



PT PLN (Persero)

UNIT INDUK PEMBANGUNAN PEMBANGKIT SUMATERA

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ENVIRONMENTAL IMPACT **ANALYSIS (EIA)**

**DEVELOPMENT PLAN OF 2 X 55 MW HULULAIS
GEOHERMAL POWER PLANT (GPP) IN
LEBONG SELATAN AND LEBONG TENGAH
SUB-DISTRICTS, LEBONG DISTRICT,
BENGKULU PROVINCE**



LEBONG, AUGUST 2018

BUSINESS NUMBER (NIB)



PEMERINTAH REPUBLIK INDONESIA

NOMOR INDUK BERUSAHA (NIB) 8120003820135

Pemerintah Republik Indonesia c.q. Lembaga Pengelola dan Penyelenggara OSS berdasarkan ketentuan Pasal 24 ayat (1) Peraturan Pemerintah Nomor 24 Tahun 2018 tentang Pelayanan Perizinan Berusaha Terintegrasi Secara Elektronik, menerbitkan NIB kepada:

Nama Perusahaan : PT PERUSAHAAN PERSEROAN (PERSERO) PT.
PERUSAHAAN LISTRIK NEGARA
Alamat Perusahaan : JL. TRUNOJOYO BLOK MI/135, MELAWAI,
KEBAYORAN BARU, Kel. Melawai, Kec. Kebayoran
Baru, Kota Adm. Jakarta Selatan, Prop. DKI Jakarta
NPWP : 01.001.629.3-051.000
Nomor Telepon : (021)7261875
Nomor Fax : (021)7221330
Email : km.mediwp@gmail.com
Nama KBLI : Pembangkitan Tenaga Listrik, Transmisi Tenaga Listrik
Kode KBLI : 35101, 35102
Jenis API : Angka Pengenal Importir Produsen (API - P)
Status Penanaman Modal : PMDN

NIB merupakan identitas Pelaku Usaha dalam rangka pelaksanaan kegiatan berusaha dan berlaku selama menjalankan kegiatan usaha sesuai ketentuan peraturan perundang-undangan.

NIB adalah bukti Pendaftaran Penanaman Modal/Berusaha yang sekaligus merupakan pengesahan Tanda Daftar Perusahaan , Angka Pengenal Impor dan hak akses kepabeanan.

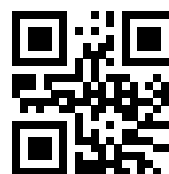
OSS berwenang untuk melakukan evaluasi dan/atau perubahan atas izin usaha (izin komersial/operasional) sesuai ketentuan perundang-undangan.

OSS berwenang memperbaiki status atas API-U atau API-P sesuai karakteristik pelaku usaha (perseorangan atau non-perseorangan).

Ke-efektifan API sesuai dengan standar yang ditetapkan Kementerian Perdagangan.

Seluruh data yang tercantum dalam NIB dapat berubah sesuai dengan perkembangan kegiatan berusaha

Ditetapkan tanggal : 03 Agustus 2018



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**COMMITTED ENVIRONMENT
PERMITS AND EFFECTIVE**



PEMERINTAH REPUBLIK INDONESIA

IZIN LINGKUNGAN

Pemerintah Republik Indonesia c.q. Lembaga Pengelola dan Penyelenggara OSS berdasarkan ketentuan Pasal 32 ayat (2) Peraturan Pemerintah Nomor 24 Tahun 2018 tentang Pelayanan Perizinan Berusaha Terintegrasi Secara Elektronik, menerbitkan Izin Lingkungan kepada:

Nama Perusahaan : PT PERUSAHAAN LISTRIK NEGARA (PERSERO)
Nomor Induk Berusaha : 8120003820135
Lokasi Yang Dimohon

- Alamat : Bengkulu, Kabupaten Lebong, Kecamatan Lebong Selatan, Kelurahan Mubai,
- Desa/Kelurahan : Mubai
- Kecamatan : Lebong Selatan
- Kabupaten/Kota : Kab. Lebong
- Provinsi : Bengkulu
- Luas Lahan : 15 Ha
- Rencana Kegiatan : - PLTP Hululais

- Koordinat : -6.4033308, 99.0392310

Izin Lingkungan ini berlaku efektif setelah perusahaan yang bersangkutan telah melakukan pemenuhan komitmen prasarana dan komitmen sesuai prasyarat izin lingkungan ini dan melakukan pembayaran Penerimaan Negara Bukan Pajak atau Pajak Daerah/Retribusi Daerah sesuai ketentuan peraturan perundang-undangan.

Dikeluarkan tanggal : 6 September 2018



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PEMERINTAH REPUBLIK INDONESIA

IZIN LINGKUNGAN

Pemerintah Republik Indonesia c.q. Lembaga Pengelola dan Penyelenggara OSS berdasarkan ketentuan Pasal 32 ayat (2) Peraturan Pemerintah Nomor 24 Tahun 2018 tentang Pelayanan Perizinan Berusaha Terintegrasi Secara Elektronik, menerbitkan Izin Lingkungan kepada:

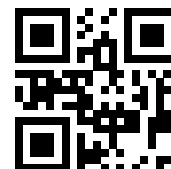
Nama Perusahaan : PT PERUSAHAAN LISTRIK NEGARA (PERSERO)
Nomor Induk Berusaha : 8120003820135
Lokasi Yang Dimohon

- Alamat : Provinsi Bengkulu, Kabupaten Lebong, Kecamatan Lebong Selatan, Kelurahan Mubai.
- Desa/Kelurahan : Mubai
- Kecamatan : Lebong Selatan
- Kabupaten/Kota : Kab. Lebong
- Provinsi : Bengkulu
- Luas Lahan : 15 Ha
- Rencana Kegiatan : - PLTP Hululais

- Koordinat : -3.231588, 102.297864

Izin Lingkungan ini telah terpenuhi sesuai ketentuan perundangan-undangan dan berlaku efektif.

