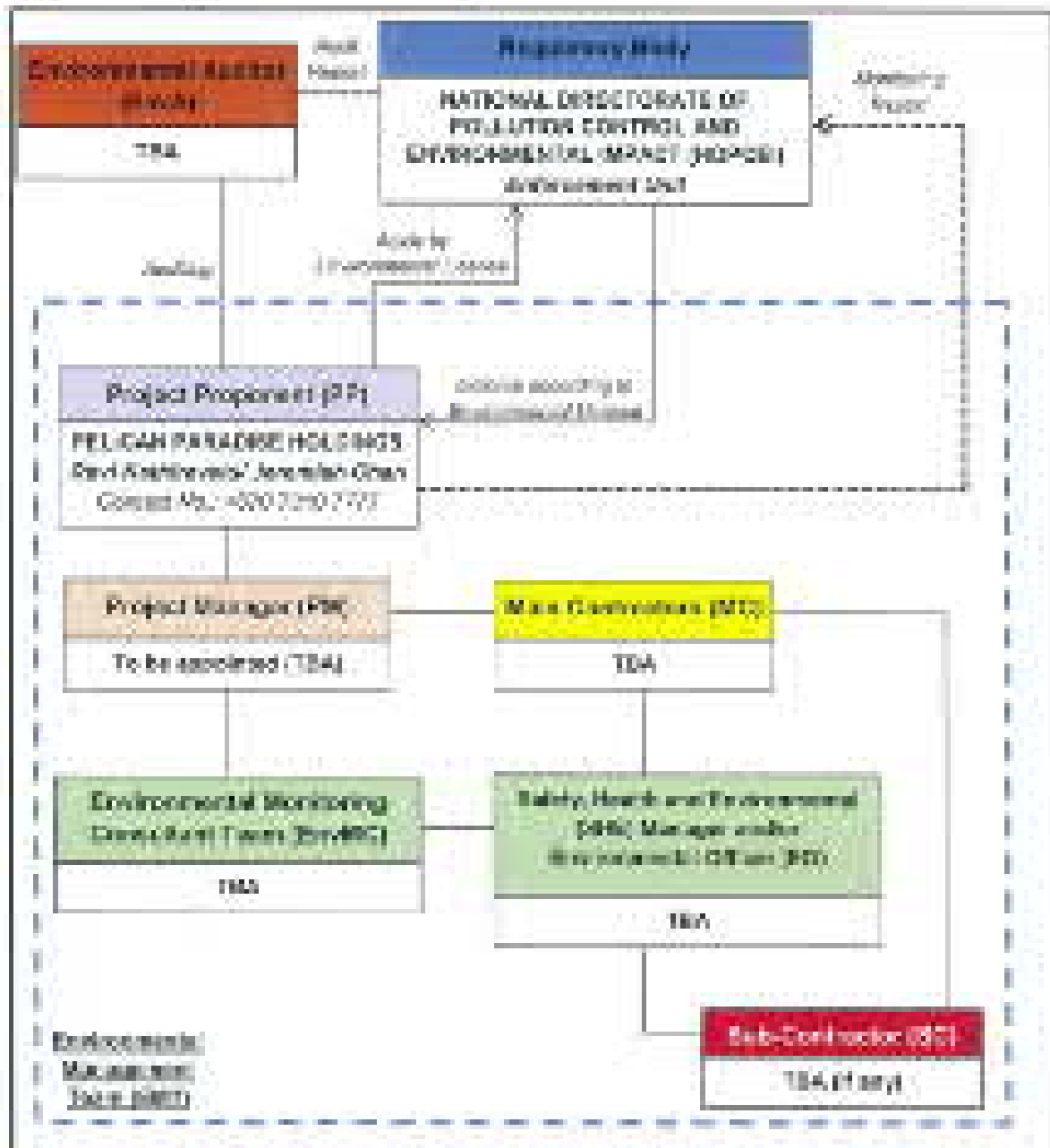
Table 10.2.1: Roles and Responsibilities of the EMT during Construction Phase

Member	Roles and Responsibilities
Project Director (during Time- Limits of PP)	<ul style="list-style-type: none"> • Ensure all the potential environmental impacts arising during construction and construction are addressed to the satisfaction of the HOPCO and other relevant authorities. • The PP's responsibilities shall include but not limited to appointing the PM, the HOPCO, EMT, and set up the EMT's for the Project. • Ensure that the MC carries out the stipulated work to protect the environment in the very high standards in the HOP plan in a change in the design plans that may arise from time to time. This clause has to be incorporated into the contract documents.
Project Manager (PM) Appointed by PP	<ul style="list-style-type: none"> • Conduct regular meetings (e.g. weekly status meetings) with the MC and the Manager to discuss day-to-day environmental issues related to the Project. • Ensure that the Project complies with the Environmental License and all other stipulated legal requirements and guidelines. • Ensure that all calls or instructions by the HOPCO comply with all other instructions given by the HOPCO local authority, etc. • The PM will also be the main person in charge of construction during emergency situations.
Main Contractor (MC)	<ul style="list-style-type: none"> • Prepare construction or site-specific EMP. • Ensure that all operations activities related to environmental matters do not conflict with standard practices and are conducted in accordance with contract specifications, regulatory stipulations and procedures as approved by the PP. • Ensure that the mitigation measures are correct and well-timed through and all procedures are completed to carry out the assigned tasks. • Provide a high degree of environmental awareness amongst all Project construction personnel. • Review all staff stands including training on environmental aspects and awareness courses coordinated by the EC or PM. • Ensure that all mitigation measures are undertaken to the satisfaction of the HOPCO, PM and the EMT for the Project. • Protect the environment both on and off the Project site and limit damage and disturbance to people and property resulting from pollution, noise and other distal risks from the development activities. • Provide technical support and advice and ensure all employees have adequate skills and appropriate protective equipment. • Ensure that the required reporting procedures on environmental matters are implemented properly. • Prepare the daily site diary of the program.

Members	Roles and Responsibilities							
<p>S&E Committee (SC)</p>	<ul style="list-style-type: none"> • Responsible to implement the EMP and to take all necessary and precautionary steps to protect the environment (soil or sea off-site) and land drainage and drainage, to provide land properly resulting from pollution, noise and other disturbances. • Provide list of equipment and facilities to comply with the various regulations and standards given in the EMP. • Have staff that attend activities taking an environmental aspects and activities classes coordinated by the PM supervised by the PP. 							
<p>Safety, Health and Environmental (SHE) Manager (SM)</p> <p>Environmental Officer (EO) are normally appointed by the Main Contractor (MC).</p> <p>S&E and EO can differ in the size of different projects.</p> <p>It is always a person, then the scope of work is being assigned.</p>	<ul style="list-style-type: none"> • If the S-E Manager and EO are the same person, then the scope of work is as stated below. <p>Safety, Health and Environmental Works</p> <ul style="list-style-type: none"> • The SHE Manager shall monitor day-to-day activities and all safety, health and environmental matters at the Project site. • Provide safety and health support and ensure all employees undergo health checks prior to start of work and periodically (once a year) during the construction phase. • Ensure all employees protection for safe access/exit from the Project site. • Monitor the application of safe environmental work practices and procedures. • Put in place and implement a system for recording all safety, health and environmental matters monthly, following safety and health procedures. • Ensure that all Project activities related to safety, health and environmental matters do not conflict with the standard practices and are conducted in accordance with contract specifications, statutory obligations and procedures as approved by the PP. This will directly support environmental procedures for environmental protection. • Provide list of relevant staff qualifications including the level of training on safety and environmental aspects and any other relevant exercises and capacity building matters. 							
	<p>Environmental Works</p> <p>The scope of work shall include the following:</p> <table border="1"> <thead> <tr> <th>General site construction works</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • Provide environmental mitigation measures are implemented in accordance with the EMP and Environmental Access conditions. </td> </tr> <tr> <td> <ul style="list-style-type: none"> • Ensure that the required existing environmental matters is kept record. </td> </tr> <tr> <td> <ul style="list-style-type: none"> • Attend site meetings called by PM, MC, MC, PP, MC and PP. </td> </tr> <tr> <td> <ul style="list-style-type: none"> • Attend PMP CM and other relevant activities the site which helps implement the PM. </td> </tr> <tr> <td> <ul style="list-style-type: none"> • Assist the PM on environmental matters and taking all the permit and authorisation as well as local communities on environmental matters relating to the Project construction activities. </td> </tr> <tr> <td> <ul style="list-style-type: none"> • Ensure that all activities or jobs comply with all appropriate environmental laws, rules, regulations, guidelines, and terms and conditions approved by the relevant authorities. </td> </tr> </tbody> </table>	General site construction works	<ul style="list-style-type: none"> • Provide environmental mitigation measures are implemented in accordance with the EMP and Environmental Access conditions. 	<ul style="list-style-type: none"> • Ensure that the required existing environmental matters is kept record. 	<ul style="list-style-type: none"> • Attend site meetings called by PM, MC, MC, PP, MC and PP. 	<ul style="list-style-type: none"> • Attend PMP CM and other relevant activities the site which helps implement the PM. 	<ul style="list-style-type: none"> • Assist the PM on environmental matters and taking all the permit and authorisation as well as local communities on environmental matters relating to the Project construction activities. 	<ul style="list-style-type: none"> • Ensure that all activities or jobs comply with all appropriate environmental laws, rules, regulations, guidelines, and terms and conditions approved by the relevant authorities.
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<ul style="list-style-type: none"> • Attend site meetings called by PM, MC, MC, PP, MC and PP. 								
<ul style="list-style-type: none"> • Attend PMP CM and other relevant activities the site which helps implement the PM. 								
<ul style="list-style-type: none"> • Assist the PM on environmental matters and taking all the permit and authorisation as well as local communities on environmental matters relating to the Project construction activities. 								
<ul style="list-style-type: none"> • Ensure that all activities or jobs comply with all appropriate environmental laws, rules, regulations, guidelines, and terms and conditions approved by the relevant authorities. 								

Members	Roles and Responsibilities
<p>The separate PC is appointed by the MC</p>	<p>Environmental Officer (EO)</p> <p>If there is a separate EO appointed by the MC, then the general administration work under a C manager will be negated and added to the scope of work of the EO.</p> <p>Scope of Work:</p> <p>General administration work: As above under C/C.</p> <p>Site inspection works:</p> <ul style="list-style-type: none"> • Supervise erosion and sediment control works at the site and ensure the related works are carried out by the MCOE in accordance to the RCR and the EMP. • Prepare and update the Site Log Book for the maintenance of all EMP components by the MC and EO, and to make it available for review by the PM, ERM, and other relevant units required by them. • The Site Log Book of all sites contain the daily review of the site progress by the MC and EO. • Take and record the readings of the rain gauge. Update the rainfall records of the rain gauge. • Carry out daily inspection on pollution control measures and BMP structures of erosion and sediment control (including sediment traps, check dam, silt trap, wash trough, slope protection, etc.). • Maintain detailed records of major defective conditions of all pollution control measures. • Monitor all other works. • Hold weekly site meetings with PM (and PM) and MC. • Prepare monthly environmental report (to separate the monthly site inspection check-up to PM of PP and ERM). • Inform immediately the PM and MC with a copy to the CrMCO of any defects in the pollution control and any additional remedial action required.
<p>Environmental Monitoring Consultant (EMC) consists of a team of consultants appointed by the MC.</p> <p>There is always one person from the EMC team stationed at site.</p> <p>This person normally acts as a PC under the MC.</p> <p>He/she reports to the MC and coordinates with the PM and MC.</p>	<ul style="list-style-type: none"> • Carry out all environmental monitoring work for the Project. • Conduct site inspection and report to the MC and prepare a quarterly monitoring reports for submission to the PM and MC; half yearly report to MCOE as per schedule is required by MCOE. • Provide relevant professional advice and guidance pertinent to environmental management. • Ensure ongoing environmental mitigation measures are implemented in accordance with the EMP. Monitor full to ensure that all the measures required in the contract are carried out judiciously to the satisfaction of the authorities. • Keep a log book and reporting to the EMF regarding the work progress at the Project site. • Liaise work with the authorities with the PM and MC. • Organise training, awareness and educational sessions for all workers to reduce incidences of occupational accidents. • Attend site meetings with regards to the environment called by the PM, MC, MCOE and other relevant authorities. • Ensure good housekeeping practices, etc., related to environmental management.

Figure 12.2 – Organisation Chart during the Construction Phase



12.3 OPERATIONAL PHASE

• Table 12.3.1 shows the roles and responsibilities of the operators during the operational phase of the Project, while Figure 12.3.1 shows the organisational structure. This is only for one year interim period.

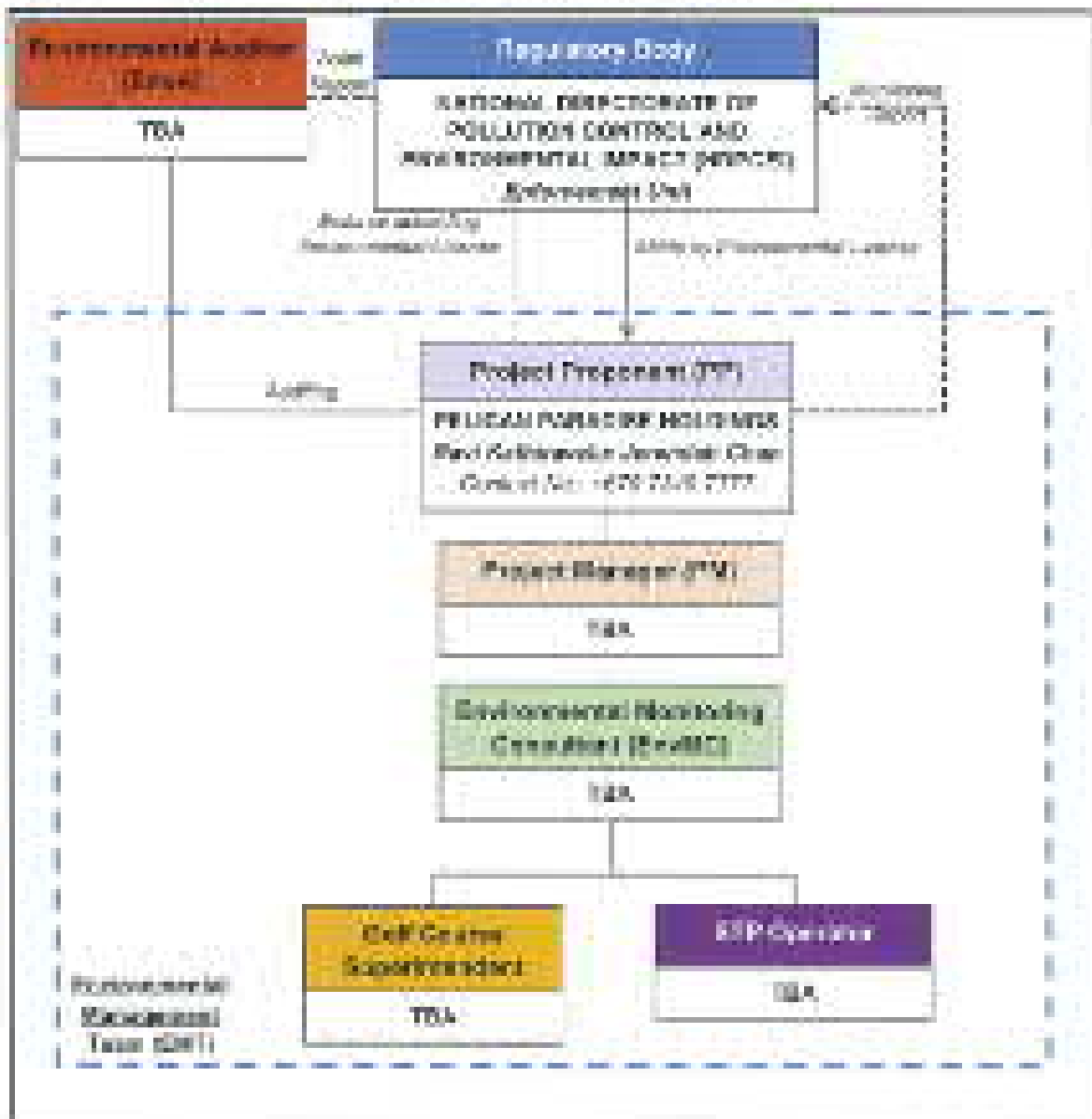
• The EMT consists of the:

- (i) Project Proponent (PP) with assistance from Project Manager (PM),
- (ii) Golf Course Superintendent,
- (iii) Sewage Treatment Plant (STP) Operator,
- (iv) Environmental Monitoring Consultant (EMC).

Table 12.3.1: Roles and Responsibilities for Mitigation and Monitoring during Operational Phase

Members	Roles and Responsibilities
Project Proponent/Holder (i.e. PM) as per assigned By Project Manager (PM)	<ul style="list-style-type: none"> • Ensure that all members of the EMT work closely to comply with the Conditions of Environmental License. • Oversees the overall Project activities on-site. • Ensures continuous commitment to the Environmental Policy, objectives and targets. • Work closely with the golf course superintendent and STP operator to visit on compliance with the environmental licensing conditions and any corrective given for environmental protection by the MOPCEL. • Organise site site inspection and meetings with golf course superintendent and STP operator. • Ensure the meeting records are properly maintained and kept. • Provide any necessary information during inspection by the MOPCEL Officers. • To work with the EMC on all necessary monitoring works to ensure compliance with the Environmental License.
Golf Course Superintendent (as per maintenance supervisor)	<ul style="list-style-type: none"> • Oversee the environmental and stadium side aspects of the golf course. • Conduct monthly inspection with golf course maintenance supervisor and quarterly site inspection with the EMC. • Will be required to be compliant in chemical and scheduled waste storage.
Sewage Treatment Plant (STP) Operator	<ul style="list-style-type: none"> • Oversee the environmental aspects of the STPs. • Conduct monthly site inspection to ensure optimal performance at STP and quarterly site inspection with EMC. • Will be required to be familiar with environmental regulations and fundamental concepts of sewage treatment sewage treatment cycle & performance monitoring, sampling, data analysis, technical writing and presentation.
Environmental Monitoring Consultant (EMC)	<ul style="list-style-type: none"> • Conduct monitoring and site inspection and prepare monitoring reports for submitted to PP (or MOPCEL) as a one year interim period. • Provide relevant professional advice and guidance pertinent to environmental monitoring and mitigation aspects of the Project side's closure. • Conduct regular meetings with the PM to update on the environmental status for reporting.

Figure 12.3.1: Organizational Chart during the Operational Phase



Chapter 13

Emergency Response Plan



CHAPTER 13: EMERGENCY RESPONSE PLAN

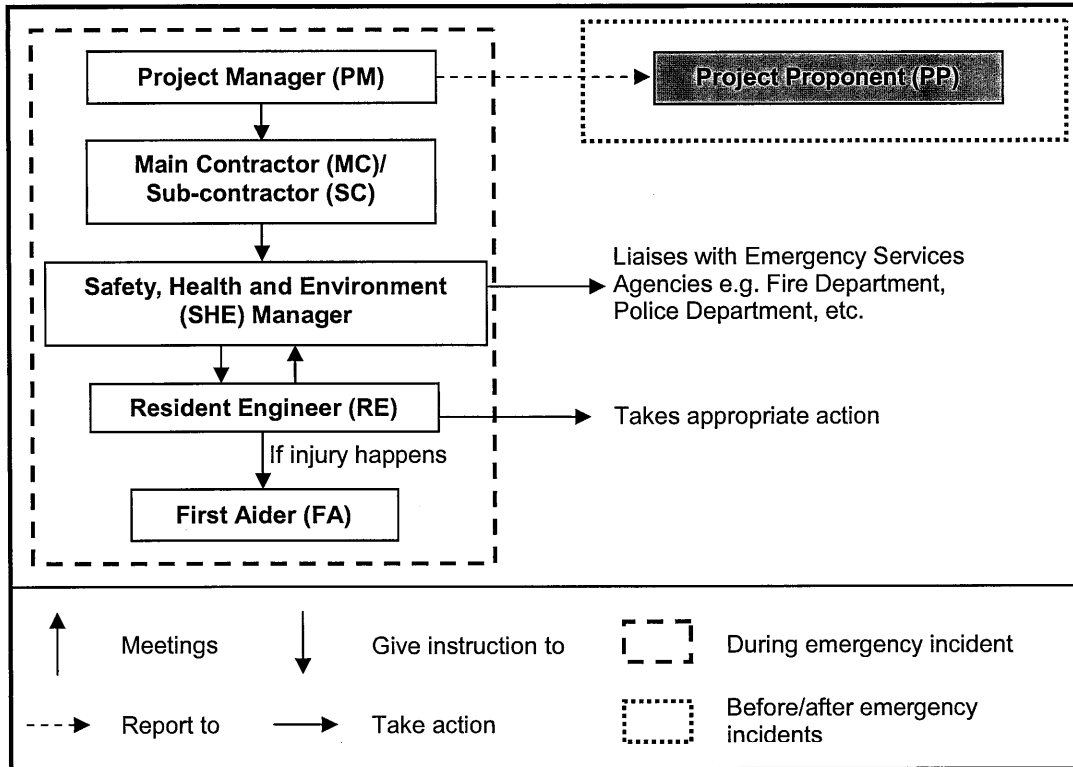
13.1 INTRODUCTION

- This Chapter provides the procedures to cope with general emergency situations during the construction and operational phases of the Project.
- The objective of the Emergency Response Plan (ERP) is to have clear and specific response procedures for any emergency that may occur at the Project site.

13.2 EMERGENCY RESPONSE TEAM (ERT)

- As the Project is large, a separate Emergency Response Team (ERT), as differed from the Environmental Management Team (EMP), is recommended to be formed to respond to any emergency with the main functions to:
 - (i) Rapidly respond to an emergency.
 - (ii) Direct all operations and relevant personnel to respond to the incident.
 - (iii) Serve as a focal point for the management of information, decision making and resource support/allocation during the emergency incident.
 - (iv) Promote a proper control and unity of command.
- Each member in the ERT will have his/her specific responsibility and be able to apply his/her specific knowledge and experience to the situation. **Figure 13.2.1** depicts a typical organisation chart for an ERT.

Figure 13.2.1: Organisational Chart of ERT



13.3 EMERGENCY SCENARIOS DURING THE CONSTRUCTION PHASE

- The ERP shall cover all potential emergency situations which include, but are not limited to:
 - Serious Accidents Involving Injury (**Figure 13.3.1**).
 - Fatal Accidents (**Figure 13.3.2**).
 - Fire or explosions (**Figure 13.3.3**).
 - Oil and hazardous materials spills on land and sea (**Figure 13.3.4**).
 - Structure collapse (**Figure 13.3.5**).
- In a fatal accident, the contractors, SHE Manager shall immediately inform the police and relevant safety and health agency in Timor-Leste. In case of oil and hazardous materials spills, the NDPCEI shall also be informed immediately for inspection at the accident site.

Figure 13.3.1: Flow Chart for Action and Procedures in Cases of Serious Accidents Involving Injury