Dikeluarkan tanggal : 25 Oktober 2018



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**DECISION LETTER OF
ENVIRONMENTAL FEASIBILITY
(SKKLH)**



**BUPATI LEBONG
PROVINSI BENGKULU**

**KEPUTUSAN BUPATI LEBONG
NOMOR 299 TAHUN 2018**

TENTANG

**KELAYAKAN LINGKUNGAN HIDUP TERHADAP RENCANA PEMBANGUNAN
PEMBANGKIT LISTRIK TENAGA PANAS BUMI (PLTP) HULULAIS (2X55 MW)
DI KECAMATAN LEBONG SELATAN DAN LEBONG TENGAH
KABUPATEN LEBONG
PROVINSI BENGKULU**

BUPATI LEBONG,

- Menimbang:
- a. bahwa rencana kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2x55 MW) di Kecamatan Lebong Selatan dan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu oleh PT. PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera merupakan kegiatan yang wajib memiliki Analisis Mengenai Dampak Lingkungan (AMDAL);
 - b. bahwa dalam rangka pengendalian dampak penting terhadap lingkungan akibat dari Rencana Kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 X 55 MW) di Kecamatan Lebong Selatan dan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu, sebagai salah satu bagian dari Studi Analisis Mengenai Dampak Lingkungan, maka perlu disusun Analisis Dampak Lingkungan Hidup (Andal), Rencana Pengelolaan Lingkungan Hidup dan Rencana Pemantauan Lingkungan Hidup (RKL-RPL);
 - c. bahwa untuk memenuhi sebagaimana dimaksud huruf (a) dan huruf (b) di atas, maka perlu ditetapkan dengan Keputusan Bupati tentang Kelayakan Lingkungan Hidup Rencana Kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 X 55 MW) oleh PT. PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera di Kecamatan Lebong Selatan dan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu.
- Mengingat :
1. Undang-Undang Nomor 9 Tahun 1967 tentang Pembentukan Provinsi Bengkulu (Lembaran Negara Republik Indonesia Tahun 1967 Nomor 19, Tambahan Lembaran Negara Republik Indonesia Nomor 2828);
 2. Undang-Undang Nomor 5 Tahun 1990 tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya (Lembaran Negara Republik Indonesia Tahun 1990 Nomor 49, Tambahan Lembaran Negara Republik Indonesia Nomor 3419);

3. Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintah Daerah (Lembaran Negara Republik Indonesia Tahun 2014 Nomor 244, Tambahan Lembaran Negara Republik Indonesia Nomor 5587) sebagaimana telah diubah beberapa kali terakhir dengan Undang-Undang Nomor 9 Tahun 2015 tentang Perubahan Kedua atas Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah (Lembaran Negara Republik Indonesia Tahun 2015 Nomor 58, Tambahan Lembaran Negara Republik Indonesia Nomor 5679);
4. Undang-Undang Nomor 26 Tahun 2007 tentang Penataan Ruang (Lembaran Negara Republik Indonesia Tahun 2007 Nomor 68, Tambahan Lembaran Negara Nomor 4725);
5. Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup (Lembaran Negara Republik Indonesia Tahun 2009 Nomor 139, Tambahan Lembaran Negara Republik Indonesia Nomor 5058);
6. Undang-Undang Nomor 12 Tahun 2011 tentang Pembentukan Peraturan Perundang-Undangan (Lembaran Negara Republik Indonesia Tahun 2011 Nomor 82, Tambahan Lembaran Negara Republik Indonesia Nomor 5234);
7. Peraturan Pemerintah Nomor 38 Tahun 2007 tentang Pembagian Urusan Pemerintahan Antara Pemerintah, Pemerintahan Daerah Provinsi, dan Pemerintahan Daerah Kabupaten/Kota (Lembaran Negara Republik Indonesia Tahun 2007 Nomor 82, Tambahan Lembaran Negara Republik Indonesia Nomor 4737);
8. Peraturan Pemerintah Nomor 27 Tahun 2012 tentang Izin Lingkungan (Lembaran Negara Republik Indonesia Tahun 2012 Nomor 48, Tambahan Lembaran Negara Republik Indonesia Nomor 5285);
9. Peraturan Menteri Negara Lingkungan Hidup Nomor 5 Tahun 2008 Tentang Tata Kerja Komisi Penilai Analisis Mengenai Dampak Lingkungan Hidup;
10. Peraturan Menteri Negara Lingkungan Hidup Nomor 5 Tahun 2012 Tentang Jenis Rencana Usaha dan/atau Kegiatan Yang Wajib Memiliki AMDAL;
11. Peraturan Menteri Negara Lingkungan Hidup Nomor 16 Tahun 2012 Tentang Pedoman Penyusunan Dokumen Lingkungan Hidup;
12. Peraturan Menteri Dalam Negeri Nomor 80 Tahun 2015 tentang Pembentukan Produk Hukum Daerah (Berita Negara Republik Indonesia Tahun 2015 Nomor 2036).

- Memperhatikan :
1. Rapat Tim Teknis Komisi Penilai AMDAL Kabupaten Lebong pada tanggal 27 Juli 2018, di Lebong, mengenai penilaian Analisis Dampak Lingkungan Hidup (ANDAL), Rencana Pengelolaan Lingkungan Hidup dan Rencana Pemantauan Lingkungan Hidup (RKL-RPL) Rencana Kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2x55 MW) di Kecamatan Lebong Selatan dan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu dan menyetujui untuk diterbitkan Surat Keputusan Kelayakan Lingkungan Hidup;
 2. Rapat Komisi Penilai AMDAL Kabupaten Lebong pada tanggal 28 Juli 2018, di Lebong, mengenai Penilaian Analisis Dampak Lingkungan Hidup (ANDAL), Rencana Pengelolaan Lingkungan Hidup dan Rencana Pemantauan Lingkungan Hidup (RKL-RPL) Rencana Kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2x55 MW) di Kecamatan Lebong Selatan dan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu dan menyetujui untuk diterbitkan Surat Keputusan Kelayakan Lingkungan Hidup;

MEMUTUSKAN :

Menetapkan : KEPUTUSAN BUPATI LEBONG TENTANG KELAYAKAN LINGKUNGAN HIDUP TERHADAP RENCANA PEMBANGUNAN PEMBANGKIT LISTRIK TENAGA PANAS BUMI (PLTP) HULULAIS (2X55 MW) DI KECAMATAN LEBONG SELATAN DAN LEBONG TENGAH KABUPATEN LEBONG PROVINSI BENGKULU

KESATU : Keputusan Kelayakan Lingkungan Hidup Rencana Kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2x55 MW) di Kecamatan Lebong Selatan dan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu.