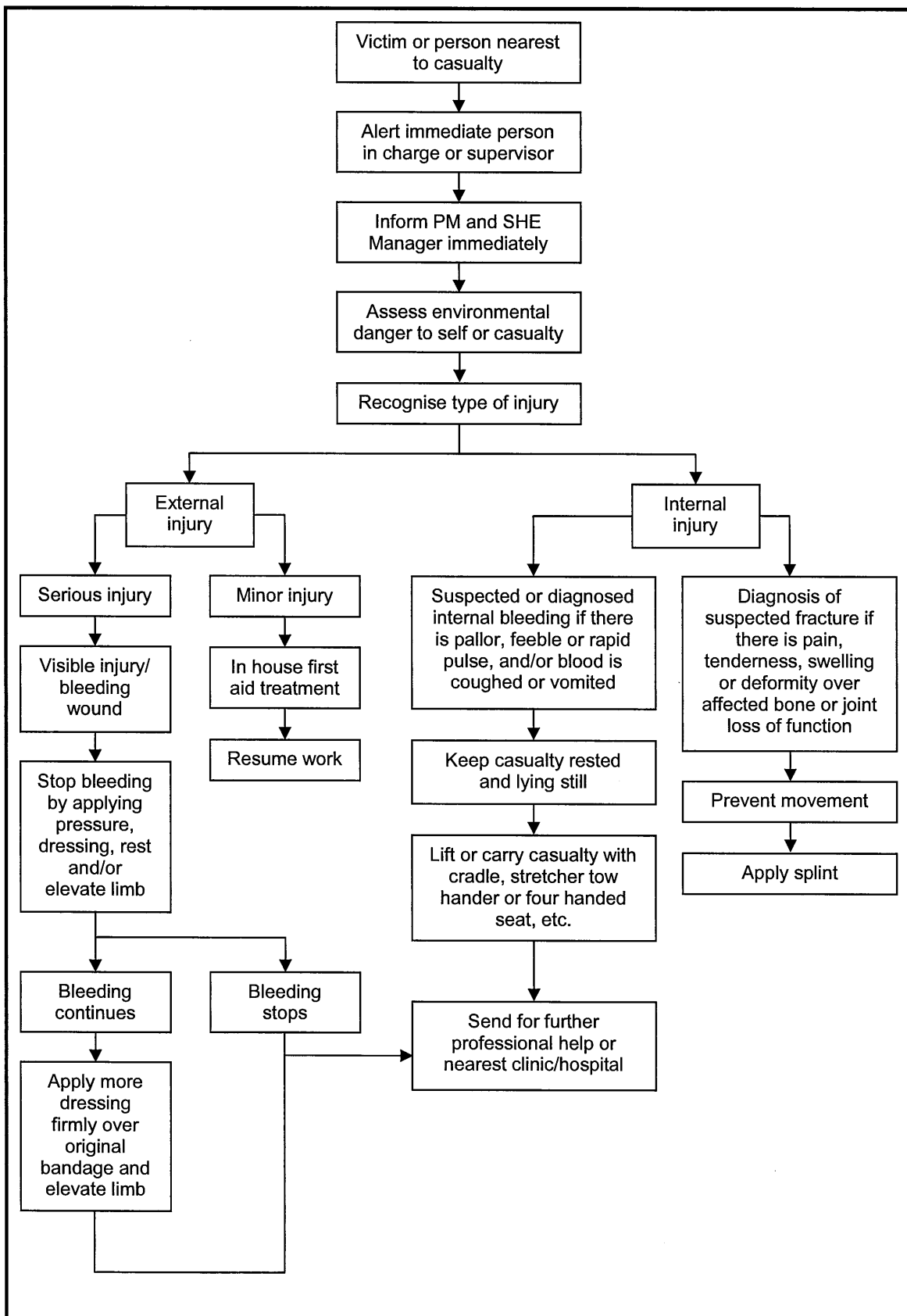


Figure 13.3.2: Flow Chart for Action and Procedures in Cases of Fatal Accidents

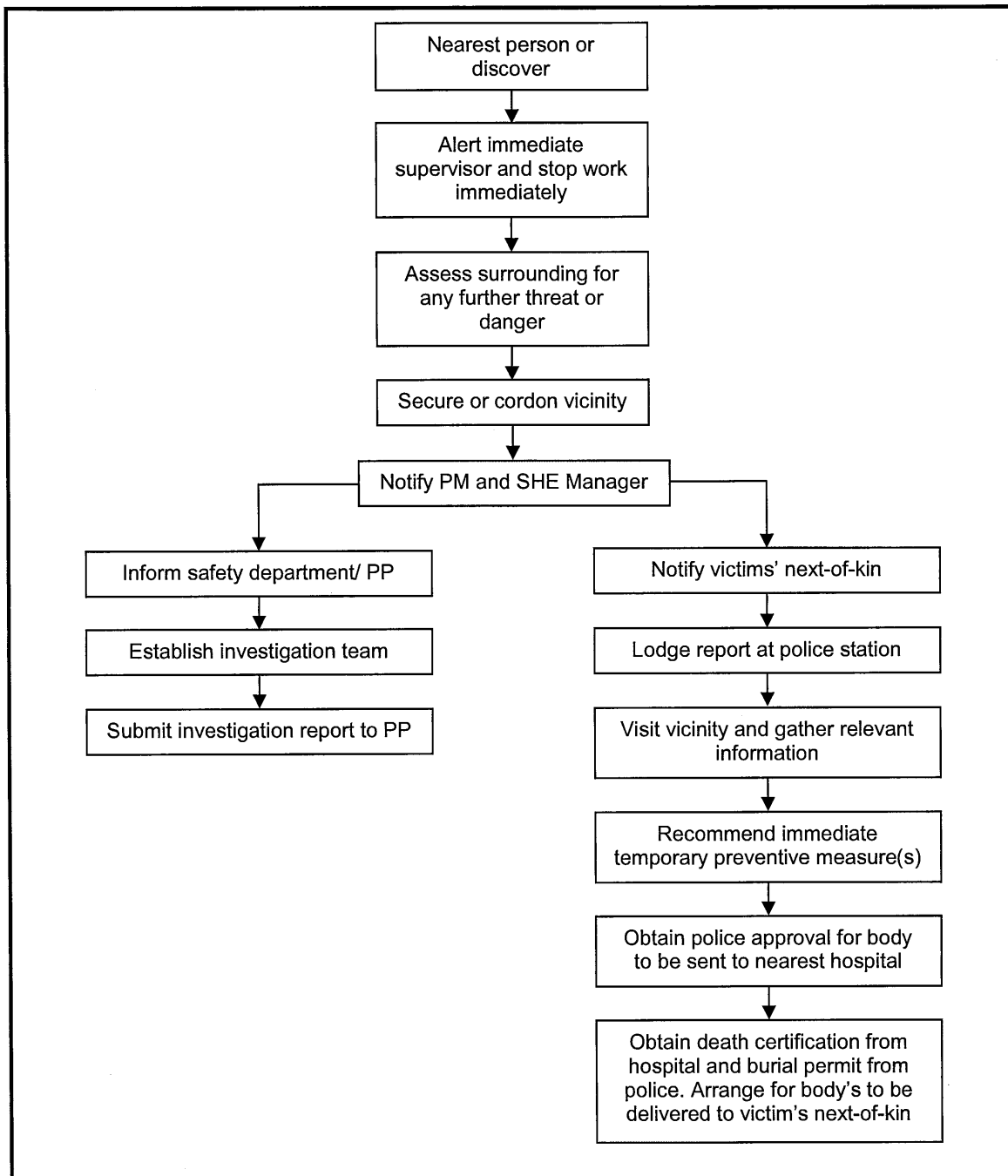


Figure 13.3.3: Flow Chart for Action and Procedures in Case of Fire or Explosion

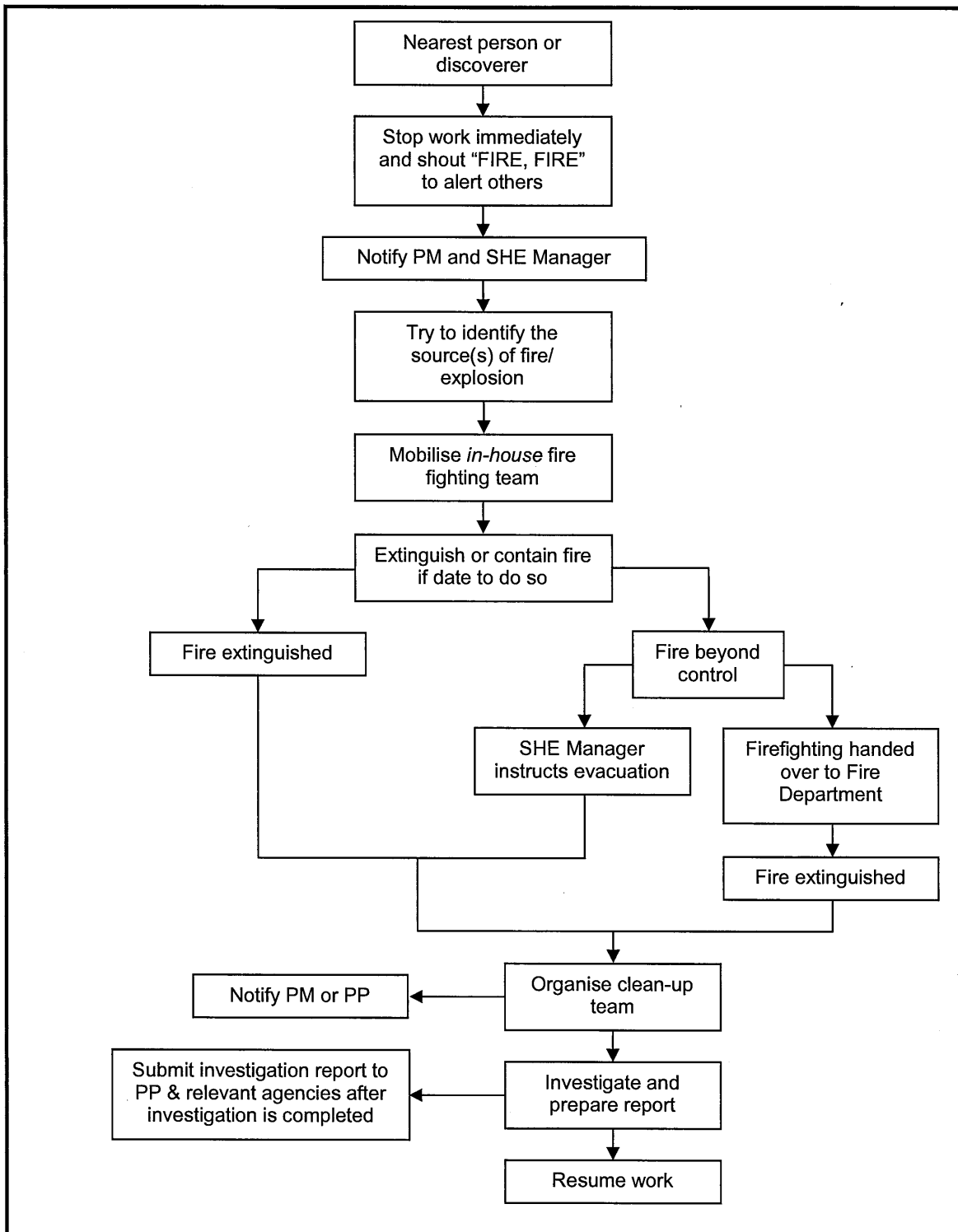


Figure 13.3.4: Flow Chart for Actions and Procedures in Spills of Oil and Hazardous Wastes on Land and Sea

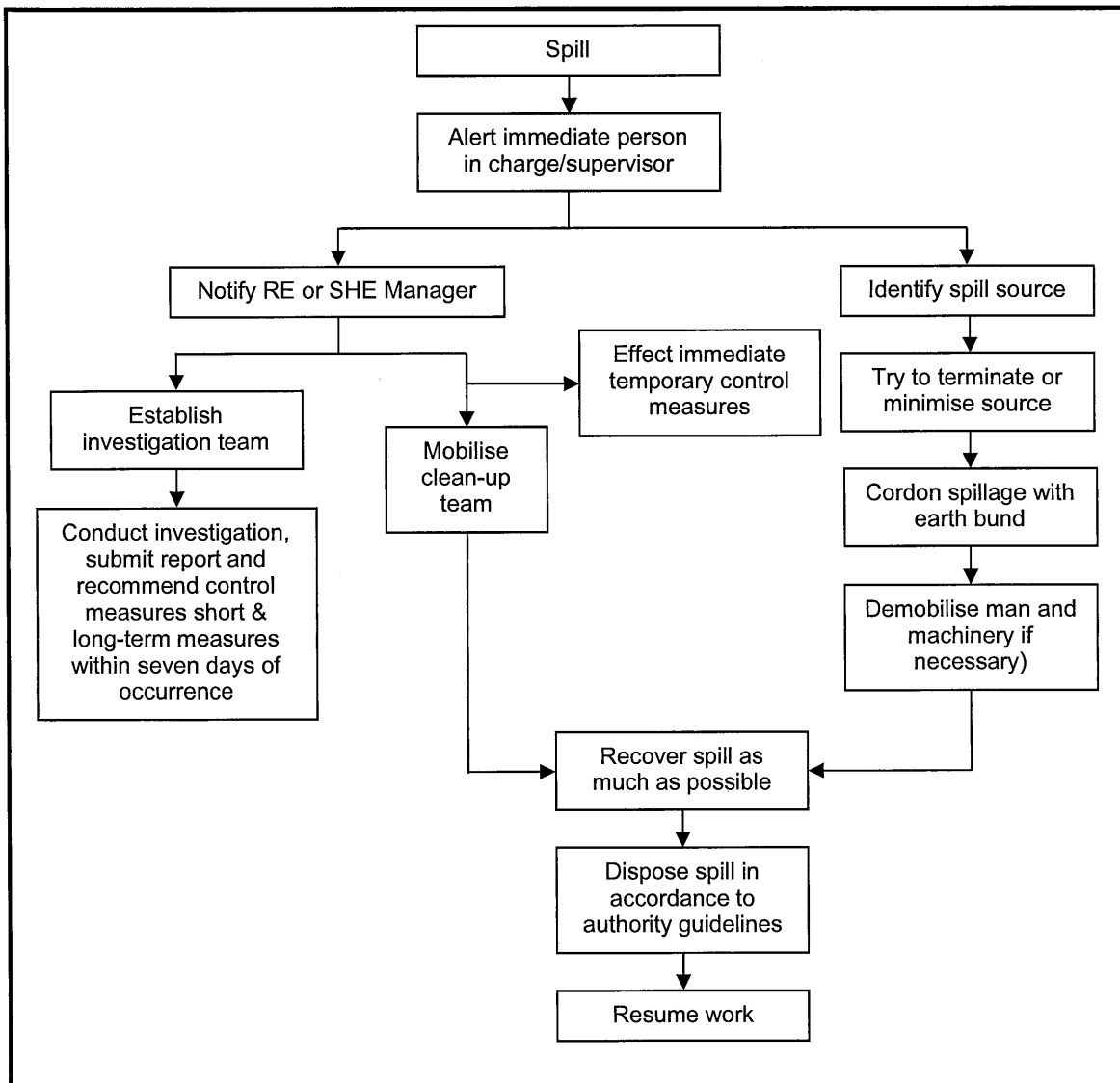
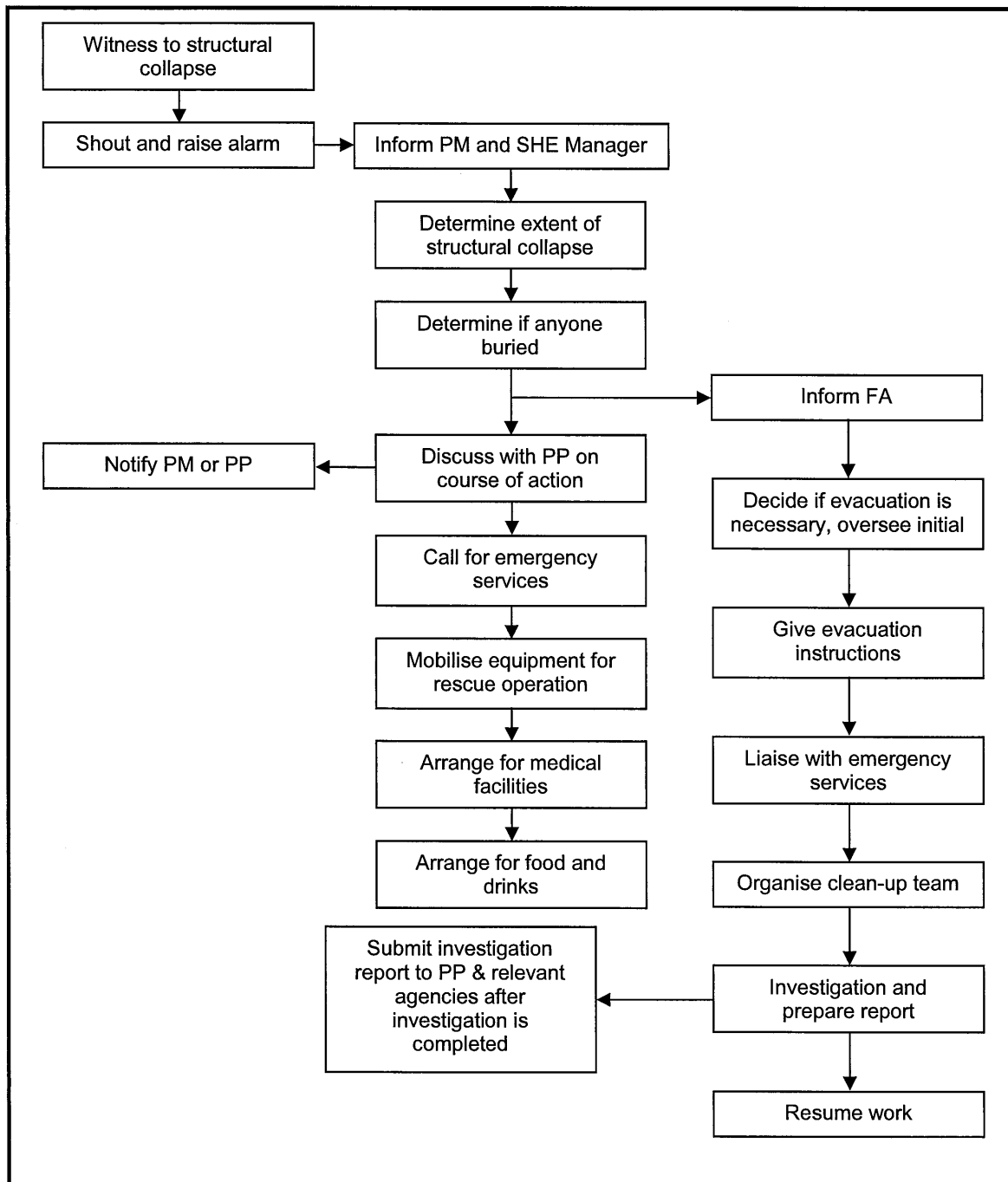


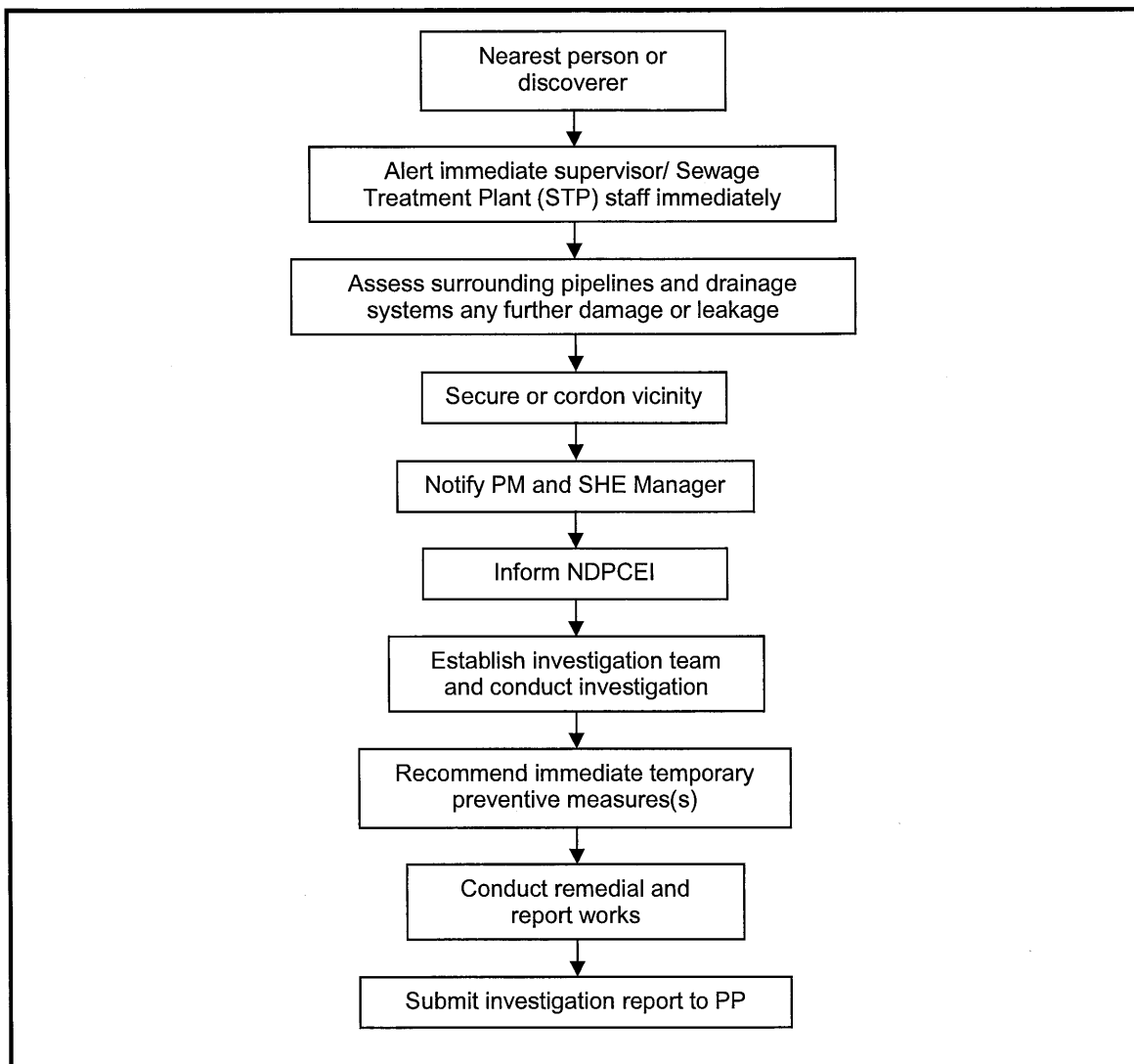
Figure 13.3.5: Flow Chart for Action and Procedures in Case of Structural Collapse



13.4 OPERATIONAL PHASE

- During the operational phase of the Project, emergency incidents related to wastewater management can occur. **Figure 13.4.1** shows the actions to be taken if such an eventuality occurs.
- Furthermore, ERP relating to accidental fires in buildings and traffic accidents along Rua Terra Santa will have to be addressed as well. The plans for both are similar for serious accidents involving injury, fatal accidents and, fire or explosions, as provided in **Figures 13.3.1 to 13.3.3** respectively. These will be referred to.

Figure 13.4.1: Flow Chart for Action and Procedures in Case of Wastewater Overflow



Chapter 14

Decommissioning Plan

CHAPTER 14: DECOMMISSIONING PLAN

14.1 INTRODUCTION

- As the Project is an integrated mixed development that has a foreseeable long-term operational life; and not projects such as mining projects that has a closure phase, no decommissioning plan is required.

Chapter 15

Capacity Development and Training

CHAPTER 15: CAPACITY DEVELOPMENT AND TRAINING

15.1 TRAINING REQUIREMENTS

15.1.1 Objective

- Environmental training for all the relevant staff involved in the Project is aimed to create competency, skill and capability to carry out environmental management throughout Project implementation.

15.1.2 Levels of Training

- There will be different levels of employees with different qualifications and skills working at the site. Many of them have little knowledge or awareness of environmental protection when carrying out their work. They will require awareness and training for environmental protection in their work routine.
- The environmental training programmes will be customised to cater to all these employees to create competency, skills and awareness to achieve environmental compliance with the regulations, and to minimise and prevent any overall environmental degradation by their actions while working for the Project.
- The training programmes shall be subjected to amendments when new procedures and directives from the National Directorate of Pollution Control and Environmental Impact (NDPCEI) or from any other relevant agencies are issued from time to time. Training programmes are also needed when site activities change, which would then require a change in environmental protection works.
- The contractors will have their own training construction programmes such as on skill training in handling equipment, land clearing, earthworks and structural works. These training are the responsibilities of the contractors; and the training can run concurrently with the environmental training.

15.1.3 Environmental Training Programmes

- The basic environmental training programmes are provided in **Table 15.1.1**. Any requirement for additional training has to be identified by the Environmental Management Team (EMT) through reviewing of the training programmes on a periodic basis.
- Evaluations shall be carried out after every training session to determine the effectiveness of the training materials and procedures used, and whether they are still relevant to the training needs of the workers, as implementation of the Project progresses.
- All the associated training records and materials shall be retained and properly documented.

Table 15.1.1: Proposed Environmental Training Programmes

No.	Training Programme	Organiser	Objective of Training	Target Participant	Schedule
1.	Briefing on environmental license and environmental management process and awareness creation	Environmental Monitoring Consultant (EnvMC)/ Environmental Officer (EO)	<ul style="list-style-type: none"> • Briefing on Environmental License, environmental management process and NDPCEI requirements. • Briefing on roles and responsibilities of personnel in managing the environmental aspects of the Project. • Applicable legal and other requirements at the site, in relation to environmental matters and safety procedures. 	Members of the EMT	Before construction work commences, and from time to time throughout the construction and operational phases.
2.	On-site scheduled wastes management training	EnvMC/EO	<ul style="list-style-type: none"> • Explain to the relevant staff on the proper actions to be carried out in handling scheduled wastes generated on-site. 	Personnel who will be involved in scheduled wastes management	From time to time throughout the construction phase.
3.	Environmental Pollution Control	EnvMC/EO	<ul style="list-style-type: none"> • This training if needed on: <ol style="list-style-type: none"> (i) Solid Waste Management. (ii) Scheduled Waste Management. (iii) Chemical Storage and Management. (iv) Fuel Storage and Management. (v) Construction Material Stockpile Management. (vi) Good Housekeeping Practices. 	All personnel working at the site	To be decided by EnvMC/EO.
4.	Environmental Protection	EnvMC/EO and by Specialists	<ul style="list-style-type: none"> • Training if needed on: <ol style="list-style-type: none"> (i) Landscape maintenance. (ii) Golf course maintenance. (iii) Reforestation works. (iv) Rehabilitation, re-stocking and ecological balance of the lakes. (v) Coral rehabilitation. 	Persons and staff involved in these sectors.	To be decided by the Project Proponent (PP), Project Manager (PM), Engineers, Golf Course Designers, Landscape Architects and the EnvMC.

Chapter 16

Public Consultation and Information Disclosure



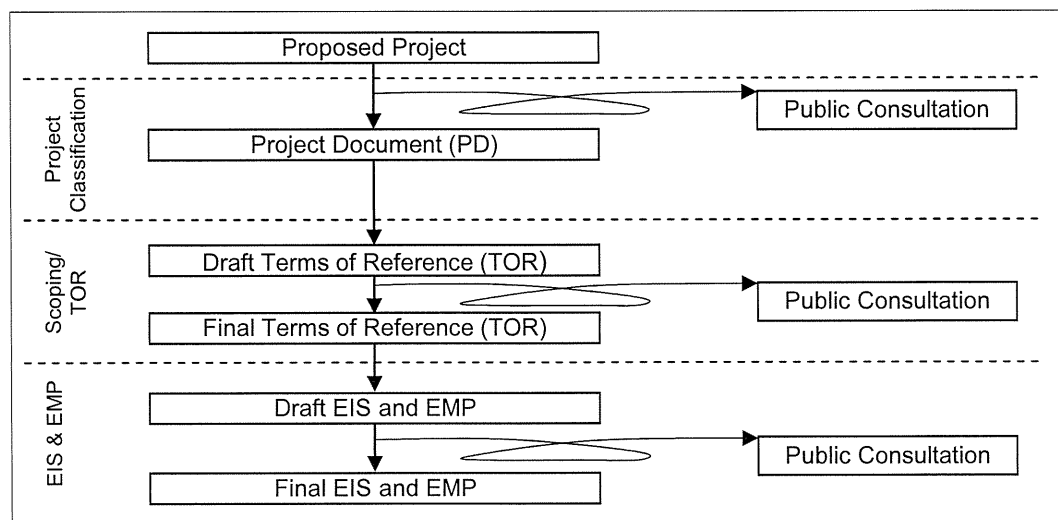
CHAPTER 16: PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

16.1 INTRODUCTION

- This Section on Public Consultation is required by the National Directorate of Pollution Control and Environmental Impacts (NDPCEI) under Decree-Law No.5/2011 on Environmental Licensing Law (ELL), for environmental assessment involving the preparation of the Environmental Impact Statement (EIS) and Environmental Management Plan (EMP).
- This requirement is aimed at addressing the public's concern, understanding and acceptance of the Project, especially on how the Project may affect them positively or negatively.
- Pursuant to the above requirement, a series of formal and informal consultations were carried out (see **Figure 16.1.1**).
- Formal public consultations have since been carried out, one each before submitting the Project Document (PD) and another one after the submission of the draft Terms of Reference (TOR). A final consultation after submission of the Draft EIS and EMP had also been carried out.
- The formal public consultations comprised group discussions with each of the relevant Governmental ministries; local government; Non-government Organisations (NGOs) and civil society; basically, for the Scoping Exercise for the PD and TOR; and Public Consultations where all relevant stakeholders were invited to provide their views on the Project prior to submission of the Final TOR and Final EIS/EMP.
- Concurrently, informal consultations were carried out involving individuals as respondents through questionnaire surveys of selected sampled settlements within the 3-km Zone of Impact (ZOI). The results of this process are reported in detail in the EIS Report, **Chapter 6: Description of the Environment, Sections 6.18 – 6.25** for Economic Environment and **Sections 6.26 – 6.32** for Social Environment; and **Chapter 10: Social Impact Assessment**.
- **Chapter 10** of the EIS Report specifically relates to the public consultation process through questionnaire surveys to obtain the social and socio-economic profiles and perceptions of respondents living within the 3-km ZOI.
- All stakeholders therefore have had an opportunity to participate fully in the consultation process. So far, the consensus was the trust accorded to the Project Proponent (PP) and his team; this was because the PP has been involved in the Project since the early 2000s until now.
- The sections to follow will provide details of the two formal public consultations where their views were incorporated into the Scoping Exercise for the PD, the TOR and the EIS for the Project.

- In terms of formal consultations, a total of 16 Group Discussions with the relevant Governmental ministries, local government and NGOs were held from 28 – 30 September and 12 – 14 October 2016. This was followed by a first Public Consultation with all the relevant stakeholders held on 12 January 2017 for the Draft TOR report, and a second Public Consultation held on 18 January 2018 for the Draft EIS and EMP Reports.
- Information and outcomes from the individual questionnaire surveys classified as the informal consultation process are in **Chapter 10** of the EIS Report.

Figure 16.1.1: The Public Consultation Process



16.2 OBJECTIVES OF PUBLIC CONSULTATION

- The main objectives of conducting public consultations for the Project were:
 - (i) Informing the stakeholders about the Project as well as obtaining their views of any potential environmental issues as seen through their eyes regarding the development of the Project.
 - (ii) To solicit any local traditional mitigation measures they might have to conserve the environment.
 - (iii) To seek their perceptions regarding the Project in the area.

16.3 METHODOLOGY AND APPROACH

- The public consultation for this Study started before the preparation of the PD. It was carried out in a Scoping Exercise format.

16.3.1 Identification of Stakeholders

- The stakeholders in the first public consultations were from groups that have knowledge of, and/or could provide information on impacts, and what they felt ought to be carried out to minimise the negative impacts on the environment, with the development of the Project. They included:
 - (i) Legal and institutional groups.
 - (ii) Relevant authorities and agencies.
 - (iii) NGOs and civil society groups.
 - (iv) Communities living within the 3-km ZOI.

- The list of stakeholders are summarised in **Table 16.3.1**.