KEDUA : Rencana Kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2x55 MW) di Kecamatan Lebong Selatan dan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu, meliputi :

1. Sosialisasi
2. Pembebasan lahan
3. Penerimaan tenaga kerja
4. Mobilisasi alat dan material
5. Operasional *base camp*
6. Penyiapan lahan
7. Konstruksi PLTP
8. Pemasangan peralatan PLTP
9. Pengurangan tenaga kerja
10. *Commisioning* (Uji Coba)
11. Penerimaan tenaga kerja
12. Pengoperasian PLTP
13. Pemeliharaan PLTP

KETIGA : Berdasarkan hasil perkiraan dari aspek geofisik kimia, biologi, sosial ekonomi budaya dan kesehatan masyarakat, pada tahap operasi usaha dan/atau kegiatan, diperoleh dampak penting yang ditimbulkan dari rencana kegiatan ini sebagai berikut :

1. Kualitas udara
2. Kebisingan
3. Getaran
4. Kualitas air permukaan
5. Kualitas air tanah
6. Kuantitas air tanah
7. Lalu lintas
8. Kerusakan jalan
9. Laju air larian & banjir
10. Erosi
11. Berkurangnya lahan produktif
12. Flora dan fauna
13. Biota perairan
14. Kesempatan kerja
15. Peluang berusaha
16. Pendapatan masyarakat
17. Sanitasi lingkungan
18. Angka kesakitan

KEEMPAT : Untuk menanggulangi dampak penting sebagaimana dimaksud dalam Diktum KETIGA, PT. PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera wajib :

1. Melakukan pemipaan *non condensable gas (NCG)* yang dialirkan kemenera pendingin supaya gas tersebut larut dalam air kondensat yang kemudian diinjeksikan ke dalam sumur injeksi;
2. Melakukan pembersihan pipa air distribusi dan filter menara pendingin secara rutin untuk menurunkan temperatur pendingin steam di kondensat supaya kelarutan NCG menjadi optimum, sehingga emisi NCG menjadi minimal;
3. Melakukan pengelolaan lingkungan saat kondisi *emergency* dan *overhaul*, steam dialirkan ke *rock muffler* yang dapat mereduksi kebisingan sebesar 16 DbA;
4. Memelihara dan melakukan peremajaan tanaman *green barrier* sekitar lokasi PLTP;
5. Menerbitkan bulletin secara periodik berisi informasi aktifitas PLTP untuk disebarakan melalui kantor kelurahan setempat;
6. Melakukan penyiraman jalan yang berdebu pada musim kemarau, khususnya yang melalui pemukiman;
7. Membatasi kecepatan kendaraan berat maksimal 20 km/jam, dan kendaraan kecil maksimal 30 km/jam pada saat melewati pemukiman;
8. Kendaraan yang digunakan dilengkapi uji emisi yang memenuhi baku mutu;
9. Membuat saluran air hujan darurat sekeliling lokasi penyiapan lahan, yang pada ujung saluran dibuat lubang (bak) pengendap untuk menampung lumpur yang terbawa air hujan agar tidak masuk keperairan;

10. Melakukan komunikasi dengan masyarakat petani merumuskan program CSR bidang pertanian dan perkebunan;
11. Membentuk forum komunikasi pemrakarsa PT. PLN dengan masyarakat petani untuk meningkatkan produktifitas lahan pertanian dan perkebunan;
12. Memprioritaskan penduduk setempat dalam penerimaan tenaga kerja secara transparan sesuai kualifikasi dan jumlah yang dibutuhkan;
13. Melakukan sosialisasi kepada masyarakat melalui koordinasi dengan muspida, pemerintahan desa dan tingkat RW sebelum pelaksanaan konstruksi;
14. Menjalankan program SHE (*Safety Health and Environment*) *Induction* bagi sopir agar mengerti tentang perlindungan lingkungan;
15. Melakukan pengelolaan erosi tanah;
16. Menjaga kesuburan tanah;
17. Mengendalikan tingkat pelayanan jalan;
18. Menjaga kualitas air;
19. Melakukan pengelolaan flora dan fauna;
20. Melakukan pengelolaan biota air;
21. Memberikan kesempatan kerja sesuai dengan pendidikan dan keahlian terutama pada penduduk lokal
22. Meningkatkan pendapatan masyarakat;
23. Mengendalikan konflik sosial;
24. Meningkatkan derajat kesehatan masyarakat;

KELIMA : Setelah diterbitkan Keputusan Kelayakan Lingkungan Hidup wajib diterbitkan Izin Lingkungan dan mengajukan izin lingkungan dan pengelolaan lingkungan hidup sesuai dengan peraturan perundangan yang berlaku.

KEENAM : Disamping izin perlindungan dan pengelolaan lingkungan hidup sebagaimana dimaksud dalam Diktum KELIMA, PT. PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera, wajib memiliki izin usaha dan/atau izin lainnya yang terkait dengan kegiatannya.

KETUJUH : Dalam pelaksanaan keputusan tentang Kelayakan Lingkungan Hidup Rencana Kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2x55 MW) oleh PT. PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera di Kecamatan Lebong Selatan dan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu harus sesuai dan berpedoman pada Peraturan Perundang-Undangan yang berlaku.

KEDELAPAN : Keputusan Bupati ini mulai berlaku pada tanggal ditetapkan, dengan ketentuan bahwa apabila dikemudian hari terdapat kekeliruan akan diperbaiki sebagaimana mestinya.

Ditetapkan di Tubei
pada tanggal 26 September 2018


BUPATI LEBONG,
[Handwritten Signature]
H. ROSJONSYAH

Tembusan disampaikan kepada :

1. Yth. Menteri Negara Lingkungan Hidup RI di Jakarta;
2. Yth. Kepala Dinas Lingkungan Hidup dan Kehutanan Provinsi Bengkulu di Bengkulu;
3. Yth. Kepala Pusat Pengelolaan Lingkungan Hidup Regional Sumatera di Pekanbaru ;
4. Sdr. Kepala Dinas Lingkungan Hidup Kabupaten Lebong di Lebong.

PREFACE

PREFACE

The PT PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera (UIP Kitsum), a state-owned company that engaged in the electricity energy supply service, is planning to conduct the construction of a 2 x 55 MW Hululais Geothermal Power Plant (GPP) in Lebong Selatan and Lebong Tengah Sub-district, Lebong District, Bengkulu Province with an area of 15 ha.