Table 16.3.1: List of Stakeholders

No.	Stakeholder
Government Ministries	
1.	Minister of State, Coordinator of Economic Affairs and Minister of Agriculture and Fisheries
2.	Ministry of Commerce, Industry and Environment <ul style="list-style-type: none"> • General Director of Environment • National Directorate of Pollution Control and Environmental Impact (NDPCEI) • Department of Environmental Impact Assessment • National Directorate of Climate Change
3.	Ministry of Justice <ul style="list-style-type: none"> • National Directorate of Land, Property and Cadastral Services
4.	Ministry of Public Works, Transport and Communications <ul style="list-style-type: none"> • National Directorate of Roads, Bridges and Flood Control • National Directorate of Water and Sanitation • National Directorate of Meteorology and Geophysics • National Directorate of Electricity
5.	Ministry of Tourism, Arts and Culture <ul style="list-style-type: none"> • National Directorate of Tourism Enterprise, Activities and Products • National Directorate of Tourism Marketing and International Relations
6.	Ministry of Agriculture and Fisheries <ul style="list-style-type: none"> • National Directorate of Aquaculture and Fisheries • General Director of Forest, Coffee and Industrial Plants • National Directorate of Forestry and Watershed Management • National Directorate of Nature Conservation
7.	Ministry of Finance <ul style="list-style-type: none"> • National Directorate of Economics and Social Statistics • National Directorate of Cartographic Statistics
8.	Ministry of Health <ul style="list-style-type: none"> • National Directorate of Community Health Services • Department of Sanitation Control and Environmental Health • Department of Health Management and Information System • Department of Policy and Strategic Planning
9.	Minister of Housing Development, Urban Planning and Environment
10.	TradeInvest Timor-Leste

No.	Stakeholder
11.	United Nations Development Programme (UNDP) Timor-Leste
Local Government	
1.	Municipality of Liquica
2.	Post Administration Bazartete
3.	Suco Comoro
4.	Suco Tibar
Local Communities	
1.	Kg Golgota
2.	Kg Fatunia
3.	Kg Libaulelo
4.	Kg 30 De Agosto
5.	Kg Moris Foun
6.	Kg Terra Santa
7.	Kg Fomento I
8.	Kg Fomento II
9.	Kg Fomento III
10.	Kg Lemcari
11.	Kg Metin I
Non-Governmental Organisations (NGOs) and Civil Society	
1.	La'o Hamutuk
2.	Luta Hamutuk
3.	Conservation International

16.3.2 Methods and Approach

- The methods and approach used were directly and indirectly through formal and informal consultations as follows:

(a) Formal Consultation

- Group Discussion:** Face-to-face group discussions with stakeholders were arranged and held at premises of Government ministries, local government and NGOs. During such meetings, the PP and Consultants briefed the groups of stakeholders about the Project and requested relevant information for the preparation of the EIS and EMP, as well as seeking their opinions on the Project. This was followed up with the stakeholders, through official letters, more face-to-face discussions and/or tele-conversations to fill in gaps in information. Such discussions were important to gauge their views and aspirations for the environment, the communities and country with the development of the Project. The information was used in a Scoping Exercise by the Consultants to prepare the PD, TOR and EIS.
- Public Consultation:** Public Consultations were carried out to brief the stakeholders on the Project and to obtain their feedbacks. The PP was in charge of the arrangements and issuance of invitations. The Public Consultation involved stakeholders in the government ministries, local government and NGOs and civil society. The PP and the Environmental Impact Assessment (EIA) Consultants jointly conducted the Public Consultations.

(b) Informal Consultation

- **Questionnaire Surveys:** This method was used intentionally to collect socio-economic information from the local communities living within the 3-km ZOI, as well as to obtain their views and perceptions of the Project. The methodology and approach of the questionnaire surveys are highlighted in **Chapter 10** of the EIS Report. Informal discussions with individuals were also carried out to obtain information.

16.4 SUMMARY OF PUBLIC CONSULTATION ACTIVITIES

(a) Formal Consultation

- A total of 16 focal group discussions were conducted from September to October of 2016 (**Table 16.4.1** and **Appendix 13-A** of the EIS Report), with the photo inventory provided in **Figure 16.4.1**.
- Two Public Consultations were conducted – first one on 12 January 2017 after the submission of the Draft TOR (see **Figure 13.4.2** and **Appendix 13-B** of the EIS Report), and the second one on 18 January 2018 after the submission of the Draft (see **Figure 13.4.3** and **Appendix 13-C** of the EIS Report).

Table 16.4.1: List of Consultation Meetings Conducted

No	Date/Time*	Stakeholder Involved
1.	28 September 2016/ 10.00 am	National Directorate of Water and Sanitation
2.	28 September 2016/ 4.40 pm	National Directorate of Aquaculture and Fisheries
3.	29 September 2016/ 9.00 am	<ul style="list-style-type: none"> • Minister of Commerce, Industry and Environment • General Director of Environment • National Directorate of Pollution Control and Environmental Impact • Department of Environmental Impact Assessment
4.	29 September 2016/ 10.00 am	<ul style="list-style-type: none"> • General Director of Environment • National Directorate of Pollution Control and Environmental Impact • Department of Environmental Impact Assessment
5.	29 September 2016/ 11.00 am	Department of Environmental Impact Assessment
6.	29 September 2016/ 2.40 pm	National Directorate of Land, Property and Cadastral Services
7.	30 September 2016/ 9.10 am	National Directorate of Cartographic Statistics
8.	30 September 2016/ 11.00 am	National Directorate of Tourism Marketing and International Relations
9.	30 September 2016/ 2.30 pm	National Directorate of Roads, Bridges and Flood Control
10.	30 September 2016/ 4.15 pm	National Directorate of Forestry and Watershed Management
11.	12 October 2016/ 10.15 am	Luta Hamutuk
12.	12 October 2016/ 11.10 am	La'o Hamutuk
13.	13 October 2016/ 9.20 am	National Directorate of Meteorology and Geophysics
14.	13 October 2016/ 11.30 am	Suco Comoro
15.	13 October 2016/ 4.30 pm	Suco Tibar
16.	14 October 2016/ 10.50 am	<ul style="list-style-type: none"> • Department of Sanitation Control and Environmental Health

No	Date/Time*	Stakeholder Involved
		<ul style="list-style-type: none"> • Department of Health Management and Information System • Department of Policy and Strategic Planning
17.	12 January 2017/ 09.30 am	<ul style="list-style-type: none"> • National Directorate of Pollution Control and Environmental Impact • Department of Environmental Impact Assessment • National Directorate of Water and Sanitation • National Directorate of Economics and Social Statistics • Department of National Account • Department of Cartographic, National Directorate of Cartographic Statistics • National Directorate of Tourism, Enterprise, Activities and Products • Department of Sanitation Control and Environmental Health • Department of Policy and Strategic Planning • National Directorate of Meteorology and Geophysics • Administration of the Municipality of Liquica • Administrative Post of Bazartete • Suco Comoro • Suco Tibar • La'o Hamutuk • Luta Hamutuk
18.	18 January 2018/ 09.00 am	<ul style="list-style-type: none"> • UNDP Timor-Leste • General Director of Environment • General Directorate of Statistic • La'o Hamutuk • Luta Hamutuk • Department of Environmental Impact Assessment • Ministry of Public Work • Ministry of Health • Ministry of Tourism Art and Culture • National Directorate of Tourism Marketing & International Relations. • Ministry of Housing, Development, Urban Planning and Environment • National Directorate of Pollution Control and Environmental Impact • National Directorate of Road, Bridge and Flood Control • National Directorate of Tourism, Enterprise, Activities and Product, Ministry of Tourism Art and Culture • National Directorate of Climate Change • TradeInvest Timor-Leste • Conservation International • Administrative of the Municipality of Liquica • Administrative Post of Barzatete

Figure 18.4.1: Photo Inventory of Group Discussions





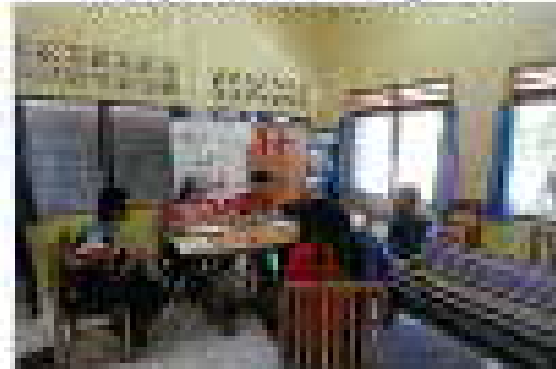
Group Discussion with the National Directors of
Health, Energy, and Food Control



Group Discussion with the National Directors of
Finance and Material Management



Group Discussion with Lt. Col. H. H. H. H.



Group Discussion with Lt. Col. H. H. H. H.



Group Discussion with the National Directors of
Meteorology and Geophysics



Group Discussion with Lt. Col. H. H. H. H.



Group Discussion with Lt. Col. H. H. H. H.



Group Discussion with Lt. Col. H. H. H. H.

Figure 18.4.3: Photo Inventory of 1st Public Consultation



Figure 18.4.3: Photo Inventory of 2nd Public Consultation

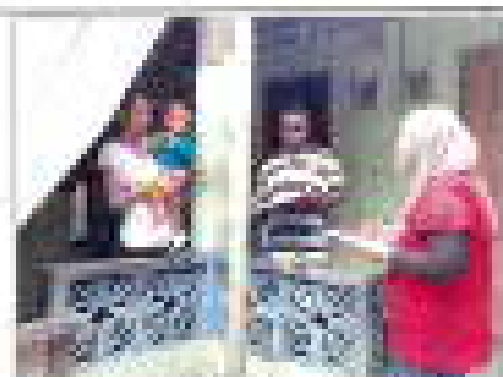


(2) Informal Consultation

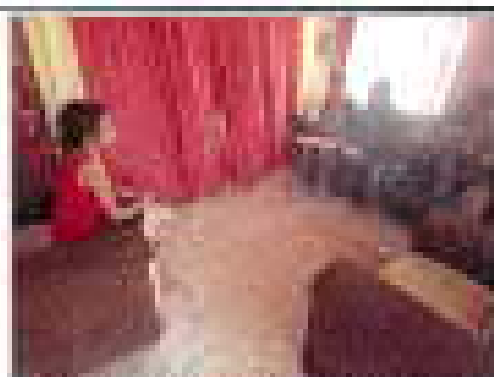
- A questionnaire survey was carried out on 12 – 13 October 2012 in 11 statistically selected settlements located within the 3-yr ZOI. Figure 18.4.4 shows some of the photo inventories during the questionnaire survey.

Figure 18.4.4 Photo Inventory of Questionnaire Survey





Community meeting at Kg. Lomomanda



Questionnaire survey at Kg. Lomomanda I



Community meeting at Kg. Lomomanda I



Questionnaire survey at Kg. Lomomanda II



Community meeting at Kg. Lomomanda II



Questionnaire survey at Kg. Lomomanda



Community meeting at Kg. Lomomanda



Questionnaire survey at Kg. Lomomanda

16.5 DETAILS OF PUBLIC PARTICIPATION ACTIVITIES

- This Section provides the details of the formal consultation activities, including group discussions and the public consultations. The details on the questionnaire surveys are in **Chapter 10** of the EIS Report.
- **Group Discussions:** The dates and time of the group discussions conducted with different stakeholders are listed in **Table 16.4.1** in **Section 16.4**. Other details including venues, agenda, list of attendees and minutes of meetings are available in **Appendix 13-A** of the EIS Report.
- **Public Consultations:** The 1st Public Consultation was conducted on 12 January 2017 at Orchid Room, Timor Plaza in Dili. The Public Consultation started at 9.30 am and ended by 2.00 pm. A total of 38 participants attended including the PP, Consultant Team and representatives of relevant stakeholders. The agenda of the Public Consultation, photo inventory and list of attendance are attached in **Appendix 13-B** of the EIS Report.
- The 2nd Public Consultation was conducted on 18 January 2018 at Timor Plaza in Dili. The Public Consultation started at 9.00 am and ended by 2.00 pm. A total of 78 participants attended including the PP, Consultant Team, representatives from government agencies and relevant stakeholders. The agenda of the Public Consultation, photo inventory and list of attendance are attached in **Appendix 13-C** of the EIS Report.

16.6 SUMMARY AND OUTCOMES OF DISCUSSIONS

(a) Group Discussions

- Since the group discussions were conducted during the earlier stage of the EIS, the discussions with stakeholders were not restricted in obtaining their views and concerns but also, to validate some of the information already gathered from the field. Where there were gaps in information, such information were requested from the stakeholders, especially from the relevant Government Departments, which would have the latest information and data.
- **Table 16.6.1** provides the outcomes of the group discussions. The Minutes of Meetings (MOM) of discussions are attached in **Appendix 13-A** of the EIS Report.
- The main concerns of the stakeholders are summarised as follows:
 - (i) Accessibility concerns over the St Paul's Holy House, the area of which is usually used for celebration events.
 - (ii) Impact(s) on air, noise and marine water quality during the construction phase of Project.
 - (iii) Socio-economic issues, e.g. livelihood, job opportunities, etc..

Table 16.6.1: Outcomes from Group Discussions

Stakeholder	Outcomes of Discussions
National Directorate of Water and Sanitation	<ul style="list-style-type: none"> • Confirmed that there are two existing water pipelines (400 dia. mm) along Rua Terra Santa. Water for the Project will be drawn from this main pipeline. • There is sufficient water supply for the construction phase. • During operations, water tanks will be required to store water at site.
National Directorate of Aquaculture and Fisheries	<ul style="list-style-type: none"> • There are 633 fishermen from the Municipality of Dili and 319 from the Municipality of Liquica. • Using <i>jaring/ jaring rumpum</i> is the common fishing techniques. • No buoys near to Project site.
<ul style="list-style-type: none"> • Minister of Commerce, Industry and Environment • General Director of Environment • National Directorate of Pollution Control and Environmental Impact • Department of Environmental Impact Assessment 	<ul style="list-style-type: none"> • Minister of Commerce, Industry and Environment was briefed on the Project by the PP and EIA Consultants. • As the previous Environmental License dated 4 May 2012 had lapsed (two years from Date of Notification in the Schedule), and because of changes to the Masterplan Layout, the PP is required to re-submit a new EIS for a new Environmental License as per the requirements of the NDPCEI. • The Government indicated that they would resettle the people within the Project site. The Project area would be provided to the PP free of encumbrances. Resettlement will not be included in the EIS and EMP. • The Minister was very supportive to see the Project coming on-stream.
<ul style="list-style-type: none"> • General Director of Environment • National Directorate of Pollution Control and Environmental Impact • Department of Environmental Impact Assessment 	<ul style="list-style-type: none"> • The NDPCEI had come out with four new guidelines to replace the UNTEAT and National Directorate of Environment (NDE) Guidelines. • To apply for an Environmental Licensing, submissions for the following are required: <ol style="list-style-type: none"> (i) Project Document (PD) (ii) Terms of Reference (TOR) (iii) Environmental Impact Statement (EIS) and Environmental Management Plan (EMP) (iv) Evaluation and Approval • Public consultation with stakeholders has to be conducted before TOR and after EIS and EMP submission. • Since the present Project layout is different from the previous one in the former EIA, the Project will be considered as a new Project, and PD submission is required under the new EIA guidelines. • NDPCEI emphasised that the EMP be submitted together with the EIS, but in separate document.
Department of Environmental Impact Assessment	<ul style="list-style-type: none"> • The Chief of the Department explained the process and requirements for each of the following stages: <ol style="list-style-type: none"> (i) PD stage (ii) TOR stage (iii) EIS and EMP stage • The Department agreed not to take into consideration the illegal housing in the impact assessment. • The Department is concerned regarding the St Paul's Holy House that is located within the Project site.

Stakeholder	Outcomes of Discussions
National Directorate of Land, Property and Cadastral Services	<ul style="list-style-type: none"> • Notices to move out from the Project site had already been given to the affected community. • The Land Department agreed to consider the Project site as zero ground (no settlement/ all settlers have moved out). • Existing road connecting Dili to Tibar would be closed for Project development. • As a replacement, a new road alignment was approved to be built cutting across the side of the mountain to Tibar.
National Directorate of Cartographic Statistics	<ul style="list-style-type: none"> • The latest census was done in year 2015. • Common languages used in Timor-Leste are Tetum and Portuguese. Other languages are English, Indonesian and 31 indigenous languages.
National Directorate of Tourism Marketing and International Relations	<ul style="list-style-type: none"> • The Project was discussed at the Trade Invest Timor-Leste (Investment and Export Promotion) Agency. The Agency was supportive of the Project. • Latest tourism data were provided.
National Directorate of Roads, Bridges and Flood Control	<ul style="list-style-type: none"> • Construction of upgrading Rua Terra Santa has been awarded by the Timor-Leste Government and construction will start in 2017. • Agreed that the road to be expanded to a 3-lane road to cater to the needs of the Project. • There were some concerns on the connectivity between the road with the egress from the Project site. • Agreed that the Tasi Tolu Lakes to be preserved for tourism.
National Directorate of Forestry and Watershed Management	<ul style="list-style-type: none"> • Tasi Tolu Lakes are important for migrating birds and some mangrove species. • The Department is currently cooperating with the PP to rehabilitate and reforest the hills within the Project site. • PP is encouraged to have a joint venture with the local communities to conserve the mangroves within the Tasi Tolu area. • The Department is also concerned on the historical places in the Tasi Tolu area.
Luta Hamutuk	<ul style="list-style-type: none"> • This NGO has always supported the Government's investment in various sectors that bring improvements to the nation. • According to them, they will support but will also voice their concerns if they find that the government is moving in the wrong direction. • Concerns forwarded by them are: <ul style="list-style-type: none"> (i) Land status and ownership of the Project site. (ii) Environmental impacts (air, noise and marine water quality) and local community during the construction of the Project. (iii) Need public consultations between the PP, Government agencies and local communities.

Stakeholder	Outcomes of Discussions
La'o Hamutuk	<ul style="list-style-type: none"> • Concerns include: <ul style="list-style-type: none"> (i) Biodiversity in Tasi Tolu especially the bird species within the Project site. (ii) Marine environmental impacts due to proximity of Project site to sea. (iii) Livelihood of local communities as Project site is an original source of income and food. (iv) Concerns over socio-economics in terms of availability of job opportunities because local communities are not skilful enough in assisting the Project. (v) Concern over the source of water supply and construction materials during the construction phase.
National Directorate of Meteorology and Geophysics	<ul style="list-style-type: none"> • Monsoon period in Dili starts at the end of November and ends at March. • Floods usually occur during the <i>La Nina</i> phase, but mostly due to bad drainage system (government addressing issue). • No flood events at Project site even during the <i>La Nina</i> phase.
Suco Comoro	<ul style="list-style-type: none"> • Concerned about the Project site due to the site being issued to the public as a "no building zone" five years ago. However, the site is currently being housed by a fairly large community, some of them are important personnel. Government should issue proper compensation to them. • Concerned that the Project development would affect the cultural, historical and environment of the area.
Suco Tibar	<ul style="list-style-type: none"> • The Project has no direct benefits to the local communities in terms of job opportunities during the construction and operational phases. • Local communities are not skilled enough to work in the Project during the construction phase. • If advance technology is adopted in the operational phase, employment opportunities would be low for the local community.
<ul style="list-style-type: none"> • Department of Sanitation Control and Environmental Health • Department of Health Management and Information System • Department of Policy and Strategic Planning 	<ul style="list-style-type: none"> • Directed the consultants to obtain health information from the relevant Departments. • Will assist on information requested.

(b) Public Consultations

- A total of two public consultations were carried throughout the preparation of the Draft TOR, EIS and EMP. The purpose of these consultations was to obtain views and opinions with regards to the said documents, as well as to validate some of the information already gathered from the field. Where there were gaps in information, such information were requested from the stakeholders, especially from the relevant Government Departments, which would have the latest information and data.
- **Tables 16.6.2 and 13.6.3** provide the major comments/issues raised by the stakeholders, as well as the responses from the PP/consultant(s).

- The concerns from the stakeholders from the public consultation dated 12 January 2017 on the Draft TOR were:
 - (i) Concerns over the future direction of socio-economic development, when there is an influx of workers who may not share the same culture and history as the locals.
 - (ii) Need to clarify on water sufficiency for the proposed golf course and public park.
 - (iii) Concerns over electricity demand of the Project.
 - (iv) Suggested all participants involved in the public consultation to form a committee to supervise the Project development.

- The concerns from the stakeholders from the public consultation dated 18 January 2018 on the Draft EIS and EMP were:
 - (i) The conversion of Lake A to freshwater as the lake is an important area for bird migration and an area of great importance to the citizens of Timor-Leste.
 - (ii) The relocation/resettlement of the residents within the Project site.
 - (iii) The effects of construction such as disruption/disturbance to the surrounding habitats.

Table 16.6.2: Issues Raised/Comments by Stakeholders in Public Consultation for Draft TOR held on 12 January 2017

Stakeholder	Question/Comment/Concern	Response by PP/Consultants
Government Ministries		
Sr Cristino Gusmao (National Director of Economics and Social Statistics)	(i) The commencement date for Project construction.	(i) Datuk Dr Edward Ong, the PP, informed that he wished to start construction as soon as possible subject to satisfying all the environmental requirements in Timor-Leste. This will require the cooperation from both the Government and the contractors.
Sr Francisco Poto (Chief of the Department of Environmental Impact Assessment)	(i) Concerned over the needs of the Project in terms of socio-economic development. (ii) Requested to show the statistics (data) in the section of social economic aspects in the Chapter on Statement of Needs, e.g. job vacancies provided, etc.	(i) Mr Ravi Kathiravelu explained the Project would create many job opportunities as well as increase the involvement of the local communities in the Project, especially in the hotel service sector. (ii) On-the-job training related to hotel catering and hospitality industry would be provided. (iii) The benefits to the local communities would be included in the EIS Report.

Stakeholder	Question/Comment/Concern	Response by PP/Consultants
<p>Sr Jose Quintas (National Director of Tourism, Enterprise, Activities and Products)</p>	<p>(i) Commented that the Study should not only concern on the surrounding environment, but also the community and socio-economic aspects due to the settlements nearby.</p> <p>(ii) Required to include the tourism carrying capacity in the Study.</p> <p>(iii) Asked whether Pelican Paradise Holdings (Timor-Leste) has a Corporate Social Responsibilities (CSR) Policy.</p> <p>(iv) Suggested the participants be invited to the Public Consultation to form a committee to supervise the Project development.</p>	<p>(i) Dr Low explained that the assessment and surveys on the settlements in the Project site had been conducted. Dr Chan Kin Meng added that the socio-economic assessment will be included in EIS Report.</p> <p>(ii) The tourism carrying capacity would be included in the EIS Report.</p> <p>(iii) Datuk Dr Edward Ong informed that Pelican Paradise Holdings Timor-Leste has its own CSR Policy but is unpublished. He added the CSR programme can be considered as one of the fundamental elements in the development of the Project. For example, the Project has included the school, which is able to take in 1,600 students or more. Furthermore, the youth development and community centre proposed in the Project, is to enable the younger generations to receive training and development of skills for future undertakings, all part of the CSR policy.</p> <p>(iv) Sr António Lelo Taci agreed with the suggestion to form a committee, as it is also required under the environmental regulation.</p>
Non-government Organisation		
<p>Sr Niall Almond (Researcher, La'ò Hamutuk)</p>	<p>(i) Commented on the need for the socio-economic study to include the profiles and settlements within the Project site.</p> <p>(ii) Clarified whether water supply is sufficient for the proposed golf course and the public park.</p> <p>(iii) Asked whether the freshwater collected can contribute to the national water supply, since the green area, e.g. golf course, public park and reserve areas are proposed as the freshwater catchment areas including a desalination plant.</p>	<p>(i) Dr Low informed that the Government had agreed to deliver the land free of all encumbrances for commencement of the Project development. The information on population of the settlement within the Project site will be included in the EIS Report.</p> <p>(ii) Datuk Dr Edward Ong explained that the golf course irrigation would use recycled water. For example, the hotel would generate 7 gallons of wastewater per guest room. This wastewater would be treated and reused for irrigation.</p> <p>(iii) Furthermore, the golf course designer would be selecting both freshwater and saline water-tolerant vegetation to be planted in the golf course so that the golf course would not only depend on freshwater irrigation.</p> <p>(iv) Datuk Dr Edward Ong further explained that the water supply for the nation is under the Government's responsibility. Water supply for the Project will be tapped from the national reticulation pipeline. The water collected from the catchment areas or desalination plant is mainly for contingency reserves in the Project, for example, during water shortage or for fire extinguishing.</p>

Stakeholder	Question/Comment/Concern	Response by PP/Consultants
Sr Juvinal Dias (President of La'o Hamutuk)	(i) Concerned on the electricity demand for the Project. (ii) Asked whether the electricity generated from the solar panel can contribute to the national grid.	(i) The electrical supply will be tapped from the national grid, which will be sufficient for the whole development. The hotel normally would have a stand-by gen-set. (ii) The electricity supply to the nation is under the Government's responsibility and not under Pelican Paradise Holdings Timor-Leste.

Table 16.6.3: Issues Raised/Comments by Stakeholders in Public Consultation for Draft EIS and EMP held on 18 January 2018

Comment By	Question/ Comment/ Concern	Response
Mr Shyam Paudel [Chief Technical Advisor of United Nations Development Programme (UNDP) Timor-Leste]	(i) Concerned on the relocation/resettlement of the residents within the Project site. (ii) Queried on the mangrove area to be reserved and location for the mangrove replanting. (iii) Asked on the types of plants that will be included in the reforestation plan.	(i) Dr Low explained that the relocation plan is under the jurisdiction of the Government of Timor-Leste. (ii) Dr Jeremiah explained that the existing mangrove around the Project site had been destroyed by the locals before the PP started the Project planning. Pelican Paradise Holdings Timor-Leste had planned to replant mangrove at the perimeter of Tasi Tolu Lakes. Dr Low added the seeds of the mangrove in Tasi Tolu area would be collected for replanting. (iii) Dr Jeremiah showed the potential trees that would be used for reforestation. He also mentioned that Pelican Paradise had started to cultivate these in a nursery for reforestation later.

Comment By	Question/ Comment/ Concern	Response
<p>Sr Carlos Ximenes (Senior Staff in General Directorate of Environment)</p>	<p>(i) Concerned on the conversion of Lake A to a freshwater lake as the Lake is known as an important area for migrating birds and also considered as a sacred area to the public.</p> <p>(ii) Suggested to construct an additional lake within the golf course area for freshwater storage and to maintain the three Lakes as saltwater lakes.</p> <p>(iii) Curious on lake restoration and the lake water parameters that would be improved through the restoration (fresh sea water circulation).</p> <p>(iv) Asked if the public could access to the Lakes after Project completion.</p> <p>(v) Expressed that Timorese are supporting the Project development but also concerned on the environmental impacts caused by the Project.</p>	<p>(i) Mr Choo C. Men explained that the conversion of Lake A into a freshwater lake is one of the options and adaptive technologies for the Project to overcome water scarcity during the dry season in Timor-Leste.</p> <p>(ii) After the conversion of Lake A, it would be used as a retention pond; collecting the surface runoff from the hill area; and also holding the treated surcharge effluent from the sewage treatment plant. This would align with the concept of preservation/ reuse of any resources available within the site and adopting the "zero discharge" concept to reduce any negative impacts arising from the sewage, etc.</p> <p>(iii) Mr Choo C. Men added, after conversion to a freshwater lake, it would become a life pond of fish and will be more productive as compared to the existing condition.</p> <p>(iv) Mr Wilson Voon explained that the restoration of Lakes B and C would be conducted by circulating lake water and to improve the semi-eutrophication condition of the lakes.</p> <p>(v) He added fresh seawater will be channelled via an underground pipeline into the Lake C under high tide condition. Then the water from Lake C would flow into Lake B via an opening between two lakes; and finally discharging back into the sea through overflow.</p> <p>(vi) Besides, foam jets and air stations would also be installed for aeration.</p>
<p>Sr Adilson da C. (La'o Hamutuk)</p>	<p>(i) Concerned on the disruption/ disturbance of habitat during the construction phase.</p> <p>(ii) Concerned on involvement of local communities in the Project development.</p> <p>(iii) Wished that the PP would protect/maintain the Tasi Tolu area (especially the lakes) while having the new development.</p>	<p>(i) Mitigations will be provided on areas deemed to disturb any habitats during the construction phase.</p> <p>(ii) Dr Low explained that employment priority would be given to the local communities. However, this would depend on the types of jobs, working skill and willingness to work amongst the local communities.</p> <p>(iii) All efforts will be taken to preserve the Tasi Tolu area, especially the lakes.</p>

Comment By	Question/ Comment/ Concern	Response
<p>H.E. Arq. Abrao Gabriel Santos Oliveira (Vice Minister of Housing Development, Urban Planning and Environment)</p>	<ul style="list-style-type: none"> (i) Rejected the option to convert the Lake A into a freshwater lake as it is a sacred and historical site. (ii) Emphasised on public access to the Tasi Tolu area once the Project is completed. (iii) Mentioned that the settlements within the Project site would definitely be relocated with or without the development. (iv) Emphasised that all investors must take care of the environment and comply with the conditions of the environmental license. 	<ul style="list-style-type: none"> (i) Dr Jeremiah informed that the option as not to convert Lake A into a freshwater lake would be taken into consideration; and the PP would look for other alternatives for freshwater storage.
<p>Sr Anibal A. Soares [Professional Technique (EIA), Department of Environmental Impact Assessment]</p>	<ul style="list-style-type: none"> (i) Rejected the idea of covering Lake A with solar panels. (ii) Expressed the importance of Tasi Tolu Lakes to the locals. (iii) Concerned on the impact to the migratory birds during Project development. (iv) Concerned on the impact from the construction of the floating jetty. 	<ul style="list-style-type: none"> (i) Pelican Paradise Holdings Timor-Leste noted the rejection of covering Lake A with solar panel. (ii) Dr Low explained the impact on the migratory birds had been addressed in the EIS.
<p>General Directorate of Environment</p>	<ul style="list-style-type: none"> (i) Appreciated the effort of PP in planning the Project. (ii) Expressed that the Tasi Tolu Lakes are historical sites and must be conserved. 	<ul style="list-style-type: none"> (i) Noted.
<p>Sr José Paulo Pinto (Ministry of Public Work)</p>	<ul style="list-style-type: none"> (i) Informed that the Government of Timor-Leste is currently upgrading the existing Rua Terra Santa. (ii) Requested that the proposed drainage plan (including lakes water circulation plan) to be incorporated with the Master Drainage Plan of the upgraded road. (iii) Suggested PP to meet with related departments for further coordination on the drainage plan. (iv) Emphasised that the National Sewerage Plan must be incorporated in the Project planning, if there is a sewage treatment plant and sewerage system in Tasi Tolu area. 	<ul style="list-style-type: none"> (i) Pelican Paradise Holdings Timor-Leste would consult with the relevant agencies on the drainage plan. The National Sewerage Plan would be incorporated in the sewerage planning of the Project.

Comment By	Question/ Comment/ Concern	Response
Ms Trudiann Dale (Country Director, Conservation International)	<p>(i) Mentioned that the Dili Rock is one of the popular dive sites in Timor-Leste; it should be included as a tourism site in EIS.</p> <p>(ii) Emphasised that the Tasi Tolu is a marine protected area as the seagrass bed in this area is the habitat for dugong.</p> <p>(iii) Concerned on the impact of the discharge of circulated lake water to the seagrass bed.</p>	<p>(i) ASPEC Sdn Bhd noted that the Dili Rock is a very well known dive site and would include it in the Final EIS.</p> <p>(ii) The issue on the seagrass bed and dugong would be taken into consideration in the Final EIS.</p>

16.7 IDENTIFY HOW THOSE COMMENTS WERE TAKEN INTO ACCOUNT

- All comments/view/issues received from the public through the consultation process have been taken into consideration wherever relevant when assessing the activities to be taken during the construction and operational phases of Project development.
- Many of the information were validated for the environmental impact study and for the consulting engineers to design. The Masterplan for the Project in fact has been revised many times to address all the details. These were:
 - (i) Water supplies – tapped from the reticulation system.
 - (ii) Electricity supply – from the national grid.
 - (iii) Infrastructure – the Rua Terra Santa will be widened to 3-lane to accommodate traffic movement to and from the Project site.
 - (iv) Hill areas – National Directorate of Forestry and Watershed Management will collaborate with the PP to reforest the hills.
 - (v) Socio-economics – job opportunities may be available but the people may not be able to apply or fill them because of low educational levels or skills.
 - (vi) Environment – concerns over a reduction in bird populations if the three saline lakes were disturbed.

16.8 SUMMARY OF THE PUBLIC ACCEPTANCE OR OPINIONS ON THE PROJECT

- As mentioned in **Section 16.2**, obtaining opinions from stakeholders is one of the key objectives of the public consultation process. Findings showed that the majority of the stakeholders were in favour of the Project development, with reasons given as follows:
 - (i) Boost and attract investments to Dili, as well as at the national level.
 - (ii) Create jobs and business opportunities for communities to improve their standard of living.
- They also recommended the PP to give priority to the local workers of any job opportunities available. They also felt that there was a need for training to strengthen their working skills.

- The stakeholders rejected the option to convert the Lake A into a freshwater lake as it is a sacred and historical site and thus must be conserved. The PP has taken this into consideration and other alternatives will be found for freshwater storage.
- The community leaders recommended for greater participation and involvement in the Project development. This echoed the suggestion by Sr Jose Quintas (National Director of Tourism, Enterprise, Activities and Products) and supported by Sr António Lelo Taci on the need to have a committee to help monitor the Project development, which is also required under the environmental regulation.

16.9 OTHER RELATED MATERIALS OR ACTIVITIES

- For the Public Consultations that were conducted on 12 January 2017 and 18 January 2018, official invitation letters were sent out to inform the relevant stakeholders to attend the events (see **Appendix 13-D** of the EIS Report).
- Printed materials regarding the agenda and venue were provided. Briefing notes were provided to each participant during the event itself (see **Appendix 13-D** of the EIS Report).

16.10 RECOMMENDATIONS FOR FUTURE CONSULTATIONS

- **Stakeholders:** It is recommended that all stakeholders who earlier attended the Public Consultation, be invited back to the last Public Consultation after the submission of Draft EIS and EMP Reports. This will give continuity to the EIS and EMP process.
- **Environmental Administration:** It is recommended that the General Director of Environment through the NDPCEI and Department of Environmental Impact Assessment, takes the lead in organising the final Public Consultation. This will ensure that the relevant departments, agencies, NGOs and civil society, will attend. The department can then decide on the date, venue, number of participants and agenda.
- Secondly, it is also useful if the Director General of the Department of Environmental Impact Assessment briefs the participants of the requirements of the environmental legislations and regulations in the context of the EIA process under which development projects are to be carried out. Presently, this is left to the PP and the Environmental Consultants to carry out, which may not be as compelling as when it is done by the Department of Environmental Impact Assessment itself.
- **Consultations on Environmental Monitoring:** There is a recommendation by the Governmental agency to form a committee to monitor the activities carried out during the construction phase. If this committee actualises, it should work very closely with the PP's Environmental Monitoring Team (EMT), to focus on measures to reduce/minimise the negative environmental impacts and rehabilitation measures. Once a year, a Feedback Workshop can be organised to deliberate on the issues with the contractors, the PP and the consultants.

- **Complaints Mechanism:** The PP may establish a complaint and grievance mechanism (CGM) related to environmental and social issues arising during the construction, operational and deactivation/decommissioning phases. The information will be channelled to the NDPCEI and Department of Environmental Impact Assessment, if actions are required from the said departments.

Chapter 17

Compliant and Grievance Mechanism

CHAPTER 17: COMPLAINT AND GRIEVANCE MECHANISM

17.1 INTRODUCTION

- This Chapter proposes a Complaint and Grievance Mechanism (CGM) as required in the EMP. This mechanism can be amended as and when necessary.

17.2 OBJECTIVE

- The main objective of setting up the CGM is to provide a time-bound and transparent mechanism for the stakeholders and public to voice their social and environmental concerns linked to the Project during the construction and operational phases.

17.3 STRUCTURE AND FUNCTIONS OF THE CGM DURING CONSTRUCTION PHASE

- The Environmental Management Team (EMT) will establish a CGM.
- The structure of the CGM shall consist of members of the EMT, which shall also be the chair of the CGM with representatives from:
 - (i) Two representatives from the Community Relations Committee (one each from Suco Tibar and Suco Comoro).
 - (ii) One representative from the National Directorate of Pollution Control and Environmental Impact (NDPCEI).
 - (iii) One representative from the Department of Environmental Impact Assessment.
 - (iv) Other representatives may be co-opted into the CGM, as and when necessary.
- The main functions of the CGM Committee:
 - (i) Receive complaints from the public.
 - (ii) Call for a meeting to resolve the complaints based on the three tiers of resolution (see **Section 17.4** below).
 - (iii) The complainant and the contractors will have to be present at the resolution meeting. However, it is noted that the NDPCEI has an open door policy for complainants to remain anonymous, if requested.
 - (iv) Have quarterly meetings to discuss matters regarding the Project even though there are no complaints. This will help to build strong relations with the public.

- (v) Post all relevant contact numbers and contact persons of the CGM in the notice boards at the construction sites and at the local authority offices.
- (vi) Complaints and grievances can be in written format or by phone at the construction site and other key public offices.

17.3.1 Levels of Resolution in the CGM

- The CGM can have three tiers for resolution of complaints and grievances as follows:

(a) First Tier Implementation of CGM

- The contractors and/or the EMT are the first tier to offer the fastest and most accessible mechanism to resolve any complaints or grievances.
- A designated officer in the EMT shall be the key officer to immediately call for a sitting of the relevant person(s) in the CGM Committee to address the grievance and complaint, and any resolution shall be achieved within 20 working days.
- Investigation of grievance shall be part of the resolution process and will involve site visits and consultations with the relevant parties (e.g. affected persons, contractors, etc.).
- Grievances shall be documented such as personal details (name, address, date of complaint, etc.), unless anonymity is requested.
- An example of the grievance report format adopted from the European Bank for Reconstruction and Development's (EBRD) Project Complaint Mechanism, can be referred to in Appendix 17-A.
- To enable easier record keeping, the following elements shall be included:
 - (i) Initial grievance record: This includes description of grievance, details of complainant, locations, etc. An acknowledgement of receipt handed back to the complainant when the complaint is registered.
 - (ii) Grievance monitoring sheet: Describes actions being taken (investigation, corrective measures).
 - (iii) Closure sheet: One copy shall be handed to the complainant after he/she has agreed to the resolution and signed-off.
- An updated register of grievances and complaints will be available to the public at the EMT office, construction site and other key public offices (e.g. *Suco* and municipality offices).
- If the complaints and grievances are unresolved at the first tier, the CGM Committee will propose it to the second tier.

(b) Second Tier Implementation of CGM

- The NDPCEI itself may have its own committee to oversee to the development of the Project; in which case, it can be in a good position to resolve the second tier problems.
- In unresolved cases, the NDPCEI will call for and chair a meeting with the CGM Committee members and any other representatives from various agencies deemed relevant to help resolve the complaints and grievances.
- Any resolutions passed at the conclusion of the meeting will have 30 working days to come up with a plan of action for corrective measures at the field level, implementation of the corrective measures, and a timeframe to complete the corrective measures.
- The EMT will be responsible for processing all documents for the Committee of NDPCEI if needed, maintaining a database of complaints, recording decisions, issuing minutes of meetings (MOM) and monitoring to see that the formal orders are issued and the decision is carried out.
- The contractor in this tier will have observer status during such meetings with the Committee of NDPCEI.

(c) Third Tier Implementation of CGM

- In the event that the two tiers could not resolve the complaints and grievances, the affected person can seek options through the *Suco* or municipality committees under the existing arrangements for redress of complaints and grievances for the affected persons.
- The EMT and the Committee of NDPCEI will be kept informed by the municipality or national authority.
- The last alternative is to seek redress from the court of law in the country.

17.4 STRUCTURE AND FUNCTIONS OF THE CGM DURING OPERATIONAL PHASE

- The CGM during the operational phase of the Project will be similar to that of the construction phase whereby members of the CGM will comprise personnel from the EMT.
- With regard to the levels of resolution in the CGM during the operation phase, the levels and tiers would be similar as in the construction phase.
- The only difference between the two would be that the Project Manager (PM) would replace the contractors in each tier, while the EMT members would still remain.
- The structure of the CGM shall consist of members of the EMT, who shall also be the chair of the CGM with representatives from:

- (i) Two representatives from the Community Relations Committee (one each from Suco Tibar and Suco Comoro).
 - (ii) One representative from the National Directorate of Pollution Control and Environmental Impact (NDPCEI).
 - (iii) One representative from the Department of Environment.
 - (iv) Other representatives may be co-opted into the CGM, as and when necessary.
- The main functions of the CGM Committee:
 - (i) Receive complaints from the public.
 - (ii) Call for a meeting to resolve the complaints based on the three tiers of resolution.
 - (iii) The complainant and the Project Manager (PM) will have to be present at the resolution meeting. However, it is noted that the NDPCEI has an open door policy for complainants to remain anonymous, if requested.
 - (iv) Have half-yearly meetings to discuss matters regarding the Project even though there are no complaints. This will help to build strong relations with the public.
 - (v) Post all relevant contact numbers and contact persons of the CGM in the notice boards at the Project site and at the local authority offices.
 - (vi) Complaints and grievances can be in written format or by phone at the Project site and other key public offices.

17.4.1 Levels of Resolution in the CGM

- The CGM can have three tiers for resolution of complaints and grievances as follows:

(a) First Tier Implementation of CGM

- The PM and/or the EMT are the first tier to offer the fastest and most accessible mechanism to resolve any complaints or grievances.
- A designated officer in the EMT shall be the key officer to immediately call for a sitting of the relevant person(s) in the CGM Committee to address the grievance and complaint, and any resolution shall be achieved within 20 working days.
- Investigation of grievance shall be part of the resolution process and will involve site visits and consultations with the relevant parties (e.g. affected persons, Project operator, etc.).
- Grievances shall be documented such as personal details (name, address, date of complaint, etc.), unless anonymity is requested.

- An example of the grievance report format adopted from the European Bank for Reconstruction and Development's (EBRD) Project Complaint Mechanism, can be referred to in **Appendix 17-A**.
- To enable easier record keeping, the following elements shall be included:
 - (i) Initial grievance record: This includes description of grievance, details of complainant, locations, etc. An acknowledgement of receipt handed back to the complainant when the complaint is registered.
 - (ii) Grievance monitoring sheet: Describes actions being taken (investigation, corrective measures).
 - (iii) Closure sheet: One copy shall be handed to the complainant after he/she has agreed to the resolution and signed-off.
- An updated register of grievances and complaints will be available to the public at the EMT office, Project Office and other key public offices (e.g. Suco and municipality offices).
- If the complaints and grievances are unresolved at the first tier, the CGM Committee will escalate it to the second tier.

(b) Second Tier Implementation of CGM

- The NDPCEI itself may have its own committee to oversee to the development of the Project; in which case, it can be in a good position to resolve the second tier problems.
- In unresolved cases, the NDPCEI will call for and chair a meeting with the CGM Committee members and any other representatives from various agencies deemed relevant to help resolve the complaints and grievances.
- Any resolutions passed at the conclusion of the meeting will have 30 working days to come up with a plan of action for corrective measures, implementation, and a timeframe to complete the corrective measures.
- The EMT will be responsible for processing all documents for the Committee of NDPCEI if needed, maintaining a database of complaints, recording decisions, issuing minutes of meetings (MOM) and monitoring to see that the formal orders are issued and the decision is carried out.
- The PM in this tier will have observer status during such meetings with the Committee of NDPCEI.

(c) Third Tier Implementation of CGM

- In the event that the two tiers could not resolve the complaints and grievances, the affected person can seek options through the Suco or municipality committees under the existing arrangements for redress of complaints and grievances for affected persons.

- The EMT and the Committee of NDPCEI will be kept informed by the municipality or national authority.
- The last alternative is to seek redress from the court of law in the country.

Chapter 18

Environmental Work Plan and Implementation Schedule



CHAPTER 18: ENVIRONMENTAL WORK PLAN AND IMPLEMENTATION SCHEDULE

18.1 PRE-CONSTRUCTION PHASE

- The work plans and implementation schedules for the Project Document (PD), Terms of Reference (TOR), Environmental Impact Statement (EIS) and Environmental Management Plan (EMP) are shown in **Table 18.1.1**.

18.2 CONSTRUCTION PHASE

- The work plans and implementation schedules are provided in **Table 18.2.1** while **Tables 18.2.2 (a) to (c)** provide the environmental monitoring schedule over a period of six years.

18.3 OPERATIONAL PHASE

- **Table 18.3.1** provides the environmental work during operational phase, which is for one-year indemnity period.

Table 18.1.1: Pre-construction Work Schedule

Stage	Task	Study Timeline (Month)											
		2016				2017							
		1 Sep	2 Oct	3 Nov	4 Dec	5 Jan	6 Feb	7 Mar	8 Apr	9 May	10 Jun	11 Jul	12 Aug
Screening – PD													
1	Site reconnaissance	■											
2	Stakeholder engagement with governmental authorities, NGOs and local community	■	■										
3	Preparation and submission of PD		■	■									
4	PD evaluation and approval			■	■								
5	Preparation and submission of Revised PD				■								
6	Revised PD evaluation and approval				■								
Scoping – TOR													
7	Preparation and submission of Draft TOR			■	■								
8	Public consultation					■							
9	Submission of Final TOR					■							
10	TOR evaluation and approval						■	■					
EA Preparation – EIS and EMP													
11	Site investigations, field sampling and baseline data collection	■	■	■	■	■							
12	Data tabulation, collation, analysis and interpretation			■	■	■	■						
13	Preparation and submission of Draft EIS and EMP reports						■	■	■	■			
14	Public Consultation										■		
15	EIS and EMP technical evaluation and approval										■	■	
16	Submission of Final EIS and EMP Report to NDPCEI for approval												■

Table 10.1: Construction Schedule

Phase	No	Activity	Duration (Months)	Construction Period (Months)																																	
				2	4	5	8	11	12	14	15	16	17	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64
Construction Phase 1	1.	Preliminary Work	18	[Blue bar from month 2 to 20]																																	
		• Site Preparation	3	[Black bar from month 2 to 5]																																	
		• Site Levelling	4	[Black bar from month 4 to 8]																																	
		• Stockpiling	3	[Black bar from month 5 to 8]																																	
		• Site Facility	2	[Black bar from month 6 to 8]																																	
	Implementing RUP	72	[Green bar from month 2 to 74]																																		
	2.	Plot 2 (Service Apartment)	20	[Blue bar from month 2 to 20]																																	
		• Excavation	10	[Black bar from month 2 to 12]																																	
		(i) Foundation	6	[Black bar from month 4 to 10]																																	
		(ii) Post Foundation Work	4	[Black bar from month 8 to 12]																																	
		(iii) Concrete Slab Pour	4	[Black bar from month 10 to 14]																																	
		• Utilities	3	[Black bar from month 12 to 15]																																	
		• Framing	3	[Black bar from month 12 to 15]																																	
		• Roofing	3	[Black bar from month 12 to 15]																																	
		• Weather Resistant Barrier	3	[Black bar from month 12 to 15]																																	
		• Mechanical Systems	4	[Black bar from month 14 to 18]																																	
		• Lighting and Electrical	4	[Black bar from month 14 to 18]																																	
		• Air Fixing	4	[Black bar from month 14 to 18]																																	
• Insulation		4	[Black bar from month 14 to 18]																																		
• Siding	4	[Black bar from month 14 to 18]																																			
• Flooring	3	[Black bar from month 15 to 18]																																			
• Tiling	3	[Black bar from month 15 to 18]																																			
• Painting	3	[Black bar from month 15 to 18]																																			
3.	Plot 1a (2 nd floor)	10	[Blue bar from month 12 to 22]																																		
	• Excavation	10	[Black bar from month 12 to 22]																																		
	(i) Foundation	7	[Black bar from month 12 to 19]																																		
	(ii) Post Foundation Work	3	[Black bar from month 19 to 22]																																		
4.	Plot 1 (Ponding Area)	12	[Blue bar from month 12 to 24]																																		
	• Earthwork	8	[Black bar from month 12 to 20]																																		
	• Paving	4	[Black bar from month 16 to 20]																																		
	• Installation of Jety	4	[Black bar from month 16 to 20]																																		
Phase 2	5.	Plot 2 (Golf Course)	12	[Blue bar from month 24 to 36]																																	
		• Earthwork	2	[Black bar from month 24 to 26]																																	
		• Paving	4	[Black bar from month 26 to 30]																																	
		• Grass Construction	4	[Black bar from month 26 to 30]																																	
		• Tee Construction	2	[Black bar from month 28 to 30]																																	

Phase	No	Activities	Duration (Months)	Construction Period (Mar 23)																																					
				2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72		
Phase 2 (Contd)		• Barter Construction	2																																						
		• Drainage	2																																						
		• Irrigation System	2																																						
		• Soil Test	1																																						
		• Herbicide	2																																						
		• Landclearing	1																																						
6.	Plot 1 (5.00A Hotel)	24																																							
	• Excavation	10																																							
	(i) Foundation	6																																							
	(ii) First Foundation Wall	2																																							
	(iii) Concrete Slab Floor	2																																							
	• Lifting	4																																							
	• Framing	4																																							
	• Roofing	4																																							
	• Weather Resistant Membrane	4																																							
	• Mechanical Systems	8																																							
	• Lighting and Structural	8																																							
	• Air-Conditioning	2																																							
	• Insulation	2																																							
	• Siding	2																																							
	• Flooring	2																																							
	• Tiling	2																																							
• Painting	2																																								
7.	Plot 4 (Hotel Service Support Centre)	8																																							
	• Excavation	2																																							
	(i) Foundation	2																																							
	(ii) First Foundation Wall	1																																							
	(iii) Concrete Slab Floor	1																																							
	• Lifting	2																																							
	• Framing	2																																							
	• Roofing	2																																							
	• Weather Resistant Barrier	2																																							
• Lighting and Electrical	2																																								

Table 18.2.2 (c): Implementation Schedule for EMP Activities and Monitoring for Phase 3 Construction

Construction Activities	No	Implementation of EMP Activities	Construction Period (Month) ⁽ⁱ⁾																								
			48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
<ul style="list-style-type: none"> • Construction of Plot 5 (School) • Construction of Plot 6 (Hospital) • Construction of Plots 7 and 13 (Commercial Centre 1 and 2) • Construction of Plot 10 (2nd Hotel) • Construction of Plot 14 (Youth Development and Community Centre) 	1.	Mitigation Measures for Impact on Geomorphology and Geology																									
	2.	Soil Erosion and Sedimentation Control Measures	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	3.	Water Quality Control Measures	●			●			●			●			●			●			●			●			●
	4.	Air Quality Control Measures	●			●			●			●			●			●			●			●			●
	5.	Mitigation Measure for Impact on Hydrology																									
	6.	Noise Quality Control Measures	●			●			●			●			●			●			●			●			●
	7.	Ecological Management (Marine, Terrestrial and Lake)	●						●						●						●						●
	8.	Mitigation Measures for Impact on Infrastructure and Utilities	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	9.	Mitigation Measures for Impact on Landuse	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	10.	Mitigation Measures for Impact on Tourism	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	11.	Mitigation Measures for Impact on Traffic	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	12.	Waste Management	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	13.	Environmental Auditing	▲						▲						▲						▲						▲

Note: (i) The construction period of each phase may be overlapped.
(ii) ■ indicates the implementation period of the mitigation measure of each environmental component.
(iii) √ indicates the site inspection conducted by Environmental Officer (EO).
(iv) ● indicates the implementation month of monitoring conducted by Environmental Monitoring Consultant (EnvMC).
(v) ▲ indicates the implementation month of environmental auditing conducted by Environmental Auditor (EnvA).

Table 18.3.1: Implementation Schedule for EMP Activities and Monitoring during Operational Phase

No	Implementation of EMP Activities	Operation Period (Month)																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	...
1.	Water Quality Control Measures	■																
				●			●			●			●					
2.	Air Quality Control Measures	■																
				●			●			●			●					
3.	Noise Quality Control Measures	■																
				●			●			●			●					
4.	Ecological Management (Marine, Terrestrial and Lake)	■																
							●						●					
5.	Mitigation Measures for Impact on Infrastructure and Utilities	■																
							●						●					
6.	Mitigation Measures for Impact on Tourism	■																
							●						●					
7.	Waste Management	■																
				●			●			●			●					
8.	Environmental Auditing																	▲

- The mitigation measure for each environmental component will be implemented throughout the operation of the Project.
- The monitoring will only be carried out for one-year indemnity period.

Note: (i) ■ indicates the implementation period of the mitigation measure of each environmental component.
(ii) ● indicates the implementation month of monitoring conducted by Environmental Monitoring Consultant (EnvMC).
(iii) ▲ indicates the implementation month of environmental auditing conducted by Environmental Auditor (EnvA).

Chapter 19

Cost Estimates

CHAPTER 19: COST ESTIMATES

19.1 COSTS OF MITIGATION MEASURES

- Pelican Paradise Holdings (Timor-Leste), as a responsible Project Proponent (PP), is committed to carry out all pragmatic mitigating measures through the contractors, to avert and minimise any potential environmental impacts.
- There shall be sufficient budgetary allocations for undertaking the environmental protection and monitoring works.
- The overall estimated environmental budget for the construction and operational phases of the Project is summarised in **Table 19.1.1**. **Table 19.1.2** shows the environmental budget for each phase of construction.

Table 19.1.1: Overall Estimated Environmental Budget for the Project Development

Developmental Phase	No	Environmental Management Plan (EMP) Activities	Cost (USD)
Construction	1.	Mitigation Measures for Impact on Geomorphology and Geology	\$100,000
	2.	Soil Erosion and Sedimentation Control Measures	\$20,000
	3.	Water Quality Control Measures	\$30,000
	4.	Air Quality Control Measures	\$50,000
	5.	Mitigation Measures for Impact on Hydrology	\$10,000
	6.	Noise Control Measures	\$100,000
	7.	Ecological Management (Marine, Terrestrial and Lake)	\$550,000
	8.	Mitigation Measures for Impact on Infrastructure and Utilities	\$10,000
	9.	Mitigation Measures for Impact on Landuse	\$5,000
	10.	Mitigation Measures for Impact on Tourism	\$5,000
	11.	Mitigation Measures for Impact on Traffic	\$1,000
	12.	Waste Management	\$20,000
Sub-total			\$901,000
Operation	1.	Water Quality Control Measures	\$20,000
	2.	Air Quality Control Measures	\$10,000
	3.	Noise Control Measures	\$5,000
	4.	Ecological Management (Marine, Terrestrial and Lake)	\$20,000
	5.	Mitigation Measures for Impact on Infrastructure and Utilities	\$5,000
	6.	Mitigation Measures for Impact on Tourism	\$10,000
	7.	Waste Management	\$10,000
Sub-total			\$80,000
Grand Total			\$981,000

Table 19.1.2: Estimated Environmental Budget for Each Phases of Construction

Construction Activities	No.	Implementation of EMP Activities	Cost (USD)
Phase 1			
<ul style="list-style-type: none"> • Preliminary Work • Construction of Plot 2 (Services Apartment) • Excavation of Plot 10 (2nd Hotel) • Construction of Plot 1 (Floating Jetty) & Operation 	1.	Mitigation Measures for Impact on Geomorphology and Geology	\$30,000
	2.	Soil Erosion and Sedimentation Control Measures	\$6,000
	3.	Water Quality Control Measures	\$9,000
	4.	Air Quality Control Measures	\$15,000
	5.	Mitigation Measures for Impact on Hydrology	\$3,000
	6.	Noise Control Measures	\$30,000
	7.	Ecological Management (Marine, Terrestrial and Lake)	\$220,000
	8.	Mitigation Measures for Impact on Infrastructure and Utilities	\$3,000
	9.	Mitigation Measures for Impact on Landuse	\$1,500
	10.	Mitigation Measures for Impact on Tourism	\$1,500
	11.	Mitigation Measures for Impact on Traffic	\$300
	12.	Waste Management	\$6,000
Sub-total			\$325,300
Phase 2			
<ul style="list-style-type: none"> • Construction of Plot 2 (Golf Course) • Construction of Plot 1 (5 Start Hotel) • Construction of Plot 4 (Hotel Service Support Centre) • Construction of Plots 8 and 9 (Residential Units) 	1.	Mitigation Measures for Impact on Geomorphology and Geology	\$50,000
	2.	Soil Erosion and Sedimentation Control Measures	\$10,000
	3.	Water Quality Control Measures	\$15,000
	4.	Air Quality Control Measures	\$25,000
	5.	Mitigation Measures for Impact on Hydrology	\$5,000
	6.	Noise Control Measures	\$50,000
	7.	Ecological Management (Marine, Terrestrial and Lake)	\$275,000
	8.	Mitigation Measures for Impact on Infrastructure and Utilities	\$5,000
	9.	Mitigation Measures for Impact on Landuse	\$2,500
	10.	Mitigation Measures for Impact on Tourism	\$2,500
	11.	Mitigation Measures for Impact on Traffic	\$500
	12.	Waste Management	\$10,000
Sub-total			\$450,500

Construction Activities	No.	Implementation of EMP Activities	Cost (USD)
Phase 3			
<ul style="list-style-type: none"> • Construction of Plot 5 (School) • Construction of Plot 6 (Hospital) • Construction of Plots 7 and 13 (Commercial Centre 1 and 2) • Construction of Plot 10 (2nd Hotel) • Construction of Plot 14 (Youth Development and Community Centre) 	1.	Mitigation Measures for Impact on Geomorphology and Geology	\$20,000
	2.	Soil Erosion and Sedimentation Control Measures	\$4,000
	3.	Water Quality Control Measures	\$6,000
	4.	Air Quality Control Measures	\$10,000
	5.	Mitigation Measures for Impact on Hydrology	\$2,000
	6.	Noise Control Measures	\$20,000
	7.	Ecological Management (Marine, Terrestrial and Lake)	\$55,000
	8.	Mitigation Measures for Impact on Infrastructure and Utilities	\$2,000
	9.	Mitigation Measures for Impact on Landuse	\$1,000
	10.	Mitigation Measures for Impact on Tourism	\$1,000
	11.	Mitigation Measures for Impact on Traffic	\$200
	12.	Waste Management	\$4,000
	Sub-total		
Grand Total			\$901,000

Chapter 20

Review of EMP

CHAPTER 20: REVIEW OF EMP

20.1 OBJECTIVE OF REVIEW

- Environmental Management Plan (EMP) is a form of self regulation, where the onus is on the Project Proponent (PP), the contractors and his consultants.
- The EMP document will be reviewed by the National Directorate of Pollution Control and Environmental Impact (NDPCEI), to ascertain whether the plan is achieving its objectives, and the requirements of relevant approval conditions are met.
- The EMP is an iterative and dynamic document where it shall be reviewed and updated or amended by the PP and the environmental consultants, wherever necessary, to ensure that it remains adequately responsive to the methods used in Project development, as the Project progresses with time during the construction and operational schedule.