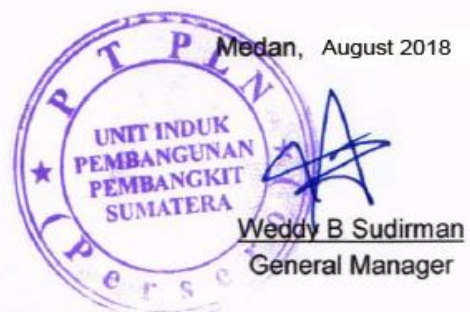
In accordance with the Law of the Republic of Indonesia Number 32 of 2009 concerning Environmental Protection and Management, the Republic of Indonesia Government Regulation Number 27 of 2012 concerning Environmental Permits, and the Regulation of the Minister of Environment Number 05 of 2012 concerning Types of Business Plans and / or Activities that Must Have the EIA, the planned construction activities of the 2 x 55 MW Hululais GPP must be accompanied by an EIA.

This Environmental Impact Analysis (EIA) document is part of the AMDAL Document for the 2x55 MW Hululais GPP Construction Plan in Lebong Selatan Sub-district, Lebong District, Bengkulu Province which is compiled based on the results of the discussion of the Reference Framework document that has been approved by the Decree of Environmental Office Head of Lebong Dsitric, Number 660.1 / 09 / DLH / 2018, dated March 19, 2018. The EIA document will be used to deepen and identify the impacts that will occur due to the activity plan of the 2x55 MW Hululais GPP development activity by PT PLN (Persero) UIP Kitsum.

The EIA writing format of the 2x55 MW Hululais GPP construction activity plan by PT PLN (Persero) UIP Kitsum was compiled in accordance with the Regulation of the Minister of Environment Number 16 of 2012 concerning Environmental Document Preparation Guidelines Attachment 2.

To the parties concerned, especially to the AMDAL Assessment Commission and the ranks of relevant agencies / institutions at the Lebong District level, we as the initiator of the activity would like to express their gratitude for all the participation, attention, assistance and cooperation to the establishment of this EIA.

Medan, August 2018



UNIT INDUK
PEMBANGUNAN
PEMBANGKIT
SUMATERA

Weddy B Sudirman
General Manager

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GLOSSARY

GLOSSARY

AMDAL (EIA)	:	Environmental Impact Analysis, namely a study of the significant impact of a planned business and / or activity on the environment that is needed for the decision making process concerning the operation of a Business and / or Activity.
Andal	:	Environmental Impact Analysis is a careful and in-depth study of the significant impacts of a business and / or activity plan.
Brine	:	Water and solid particles resulting from the separation of water vapor in the separator
Brushless excitation	:	The brushless excitation system, which means that the system is to channel the excitation current to the main generator rotor, as well as for exciter excitation without going through charcoal brush media.
Cooling Tower	:	A tool that can save water (water conservation) or a tool that reprocesses water or is able to reduce water temperature (recovery devices).
Counter flow	:	The direction of the flow of fresh water is opposed to the direction of the water drop from the condenser.
Cross flow	:	The direction of the flow of fresh water is perpendicular to the direction of the water drop from the condenser.
Excitation/exciter	:	A device that serves to supply the amplifier current to generate a magnetic field in the generator rotor.
Entalpi	:	The amount of energy contained in the fluid.
Environmental Permit	:	permission granted to every person who conducts a business and / or activity that is required by Amdal or UKL-UPL in the context of environmental protection and management as a prerequisite for obtaining a business and / or activity permit.
Condenser	:	Equipment that serves to convert steam into water
Mechanical draft	:	Air circulation on the cooling tower is carried out in action (force) by a fan or blower.
OLTC (On Load Tap Changer)	:	Transformer turns the transformer to get the desired voltage.
GPP	:	Geothermal Power Plant is a power plant that uses fuel from geothermal energy to drive a turbine generator.
RKL	:	Environmental Management Plan is an effort to deal with the impact on the environment resulting from the planned business and / or activity.
RPL	:	Environmental Monitoring Plan is an effort to monitor environmental components affected by the planned business and / or activity.

Single flash steam cycle	:	A single evaporation cycle that is a fluid that appears on the surface or at the wellhead is a two-stage fluid with high water levels. To get more vapor fractions, the fluid pressure is lowered, this process is known as flashing. During flashing, the fluid pressure drops along with a decrease in temperature, the enthalpy remains, entropy rises, and the most significant is the amount of vapor fraction increases.
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CHAPTER 1

INTRODUCTION

CHAPTER 1. INTRODUCTION

1.1. SUMMARY DESCRIPTION OF ACTIVITY PLAN

1.1.1. STATUS OF AMDAL STUDY

The AMDAL study status for the 2 x 55 MW Hululais Geothermal Power Plant (GPP) Construction by PT PLN (Persero)'s Sumatra Generator UIP was prepared based on the results of the location selection study (Site Selection Hululais Geothermal Power Plant 2 x 55 MW) and implemented in an integrated manner after its technical and economic feasibility study had been implemented. The initial step taken by the initiator was a technical and economic feasibility study of the planned activities, through a field survey to determine the location of 2 x 55 MW Hululais GPP and the results of this survey were used as material in the preparation of technical planning (Engineering Design Development) which included: master plan, site plan, technical drawings and budget plans. The results of this technical planning study are used as the basis for preparing a description of the activity plan in the preparation of the AMDAL study. This Environmental Impact Analysis (EIA) document is part of the AMDAL Document for the 2 x 55 MW Hululais GPP Development Plan in Lebong Selatan Sub-district, Lebong District, Bengkulu Province which is compiled based on the results of the discussion of the Reference Framework document that has been approved by the Head of the Environmental Office Lebong District, Number 660.1 / 09 / DLH / 2018, dated March 19, 2018. EIA's document will be used to deepen and identify the impacts that will occur due to the planned activities of 2 x 55 MW Hululais GPP development activities by PT PLN (Persero) Sumatra Generator UIP (Appendix 1).

Based on the results of a feasibility study (FS) of Pertamina Geothermal Energy (PGE), Hululais's geothermal steam capacity is sufficient to produce 110 MW of electricity. On the FS, it was listed that the potential of steam from 3 (three) wells has been tested and producing 40 MW of electricity equivalent steam; and 10 wells have been drilled (equivalent to 130 MW or steam equivalent of 950 tons / day).

1.1.2. LOCATION OF ACTIVITIES PLAN

Development Plan for Geothermal Power Plant (GPP) 2 x 55 MW Hululais administratively located in Mubai Village, Lebong Selatan Sub-district, Lebong District, Bengkulu Province. The coordinates of the 2 x 55 MW Hululais GPP location are presented at **Table 1-1**.