20.2 REASONS FOR AMENDMENT AND UPDATES

- Before an amendment/update to the EMP document is carried out, the PP through the Project Manager (PM), technical engineers and the environmental consultants shall first take into account the environmental monitoring records, environmental incidents, corrective actions and the results of any audits.
- Suggestions for amendments/update can be received through the contractor and PP on the Project development.
- The review of the EMP would typically be undertaken based on the following:
 - (i) Significant environmental incidents that need follow-up actions.
 - (ii) When there is a need to improve the performance in an area of environmental impact.
 - (iii) Periodical actions that are needed for longer timeframes such as for more than six years.
 - (iv) Environmental quality standards and requirements that have been amended, upgraded and adopted by the NDPCEI.
 - (v) Changing of construction methods, design, or sites of construction works.

20.3 AMENDMENT AND UPDATES DURING CONSTRUCTION PHASE

- The PP or the PM shall:
 - (i) Undertake a full review of the EMP annually with the appointed contractors, and Environmental Monitoring Consultants (EnvMC).
 - (ii) Encourage the contractors to propose changes to the EMP when needed.

- (iii) Endorse any decisions made to amend the EMP if needed.

20.4 AMENDMENT AND UPDATES DURING OPERATIONAL PHASE

- The environmental operational EMP is only for one year. It is unlikely that there will be any amendments to the EMP when the environment would have been made good by then.
- The only updates that would possibly be needed for the long-term, are for the continual proper handling of all wastes and effluent from the treatment plants:
 - (i) Vegetated wastes from the Project may be too much for composting and hence, need to be transferred direct to the Tibar Landfill instead.
 - (ii) As there is no facility yet in Timor-Leste to neutralise and treat scheduled wastes, these waste streams will have to be got rid off by proper storage or sold to agents for their use.
 - (iii) Treated effluent from the sewage treatment plants (STPs) may be reticulated to other areas instead of to the original intended locations such as at the lakes and golf course, in which case will require amendments to the EMP.

Chapter 21

Non-Technical Summary

CHAPTER 21: NON-TECHNICAL SUMMARY

21.1 EXECUTIVE SUMMARY

- The Project is for an integrated mixed development covering a total of 563.04 ha, straddling Post Administration Dom Aleixo, Municipality of Dili, and Post Administration Bazartete, Municipality of Liquica. It is located ~8 km from the capital, Dili.
- Details of this Environmental Management Plan (EMP) from **Chapters 2 to 21** are summarised in **Chapter 1: Executive Summary**.

21.2 DETAILS OF PROJECT PROPONENT

- Pelican Paradise Holdings Timor-Leste is the Project Proponent (PP) that initiates the EIS and EMP for the Proposed Pelican Paradise Development, Tibar-Tasi Tolu, Timor-Leste.

21.3 DETAILS OF THE ENVIRONMENTAL CONSULTANTS

- The Environmental Consultant is Asia Pacific Environmental Consultants Sdn Bhd ('ASPEC' for short).

21.4 ENVIRONMENTAL ASSESSMENT AND APPROVAL PROCESS

- **Legislation:** Regulatory approval for developmental projects, such as this Project (under Category A), is undertaken by the National Directorate of Pollution Control and Environmental Impact (NDPCEI), under Decree-Law No.5/2011 on Environmental Licensing Law (ELL) that defines the environmental licensing system for public and private projects likely to produce environmental impacts. The licensing system comprising procedures, roles and responsibilities is shown in **Figure 4.2.1 (Chapter 4: Description of the Project)**.

21.5 PROJECT DESCRIPTION

- The Project is an integrated mixed Project with a focus on resort development comprising:
 - (i) Commercial component: with an 18-hole golf course, hotels, service apartments, residential units and commercial centres.
 - (ii) Institutional component: with a youth development and community centre, a school and a hospital.
 - (iii) National and environmental component: with parks and hill areas for recreation, with a replanting scheme to rehabilitate the degraded forest.

- (iv) Infrastructure and utility component: with internal roads, sub-stations, a utility centre including sewage treatment plants, water recycling and a desalination plant.

21.6 LEGAL REQUIREMENTS

- This EMP has been prepared to comply with the legal and regulatory requirements under the Decree Law No.26/2012 on Environmental Basic Law (EBL), and the Decree Law No.5/2011 on Environmental Licensing Law (ELL) of the National Directorate of Pollution Control and Environmental Impact (NDPCEI), Democratic Republic of Timor-Leste (DRTL).
- The EMP has used the standards, guidelines and best management practices (BMPs) of Timor-Leste. Wherever these are found lacking, standards and BMPs from ASEAN countries such as Malaysia have been used as agreed upon during our earlier discussions with officials from the NDPCEI.

21.7 INSTITUTIONAL ROLES AND RESPONSIBILITIES

- The institutions that will play a vital role in ensuring a smooth and environmentally sound development of the Project for each phase of development, are listed in **Table 21.7.1**.

Table 21.7.1: Institutions Involved in the Project Development

Phase	Institutions
Pre-construction	• National Directorate of Pollution Control and Environmental Impact (NDPCEI)
	• Pelican Paradise Holdings (Timor-Leste) or Project Proponent (PP)
	• Asia Pacific Environmental Consultants Sdn Bhd (ASPEC)
Construction	• National Directorate of Pollution Control and Environmental Impact (NDPCEI)
	• National Directorate of Land, Property and Cadastral Services
	• National Directorate of Roads, Bridges and Flood Control
	• National Directorate of Water and Sanitation
	• National Directorate of Aquaculture and Fisheries
	• National Directorate of Sanitation Control and Environmental Health
	• Department of Policy and Strategic Planning
	• Suco Comoro and Tibar
	• Pelican Paradise Holdings (Timor-Leste) or PP
	• Main Contractor (MC)
	• Environmental Monitoring Consultant (EnvMC)
• Environmental Auditor (EnvA)	

Phase	Institutions
Operation	<ul style="list-style-type: none"> National Directorate of Pollution Control and Environmental Impact (NDPCEI)
	<ul style="list-style-type: none"> National Directorate of Water and Sanitation
	<ul style="list-style-type: none"> National Directorate of Forestry and Watershed Management
	<ul style="list-style-type: none"> Pelican Paradise Holdings (Timor-Leste) or PP
	<ul style="list-style-type: none"> Environmental Monitoring Consultant (EnvMC)
	<ul style="list-style-type: none"> Environmental Auditor (EnvA)

21.8 SUMMARY OF IMPACTS

- The impacts during each phase of development are summarised in **Table 21.8.1**, where the significance of both positive and negative impacts are provided.

Table 21.8.1: Summary of Impacts and Significance

Impacts		Description
Pre-construction Phase		
Significant Negative Impacts		<ul style="list-style-type: none"> No significant negative impacts ascertained. Result: No mitigations needed.
Construction Phase		
Significant Negative Impacts	Major	<ul style="list-style-type: none"> Soil erosion and sedimentation. Marine and lake water quality deterioration. Air pollution. Result: Mitigations required. Time Period: Short to mid-term.
	Minor	<ul style="list-style-type: none"> Alteration of hydrological system. Displacement of fauna through loss of habitat. Increased noise. Landuse change. Traffic congestion. Social conflicts. Result: Intermittent mitigations required. Time Period: Short to mid-term.
Significant Positive Impacts		<ul style="list-style-type: none"> More jobs and business opportunities. Multiplier effects on the local economy. Result: Need only enhancements. Time Period: Short to long-term.
Operational Phase		
Significant Negative Impacts	Major	<ul style="list-style-type: none"> Water pollution by sewage effluents. Increased traffic volumes. Result: Mitigation measures required. Time Period: Short to mid-term.
	Minor	<ul style="list-style-type: none"> Air pollution. Increased noise level. Increased peak flow discharges. Result: Intermittent mitigation measures required. Time Period: Short to mid-term.

Impacts	Description
Significant Positive Impacts	<ul style="list-style-type: none"> • Aesthetic improvements to Tasi Tolu area. • Enhanced terrestrial and lake ecology. • Generation of jobs and business. • Land value appreciation. • Increase in housing, commercial and institutional development. • Improvements in standard of living. • Increased Gross Domestic Product (GDP) of the country. • Increased tourist arrival. • Result: Need only enhancements. • Time Period: Short to long-term.

21.9 SOCIAL IMPACTS

- The social impacts are summarised in **Table 21.9.1**.

Table 21.9.1: Social Impacts According to Phases

Phase	Impact
Pre-construction	<ul style="list-style-type: none"> • Economic impact due to increased travel time to work place. • Psychological impact due to relocation and anxiety issues.
Construction	<ul style="list-style-type: none"> • Increased pressure on public amenities and services due to influx of migrant workers. • Public health and safety issues due to construction activities and influx of workers. • Social conflicts due to job competition and different culture and ways of life between migrant workers and locals.
Operation	<ul style="list-style-type: none"> • Influx of tourists, visitors, and hotel employees from other areas may affect tranquillity and way of life.

21.10 MITIGATION MEASURES

- The mitigation measures provided in this EMP to mitigate against the significant negative impacts as listed in **Table 21.8.1** as well as the social-economic impacts (**Table 21.9.1**) brought upon by the Project development.

21.11 GOVERNING PARAMETERS

- Environmental Performance Indicators (EPI) to ensure the objectives and standards are met, are listed in **Table 21.11.1**.

Table 21.11.1: EPI and Targeted Compliance Criteria

Key Performance Indicator	Targeted Compliance Criteria	Application																																													
		Construction Phase	Operational Phase																																												
Marine and Lake Water Quality	(a) Class 2 of the Malaysia Marine Water Quality Criteria and Standards (MWQCS)	✓	✓																																												
		<ul style="list-style-type: none"> Compliance limit for marine and lake water quality: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Parameter⁽ⁱ⁾</th> <th style="text-align: center;">Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Temperature</td> <td>≤2°C increase over maximum ambient</td> </tr> <tr> <td>Total Suspended Solid (TSS)⁽ⁱⁱⁱ⁾</td> <td>50 mg/L (25 mg/L) or ≤0% increase in seasonal average, whichever is lower</td> </tr> <tr> <td>Dissolved Oxygen (DO)</td> <td>5 mg/L</td> </tr> <tr> <td>pH</td> <td>-</td> </tr> <tr> <td>Salinity</td> <td>-</td> </tr> <tr> <td>Conductivity</td> <td>-</td> </tr> <tr> <td>Turbidity</td> <td>-</td> </tr> <tr> <td>Oil and grease (O&G)</td> <td>0.14 mg/L</td> </tr> <tr> <td>Phosphate</td> <td>75 µg/L</td> </tr> <tr> <td>Phenol</td> <td>10 µg/L</td> </tr> <tr> <td>Faecal Coliform⁽ⁱⁱⁱ⁾</td> <td>10 MPN/100 mL (70 MPN/100 mL)</td> </tr> <tr> <td>Mercury⁽ⁱⁱⁱ⁾ (Hg)</td> <td>0.16 (0.04) µg/L</td> </tr> <tr> <td>Cadmium⁽ⁱⁱⁱ⁾ (Cd)</td> <td>2 (3) µg/L</td> </tr> <tr> <td>Chromium (VI) (Cr⁶⁺)</td> <td>10 µg/L</td> </tr> <tr> <td>Copper (Cu)</td> <td>2.9 µg/L</td> </tr> <tr> <td>Arsenic⁽ⁱⁱⁱ⁾ (As)</td> <td>20 (3) µg/L</td> </tr> <tr> <td>Lead (Pb)</td> <td>8.5 µg/L</td> </tr> <tr> <td>Zinc (Zn)</td> <td>50 µg/L</td> </tr> <tr> <td>Cyanide (CN)</td> <td>7 µg/L</td> </tr> <tr> <td>Ammonia</td> <td>70 µg/L</td> </tr> <tr> <td>Nitrite (NO₂⁻)</td> <td>55 µg/L</td> </tr> <tr> <td>Nitrate (NO₃⁻)</td> <td>60 µg/L</td> </tr> </tbody> </table>		Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Temperature	≤2°C increase over maximum ambient	Total Suspended Solid (TSS) ⁽ⁱⁱⁱ⁾	50 mg/L (25 mg/L) or ≤0% increase in seasonal average, whichever is lower	Dissolved Oxygen (DO)	5 mg/L	pH	-	Salinity	-	Conductivity	-	Turbidity	-	Oil and grease (O&G)	0.14 mg/L	Phosphate	75 µg/L	Phenol	10 µg/L	Faecal Coliform ⁽ⁱⁱⁱ⁾	10 MPN/100 mL (70 MPN/100 mL)	Mercury ⁽ⁱⁱⁱ⁾ (Hg)	0.16 (0.04) µg/L	Cadmium ⁽ⁱⁱⁱ⁾ (Cd)	2 (3) µg/L	Chromium (VI) (Cr ⁶⁺)	10 µg/L	Copper (Cu)	2.9 µg/L	Arsenic ⁽ⁱⁱⁱ⁾ (As)	20 (3) µg/L	Lead (Pb)	8.5 µg/L	Zinc (Zn)	50 µg/L	Cyanide (CN)	7 µg/L	Ammonia	70 µg/L	Nitrite (NO ₂ ⁻)	55 µg/L
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		Construction Phase	Operational Phase																			
	(b) Conditions of environmental license (if any)	✓	✓																			
Groundwater Quality	(i) Decree-Law No.5/2009, Licensing Regulations, Sale and Quality of Drinking Water	X	✓																			
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Erosion and Sedimentation	(a) Erosion and Sediment Control Plan (ESCP)	TSS: 50 mg/L	X																		
	(b) Conditions of environmental license (if any)	✓	X																		
Air Quality	(a) World Health Organisation (WHO) Air Quality Guidelines	✓	X																		
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Key Performance Indicator	Targeted Compliance Criteria	Application							
		Construction Phase	Operational Phase						
	(b) Conditions of environmental license (if any)	✓	X						
Noise	(a) WHO Guidelines Values for Community Noise in Specific Environments	✓	X						
		<ul style="list-style-type: none"> Compliance limit for ambient noise: <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>L_{eq}</td> <td>outdoor living area environment category with a limit of L_{Aeq} of 55 dB or 50 dB during day and evening with a time base of 16 hours</td> </tr> </tbody> </table>		Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	L _{eq}	outdoor living area environment category with a limit of L _{Aeq} of 55 dB or 50 dB during day and evening with a time base of 16 hours		
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(b) Conditions of environmental license (if any)	✓	X							
Waste Management	(a) <u>Solid Waste Management</u> : Decree Law No.26/2012 Environmental Basic Law Article 39	✓	✓						
	(b) <u>Hazardous/Scheduled Waste Management</u> : Decree Law No. 26/2012 Environmental Basic Law, Article 42	✓	✓						
	(c) <u>Sewage (for temporary facility)</u> : (a) Decree Law No. 26/2012 Environmental Basic Law, Article 41. (b) Malaysian Sewerage Industry Guidelines, SPAN, 2009.	✓	X						
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	(e) Conditions of Environmental License (if any)	✓	✓																																		

Key Performance Indicator	Targeted Compliance Criteria	Application	
		Construction Phase	Operational Phase
Biodiversity	(a) UNTAET Regulation 2000/19 on Protected Places	✓	X
	(b) Decree Law No.26/2012 Environmental Basic Law, Article 27	✓	X
	(c) UNTAET Regulation No.2000/17 on the Prohibition of Logging Operations and the Export of Wood from East Timor	✓	✓
	(d) Draft Decree Law on Biodiversity, dated March 2012	✓	✓
	(e) Draft Decree Law on Forest Management, draft 6	✓	✓
	(f) National Biodiversity Strategy and Action Plan (2011 – 2012)	✓	✓
	(g) Forestry Sector Policy Goal Objective and Strategy	✓	X
	(h) Conditions of environmental license (if any)	✓	✓

21.12 MONITORING AND AUDITING PROGRAMMES

- Environmental components to be monitored during the construction phase are:
 - (i) Site conditions.
 - (ii) Water quality (lake and marine waters).
 - (iii) Air quality.
 - (iv) Noise.
 - (v) Ecology.
 - (vi) Waste management.
 - (vii) Safety and health.
- Environmental components to be monitored during the operational phase are:
 - (i) Water quality (lake, marine water and groundwater).
 - (ii) Sewage effluent.
 - (iii) Ecology.
- Environmental audit for the Project will be done half yearly during the construction and operational phases.

21.13 REPORTING REQUIREMENTS

- Two types of monitoring reports will be prepared for all phases:
 - (i) The first report will be prepared for internal use (quarterly) to provide feedbacks to the Project Proponent (PP), Main Contractor (MC), Environmental Management Team (EMT) and Emergency Response Team (ERT).
 - (ii) The second (half yearly and/or yearly) will be prepared for external use to the NDPCEI for their information.

21.14 RESPONSIBILITIES FOR MITIGATION AND MONITORING

- The members responsible for implementing the mitigation measures and monitoring during each phase of development are provided in **Table 21.14.1**.

Table 21.14.1: Members Responsible for Implementation of Mitigation and Monitoring

Developmental Phase	EMT Members
Construction	<ul style="list-style-type: none"> • Pelican Paradise Holdings (Timor-Leste) or PP • Project Manager (PM) appointed by PP • Main Contractor (MC) • Sub-contractors (SC) • Safety, Health and Environmental (SHE) Manager and Environmental Officer (EO) appointed by the MC • Environmental Monitoring Consultant (EnvMC)

Developmental Phase	EMT Members
Operation	<ul style="list-style-type: none"> • PP assisted by PM • Golf Course Superintendent assisted by maintenance supervisor • STP Operator • EnvMC

21.15 EMERGENCY RESPONSE PLAN

- **Table 21.15.1** provides a summary of the Emergency Response Plan (ERP) for each phase of development. The details are in **Chapter 13** of this EMP.

Table 21.15.1: Emergency According to Development Phases

Developmental Phase	Emergency Scenarios
Construction	<ul style="list-style-type: none"> • Serious accidents involving injury • Fatal accidents • Fire or explosions • Oil and hazardous materials spills on land and sea • Structure collapse
Operation	<ul style="list-style-type: none"> • Wastewater overflow • Serious accidents involving injury • Fatal accidents • Fire or explosion

21.16 DECOMMISSIONING PLAN

- As the Project is an integrated mixed development that has a foreseeable long-term operational life; and not a project (i.e. mining projects) that has a closure phase, no decommissioning plan is required.

21.17 TRAINING

- Training specifically targeting personnel associated with the Project will be provided to enhance their skills in managing the environmental components of the Project.

21.18 PUBLIC CONSULTATIONS AND INFORMATION DISCLOSURE

- Public consultations with the local communities, Sucos, NGOs and environmental authorities have been carried out from September 2016 to January 2018 (see **Chapter 16** for details).
- The stakeholders have been briefed on the Project and their views considered in the EIS and EMP Reports. The stakeholders perceived that jobs and business would be created to help reduce the unemployment situation in the country and hence they supported the Project. The stakeholders, however, rejected the option to convert the Tasi Tolu Lake A into a freshwater lake as it is a sacred and historical site.

21.19 COMPLAINT AND GRIEVANCE MECHANISM

- A three-tiered complaint and grievance mechanism (CGM) has been proposed in **Chapter 17**, as an avenue to resolve and address any complaints and grievances that may occur as part of the Project's social responsibilities.

21.20 IMPLEMENTATION SCHEDULE

- The development of the Project from the construction until its final completion is slated originally for three years but is now scheduled for a total of six years.
- The development for the three phases is shown in **Table 21.20.1**.

Table 21.20.1: Project Development Timeline

Phasing	Development Plot/ Component	2017	2018	2019	2020	2021	2022	2023
Phase 1	Plot 1 – Jetty Plot 3 – Service Apartment Plot 10 – 2 nd Hotel (earthworks only)		■					
Phase 2	Plot 1 – 5-Star Hotel Plot 2 – 18-Hole Golf Course Plot 4 – Utility Centre Plots 8 & 9 – Residential Units (infrastructure works)*		■					
Phase 3	Plot 5 – School Plot 6 – Hospital Plot 7 & 13 – Commercial Centre 1 & 2 Plot 10 – 2 nd Hotel Plot 14 – Youth Development and Community Centre Plot 11 – Forest Reserve Areas (Reforestation)				■			

Note: *Earth fill will be obtained from Plots 8 and 9 for earthworks of the other development component parcels.

21.21 COST ESTIMATES

- Details of the budget allocations for environmental protection have been provided in **Chapter 19**.

21.22 REVIEW OF EMP

- The procedures to review this EMP for all phases of development have been provided in **Chapter 20** to meet the objectives and requirements of the approval conditions of the NDPCEI.

Rezumu Eksekutif



Projeitu nee, la iha impaktu ambiente boot iha faze pre-konstrusaun no la iha faze Demobilization. Impaktu ambiente neebe idenfika sei tuir kategoria rua: i) Impaktu Faze Konstrusaun ii) Impaktu Faze Operasional.

Faze Konstrusaun

Aktivitas Projeitu	Impaktu Ambiente Nee'be Bele Mosu	Medida Mitigasi	Kustu Medida (Anggaran) (USD)	Fatin Foti Sampel/Parameter Monitoring No Limitadu	Frekuensi Monitoring no Responsibilidade	Responsibilidade atu Halo Mitigasi						
<ul style="list-style-type: none"> Mobilizasaun husi kontraktor Rekrut traballador Konstrusaun edifisiu temporaria ba konstrusaun Mobilizasaun ekipa no makina servisu Konstrusaun ponte Hamoos rai Hamuda biomass 	<p>Geoloji</p> <ul style="list-style-type: none"> Servisu hanesa kee rai iha fatin rai lolon bele halo rai lolon monu. 	<p>Geomorfologi no geologi</p> <ul style="list-style-type: none"> Shotcrete bele prevensaun no kontrola fatuk no rai monu. Concrete buttresses atu suporta overhanging rock blocks. Potentially loose blocks to be secured by applying various reinforcement techniques such as the installation of dowels, rock bolts of rock anchors. Hasai fatuk neebe ladun stabil no halo reinforced wall. Halo saluran ba bee atu bee la bele ba fatin rai lolon. Horizontal or inclined subsurface drains drilled into the slope cuts will reduce the groundwater level within and prevent build-up of excess water pressure. 	\$100,000	<ul style="list-style-type: none"> La presiza foti sampel. 	<ul style="list-style-type: none"> Semana ida dala ida - Environmental Officer (EO). 	<ul style="list-style-type: none"> kontraktor 						
<ul style="list-style-type: none"> Earthwork and platform formation Earthworks, sculpturing and shaping the golf course General piling and structural works Final finishing and landscape 	<p>Erozaun rai</p> <ul style="list-style-type: none"> Erozaun rai bele mosu bainhira konstrusaun no bele afeta kualitas bee danau no tasi. 	<p>Erozaun rai no sedimentasi rai</p> <ul style="list-style-type: none"> Aktivitas kee rai tenke minimum bainhira loron uda, Implementasi best management practices (BMPs) in Erosion and Sediment Control Plan (ESCP). Kuda duut atu taka rai nebe bele monu nia. Runoff control including earth drain, check dam, temporary berm drain and temporary slope drain to be constructed and well-maintained. Kontrola erozaun uza covers, such as plastic sheets, turfing and planting, buffer strips and surface roughening. Kontrola sedimentasi liu husi konstrusaun long bund, check dams, silt fence, silt traps no wash trough. Monitoring total suspended solid (TSS) and turbidity at discharge points of silt traps. 	\$20,000	<ul style="list-style-type: none"> Kondisi fatin stockpile. Implementasaun Best Management Practices (BMP). Sampel bee iha outlet silt trap. Fulan ida, halo sampel dala ida. Parameter analisis hanesan nee: <table border="1"> <thead> <tr> <th>Parameter</th> <th>Limits</th> </tr> </thead> <tbody> <tr> <td>Total Suspended Solid (TSS)</td> <td><50 mg/L</td> </tr> <tr> <td>Turbidity</td> <td><250 NTU</td> </tr> </tbody> </table>	Parameter	Limits	Total Suspended Solid (TSS)	<50 mg/L	Turbidity	<250 NTU	<ul style="list-style-type: none"> Inspesaun loron loron husi Environmental Officer (EO). Fiskaliza sampel bee fulan ida dala ida husi Environmental Officer (EO). Fiskaliza husi Environmental Monitoring Consultant (EnvMC), fulan 4 dala ida. 	<ul style="list-style-type: none"> kontraktor
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Fatin tein tenke iha instalasaun <i>oil and grease traps</i> no mos tenke halo manutensaun. <i>All scheduled wastes to be managed properly e.g. collected in durable containers with proper labels for neutralisation or treatment.</i> Fiskaliza kualitas bee. 	<p>\$30,000</p>	<p>Fiskaliza bee iha danau Tasi Tolu</p> <ul style="list-style-type: none"> Fatin atu lori sampel bee danau: <p style="text-align: center;">Lake Saltwater Sampling</p> <table border="1"> <thead> <tr> <th>Points</th> <th>Coordinates</th> </tr> </thead> <tbody> <tr> <td>LW1 (Lake C)</td> <td>S8.56623° E125.51079°</td> </tr> <tr> <td>LW2 (Lake B)</td> <td>S8.56587° E125.50720°</td> </tr> <tr> <td>LW3 (Lake A)</td> <td>S8.56198° E125.49990°</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Bee danau sei presize tempo uituan atu stabiliza no rehabilitasi. Rekomendasaun iha EMP nee katak bee danau sei kumpri ho baseline hanesan iha okos. <i>Monitoring parameters/limits (baseline):</i> <table border="1"> <thead> <tr> <th rowspan="2">Parameter⁽ⁱ⁾</th> <th colspan="3">Limits (Baseline)⁽ⁱⁱ⁾</th> </tr> <tr> <th>Lake A (LW3)</th> <th>Lake B (LW2)</th> <th>Lake C (LW1)</th> </tr> </thead> <tbody> <tr><td>Temperature</td><td>37.0</td><td>37.8</td><td>36.5</td></tr> <tr><td>Total Suspended Solid (TSS)</td><td>23</td><td>66</td><td>31</td></tr> <tr><td>Dissolved Oxygen (DO)</td><td>6.3</td><td>4.7</td><td>5.1</td></tr> <tr><td>pH</td><td>7.99</td><td>8.48</td><td>8.40</td></tr> <tr><td>Salinity</td><td>35.0</td><td>48.7</td><td>50.2</td></tr> <tr><td>Conductivity</td><td>41</td><td>51</td><td>54</td></tr> <tr><td>Oil and Grease (O&G)</td><td>ND (<0.5)</td><td>ND (<0.5)</td><td>ND (<0.5)</td></tr> <tr><td>Phenol</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Faecal Coliform</td><td>Absent</td><td>Absent</td><td>Absent</td></tr> <tr><td>Mercury (Hg)</td><td>ND (<0.8)</td><td>ND (<0.8)</td><td>ND (<0.8)</td></tr> <tr><td>Cadmium (Cd)</td><td>ND (<2.0)</td><td>ND (<2.0)</td><td>ND (<2.0)</td></tr> <tr><td>Chromium (VI) (Cr⁶⁺)</td><td>ND (<5.0)</td><td>ND (<5.0)</td><td>ND (<5.0)</td></tr> <tr><td>Copper (Cu)</td><td>24</td><td>28</td><td>12</td></tr> <tr><td>Arsenic (As)</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Lead (Pb)</td><td>ND (<10.0)</td><td>18.7</td><td>ND (<10.0)</td></tr> <tr><td>Zinc (Zn)</td><td>150</td><td>42</td><td>18</td></tr> <tr><td>Cyanide (CN)</td><td>ND (<10.0)</td><td>ND (<10.0)</td><td>ND (<10.0)</td></tr> <tr><td>Ammonia</td><td>64.0</td><td>64.4</td><td>35.5</td></tr> <tr><td>Nitrite (NO₂⁻)</td><td>69.3</td><td>135</td><td>69.7</td></tr> <tr><td>Nitrate (NO₃⁻)</td><td>361</td><td>140</td><td>283</td></tr> <tr><td>Total Phosphorus</td><td>ND (<90)</td><td>104</td><td>282</td></tr> <tr><td>Turbidity</td><td colspan="3" style="text-align: center;">-</td></tr> <tr><td>Phosphate⁽ⁱⁱⁱ⁾</td><td colspan="3" style="text-align: center;">75 µg/L</td></tr> </tbody> </table> <p><i>Note:</i></p> <p>(i) <i>Parameters shown in the table above are analysed for ambient lake water quality.</i></p> <p>(ii) <i>Limits values shown in the table above are baseline findings.</i></p> <p>(iii) <i>Limits value for phosphate is adopted from Class 2 of Malaysia Marine Water Quality Criteria and Standards (MWQCS).</i></p>	Points	Coordinates	LW1 (Lake C)	S8.56623° E125.51079°	LW2 (Lake B)	S8.56587° E125.50720°	LW3 (Lake A)	S8.56198° E125.49990°	Parameter ⁽ⁱ⁾	Limits (Baseline) ⁽ⁱⁱ⁾			Lake A (LW3)	Lake B (LW2)	Lake C (LW1)	Temperature	37.0	37.8	36.5	Total Suspended Solid (TSS)	23	66	31	Dissolved Oxygen (DO)	6.3	4.7	5.1	pH	7.99	8.48	8.40	Salinity	35.0	48.7	50.2	Conductivity	41	51	54	Oil and Grease (O&G)	ND (<0.5)	ND (<0.5)	ND (<0.5)	Phenol	ND (<1.0)	ND (<1.0)	ND (<1.0)	Faecal Coliform	Absent	Absent	Absent	Mercury (Hg)	ND (<0.8)	ND (<0.8)	ND (<0.8)	Cadmium (Cd)	ND (<2.0)	ND (<2.0)	ND (<2.0)	Chromium (VI) (Cr ⁶⁺)	ND (<5.0)	ND (<5.0)	ND (<5.0)	Copper (Cu)	24	28	12	Arsenic (As)	ND (<1.0)	ND (<1.0)	ND (<1.0)	Lead (Pb)	ND (<10.0)	18.7	ND (<10.0)	Zinc (Zn)	150	42	18	Cyanide (CN)	ND (<10.0)	ND (<10.0)	ND (<10.0)	Ammonia	64.0	64.4	35.5	Nitrite (NO ₂ ⁻)	69.3	135	69.7	Nitrate (NO ₃ ⁻)	361	140	283	Total Phosphorus	ND (<90)	104	282	Turbidity	-			Phosphate ⁽ⁱⁱⁱ⁾	75 µg/L			<ul style="list-style-type: none"> Fiskaliza husi EnvMC fulan 4 dala ida 	<ul style="list-style-type: none"> Kontraktor
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Mercury ⁽ⁱⁱⁱ⁾ (Hg)	0.16 (0.04) µg/L																																																																																			
Cadmium ⁽ⁱⁱⁱ⁾ (Cd)	2 (3) µg/L																																																																																			
Chromium (VI) (Cr ⁶⁺)	10 µg/L																																																																																			
Copper (Cu)	2.9 µg/L																																																																																			
Arsenic ⁽ⁱⁱⁱ⁾ (As)	20 (3) µg/L																																																																																			
Lead (Pb)	8.5 µg/L																																																																																			
Zinc (Zn)	50 µg/L																																																																																			
Cyanide (CN)	7 µg/L																																																																																			
Ammonia	70 µg/L																																																																																			
Nitrite (NO ₂ ⁻)	55 µg/L																																																																																			
Nitrate (NO ₃ ⁻)	60 µg/L																																																																																			
Points	Coordinates																																																																																			
JW1	S8.55577° E125.50344°																																																																																			
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JW3	S8.55703° E125.50587°																																																																																			
JW4	S8.55743° E125.50388°																																																																																			
Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾																																																																																			
Total Suspended Solid (TSS) ⁽ⁱⁱⁱ⁾	50 mg/L (25 mg/L) or ≤10% increase in seasonal average, whichever is lower																																																																																			