Table 1-1 Coordinate of GPP Power Plant Locations

NO	UTM coordinates		Latitude Longitude Coordinates	
	X	Y	BT	LS
1.	197.581,5708	9.642.169,6390	102°16'44,24"	3°14'01,35"
2.	197.300,5324	9.642.286,0489	102°16'35,15"	3°13'57,52"
3.	197.327,3203	9.642.350,7205	102°16'36,03"	3°13'55,44"
4.	197.234,9323	9.642.388,9888	102°16'33,03"	3°13'54,19"
5.	197.361,2179	9.642.693,8691	102°16'37,16"	3°13'44,28"
6.	197.586,6466	9.642.600,4935	102°16'44,44"	3°13'47,33"
7.	197.557,9456	9.642.531,2024	102°16'43,49"	3°13'49,57"
8.	197.604,3547	9.642.511,9791	102°16'45,01"	3°13'50,22"
9.	197.679,3509	9.642.419,2631	102°16'47,43"	3°13'53,22"
10.	197.599,7841	9.642.227,1630	102°16'44,83"	3°13'59,46"
11.	197.650,5944	9.642.206,1175	102°16'46,48"	3°14'00,15"
12.	197.572,5338	9.642.019,7264	102°16'43,93"	3°14'06,23"
13.	197.508,3061	9.641.963,3227	102°16'41,86"	3°14'08,04"
14.	197.487,9482	9.641.979,4954	102°16'41,18"	3°14'07,52"
15.	197.531,1680	9.642.044,0753	102°16'42,61"	3°14'05,41"

Source: Site Selection Hululais Geothermal Power Plant 2 X 55 MW, 2017.

1.1.3. COMPATIBILITY OF LOCATION PLAN OF ACTIVITIES WITH REGIONAL SPATIAL PLAN

The suitability of the 2 x 55 MW Hululais Geothermal Power Plant (GPP) construction plan location based on Lebong District Local Regulation Number 14 of 2012 concerning Lebong District Spatial Plan (RTRW) 2012 – 2032, contained in the Lebong District Secretariat Letter, No. 530.3 / 1884 / BAPPEDA / 2017 date October 30, 2017 (Appendix 2). The overlay map of the activity plan location with the Lebong District Spatial Plan Pattern is presented in Appendix 2. The location of the Hululais geothermal power plant has obtained a Certificate of Location Suitability with an Indicative Map of the Postponement of New Permit Approval (PIPIB) from the Bengkulu Provincial Environment and Forestry Office, Number 522/1609 / IV -1 dated September 26, 2017 (Appendix 3). The overlay map of the location of the activity plan with PIPIB (Revision XII) is listed in the Appendix Letter. The location of the GPP plan is outside the Indicative Map for Postponement of the New Permits Approval (PIPIB).

Bengkulu Province Regional Regulation Number 02 of 2012 concerning the Bengkulu Provincial Spatial Plan (RTRW) 2012-2032; Article 23 paragraph (1) point (c) states: Bengkulu Province energy network system consists of the development of a new power plant which is Hululais Geothermal Power Plant (GPP).

1.1.4. LAYOUT AND LAND USE

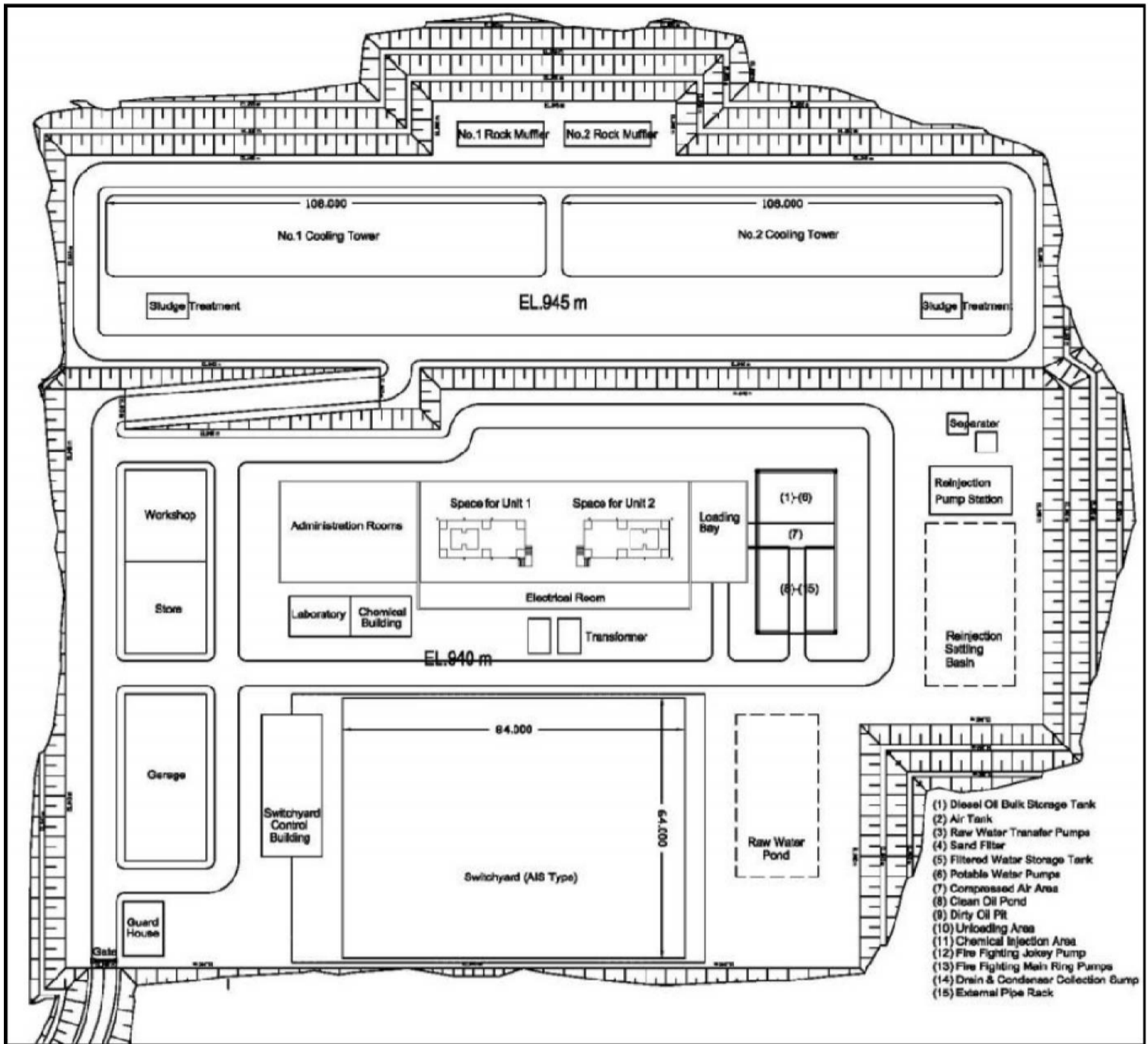
The land use of the GPP location is listed in the table below:

Table 1-2 Land Use of GPP Location

No	Use	Area (m ²)	Information
1.	Powerhouse	3.400	
2.	Transformers	100	50 m ² x 2 unit
3.	Cooling towers	4.400	2.200 m ² x 2 unit
4.	Sludge treatment	150	75 m ² x 2 unit
5.	Rock muffler	260	130 m ² x 2 unit
6.	Workshop and store	900	
7.	Laboratory and Chemical building	300	
8.	Miscellaneous equipment area	800	Firefighting pumps, etc
9.	Raw water pond	800	
10.	Reinjection settling basin	900	
11.	Reinjection pump station	250	
12.	Separator	50	
13.	Switchyard Control Building	550	
14.	Switchyard Area (AIS)	5.400	
15.	Guard house	140	
16.	Yard road	8.000	
17.	Access road	2.300	
18.	Cut slope	15.500	
19.	Disposal area	42.500	
	total	86.700	

Source: *Feasibility Study of Hululais geothermal power plant, 2018.*

Layout of GPP locations as presented in Picture 1-1.



Picture 1-1 GPP Layout

1.1.5. SELECTION OF HULULAIS GPP TECHNOLOGY

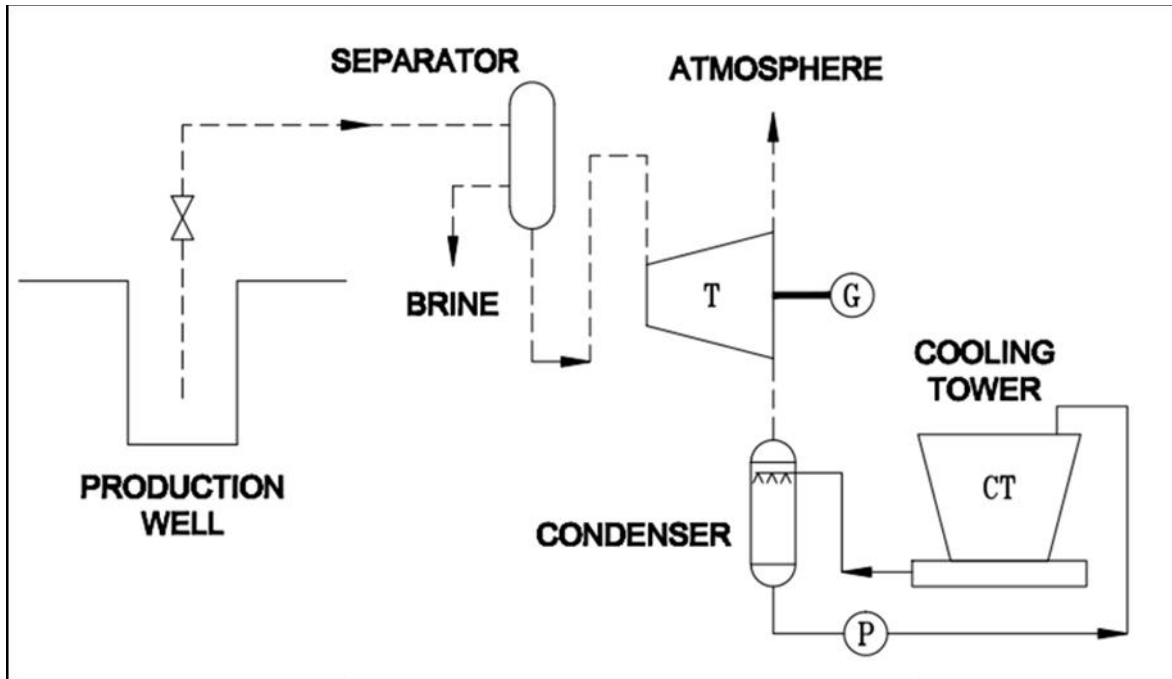
Geothermal energy is an energy that is more environmentally friendly because the heat energy in geothermal fluid (steam) after being converted into electrical energy, then brine fluid (water and solid particles produced from the separation of water vapor in the separator) is returned to the surface (injection) through injection wells. So the utilization of geothermal energy is a closed cycle, namely: Reservoir - Steam Production - GPP - Injection - Reservoir. The return of water into the reservoir is a must to maintain the balance of the mass so that it slows down the reservoir pressure. Returning fluid (water) and seepage (recharge) surface water into the bowels of the earth, makes geothermal energy as a sustainable energy.

The GPP technology selection depends on the characteristics of the geothermal vapor that will be used. Hot steam from the Hululais field that will be used in the Hululais geothermal power plant contains water, so a separator is needed. This separator separates water from steam. The water is then channeled to the reinjection well through a pipe. If needed, acidic compounds will be used to maintain the pH of the water being injected.

Steam from the separator is collected at the steam receiver (header) and flowed to the steam turbine through scrubbers and demisters. The scrubbers and demisters are used to narrow the separation of water content from steam. Scrubbers and demisters will be outdoors outside the power house. All equipment is coated with good insulation to prevent the influence of hot temperatures on the environment.

Drainage water from the GPP comes from cooling tower's blow down (water that has been used as a cooling), scrubber, demisters, power house. Water that has been used as a cooling (Blow down from cooling tower) is collected temporarily in concrete ponds and then flowed through a steel pipe to a reinjection well by gravity and / or using a pump. If needed, caustic soda will be used to maintain the pH of drainage water.

The average steam enthalpy of steam produced from the PGU Hululais is estimated at 1,185 kJ / kg, so the technology used is a single flash steam cycle technology. A single evaporation cycle is suitable for high temperature systems both in the environment of reservoir domination of water and in the steam domination reservoir, with a work flow chart as presented in **Picture 1-2**.