Aktivitas Projeto	Impaktu Ambiente Nee'be Bele Mosu	Medida Mitigasi	Kustu Medida (Anggaran) (USD)	Fatin Foti Sampel/Parameter Monitoring No Limitadu	Frekuensi Monitoring no Responsibilidade	Responsibilidade atu Halo Mitigasi														
<ul style="list-style-type: none"> Mobilizasaun husi kontraktor Rekrut traballador Konstrusaun edifisiu temporaria ba konstrusaun Mobilizasaun ekipa no makina servisu Konstrusaun ponte Hamoos rai Hamuda biomass Earthwork and platform formation Earthworks, sculpturing and shaping the golf course General piling and structural works Final finishing and landscape (kontinuasaun) 	<p>Kualitas udara</p> <ul style="list-style-type: none"> Rai rahun no rai uut bele mosu husi aktivitas konstrusaun no transportasaun sasan konstrusaun. Sentina foer no fatin lixu foer mos bele halo fatin projeto sai dois. 	<p>Polusi Udara</p> <ul style="list-style-type: none"> Tamba fatin projeto nee sei esperiensa tempo maran fulan neen, <i>wet suppression</i> sei sai hanesan medida diak. Nee inklui: <i>water bowing on untarred roads; having wash troughs at the egress and ingress junctions; and sand stockpile areas.</i> Material konstrusaun neebe bele sai hanesan rai rahun mos tenke taka ho tarpaulin/plastic sheet. Kuda duut iha fatin neebe bele mosu rai rahun barak. Kompaktu rai neebe bele sai rai rahun barak Provision of temporary hoarding or barriers. Kuda ai horis no duut bele minimiza rai rahun Lixu tenke lori ba fatin foer iha Tibar loran ba loran atu labele sai dois. Konstrusaun kampu golf tenke planu didiak atu bele miniza rai rahun. Praktika standard operating procedures (SOP) diak hanesan: <ul style="list-style-type: none"> (i) Makina neebe la uza nian tenke taka ni nia enjin atu minimiza polusi udara. (ii) Makina hotu tenke halo manutensaun diak. (iii) Trek neebe tula rai nian tenke taka ho tarpouline. (iv) Karik mina sulisai iha Estrada, tenke hamoos lalais.. (v) Trek neebe tula rai labele lao lalais. (vi) Personal protective equipment (PPE) tenke foo ba traballador hotu atu uza. (vii) Labele sunu arbiru. Sekarik simu keixa tenke resolve lalais. Fiskaliza kualitas udara. 	<p>\$50,000</p>	<p>Kualitas Udara Ambiente</p> <ul style="list-style-type: none"> Fatin atu halo fiskaliza kualitas udara <table border="1"> <thead> <tr> <th>Points</th> <th>Coordinates</th> </tr> </thead> <tbody> <tr> <td>A1</td> <td>S8.56014° E125.51417°</td> </tr> <tr> <td>A3</td> <td>S8.55946° E125.49766°</td> </tr> <tr> <td>A5</td> <td>S8.56853° E125.51466°</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Monitoring parameters/limits: <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>PM_{2.5}</td> <td>25 µg/m³ over an averaging time of 24 hour (99th percentile)</td> </tr> <tr> <td>PM₁₀</td> <td>50 µg/m³ over an averaging time of 24 hour (99th percentile)</td> </tr> </tbody> </table> <p>Note: (i) Parameters shown in the table above are for ambient air quality. (ii) Limits values shown in the table above are adopted from WHO Air Quality Guidelines for Particulate Matter.</p>	Points	Coordinates	A1	S8.56014° E125.51417°	A3	S8.55946° E125.49766°	A5	S8.56853° E125.51466°	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	PM _{2.5}	25 µg/m ³ over an averaging time of 24 hour (99 th percentile)	PM ₁₀	50 µg/m ³ over an averaging time of 24 hour (99 th percentile)	<ul style="list-style-type: none"> Fiskaliza husi EnvMC fulan 4 dala ida. 	<ul style="list-style-type: none"> Kontraktor
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	<p>Hidroloji no saluran</p> <ul style="list-style-type: none"> Nalihun bele mosu husi aktivitas kee rai no rehabilitasaun danau. 	<p>Hydrology</p> <ul style="list-style-type: none"> Saluran tempororia atu <i>divert high flows to detention ponds or the lakes when they are yet to be rehabilitated.</i> Tenke halo silt traps no saluran kaptura sedimentasi antes komesa konstrusaun. 	<p>\$10,000</p>	<ul style="list-style-type: none"> La presiza foti sampel. 	<ul style="list-style-type: none"> Fiskaliza semana ida dala ida husi Environmental Officer (EO). 	<ul style="list-style-type: none"> Kontraktor 														

Aktivitas Projeto	Impaktu Ambiente Nee'be Bele Mosu	Medida Mitigasi	Kustu Medida (Anggaran) (USD)	Fatin Foti Sampel/Parameter Monitoring No Limitadu	Frekuensia Monitoring no Responsabilidade	Responsabilidade atu Halo Mitigasi																																														
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	<p>Ekoloji marine</p> <ul style="list-style-type: none"> Servisu hamoos no kee rai, konstrusaun ponte iha potencia atu afeta koral. Ro boot karik pakir iha tasi iha fatin projetu nia oin mos bele afeta koral. Oli, kimia no mina kari suli sai bele afeta tasi. Bee sentina foer kari suli sai bele afeta danau no tasi. Algae bele komesa moris. Sekarik lixu tama ba tasi no danau laran, bele afeta kualitas bee no organisma balu bele mate. Karik ema balu foti koral mos bele halo aat koral iha tasi laran. 	<p>Ekoloji marine</p> <ul style="list-style-type: none"> Tuir medida mitigasi hotu ba kontrola rai uut,kualitas bee no lixu. Provision of silt traps and silt curtain on land to reduce silt from flowing into the sea. Use silt curtains around piling works during jetty construction to help control the spread of re-suspended silt. Bainhira hatun sasan no ekipa boot besik tasi ibun, tenke halo ho kuida. Sekarik material suli sai iha Estrada, tenke hamoos lalais. Roo boot tenke para iha fatin la iha koral nia. Ponte tenke iha spill kit. Tenke multa traballador neebe foer lixu arbiru. Traballador sira la bele ba foti koral iha tasi laran. 	<p>\$50,000</p>	<p>Ekoloji Marine</p> <ul style="list-style-type: none"> Fiskaliza ekoloji marine sei halo iha nee: <table border="1"> <thead> <tr> <th colspan="2">Coral Reef</th> <th colspan="2">Phytoplankton and Zooplankton</th> </tr> <tr> <th>Points</th> <th>Coordinates</th> <th>Points</th> <th>Coordinates</th> </tr> </thead> <tbody> <tr> <td>T1</td> <td>S 8.55743° E 125.50452°</td> <td>B1</td> <td>S8.54759° E125.51584°</td> </tr> <tr> <td>T2</td> <td>S 8.55678° E 125.50447°</td> <td>B2</td> <td>S8.55638° E125.50647°</td> </tr> <tr> <td>T3</td> <td>S 8.55722° E 125.50043°</td> <td>B3</td> <td>S8.55572° E125.48918°</td> </tr> <tr> <td>T4</td> <td>S 8.55588° E 125.50070°</td> <td></td> <td></td> </tr> <tr> <td>T5</td> <td>S 8.55450° E 125.48945°</td> <td></td> <td></td> </tr> <tr> <td>T6</td> <td>S 8.55477° E 125.48993°</td> <td></td> <td></td> </tr> <tr> <td>T7</td> <td>S 8.55547° E 125.49722°</td> <td></td> <td></td> </tr> <tr> <td>T8</td> <td>S 8.55527° E 125.49807°</td> <td></td> <td></td> </tr> </tbody> </table> <ul style="list-style-type: none"> No specific compliance limits/standard for the marine ecology monitoring. The monitored marine components will be benchmarked against the baseline findings. The marine ecology components during monitoring are: <table border="1"> <thead> <tr> <th>Marine Component</th> <th>Analysis/Observation⁽ⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Phytoplankton and Zooplankton</td> <td> <ul style="list-style-type: none"> Density. Species Diversity. </td> </tr> <tr> <td>Coral Reef</td> <td> <ul style="list-style-type: none"> Percentage cover of live corals, dead coral, rock, sand and rubble. Observation on coral bleaching, broken or damaged corals. </td> </tr> </tbody> </table>	Coral Reef		Phytoplankton and Zooplankton		Points	Coordinates	Points	Coordinates	T1	S 8.55743° E 125.50452°	B1	S8.54759° E125.51584°	T2	S 8.55678° E 125.50447°	B2	S8.55638° E125.50647°	T3	S 8.55722° E 125.50043°	B3	S8.55572° E125.48918°	T4	S 8.55588° E 125.50070°			T5	S 8.55450° E 125.48945°			T6	S 8.55477° E 125.48993°			T7	S 8.55547° E 125.49722°			T8	S 8.55527° E 125.49807°			Marine Component	Analysis/Observation ⁽ⁱ⁾	Phytoplankton and Zooplankton	<ul style="list-style-type: none"> Density. Species Diversity. 	Coral Reef	<ul style="list-style-type: none"> Percentage cover of live corals, dead coral, rock, sand and rubble. Observation on coral bleaching, broken or damaged corals. 	<ul style="list-style-type: none"> Fiskaliza husi EnvMC fulan 6 dala ida. 	<ul style="list-style-type: none"> Kontraktor
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<ul style="list-style-type: none"> Mobilizasaun husi kontraktor Rekrut traballador Konstrusaun edifisiu temporaria ba konstrusaun Mobilizasaun ekipa no makina servisu Konstrusaun ponte Hamoos rai Hamuda biomass Earthwork and platform formation Earthworks, sculpturing and shaping the golf course General piling and structural works Final finishing and landscape (kontinuasaun) 	<p>Ekoloji Terrestrial</p> <ul style="list-style-type: none"> Ekolojia terrestrial agora ladun barak. Habitat balu bele afeta sekarak ai horis lakon. Traballador parese bele oho ema nia animal <p>Infrastruktura no utilitas</p> <ul style="list-style-type: none"> Makina boot bele estraga Estrada. Eziji bee no elektrisidade bele sai <p>Landuse</p> <ul style="list-style-type: none"> Increased pressures on existing infrastructure and services especially at the northeast quadrant (NEQ) of Zone of Impact (ZOI). Possible difficulties of access to religious, recreational or residential houses, will cause distress. <p>Turismo</p> <ul style="list-style-type: none"> Parese fatin Turismo bele afeta 	<p>Ekoloji Terrestrial</p> <ul style="list-style-type: none"> Sekarak hetan animal uniku tenke kontaktu atoritas sira. Kuda ai horis iha foho no fatin projeto Konstrusaun lutu Traballador sira bandu oho animal ema nian. <p>Infrastruktura no utilitas</p> <ul style="list-style-type: none"> Karik halo Estrada aat, tenke hadiak lalais. Tau proper signage para foo hatene ema didiak kampu konstrusaun iha neebe. Karik halo Estrada foer, tenke hamoos lalais. Trek neebe tula sasan, ekipa no makina konstrusaun labele halai lalais iha Estrada. <p>Landuse</p> <ul style="list-style-type: none"> Tenke kontrola trafiku didiak. Responde lalais karik iha disastre. Halo Estrada alternative sekarak atu taka Estrada boot. Estrada alternative tenke halo ba fatin religious importante. <p>Turismo</p> <ul style="list-style-type: none"> Estrada alternatif ba fatin Turismo iha projeto fatin antes taka Estrada ba fatin Turismo hirak nee. Roo labele para besik fatin luku. Signages, sea buoys, routing and markers for construction vessels to be provided. Tuir Best Management Practises atu minimiza impaktu ba fatin turista neebe hanesan tasi ibun no fatin luku. 	<p>\$500,000</p> <p>\$10,000</p> <p>\$5,000</p> <p>\$5,000</p> <p>\$1,000</p>	<ul style="list-style-type: none"> La presiza sampling. Bainhira halo planu management, sei tuir <ul style="list-style-type: none"> UNTAET Regulation 2000/19 on Protected Places. Decree Law No. 26/2012 Environmental Basic Law, Article 27. UNTAET Regulation 2000/17 on the Prohibition of Logging Operations and the Export of Wood from East Timor. Draft Decree Law on Biodiversity dated March 2012. Draft Decree Law on Forest Management, Draft 6. National Biodiversity Strategy and Action Plan (2011 – 2012). Forestry Sector Policy Goal Objective and Strategy. La presiza sampling. La presiza sampling. La presiza sampling. 	<ul style="list-style-type: none"> Fiskaliza hus EnvMC fulan 6 dala ida Fulan ida dala ida husi Environmental Officer (EO) Fulan ida dala ida husi Environmental Officer (EO) Fulan ida dala ida husi Environmental Officer (EO). Fulan ida dala ida husi Environmental Officer (EO). 	<ul style="list-style-type: none"> Kontraktor Kontraktor PP Contractor PP Contractor PP Contractor
<ul style="list-style-type: none"> kontraktor Rekrut traballador Konstrusaun edifisiu temporaria ba konstrusaun Mobilizasaun ekipa no makina 	<p>Trafiku</p> <ul style="list-style-type: none"> Macet bele mosu. Disastre trafiku bele mosu. 	<p>Trafiku</p> <ul style="list-style-type: none"> Kontrola makina todan atu labele uza Estrada boot bainhira tpeak hours. Positioning flagmen at suitable locations to indicate traffic diversion, if any. Minimum of two flagmen at suitable locations or temporary traffic lights to be installed to control traffic movement. 	<p>\$1,000</p>	<ul style="list-style-type: none"> La presiza sampling 	<ul style="list-style-type: none"> Fulan ida dala ida husi Environmental Officer (EO). 	<ul style="list-style-type: none"> Contractor

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<p>servisu</p> <ul style="list-style-type: none"> Konstrusaun ponte Hamoos rai Hamuda biomass Earthwork and platform formation Earthworks, sculpturing and shaping the golf course General piling and structural works Final finishing and landscape <p>(kontinuasaun</p>	<p>Lixu</p> <p>Biomass</p> <ul style="list-style-type: none"> Halo kompos natureza maibe dook husi danau no tasi ibun. <p>Rai Rahun</p> <ul style="list-style-type: none"> Rai rahun iha potencia halo polusaun udara <p>Construction and Demolition (C&D) Wastes</p> <ul style="list-style-type: none"> Rusted steel and decomposed wood may contaminate runoff. Sasan hanesan nee tenke foer ho kuidadu. <p>Scheduled/Hazardous Wastes</p> <ul style="list-style-type: none"> Polusi bee bele mosu sekarak sasan nee tam aba tasi no danau laran. Traballador sira mos bele afeta sekarak la kuidadu. <p>Lixu munisipal</p> <ul style="list-style-type: none"> Sekarik la kontrola lixu didiak, bele sai dois, polusaun no halo aat ema nia saude. Sunu arbiru bele halo polusi udara no halo ema nia saude la diak. <p>Bee foer</p> <ul style="list-style-type: none"> Bee foer neebe la halo tratamentu bele halo kontaminaun ba bee danau no tasi. Tee iha bee foer bele kauza ema kona moras. 	<p>Lixu</p> <p>Biomass</p> <ul style="list-style-type: none"> Bele faan sekarak iha valor. No mos bele halo kompos. La bele sunu biomass. <p>Rai rahun</p> <ul style="list-style-type: none"> Bele uza bainhira kuda ai horis. <p>Construction and Demolition (C&D) Wastes</p> <ul style="list-style-type: none"> C&D wastes tenke tau ketak iha fatin <i>designated Scheduled/Hazardous Wastes</i> La bele foer iha danau ka tasi laran. Tenke rai iha fatin neebe la bele suli sai nia. Tenke rai iha fatin dook husi danau no tasi. Tenke label ho <i>date generation, contact details of waste generator and waste characteristics.</i> <i>Bunded storage area containing scheduled/hazardous wastes to be designed, constructed and maintained adequately to prevent spillage or leakage and to be sheltered or roofed or covered with suitable material.</i> Halo trainu espesial ba traballador neebe sei kontrola lixu hazardous. <i>An accurate and up-to-date inventory of scheduled/hazardous wastes to be prepared and kept for a period of three years.</i> Lixu hazardous tenke foer iha fatin espesial neebe governu aseita nian. PPE tenke foo ba traballador neebe sei kontrola lixu hazardous. <i>Emergency spill kits to be provided on-site to facilitate clean-up. Contaminated materials to be treated as hazardous wastes.</i> <p>Lixu munisipal</p> <ul style="list-style-type: none"> Tenke prepara lixu fatin iha fatin projeitu Lixu nee tenke ba hafoer iha Tibar Landfill deit. Fatin hela traballador iha fatin projeitu tenke mos. 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Faze Operasional

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Fiskaliza sewage treatment plants' (STPs') nia <i>effluent quality</i> no performa. <p>Dezenvolvimentu kampu golf</p> <ul style="list-style-type: none"> Implentasaun <i>pest management</i> Tenke hili kimia, <i>fertilizer</i> no pestisida neebe la iha organochlorine no <i>low leaching potential index</i> nia, tenke limitadu ninia uza no labele iha kontaktu direkta ho bee danau. Iha rekod didiak konaba bainhira uza kimia, pestisida no <i>fertilizer</i>. Traballador sira neebe sei uza kimia, pestisida no <i>fertilizer</i> tenke simu trainu espesial. Pestisida no <i>fertilizer</i> tenke rai iha fatin seguru. <i>Provide only enough irrigation water to a depth just below the root system to minimise leaching.</i> Hili duut didiak atu bele minimiza pestisida no <i>fertilizer</i>. <i>Use of weed-free plants.</i> Fiskaliza kualitas bee. <p>Dezenvolvimentu hospital</p> <ul style="list-style-type: none"> mantutensaun <i>regular</i> ba pipa no Sistema tratamentu bee foer iha hospital. <i>Provision of an on-site incinerator for clinical wastes.</i> 	<p>\$20,000</p>	<p>Kualitas Bee Ambiente (danau Tasi Tolu)</p> <ul style="list-style-type: none"> <i>Water sampling points:</i> <p style="text-align: center;">Lake Saltwater Sampling</p> <table border="1"> <thead> <tr> <th>Points</th> <th>Coordinates</th> </tr> </thead> <tbody> <tr> <td>LW1 (Lake C)</td> <td>S8.56623° E125.51079°</td> </tr> <tr> <td>LW2 (Lake B)</td> <td>S8.56587° E125.50720°</td> </tr> <tr> <td>LW3 (Lake A)</td> <td>S8.56198° E125.49990°</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <i>As the lake water quality will take some time to stabilise even with rehabilitation measures, it is recommended that the lake water shall be complied with the baseline water quality during the first three years of the operational phase.</i> <i>Monitoring parameters/limits (baseline):</i> <table border="1"> <thead> <tr> <th rowspan="2">Parameter⁽ⁱ⁾</th> <th colspan="3">Limits (Baseline)⁽ⁱⁱ⁾</th> </tr> <tr> <th>Lake A (LW3)</th> <th>Lake B (LW2)</th> <th>Lake C (LW1)</th> </tr> </thead> <tbody> <tr><td>Temperature</td><td>37.0</td><td>37.8</td><td>36.5</td></tr> <tr><td>Total Suspended Solid (TSS)</td><td>23</td><td>66</td><td>31</td></tr> <tr><td>Dissolved Oxygen (DO)</td><td>6.3</td><td>4.7</td><td>5.1</td></tr> <tr><td>pH</td><td>7.99</td><td>8.48</td><td>8.40</td></tr> <tr><td>Salinity</td><td>35.0</td><td>48.7</td><td>50.2</td></tr> <tr><td>Conductivity</td><td>41</td><td>51</td><td>54</td></tr> <tr><td>Oil and Grease (O&G)</td><td>ND (<0.5)</td><td>ND (<0.5)</td><td>ND (<0.5)</td></tr> <tr><td>Phenol</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Faecal Coliform</td><td>Absent</td><td>Absent</td><td>Absent</td></tr> <tr><td>Mercury (Hg)</td><td>ND (<0.8)</td><td>ND (<0.8)</td><td>ND (<0.8)</td></tr> <tr><td>Cadmium (Cd)</td><td>ND (<2.0)</td><td>ND (<2.0)</td><td>ND (<2.0)</td></tr> <tr><td>Chromium (VI) (Cr⁶⁺)</td><td>ND (<5.0)</td><td>ND (<5.0)</td><td>ND (<5.0)</td></tr> <tr><td>Copper (Cu)</td><td>24</td><td>28</td><td>12</td></tr> <tr><td>Arsenic (As)</td><td>ND (<1.0)</td><td>ND (<1.0)</td><td>ND (<1.0)</td></tr> <tr><td>Lead (Pb)</td><td>ND (<10.0)</td><td>18.7</td><td>ND (<10.0)</td></tr> <tr><td>Zinc (Zn)</td><td>150</td><td>42</td><td>18</td></tr> <tr><td>Cyanide (CN)</td><td>ND (<10.0)</td><td>ND (<10.0)</td><td>ND (<10.0)</td></tr> <tr><td>Ammonia</td><td>64.0</td><td>64.4</td><td>35.5</td></tr> <tr><td>Nitrite (NO₂⁻)</td><td>69.3</td><td>135</td><td>69.7</td></tr> <tr><td>Nitrate (NO₃⁻)</td><td>361</td><td>140</td><td>283</td></tr> <tr><td>Total Phosphorus</td><td>ND (<90)</td><td>104</td><td>282</td></tr> <tr><td>Turbidity</td><td colspan="3" style="text-align: center;">-</td></tr> <tr><td>Phosphate⁽ⁱⁱⁱ⁾</td><td colspan="3" style="text-align: center;">75 µg/L</td></tr> </tbody> </table> <p><i>Note:</i></p> <p>(i) <i>Parameters shown in the table above are for ambient lake water quality.</i></p> <p>(ii) <i>Limits values shown in the table above to be comply with the baseline findings.</i></p> <p>(iii) <i>Limits value of phosphate is adopted from Class 2 of Malaysia Marine Water Quality Criteria and Standards (MWQCS).</i></p>	Points	Coordinates	LW1 (Lake C)	S8.56623° E125.51079°	LW2 (Lake B)	S8.56587° E125.50720°	LW3 (Lake A)	S8.56198° E125.49990°	Parameter ⁽ⁱ⁾	Limits (Baseline) ⁽ⁱⁱ⁾			Lake A (LW3)	Lake B (LW2)	Lake C (LW1)	Temperature	37.0	37.8	36.5	Total Suspended Solid (TSS)	23	66	31	Dissolved Oxygen (DO)	6.3	4.7	5.1	pH	7.99	8.48	8.40	Salinity	35.0	48.7	50.2	Conductivity	41	51	54	Oil and Grease (O&G)	ND (<0.5)	ND (<0.5)	ND (<0.5)	Phenol	ND (<1.0)	ND (<1.0)	ND (<1.0)	Faecal Coliform	Absent	Absent	Absent	Mercury (Hg)	ND (<0.8)	ND (<0.8)	ND (<0.8)	Cadmium (Cd)	ND (<2.0)	ND (<2.0)	ND (<2.0)	Chromium (VI) (Cr ⁶⁺)	ND (<5.0)	ND (<5.0)	ND (<5.0)	Copper (Cu)	24	28	12	Arsenic (As)	ND (<1.0)	ND (<1.0)	ND (<1.0)	Lead (Pb)	ND (<10.0)	18.7	ND (<10.0)	Zinc (Zn)	150	42	18	Cyanide (CN)	ND (<10.0)	ND (<10.0)	ND (<10.0)	Ammonia	64.0	64.4	35.5	Nitrite (NO ₂ ⁻)	69.3	135	69.7	Nitrate (NO ₃ ⁻)	361	140	283	Total Phosphorus	ND (<90)	104	282	Turbidity	-			Phosphate ⁽ⁱⁱⁱ⁾	75 µg/L			<ul style="list-style-type: none"> Fiskaliza fulan 4 dala ida husi EnvMC toó tinan ida. 	<ul style="list-style-type: none"> PP
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(iv) Malaysia Environmental Quality Report (EQR) 2015, DOE, 2015.</p>	Points	Coordinates	GW1	S8.55891° E125.50387°	GW2	S8.55854° E125.49889°	Parameter ⁽ⁱ⁾	Limits	<i>Enterococcus</i> ⁽ⁱⁱ⁾	0 Number/100 mL	<i>Arsenic</i> ⁽ⁱⁱⁱ⁾ (As)	10 µg/L	<i>Copper</i> ⁽ⁱⁱⁱ⁾ (Cu)	2.0 µg/L	<i>Cadmium</i> ⁽ⁱⁱⁱ⁾ (Cd)	5.0 µg/L	<i>Lead</i> ⁽ⁱⁱⁱ⁾ (Pb)	Up to 25 µg/L	<i>Chromium</i> ⁽ⁱⁱⁱ⁾ (Cr)	50 µg/L	<i>Mercury</i> ⁽ⁱⁱⁱ⁾ (Hg)	1.0 µg/L	<i>Nitrate</i> ⁽ⁱⁱⁱ⁾ (NO ₃)	50 µg/L	<i>Total Pesticide</i> ⁽ⁱⁱⁱ⁾	0.50 µg/L	Parameter ⁽ⁱ⁾	Limits	<i>Selenium</i> ⁽ⁱⁱⁱ⁾ (Se)	10 µg/L	<i>Sulphate</i> ^(iv)	250 mg/L	<i>Total Coliform</i> ^(iv)	0 MPN/100 mL	<i>Manganese</i> ^(iv) (Mn)	0.1 mg/L	<i>Zinc</i> ^(iv) (Zn)	3 mg/L	<i>Iron</i> ^(iv) (Fe)	0.3 mg/L	<i>Conductivity</i> ^(iv)	-	<i>Chloride</i> ^(iv)	250 mg/L	<ul style="list-style-type: none"> Fiskaliza fulan 4 dala ida husi EnvMC toó tinan ida 	<ul style="list-style-type: none"> PP
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	<p>Ekoloji teresterial</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Konflitu ema-animal Lampre tempo kalan bele halo disrupsi ba animal <p>Dezenvolvimentu kampu golf</p> <ul style="list-style-type: none"> Fertilizer no pestisida iha potensi polusi bee neebe animal sira uza atu hemu. 	<p>Ekoloji teresterial</p> <p>Integrated Mixed Development</p> <ul style="list-style-type: none"> Labele oho animal arbiru. Reforestation of hillslopes. <p>Dezenvolvimentu kampu golf</p> <ul style="list-style-type: none"> Oversee <i>turf maintenance and management such as mowing, soil aeration, topdressing with sand, and dethatching of the turf root zone.</i> 	\$10,000	<ul style="list-style-type: none"> La presiza sampling. Bainhira halo planu manutensaun ekoloji teresterial, tenke tuir: <ol style="list-style-type: none"> UNTAET Regulation 2000/19 on Protected Places. UNTAET Regulation 2000/17 on the Prohibition of Logging Operations and the Export of Wood from East Timor. Draft Decree Law on Biodiversity dated March 2012. Draft Decree Law on Forest Management, Draft 6. Draft Decree Law on Biodiversity dated March 2012. Forestry Sector Policy Goal Objective and Strategy. 	<ul style="list-style-type: none"> Fiskaliza fulan 6 dala ida husi EnvMC toó tinan ida 	<ul style="list-style-type: none"> PP 																																														
	<p>Ekoloji Danau</p> <ul style="list-style-type: none"> Bee foer, pestisida no fertilizer sekarak tam aba danau bele afeta organisma akuatika iha danau laran. 	<p>Ekoloji Danau</p> <ul style="list-style-type: none"> Maintain the efficient functions of the mechanical aeration system to aid water circulation and oxygenation. Implementasaun Best Management Practises ba kualitas bee nian. 	\$5,000	<ul style="list-style-type: none"> La presiza sampling. Bainhira halo planu manutensaun ekoloji danau, tenki kumpri ho: <ol style="list-style-type: none"> UNTAET Regulation 2000/19 on Protected Places. Draft Decree Law on Biodiversity dated March 2012. National Biodiversity Strategy and Action Plan (2011 – 2012). 	<ul style="list-style-type: none"> Fiskaliza fulan 6 dala ida husi EnvMC toó tinan ida 	<ul style="list-style-type: none"> PP Golf Course Superintendent 																																														

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<ul style="list-style-type: none"> Operasaun projetu Manutensaun kampu golf no <i>landscape</i> Manutensaun danau Manutensaun infrastruktura, utilitas no fasilitas (kontinuasau) 	<p>Infrastruktura no utilitas Integrated Mixed Development</p> <ul style="list-style-type: none"> Trafiku aumenta Ema barak tan presiza elektrisidade no bee mos. Lixu mos bele aumenta <p>Kampu golf</p> <ul style="list-style-type: none"> Kampu golf presiza irrigasaun <p>Hospital Development:</p> <ul style="list-style-type: none"> Foer klinikal bele mosu. 	<p>Infrastructure and Utilities Integrated Mixed Development</p> <ul style="list-style-type: none"> Tenke halo manutensaun ba STP didiak. Luang Estrada tenke aumenta atu bele trafiku barak uza. Fatin lixu tenke too Oli no mina tenke foer ho responsibilidade. Keta foer arbiru. <p>Golf Course Development</p> <ul style="list-style-type: none"> Kompos foer organik hotu. <p>Hospital Development</p> <ul style="list-style-type: none"> Foer klinikal tenke tratamentu no foer tuir regulamentu hospital nian. 	\$5,000	<ul style="list-style-type: none"> La presiza sampling. 	<ul style="list-style-type: none"> Fiskaliza fulan 6 dala ida husi EnvMC toó tinan ida 	<ul style="list-style-type: none"> PP Contractor
	<p>Turismo</p> <ul style="list-style-type: none"> Sekarik fertilizer no pestisida tama ba danau, bele afeta kualitas bee danau no turista neebe visita danau. Ro tula turista sira bele afeta aktivitas peskador lokal. Sekarik pestisida, lixu, kimia tama ba tasi laran, koral bele mate. 	<p>Turismo</p> <ul style="list-style-type: none"> Ro tula turista sira tenke tuir regulamentu autoritas portu Dili. Fatin ro para tenke dook husi koral. Tenke prepara fasilitas be turista hanesan sentina. Tenke bandu ema foti koral husi tasi laran. Kuda ai horis iha foho Manutensaun kampu golf didiak. 	\$10,000	<ul style="list-style-type: none"> La presiza sampling. 	<ul style="list-style-type: none"> Fiskaliza fulan 6 dala ida husi EnvMC toó tinan ida 	<ul style="list-style-type: none"> PP

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<ul style="list-style-type: none"> • Operasaun projetu • Manutensaun kampu golf no <i>landscape</i> • Manutensaun danau • Manutensaun infrastruktura, utilitas no fasilitas (kontinuasaun) 	<p>Lixu Lixu Munisipal</p> <ul style="list-style-type: none"> • Sekarik la iha manajmen lixu didiak, bele mosu dois no afeta ema nia saude. • Lixu mos bele atrai lalar, lahor no animal seluk tan. <p>Scheduled/Hazardous Waste</p> <ul style="list-style-type: none"> • Bele impaktu kualitas bee, ema nia saude no mos organisma akuatik. <p>Green Waste</p> <ul style="list-style-type: none"> • <i>Leachates</i> husi <i>green wastes</i> bele afeta organisma danau sekarik tama ba danau laran <p>Bee foer</p> <ul style="list-style-type: none"> • Sekarik STP aat no la iha fatin alternatif atu tratamentu bee foer, bele afeta ema nia saude. <p>Foer klinikal</p> <ul style="list-style-type: none"> • Bele afeta ema nia saude 	<p>Lixu Integrated Mixed Development</p> <ul style="list-style-type: none"> • La bele foer lixu arbiru no lixu la bele tama ba saluran bee, danau no tasi. • <i>Hazardous wastes</i> tenke foer iha fatin espesial no tuir regulamentu autoritas lokal. <p>Kampu golf</p> <ul style="list-style-type: none"> • Biomass tenke kompos depois bele uza fali iha kampu golf. <p>Hospital Development</p> <ul style="list-style-type: none"> • <i>Hazardous wastes</i> labele kahur ho lixu municipal. Tenke tau ketak iha fatin lixu ketak no label didiak. • Foer klinikal tenke hafoer tuir regulamentu hospital nian. • Traballador neebe servisu konaba hafoer foer klinikal tenke uza Personal Protective Equipment (PPE) • Lixu munisipal husi hospital bele hafoer iha fatin lixu Tibar. 	<p>\$10,000</p>	<p>Solid Waste and Hazardous/Scheduled Waste</p> <ul style="list-style-type: none"> • <i>No sampling required. However, site inspection will be conducted:</i> <table border="1"> <thead> <tr> <th>Component</th> <th>Observation</th> <th>Inspection Location</th> <th>Compliance</th> </tr> </thead> <tbody> <tr> <td>Solid Waste Management</td> <td> <ul style="list-style-type: none"> • General cleanliness. • Number of bins provided and adequacy. </td> <td> <ul style="list-style-type: none"> • At base camp, site office and active work areas. </td> <td>Decree Law No.26/2012 Environmental Basic Law Article 39.</td> </tr> <tr> <td>Hazardous/Scheduled Waste Management</td> <td> <ul style="list-style-type: none"> • Waste disposal at designated scheduled waste disposal area. • Visual inspection of storage condition. • Signs of oil spill. </td> <td> <ul style="list-style-type: none"> • At storage areas for scheduled wastes. • At active work areas. </td> <td>Decree Law No. 26/2012 Environmental Basic Law, Article 42.</td> </tr> </tbody> </table> <p>Sewage</p> <ul style="list-style-type: none"> • <i>Sample to be collected at the discharge point of treated effluent.</i> • <i>Parameters to be analysed:</i> <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Temperature</td> <td>-</td> </tr> <tr> <td>Ammoniacal Nitrogen (AN)</td> <td>0.3 mg/L</td> </tr> <tr> <td>Biochemical Oxygen Demand (BOD)</td> <td>3 mg/L</td> </tr> <tr> <td>Chemical Oxygen Demand (COD)</td> <td>25 mg/L</td> </tr> <tr> <td>Dissolved Oxygen (DO)</td> <td>5 – 7 mg/L</td> </tr> <tr> <td>pH</td> <td>6 – 9</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Parameter⁽ⁱ⁾</th> <th>Limits⁽ⁱⁱ⁾</th> </tr> </thead> <tbody> <tr> <td>Oil and grease (O&G)</td> <td>0.04 mg/L</td> </tr> <tr> <td>Total Suspended Solid (TSS)</td> <td>50 mg/L</td> </tr> <tr> <td>Total Coliform</td> <td>5,000 count/100 mL</td> </tr> <tr> <td>Faecal Coliform</td> <td>400 count/100 mL</td> </tr> <tr> <td>Salinity</td> <td>-</td> </tr> <tr> <td>Lead (Pb)</td> <td>0.05 mg/L</td> </tr> <tr> <td>Zinc (Zn)</td> <td>5 mg/L</td> </tr> <tr> <td>Copper (Cu)</td> <td>0.02 mg/L</td> </tr> <tr> <td>Nitrate (NO₃)</td> <td>7 mg/L</td> </tr> <tr> <td>Phosphorus</td> <td>0.2 mg/L</td> </tr> </tbody> </table> <p>Note: (i) Parameters shown in the table above are for water quality after treatment. (ii) Limits values shown in the table above are adopted from Class IIB of NWQS for Malaysia.</p>	Component	Observation	Inspection Location	Compliance	Solid Waste Management	<ul style="list-style-type: none"> • General cleanliness. • Number of bins provided and adequacy. 	<ul style="list-style-type: none"> • At base camp, site office and active work areas. 	Decree Law No.26/2012 Environmental Basic Law Article 39.	Hazardous/Scheduled Waste Management	<ul style="list-style-type: none"> • Waste disposal at designated scheduled waste disposal area. • Visual inspection of storage condition. • Signs of oil spill. 	<ul style="list-style-type: none"> • At storage areas for scheduled wastes. • At active work areas. 	Decree Law No. 26/2012 Environmental Basic Law, Article 42.	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Temperature	-	Ammoniacal Nitrogen (AN)	0.3 mg/L	Biochemical Oxygen Demand (BOD)	3 mg/L	Chemical Oxygen Demand (COD)	25 mg/L	Dissolved Oxygen (DO)	5 – 7 mg/L	pH	6 – 9	Parameter ⁽ⁱ⁾	Limits ⁽ⁱⁱ⁾	Oil and grease (O&G)	0.04 mg/L	Total Suspended Solid (TSS)	50 mg/L	Total Coliform	5,000 count/100 mL	Faecal Coliform	400 count/100 mL	Salinity	-	Lead (Pb)	0.05 mg/L	Zinc (Zn)	5 mg/L	Copper (Cu)	0.02 mg/L	Nitrate (NO ₃)	7 mg/L	Phosphorus	0.2 mg/L	<p>Fiskaliza fulan 4 dala ida husi EnvMC toó tinan ida</p>	<ul style="list-style-type: none"> • STP Operator • Golf Course Superintendent
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Medida Mitigasi Sosio-Ekonomi

Impaktu Sosio-Ekonomi	Medida Mitigasi
<ul style="list-style-type: none"> • Prosesu muda povu sira neebe agora dadaun okupa rai estado bele iha impaktu psikolojikal. • Bele mosu problema sosial iha fatin relokasaun sekarak komunitas iha fatin neeba la simu komunitas foun. • Bele mosu problema saude ba traballador no povu sira sekarak la iha sanitasaun diak, manajmen lixu diak. • Konflikto sosial bele mosu tamba ema kompetisi atu hetan servisu. 	<p><u>Sosiolisasi</u></p> <ul style="list-style-type: none"> • Harii <i>Community Relations Committee</i> iha nivel Suco atu bele ajuda komunikasaun entre komunitas lokal no Pelican Paradise <p><u>Vaga servisu</u></p> <ul style="list-style-type: none"> • Sekarik populasaun lokal iha nivel skill no Teknik too, tenke foo prioridade ba sira atu hetan servisu. • Harii "labour desk" lokal atu fasilita servisu ba komunitas loakl iha faze konstrusaun. <p><u>Seguransa no Saude Publiku</u></p> <ul style="list-style-type: none"> • <i>Community Relations Committee</i> bele halo kampanhia konaba seguransa no saude publiku no mos fahe informasaun konaba medida neebe PP halo atu seguru publiku nia saude no seguransa. • Sekarik PP presiza taka dalan ka halo dalan alternatif bainhira konstrusaun, tenke hatoo informasaun ba publiku. • Fasilitas no infrastruktura tenke too iha kampu konstrusaun atu traballador sira neebe hela iha neeba bele moris ho seguru no saude diak. <p><u>Promosaun Ligasaun Ekonomia</u></p> <ul style="list-style-type: none"> • Tenke kria ligasaun ekonomia entre PP no komunitas lokal. Prosesu nee importante tambe bele ajuda dezenvolvimente ekonomia lokal. • Por examplu, sekarak produktu lokal hanesan rai henek, modo tahan nee hola husi merkadu lokal, bele ajuda dezenvolvimente ekonomia lokal no mos hatun dezempregu. • Fornese trainu <i>semi-skilled</i> no <i>skilled</i> ba joven lokal. • <i>Community Relations Committee</i> bele ajuda buka traballador neebe iha interese atu servisu iha hotel no mos industry Turismo. • Populasaun lokal bele loke negosiu Turismo nian.

the 1990s, the number of people in the world who are illiterate has increased from 1.2 billion to 1.5 billion (UNESCO, 2003).

There are many reasons for the increase in illiteracy. One of the main reasons is the rapid population growth in developing countries. Another reason is the lack of access to education, particularly in rural areas. A third reason is the high cost of education, which makes it difficult for many people to afford it.

There are many ways to reduce illiteracy. One way is to improve access to education, particularly in rural areas. Another way is to reduce the cost of education. A third way is to provide adult literacy programs for people who have not had the opportunity to attend school.

There are many challenges to reducing illiteracy. One challenge is the lack of resources. Another challenge is the lack of motivation. A third challenge is the lack of time. People who are illiterate often have to work long hours to support their families, which makes it difficult for them to attend school or a literacy program.

There are many ways to overcome these challenges. One way is to provide financial support for education. Another way is to provide flexible learning schedules. A third way is to provide incentives for people to attend school or a literacy program.

There are many benefits to reducing illiteracy. One benefit is that it helps people to find better jobs. Another benefit is that it helps people to understand the world around them. A third benefit is that it helps people to participate in their communities.

There are many ways to measure illiteracy. One way is to count the number of people who cannot read and write. Another way is to measure the number of people who cannot understand a simple text. A third way is to measure the number of people who cannot fill out a form.

There are many ways to improve literacy. One way is to provide more schools. Another way is to provide more teachers. A third way is to provide more books and other learning materials.

There are many ways to promote literacy. One way is to use mass media. Another way is to use community-based organizations. A third way is to use peer education.

References

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GLOSSARY

Air pollution	The presence of contaminant or pollutant substances in the air that do not disperse properly and interfere with human health or welfare or produce other harmful environmental effects.
Algal bloom	See <i>Eutrophication</i> .
Aquatic	Living, growing or taking place in or on water.
Assessment	An examination of a subject matter. See <i>analysis</i> .
Auditing	Evaluation process carried out by an independent auditor to determine effectiveness and performance of mitigation measures and to ensure compliance of a project with the Condition of Environmental License.
Avian	An adjective describing something that relates to birds.
Base camp	A central encampment providing amenities, supplies, shelter, and communications for workers engaged in construction.
Baseline data	Site specific data pertaining to the existing environment (physical, chemical, biological and human). It establishes the ambient situation, usually before some drastic change occurs, e.g. a major project.
Best management practices (BMPs)	Any program, technology, process, operating method, measure, or device that controls, prevents, removes, or reduces pollution and impact on the environment.
Biochemical oxygen demand	A measure of the amount of oxygen consumed by biological processes that break down organic matter in water. The greater the BOD, the greater the degree of pollution. BOD ₅ is the amount of dissolved oxygen so consumed in five days.
Biomass	All the living material in a given area; often refers to vegetation.
Buffer zone	An area designated around the boundary of a project and/or adjacent to environmentally sensitive areas where no or limited development is allowed for the purpose of mitigating against any environmental impact from the site to the surrounding areas or vice versa. Can be in the form of natural green area or non-sensitive structure separating two incompatible landuse.
Bund	(i) An embankment or causeway. (ii) A wall surrounding an industrial fuel tank.
Carrying capacity	(i) Maximum demand or load that may be placed on a machine, resource, or system for extended periods under normal or specified conditions. (ii) Theoretical limit to the capacity of a natural ecosystem to support continued increase in consumption of its resources and in generation of pollution without being overwhelmed. It depends on factors such as population size and density, and rate of renewability of its resources.
Catchment area	An area, demarcated by a highland ridge, where all water drains into a particular river system.
Check dam	A small temporary dam constructed across a swale, drainage ditch, or waterway to counteract erosion by reducing water flow velocity.
Chemical oxygen demand	A measure of the oxygen required to oxidise all compounds in water, both organic and inorganic.
Climate	The weather conditions prevailing in an area in general or over a period of time.

Coliform	Microorganisms found in the intestinal tracts of humans and animals. Their presence in water indicates fecal pollution and potentially dangerous bacterial contamination by disease-causing microorganisms.
Community	Any natural group of organisms/humans sharing a habitat/settlement.
Contamination	The act of rendering something harmful or unusable by the addition of impure or by contact with something unclean e.g. pollutant, contaminant, poison, etc.
Coral bleaching	A process whereby coral colonies when stressed by changes in conditions such as temperature, light or nutrients, expel their symbiotic algae living on their tissues, causing them to turn completely white.
Coral reefs	A mound or ridge of living coral, coral skeletons and calcium carbonate deposits from other organisms such as calcareous algae, mollusks and protozoans.
Corrective action	The rehabilitation measures undertaken to close non-compliance items as issued by an auditor or the Environment Authority.
Coastal areas	Shoreline area which interfaces with the land and the sea.
Data	Any fact in the form of numbers, letters, text or symbols. Raw facts, or statistics, which alone have little or no meaning, but as a group, will allow some meaningful relationships to be drawn.
Desalination	A process of removing salts and minerals from saline water to produce water suitable for daily potable usage.
Detention pond	A low lying area/depression that is designed to temporarily hold a set amount of water while slowly draining to another location. They are mostly for flood control when large amounts of rain could cause flash flooding.
Discharge point	The point at which the effluent from a facility (sewage, industrial, etc.) enters a public drain, discharges to the surface of the ground, or to a body of water.
Dissolved oxygen	The oxygen freely available in water; vital to fish and other aquatic life. The level of dissolved oxygen is the single most important indicator of the ability of a water body to support desirable aquatic life.
Drainage	Natural or artificial removal of surface and sub-surface water from an area.
Dust	Fine, dry powder consisting of tiny particles of earth or waste matter lying on the ground or on surfaces or carried in the air.
Earthworks	Excavation and relocation of large quantities of soil and earth to form slopes, platforms, embankments, etc.
Ecology	The relationship of living things to one another and their environment, or the study of such relationships.
Ecosystem	The interacting system of a biological community (biotic) and its non-living environmental surroundings (abiotic).
Effluent	Wastewater (treated or untreated) that flows out of a treatment plant, sewer, or industrial outfall; generally refers to wastes discharged into surface waters.
Emergency response plan	A document listing the probable emergencies and crisis that could potentially occur, details out the standard operating procedures to be carried out during such an emergency/crisis and the responsibility of each member of the Emergency Response Team.
Emission	Pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities, from residential chimneys; and from motor vehicle, locomotive, or aircraft exhausts.

Environment	The area (specific zone to be affected by the project), and all natural resources (physical, biological and human resources), people, economic development and quality-of-life values.
Environmental impact	An effect on an environment resource or value from natural or man-made actions, including project development (measured using physical, chemical, biological and social parameters).
Environmental impact statement	A study to identify, predict, evaluate and communicate information about the impacts (both beneficial and adverse) on the environment of a proposed development activity and to detail out the mitigating measures prior to project approval and implementation
Environmental Licensing	An official document issued by the NDPCEI which contains all the conditions of approval for a specific project – environmental requirements to be adhered; monitoring and reporting protocols; and administrative procedures throughout its construction and/or operational phases.
Environmental management plan	A legal binding document which spells out in concise details the environmental requirements and mitigation measures as detailed in the EIS as well at other information e.g. environmental budget, monitoring and audit programmes and roles and responsibilities of the EMT. The EMP is a dynamic document that needs to be revised from time to time to suit the progress of work at-site.
Environmental management team	Specialist team comprising of relevant personnel of a project with specific roles and responsibilities in the management of environmental matters at-site.
Environmental monitoring and surveillance plan	A plan drawn up detailing the monitoring programme for a project incorporating the conditions of approval. Usually incorporated into the environmental management plan.
Environmental officer	The site personnel directly in charge of supervising a site to ensure that all mitigation measures are in place, maintained and repaired and that all requirements within the Condition of Environmental Licensing are adhered by the contractors. Other tasks include training of staff, taking samples for reporting and attending site walkabouts and meetings.
Environmental planning	Planning activities with the objective of preserving or enhancing environmental values or resources.
Environmental training	Required training to be provided to members of the project team to provide them with the environmental knowledge and understanding to carry out their duties.
Erosion	Wearing away of rock or soil by the gradual or fast detachment of the fragments by water, wind, ice, and other mechanical, chemical and biological forces.
Erosion and Sediment control plan	A document containing information on all the BMPs and structures required for controlling erosion and sedimentation on-site that has to be implemented by the contractors prior and during the construction phase.
Eutrophication	Excessive richness of nutrients in a lake or other body of water, frequently due to runoff from the land, which causes a dense growth of plant life and death of animal life from lack of oxygen.
Executive Summary (ES)	A document which provides a summary of the findings from the EIA for a project, highlighting the significant issues and mitigation measures. Submitted along with the EIA report.
Fertiliser	Materials such as nitrogen and phosphorus that provide nutrients for plants. Commercially sold fertilizers may contain other organic and inorganic chemicals.
Flood	Overflow of water that submerges land which is usually dry.

Flora and fauna	The plants and animals that are native to a particular area or period of time.
Frequency	Rate of occurrence per unit of time.
Geology	Study of Earth materials, structures, processes and life over time.
Groundwater	Subsurface water and underground water from aquifers that can be abstracted from wells, or that flows naturally to the earth's surface through springs.
Guidelines	Administrative rules or instructions applicable in developing a plan and criteria directing the action(s) to be taken to achieve the objectives.
Habitat	The local environment in which an organism normally lives and grows.
Hazard	Anything that jeopardises safety and health.
Hazardous wastes	All wastes which pose significant hazards to people and ecology, including toxins, inflammables, explosives and incendiary material.
Health and safety	Pertaining to the condition of a person and the risks posed by the environment on his wellbeing and good health.
Heavy metals	Any metallic chemical element that has a relatively high density and is toxic or poisonous at low concentrations
Herpetofauna	Pertaining to reptiles and amphibians.
Hoarding	A temporary fencing and barrier erected around a building site.
Housekeeping	The act of ensuring a site is clean, devoid of hazardously placed materials and well-kept to ensure a safe and secure working environment.
Human-wildlife conflict	Incidents involving animals that invade into human areas in search of food due to loss of habitat, injury or increasing encroachment of human settlements into their natural areas.
Hydrology	Properties, distribution and circulation of water, on the surface of the land, in the soil and underlying rocks and in the atmosphere.
Industry	Economic activity concerned with the processing of raw materials and manufacture of goods in factories.
Labour	The aggregate of all human physical and mental effort used in creation of goods and services
Landscaping	Improvement to the aesthetic appearance of (a piece of land) by changing its contours, adding ornamental features, or planting trees and shrubs.
Landuse	Arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it.
Mangroves	Are a group of trees and shrubs that live in the coastal intertidal zone.
Mitigation measures	Specific actions taken to: (1) avoid impacts by not taking a certain action or parts of an action; (2) minimise impacts by limiting the magnitude of the action; (3) rectify impacts by repairing, rehabilitating or restoring the affected environment; (4) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (5) compensate for the impacts by replacing or providing substitute resources or environments.
Modelling	An investigative technique using a mathematical or physical representation of a system or theory that accounts for all or some of its known properties. Models are often used to test the effect of changes in system components on the overall performance of the system.