Picture 1-2 Steam cycle single flash system flow chart

The characteristics of steam used are as follows:

- Steam fraction : 99%
- Total Dissolved Solid (TDS) : 20 10-20 ppm
- Silica content : 1 ppm
- Non Condensable Gas (NCG) content : 1.5% wt
- pH of condensate vapor : 4: 5
- Steam pressure at the delivery point : 7.5 bar abs

1.1.6. EQUIPMENTS AND FACILITIES OF 2 X 55 MW HULULAIS GPP

The 2 x 55 MW Hululais GPP's equipments and facilities consist of:

1. Turbine Steam

The turbine steam that will be used is the bottom exhaust type and will be installed on the ground floor.

2. Power House

Power house (power plant building) is made with the power to be able to withstand vibrations arising from GPP equipment operations.

3. Cooling Tower

Cooling towers (cooling towers) will be made from materials that are resistant to acidic water with a sturdy structure and between the cooling tower and turbine will be connected with a steam pipe placed under the internal access road.

4. Receiver (Steam Header)

The steam receiving station will be built on the north side. The steam receiving header receives steam flow from the production well. Furthermore, through a flow meter, steam is flowed into the separator and demister to separate solids, silica and water spots carried in them.

5. Condensing System

Steam turbine contains non condensable gas which is mainly carbon dioxide. For this reason a non condensable gas extraction system is installed to maintain system pressure.

6. Separator

Geothermal wells generally produce mixed fluids, steam and water, while turbines in GPP are driven by working fluid in the form of dry or almost superheated vapor. This steam and water separation is done in the separator. The operational characteristics of separators that must be achieved in the separation of geothermal fluids are the efficiency of fluid separation that must be high and a small pressure drop while in the separator to prevent scaling and corrosion in the turbine blade and produce high electrical output.

7. Rock Muffler

Rock mufflers function is to keep constant flow of steam to the turbine. The rock muffler is connected to the receiver, serves to reduce the flow of steam when the turbine load decreases, and adds steam flow when the turbine load increases.

8. Mist Eliminator

Mist Eliminator / demister functions to separate the water content carried by steam from the well - as well as the result of steam condensation itself. This is done to keep the steam entering the turbine to be completely dry and clean, so that the corners of the turbine free of corrosion. Mist eliminator is the final separation of steam transmission from wells.

9. Loading Bay

Loading Bay / Bay Transformer Generator is functioned to convert mechanical energy into electrical energy.

10. Control Room and Workshop

The control room is located near the turbine room to easily control the turbine operation.

11. Auxiliary Transformer

Auxiliary Transformer Unit is to adjust the voltage level so that the electricity produced can be used for the power plant's own needs

12. Generator Transformer

The generator transformer is functioned to convert mechanical energy into electrical energy

13. Switchyard 150 kV

Switchyard in energy distribution and load regulation.

14. Administration Building

The administrative building will be built near the entrance. The administration building is equipped with a parking space with a capacity of 20 vehicles. The administration building is 40 meters from the cooling tower.

15. Fire Fighting Station

Fire Station is a Flight Accident and Fire Fighting Service (PKP-PK) service station to control all activities contained in all PKP-PK facilities

16. Caustic Storage and Caustic Mixing Area

Caustic Storage and Caustic Mixing Area is a storage area for caustic materials.

17. Warehouse

Warehouse is a warehouse for storage of materials and equipment.

18. WTP and Sludge Disposal Area

Waste Treatment Plan (WTP) and Sludge Disposal Area are temporary storage facilities (TPS) of B3 Waste from GPP operations.

19. Fire Fighting Water Pond

Fire fighting water pond will be built next to the turbine.

20. Turbine Wash Station

Turbine Wash Station is an equipment for cleaning turbines with a compressor system.

21. Gas Extraction Station

Gas Extraction Station is a gas extraction equipment.

22. Guard House

Guard House is a security post for GPP operations.

23. Mosque

The mosque will be built in the GPP area.

24. Dead End Tower

Dead End Tower is a transmission tower for the distribution of electrical energy from GPP.

25. Workshop

Workshop is a workshop building and equipment maintenance

26. Garage

Garage is a vehicle parking lot.

27. Rock Muffler Control Room

Rock Muffler Control Room is a GPP operational control room

The turbine specifications that will be used are as follows:

- Vapor pressure at the turbine inlet: 7.1 abs bar
- Type: double flow for condensation type
- Capacity: 55 MW
- Amount: two units
- Speed: 3,000 rpm

Generator

- Type: Generator 3 (three) stages
- Power Value: 55 MW
- Frequency: 50 Hz
- Voltage: 11 kV
- Average Power Factor: 0.8
- Excitation system: Brushless excitation
- Amount: 2 (two) units

Step-up Transformer

- Power value: 68.75 MVA
- Voltage: 150 kV \pm 10% / 11 kV
- OLTC: 1,25x17 (\pm 10%)

Condenser

- Type: Direct contact
- Amount: one set for one unit (total of two units)

Cooling Tower

- Type: Mechanical draft, Cross-flow / Counter-flow
- Structure: Fiberglass / steel reinforced concrete
- Amount: one set for one unit (total of two units)

1.1.7. WORK PRINCIPLES GPP 2 X 55 MW HULULAIS

The working principle of 2 x 55 MW Hululais GPP is presented in the diagram below. Steam from the production well is initially channeled to the receiving header steam, which serves to ensure that the steam supply will not be disrupted despite changes in supply from the production well. Furthermore, through the flow meter it is flowed to the separator and demister to separate solids, silica and water spots carried in it. This is done to avoid vibration, erosion and crust formation on the blade and turbine nozzle.

The clean steam is flowed through the main steam valve / electric control valve / governor valve to the turbine. In the turbine, the steam is functioned to rotate the double flow condensing coupled with the generator, at a speed of 3,000 rpm. This process produces electrical energy. Through step-up transformers, the electric current's voltage is increased, then connected in parallel with the distribution system.

In order for the turbine to work efficiently, the exhaust steam coming out of the turbine is in a vacuum (0.10 bar), by condensing the steam in the direct contact condenser installed under the turbine. Exhaust steam from the turbine enters from the top side of the condenser, then condensed as a result of heat absorption by the cooling water injected through the spray-nozzle. The level of condensate is always maintained under normal conditions by the cooling water pump, then cooled in cooling water before being recirculated.