Monitoring	Periodic or continuous surveillance or testing to determine the level of compliance with statutory requirements or pollutant levels in various media or in humans, animals, and other living things.
Noise	Pertaining to sound of various frequencies. Also used to refer to loud and unpleasant sound that disturbs.
Noise pollution	Noises that disturb the environment and people's ability to enjoy it, for example continually sounding house alarms, loud music, air conditioning or other electrical units and aircraft or motor engines.
Non-government Organisation (NGO)	Organisations, groups and bodies which are not affiliated with the government and which draws members from the public to advance a cause, objectives or special interests.
Nutrients	E.g. phosphates, nitrates. These arise primarily from the fertiliser and food processing industries. As in the case of discharge of domestic wastewater, the presence of nitrogen and phosphorus together enhances eutrophication and stimulates undesirable algal growth (algal blooms).
Odour	Substance that activates the sense of smell: to have an unpleasant odour.
Oil and grease	A viscous liquid/semi-liquid derived from petroleum, especially for use as a fuel or lubricant. Non-soluble in water and form thin film when discharged into waterways.
Oil spill	The harmful release of oil into the environment, usually through water, which is very difficult to clean up and often kills birds, fish and other wildlife.
Open burning	Any fire, combustion or smouldering that occurs in the open air and which is not directed through a chimney or stack.
Particulate matter	Fine solid or liquid particles that pollute the air and are added to the atmosphere by natural and man-made processes at the Earth's surface. Examples of particulate matter include dust, smoke, soot, pollen and soil particles.
Pathogens	Microorganisms that can cause disease in other organisms or in humans, other animals, and plants. They may be bacteria, viruses, or parasites and are found in sewage, in runoff from animal farms or rural areas populated with domestic or wild animals, and in water used for swimming.
Personal protection equipment (PPE)	Anything used or worn by a person to minimise risk to the person's health or safety and includes a wide range of clothing and safety equipment.
pH	A measure of the acidity or alkalinity of a liquid or solid material.
Phase	A distinct stage of development in a Project.
Platform	A raised level or surface.
Policy	A course or principal of action adopted by a government, business or organisation.
Poaching	Illegal practice of trespassing on another's property to hunt or steal game without the landowner's permission.
Pollutants	Any natural or artificial substances, whether in a solid, semi-solid or liquid form, or in the form of gas or vapour, or in a mixture of at least two of these substances, or any objectionable odour or noise or heat emitted, discharged or deposited or is likely to be emitted, discharged or deposited from any source which can directly or indirectly cause pollution and includes any environmentally hazardous substances.
Pollution	An act or process, whether natural or artificial, resulting in the introduction of any pollutant into the environment in contravention of the acceptable conditions.

Population Equivalent (P.E.)	The number expressing the ratio of the sum of the pollution load produced in an industrial facility or services to the individual pollution load in household sewage produced by one person in the same time.
Project boundary	The bound or limit of an area e.g. construction site.
Project Proponent	The main person, organization or body which is proposing to undertake a project or activity. He/she shall bear responsibility to ensure that the project meets all environmental requirements mandated by DOE and other government agencies or is liable to be held accountable under the law.
Project Activities	Specific tasks undertaken throughout the course of a project (pre-construction, construction, operational) which serve to meet certain objectives.
Records	A piece of evidence, especially an account of an act or occurrence kept in writing or some other permanent form.
Recycle/Reuse	The process of minimising the generation of waste by recovering usable products that might otherwise become wastes. Examples are the recycling of aluminum cans, waste paper, and bottles.
Reforestation	An action of renewing forest cover.
Residual	Amount of a pollutant remaining in the environment after a natural or technological process has taken place.
Restoration	Renewing/repairing a natural system to, insofar as possible, restore its functions and pristine state.
River basin	An area where all the flows from that area are drained into a particular river system. See <i>Catchment area</i> .
Runoff	Part of the precipitation as well as any other flow contributions, which appears in surface streams and rivers of either perennial or intermittent form.
Sanitary facilities	Any facilities used for the purpose of hygiene such as toilets, wash basins, baths, sink, showers, urinals, etc.
Sediment	Inorganic materials transported and deposited by wind and water.
Scoping	Initial phase in an EIS to identify the key environmental issues and study spatial and temporal boundaries. The scoping will identify the required investigations and assessment of significant impacts during the subsequent phases of the EIS process.
Sedimentation	Deposition of sediment.
Sewage	Human excreta and waste water flushed along a sewer pipe.
Sewage treatment plant	Facility utilised in the process of removing contaminants from wastewater, primarily from household sewage. It includes physical, chemical, and biological processes to remove these contaminants and produce environmentally safe treated wastewater.
Silt	Substrate particles smaller than sand and larger than clay.
Silt fence	A temporary sediment control device used on construction sites to protect water quality in nearby streams, rivers, lakes and seas from sediment (loose soil) in stormwater runoff.
Silt Trap	Temporary pond built on a construction site to capture eroded or disturbed soil that is washed off during rain storms, and protect the water quality of a nearby stream, river, lake, or bay. The sediment-laden soil settles in the pond before the runoff is discharged.
Slope	The incline surface of the terrain.

Social Impact Assessment (SIA)	A study detailing findings on the demographic, socio-economic indicator and perception of a study group on a project's acceptability and perceived impacts on the group.
Sludge	Deposits or particulate matter settled from any liquid, including deposit resulting from physical, chemical, biological or other treatment of water or industrial effluent or mixed effluent.
Soil	Earth, sand, rock, shales, minerals and vegetation in the soil.
Solid wastes	Any scrap material or other unwanted surplus substance or rejected products arising from the application of any process; any substance required to be disposed of as being broken, worn out, contaminated or otherwise spoiled; or any other material that is required by the authority to be disposed of.
Species	A group of animals, with similar characteristics and common name, that reproduces true to type.
Spoils	Rock and debris produced by tunnelling and other excavations.
Stockpile	Large accumulated stock of goods or materials held in a specific area, especially one held in reserve for use at a time of shortage or other emergency.
Stormwater	Surface water runoff during a storm event to drains or canals.
Sullage	Waste from household sinks, showers, and baths, but not toilets.
Surface water	All waters naturally exposed to the atmosphere, for example, rivers, lakes, sea, estuaries, springs, wells, etc.
Suspended solids	Finer particles that do not settle out as easily but can still be filtered. These are aesthetically undesirable and also reduce light penetration to benthic plants.
Terrestrial	Pertaining to living or growing on land.
Topography	Is the physical features of a surface area including relative elevations and the position of natural and man-made features.
Total suspended sediments	A measure of the suspended solids in wastewater, effluent, or water bodies.
Terms of Reference (TOR)	Product from scoping process which sets the objectives, defines the scope, and establishes the strategy and schedule for EIA process to address identified significant issues.
Toxic chemicals	E.g. cyanide, PCBs (polychlorobiphenyls). These have a high toxicity to man, aquatic ecosystems and also conventional biological treatment.
Tourism	Activity of travelling to a place for pleasure and/or the business of providing hotels, restaurants, entertainment, etc. to cater to the needs of travellers.
Traffic	The amount of vehicles along a stretch of road at any given period of time.
Turbidity	Water containing suspended matter that interferes with the passage of light or in which the visual depth is restricted.
Transportation	Means by which to move or transport people, materials and goods from one location to another either by land, sea or air.
Turfing	Layering of earth containing a dense growth of grass and its matted roots; sod or artificial substitute to control erosion and sedimentation.
Vector	An organism, typically a biting insect or tick that transmits a disease or parasite from one animal or plant to another.

Vehicle	A structure capable of moving or being moved or used for the conveyance of any person or thing and which maintains contact with the ground when in motion.
Aesthetics	Pleasing scenery, vistas and view to an audience.
Wastes	Any matter whether in a solid, semi-solid or liquid form, or in the form of gas or vapour which is emitted, discharged or deposited in the environment in such volume, composition or manner as to cause pollution.
Water pollution	The presence of enough harmful or objectionable material in the water to compromise its quality.
Water Quality	A term to describe the chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose.
Water treatment plant (WTP)	A facility that utilizes raw water from a source, which then undergoes treatment to remove impurities and pollutants to achieve a quality acceptable for potable water supply.
Waterway	Any reservoir, lake, river, stream, canal, drain, spring, well or any part of the sea abutting a foreshore and any other body of natural or artificial surface or sub-surface water.
Wetlands	Land of areas that are covered often intermittently with shallow water or have soil saturated with moisture
Zone of Impact	A designated zone whereby the consultant shall conduct the Environmental Impact Assessment Study on the various physical, biological and socio-economic characteristics within it. The typical radial ZOI required for an EIS assessment is 3-km.

Appendices

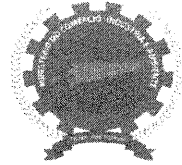


Appendix 4-A

Table 2



REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE
MINISTÉRIO DE COMÉRCIO, INDÚSTRIA E AMBIENTE
DIRECÇÃO GERAL DO MEIO-AMBIENTE
DIRECÇÃO NACIONAL DO CONTROLO POLUÇÃO E IMPACTO AMBIENTAL
Edifício do Fomento, Rua Dom Boa Ventura, Mandarin, Díli.
Mb.: 78 317773; e-mail: antonio_ciatl@yahoo.com



Nu . Ref. : 353 /DNCPIA/XII/2016

Dili, 20th of December 2016

To : Mr. Ravi Kathiravelu,
Director of Pelican Paradise

Cc : 1. H.E Minister of Commerce, Industry and Environment,
Mr. Constâncio da Conceição Pinto

2. H.E Vice Minister of Commerce, Industry and Environment,
Mr. Filipus Nino Pereira


3. Mr. João Carlos Soares,
General Director of Environment

Subject : Project Category

Referring to the Project Document (PD) revision for Pelican Paradise (PP) development project submitted to the National Directorate of Pollution Control and Environmental Impact (NDPCEI) dated 16th of December 2016. The NDPCEI have review the documents, which the revision of PD is refer to technical comments and complete. *The Pelican Paradise (PP) development project comprise of 14 project component such as hotels 1 and 2, apartments, golf course, school 1 and 2, commercial, hospital, residences 1 and 2, public park, reserve area, youth development centre, utilities and occupy land is 621. 837 ha, at Tacitolu, Díli, classify as category A.*

This classification is in reference to Decree Law Environmental License Nu. 5/2011, article 4 section 2.a: project that may potentially cause significant environmental impacts. Pursuant to the category A project above, *the proponent need to submit the Terms of Reference draft of Environmental Impact Statement (EIS) and Environmental management Plan (EMP) for the project to the Ministry of Commerce, Industry and Environment in hard and soft copy.*

Yours sincerely

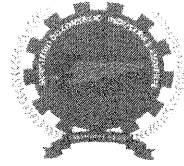

Antonio Lelo Taci, M.Sc
Director of NDPCEI

Appendix 4-B



REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE
MINISTÉRIO DO COMÉRSIO, INDÚSTRIA E AMBIENTE
GABINETE DO MINISTRO

Rua Dom Boa Ventura, Fomenta, Mandarin Dili, Timor-Leste, Tlf: 3331206



Díli, 6th of March, 2017

Notification : 407/Gab. MCIA/III/2017


Mr. Jeremiah Chan,
Executive Director of Pelican Paradise Holdings Timor – Leste

Subject : Decision of Approval of the Terms of Reference (ToR)

Referring to the ToR revision of Environmental Impact Statement (EIS) and Environmental Management Plan (EMP) for Pelican Paradise (PP) development project submitted to the Ministry of Commerce Industry and Environment (MCIE) dated 2^{ed} of February, 2017.

The Environmental Impact Assessment (EIA) technical of National Directorate of Pollution Control and Environmental Impact (NDPCEI), under Directorate of General Environment (DGE) has reviewed the ToR and concludes the revision is complete and pursuant to article 6 on Decree Law number 05/2011, submission of the ToR, the MCIE approves the ToR of EIS and EMP for Pelican Paradise (PP) development project in Tacitolo, Dili and Tibar, Liquiça. Related to the approval of the ToR mentioned above, the proponent need to submit the EIS and EMP draft of the project to the MCIE in hard and soft copy.

Sincerely yours


Constância da Conceição Pinto
Minister of the MCIE

Appendix 9-A



APPENDIX 9-A: ENVIRONMENTAL STANDARDS AND COMPLIANCE CRITERIA

1.0 MALAYSIAN NATIONAL WATER QUALITY STANDARD

Table 1.1: National Water Quality Standard for Malaysia

Parameter	Unit	Class					
		I	IIA	IIB	III	IV	V
AN	mg/L	0.1	0.3	0.3	0.9	2.7	>2.7
BOD	mg/L	1	3	3	6	12	>12
COD	mg/L	10	25	25	50	100	>100
DO	mg/L	7	5 - 7	5 - 7	3 - 5	<3	<1
pH	-	6.5 - 8.5	6 - 9	6 - 9	5 - 9	5 - 9	-
TSS	mg/L	25	50	50	150	300	300
Faecal Coliform**	Count/100 mL	10	100	400	5000 (20000) ^a	5000 (20000) ^a	-

Source: Malaysia Environmental Quality Report (EQR) 2015, Department Of Environment (DOE), 2016.

Note: **: Geometric mean.

^a: Maximum not to be exceeded.

Table 1.2: Water Classes and Their Uses

Class	Uses
Class I	Conservation of Natural Environment.
	Water Supply I – Practically no treatment necessary.
	Fisher I – Very sensitive aquatic species.
Class IIA	Water Supply II – Conventional treatment required.
	Fishery II – Sensitive aquatic species.
Class IIB	Recreational use with body contact.
Class III	Water Supply III – Extensive treatment required.
	Fishery III – Common, of economic value and tolerant species; livestock drinking.
Class IV	Irrigation.
Class V	None of the above.

Source: Malaysia EQR 2015, DOE, 2016.

Table 3: Water Quality Classification Based on WQI

Water Quality Index	Index Range		
	Clean	Slightly Polluted	Polluted
WQI	81 - 100	60 - 80	0 - 59

Source: Malaysia EQR 2015, DOE, 2016.

2.0 MALAYSIAN MARINE WATER QUALITY CRITERIA AND STANDARDS

Table 2.1: Marine Water Quality Criteria and Standards

Parameter	Unit	Class 1	Class 2	Class 3	Class E
Beneficial Uses		Preservation, Marine Protected Areas, Marine Parks	Marine Life, Fisheries, Coral Reefs, Recreational and Mariculture	Ports, Oil and Gas Field	Mangroves Estuarine & River-mouth Water
Beneficial Uses		Preservation, Marine Protected Areas, Marine Parks	Marine Life, Fisheries, Coral Reefs, Recreational and Mariculture	Ports, Oil and Gas Field	Mangroves Estuarine & River-mouth Water
Temperature	(°C)	≤2°C increase over maximum ambient	≤2°C increase over maximum ambient	≤2°C increase over maximum ambient	≤2°C increase over maximum ambient
Dissolved Oxygen	(mg/L)	>80% saturation	5	3	4
Total Suspended Solid	(mg/L)	25 mg/L or ≤10% increase in seasonal average, whichever is lower	50 mg/L (25 mg/L) or ≤10% increase in seasonal average, whichever is lower	100 mg/L or ≤10% increase in seasonal average, whichever is lower	100 mg/L or ≤30% increase in seasonal average, whichever is lower
Oil and Grease	(mg/L)	0.01	0.14	5	0.14
Mercury*	(µg/L)	0.04	0.16 (0.04)	50	0.5
Cadmium	(µg/L)	0.5	2(3)	10	2
Chromium (VI)	(µg/L)	5	10	48	10
Copper	(µg/L)	1.3	2.9	10	2.9
Arsenic (III)*	(µg/L)	3	20(3)	50	20(3)
Lead	(µg/L)	4.4	8.5	50	8.5
Zinc	(µg/L)	15	50	100	50
Cyanide	(µg/L)	2	7	20	7
Ammonia (unionized)	(µg/L)	35	70	320	70
Nitrite (NO ₂)	(µg/L)	10	55	1,000	55
Nitrate (NO ₃)	(µg/L)	10	60	1,000	60
Phosphate	(µg/L)	5	75	670	75
Phenol	(µg/L)	1	10	100	10
Tributyltin (TBT)	(µg/L)	0.001	0.01	0.05	0.01
Faecal Coliform	(MPN)	70 faecal coliform/ 100mL	100 faecal coliform/ 100 mL & (70 faecal coliform/ 100mL)	200 faecal coliform/ 100mL	100 faecal coliform/ 100 mL & (70 faecal coliform/ 100mL)
Polycyclic Aromatic Hydrocarbon	(ng/g)	100	200	1,000	1,000

Source: EQR 2015, DOE, 2016.

Note: Parenthesis indicates for coastal and marine water areas where seafood and human consumption is applicable.

3.0 DECREE-LAW NO.5/2009 ON LICENSING REGULATIONS, SALE AND QUALITY OF DRINKING WATER

Table 3.1: Microbiological Parameters

Parameter	Parameter Value	Units
<i>Escherichia coli</i> (<i>E.coli</i>)	0	Number/100ml
Enterococcus	0	Number/100ml

Table 3.2: Chemical Parameters

Number	Parameter	Parameter Value	Units	Notes
1	Acrylamide	0.10	µg/L	Note 1
2	Antimony	5.0	µg/L Sb	
3	Arsenic	10	µg/L As	
4	Benzene	1.0	µg/L	
5	Benzo[a]pyrene	0.010	µg/L	
6	Boron	1.0	mg/L B	
7	Bromates	10	µg/L BrO ₃	Note 2
8	Cadmium	5.0	µg/L Cd	
9	Chromium	50	µg/L Cr	Note 3
10	Copper	2.0	µg/L Cu	Note 3
11	Cyanides	50	µg/L Cu	
12	1,2 Dichloroethane	3.0	µg/L	
13	Epichlorohydrin	0.10	µg/L	Note 1
14	Fluorides	1.5	mg/L F	
15	Lead	Up to 25	µg PB/L	Note 3 and 4
16	Mercury	1.0	µg/L Hg	
17	Nickel	20	µg/L Ni	Note 3
18	Nitrates	50	mg/L NO ₃	Note 5
19	Nitrites	0.5	mg/L NO ₂	Note 5
20	Individual pesticides	0.10	µg/L	Note 6 and 7
21	Pesticides - Total	0.50	µg/L	Note 6 and 8
22	Polycyclic aromatic hydrocarbons (PAHs)	0.10	µg/L	The sum of concentrations of specified compounds: Note 9
23	Selenium	10	µg/L SE	
24	Tetrachloroethene and Trichloroethene	10	µg/L	The sum of concentrations of specified compounds.
25	Total Trihalometanes (THMs)	100	µg/L	The sum of concentrations of specified compounds: Note 10
26	Vinyl chloride	0.50	µg/L	Note 1

Source: Decree-Law No.5/2009, Government of the Democratic Republic of Timor-Leste, 2015.

Note: All necessary measures must be taken to reduce to the greatest extent possible concentrations of THMs (Trihalomethanes) in water intended for human consumption. The applicable measures must primarily benefit areas where THM concentrations in water intended for human consumption are the highest.

Table 3.3: Notes from as specified for Groundwater Chemical Criteria

Note	Explanation
Note 1	The parameter value refers to the residual monomer concentration in water, calculated based on specifications for the corresponding polymer's maximum migration when in contact with water. This value must be confirmed at the time the product is acquired.
Note 2	The lowest possible value without affecting the effectiveness of disinfection.
Note 3	This value applies to samples collected from the tap of water intended for human consumption, using an adequate sampling method and collected in such a way as to be representative of the average monthly amount ingested by consumers.
Note 4	The maximum parameter value for lead concentrations will be 25 µg/ L Pb. Insofar as is possible, all necessary measures shall be taken to decrease the concentrations of lead in water intended for human consumption to 15 µg/L Pb.
Note 5	It is the duty of the proper authorities to ensure that the water exiting water treatment plants meet the standard of $[nitrates] 50 + [nitrites] /3^{*}1$, where the value in brackets is the concentration in mg/L for nitrates [NO ₃] and for nitrites [NO ₂], as well as the upper limit of 0.10 for nitrites.
Note 6	Pesticides are understood to be the following: Organic insecticides; Organic herbicides; Organic fungicides; Organic nematocides; Organic acaricides; Organic algicides; Organic rodenticides; Organic controllers of viscous secretions; Similar products, namely growth regulators and their metabolites, products causing significant degradation and reaction. Only those pesticides whose presence is probable within a particular drinking water supply system need to be investigated.
Note 7	This parameter value applies individually to each pesticide. For Aldrin, Dieldrin, heptachlor and chlorine epoxide, the parameter value used is 0.030 µg/L.
Note 8	Total pesticides means the sum of all pesticides detected and quantified during water quality control procedures.
Note 9	The specified compounds are: Benzo[b] fluoranthene; Benzo[k] fluoranthene; Benzo[ghi] perylene; Indeno[1,2,3-cd] pyrene.
Note 10	Whenever possible, but without prejudice to disinfection, the concentrations of organochlorines in water shall be reduced. The specified compounds are: chloroform, bromoform, dibromochloromethane, bromodichloromethane.

4.0 MALAYSIAN NATIONAL GUIDELINES FOR DRINKING WATER QUALITY

Table 4.1: National Guidelines for Drinking Water Quality

Parameter	Symbol	Unit	Acceptable Limit
Sulphate	SO ₄ ⁻	mg/L	250
Hardness	CaCO ₃	mg/L	500
Nitrate	NO ₃ ⁻	mg/L	10
Total Coliform	-	MPN/100ml	Must not be detected in any 100ml sample
Manganese	Mn	mg/L	0.1
Chromium	Cr	mg/L	0.05
Zinc	Zn	mg/L	3
Arsenic	Ar	mg/L	0.01
Selenium	Se	mg/L	0.01
Chloride	Cl	mg/L	250
Phenolics	-	mg/L	0.002
TDS	-	mg/L	1000
Iron	Fe	mg/L	0.3
Copper	Cu	mg/L	1.0
Lead	Pb	mg/L	0.01
Cadmium	Cd	mg/L	0.003
Mercury	Hg	mg/L	0.001

Source: EQR 2015, DOE, 2016.

5.0 WORLD HEALTH ORGANISATION (WHO) AIR QUALITY GUIDELINES

Table 5.1: WHO Air Quality Guideline Values

Pollutant	Averaging Time	AQG Value ($\mu\text{g}/\text{m}^3$)
PM _{2.5}	1 year	10
	24 hour (99 th percentile)	25
PM ₁₀	1 year	20
	24 hour (99 th percentile)	50
Ozone, O ₃	8 hour, daily maximum	100
Nitrogen Dioxide, NO ₂	1 year	40
	1 hour	200
Sulfur Dioxide, SO ₂	24 hour	20
	10 minute	500

Source: World Health Organization (WHO) Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide, Global Update, 2005, WHO, 2005.

6.0 WORLD HEALTH ORGANISATION (WHO) GUIDELINES VALUES FOR COMMUNITY NOISE IN SPECIFIC ENVIRONMENTS

Table 6.1: WHO Guidelines for Community Noise in Specific Environments

Environment	Critical Health Effect(s)	L _{Aeq} (dB)	Time Base (hours)	L _{Amax, fast} (dB)
Outdoor living area	Serious annoyance, day time and evening	55	16	-
	Moderate annoyance, day time and evening	50		
Dwelling, indoors Inside bedrooms	Speech intelligibility and moderate annoyance, day time and evening	35	16	-
	Sleep disturbance, night time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60
School class rooms and pre-schools, indoors	Speech intelligibility, disturbance of information extraction, message communication	35	during class	-
Pre-school bedrooms, indoors	Sleep disturbance	30	sleeping-time	45
School, playground outdoor	Annoyance (external source)	55	during play	-
Hospital, ward rooms, indoors	Sleep disturbance, night time	30	8	40
	Sleep disturbance, day time and evenings		16	-
Hospitals, treatment rooms, indoors	Interference with rest and recovery	#1	-	-
Industrial, commercial shopping and traffic areas, indoors and outdoors	Hearing impairment	70	24	110
Ceremonies, festivals and entertainment events	Hearing impairment (patrons: <5 times/year)	100	4	110
Public addresses, indoors and outdoors	Hearing impairment	85	1	110
Music through headphones/earphones	Hearing impairment (free-field value)	85 #4	1	110
Impulse sounds from toys, fireworks and firearms	Hearing impairment (adults)	-	-	140 #2
	Hearing impairment (children)			120 #2
Outdoors in parkland and conservation areas	Disruption of tranquillity	#3	-	-

Source: Guidelines for Community Noise, WHO, 1999.

7.0 MALAYSIAN INDUSTRIAL SEWERAGE EFFLUENT STANDARDS

Table 7.1: Design Effluent Values

Parameter	Effluent Discharge to Rivers / Stream				Effluent Discharge to Stagnant Water Bodies			
	Standard A		Standard B		Standard A		Standard B	
	Absolute	Design	Absolute	Design	Absolute	Design	Absolute	Design
BOD ₅	20	10	50	20	20	10	50	20
SS	50	20	100	40	50	20	100	40
COD	120	60	200	100	120	60	200	100
AMN	10	5	20	10	5	2	5	2
Nitrate Nitrogen	20	10	50	20	10	5	10	5
Total Phosphorus	N/A	N/A	N/A	N/A	5	2	10	5
O&G	5	2	10	5	5	2	10	5

Source: Malaysian Sewerage Industry Guidelines, SPAN, 2009.

Notes: NA = Not Applicable.

All values in mg/L unless otherwise stated.

*Stagnant Water Bodies refer to enclosed water bodies such as lakes, ponds and slow moving watercourses where dead zone occur.

Appendix 17-A



Complaint Form

In order for the PCM to address your complaint, you must provide the following information:



<p>1. Name of the Person(s) or Organisation(s) filing the Complaint ("the Complainant").</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>2. Contact information of the Complainant (please include email address and phone number if possible).</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>3. Is there a representative making this Complaint on behalf of the Complainant?</p> <p>Yes <input type="checkbox"/> (if yes, please provide the Name and Contact information of the Representative):</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>Please attach proof that the Representative has been authorised by the Complainant to file the Complaint. For example, this can be in the form of a letter signed by the Complainant giving permission to the Representative to make the Complaint on his behalf.</p> <p>No <input type="checkbox"/></p>
<p>Is proof of authorisation included with the Complaint?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p>4. Are you requesting that this Complaint be kept confidential?</p> <p>Yes <input type="checkbox"/> (if yes, please explain why you are requesting confidentiality)</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>No <input type="checkbox"/></p>
<p>5. Please provide the name or a description of the EBRD Project at issue.</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>6. Please describe the harm that has been caused or might be caused by the Project (please continue on a separate sheet if needed):</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

Please write on a separate sheet wherever needed.

7. If you are requesting the PCM's help through a **Problem-solving Initiative**, you must have made a genuine effort to contact the EBRD or Project Sponsor regarding the issues in this complaint.

a. Have you **contacted the EBRD** to try to resolve the harm caused or expected to be caused by the Project?

Yes (If yes, please list when the contact was made, how and with whom):

.....
.....
.....

Please also describe any response you may have received.

.....
.....
.....

No (please go to question 8)

Is the written record of this contact with the EBRD attached to your complaint?

Yes (please list)

.....
.....
.....

No (if not, please arrange for all relevant documents to be delivered to the PCM Officer as soon as possible).

b. Have you **contacted the Project Sponsor** to try to resolve the harm caused or expected to be caused by the Project?

Yes (if yes, please list when the contact was made, how and with whom)

.....
.....
.....

Please also describe any response you may have received.

.....
.....
.....

No (please go to question 8)

Is the written record of this contact with the Project Sponsor attached to your complaint?

Yes (please list)

.....
.....
.....

No (if not, please arrange for all relevant documents to be delivered to the PCM Officer as soon as possible).

8. If you have not contacted the EBRD and/or Project Sponsor to try to resolve the harm or expected harm, please explain why.

.....
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.....
.....

Although not required, it would be helpful to the PCM if you could also include the following information:

9. If you believe the EBRD may have failed to comply with its own policies, please describe which EBRD policies.

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10. Please describe any other complaints you may have made to try to address the issue(s) at question (for example, court cases or complaints to other bodies).

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11. Are you seeking a Compliance Review where the PCM would determine whether the EBRD has failed to comply with its Relevant Policies? Yes No

12. Are you seeking a Problem-solving Initiative where the PCM would help you to resolve a dispute or problem with the Project?" Yes No

13. What results do you hope to achieve by submitting this Complaint to the PCM?

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.....

.....

Date:

Please send your Complaint to: **Project Complaint Mechanism**
Attn: PCM Officer
European Bank for Reconstruction and Development
One Exchange Square
London EC2A 2JN
Fax: +44 20 7338 7633
E-mail: pcm@ebrd.com

Alternatively, a Complaint may be delivered by post or hand, at any one of the EBRD's Resident Offices, indicating that it is for transmission to the PCM.

Please write on a separate sheet wherever needed.