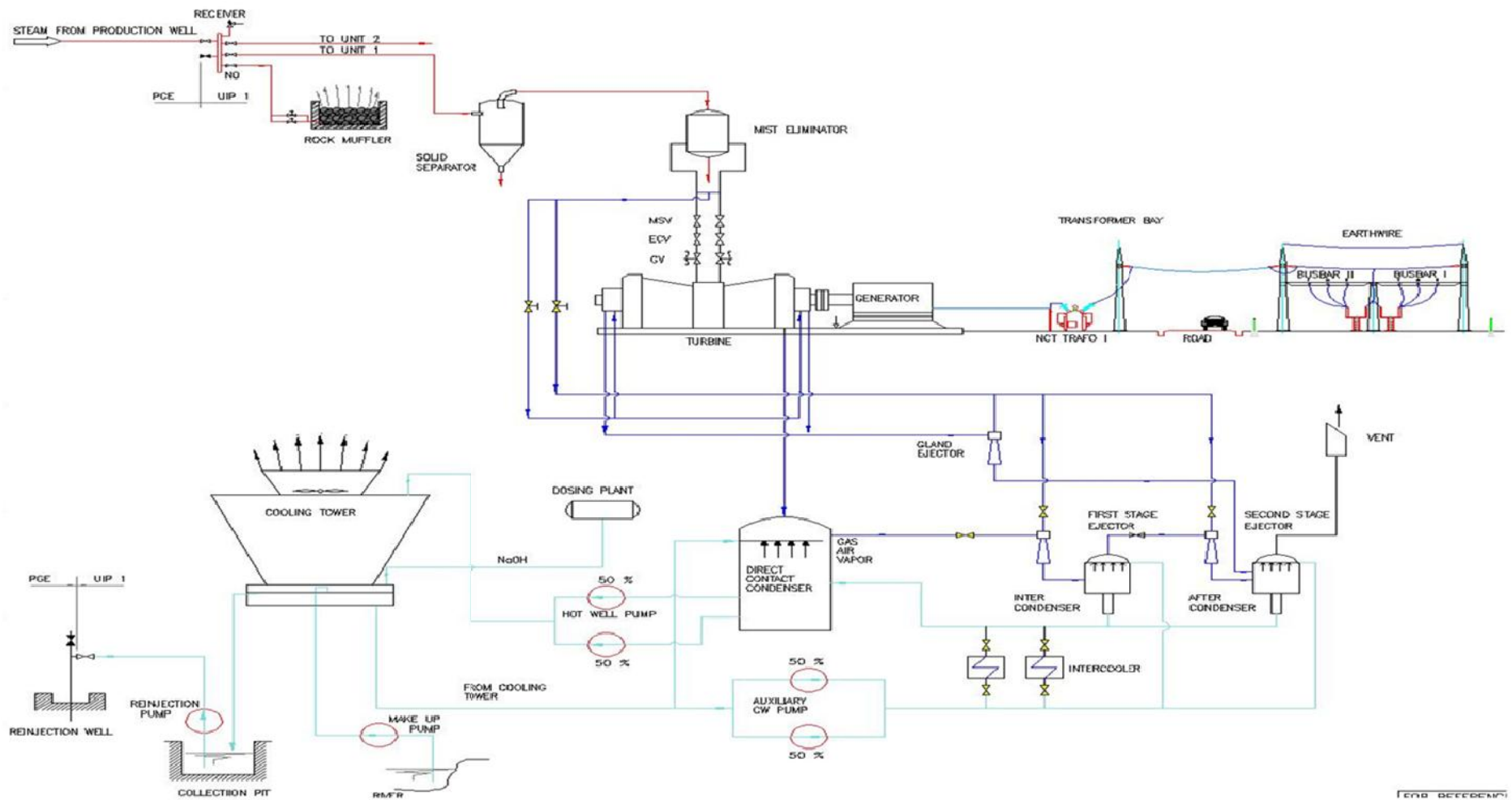
To maintain the vacuum condenser, uncondensed gas is released continuously by the gas extraction system. These gases contain: CO₂ 85-90% wt; 3.5% H₂S wt; the rest are N₂ and other gases. The gas extraction system consists of ejector and liquid ring vacuum pump.

The cooling system in a geothermal power plant is a cooling system with a closed circulation of water resulting from steam condensation, where the excess condensate that occurs is reinjected into the reinjection well. The principle of heat energy absorption from circulated water is by channeling the cooling air by force in the direction of perpendicular flow. This process occurs in cooling water.

Approximately 70% of condensed steam will be lost due to evaporation in cooling water, while the rest is injected back into the reservoir. Re-injection is done to reduce the influence of environmental pollution, reduce ground subsidence, maintain pressure, and recharge water for the reservoir. The flow of water from the reservoir is circulated again by the primary pump. Then through the condenser and intercondenser after being put back into the reservoir.

Some auxiliary equipments to help the steam turbine cycle process:

1. Lube oil system.
2. Cooling system.
3. Air control system.
4. Air service system.
5. Hydraulic system.
6. Air pressure system.



Picture1-3 Diagram of 2 x 55 MW Hululais GPP

EIA

Development Plan of 2 x 55 MW Hululais Geothermal Power Plant (GPP) in Lebong Selatan and Lebong Tengah Sub-districts, Lebong District, Bengkulu Province

1.1.8. SCHEDULE OF ACTIVITIES IMPLEMENTATION PLAN

Tentative schedule for Hululais geothermal power plant development activities as presented in the table below. Construction activities will begin in 2019 and last for ± 3 years.

Table 1-3 Tentative Schedule of Hululais Geothermal Power Plant Development Activities

No	Stages of activities	Year			
		2018	2019	2020	2021-2051
I	Preconstruction Stage				
1	Socialization	■			
2	Land acquisition	■			
II	Construction Stage				
1	Construction labor recruitment		■		
2	Mobilization of equipment and materials		■	■	
3	Operational basecamp labor		■	■	
4	Land preparation		■		
5	GPP construction		■	■	
6	GPP equipment installation			■	
7	Construction labor downsize			■	
8	Testing / Commissioning				■
III	Operation Stage				
1	Operation Labor Recruitment				■
2	GPP operation				■
3	GPP maintenance				■

Source: PT PLN (Persero) UIP Kitsum, 2017

1.1.9. ACTIVITY PLAN STAGES

The stages of the planned activities for the construction of GPP 2 x 55 MW Hululais consist of 4 (four) stages, namely the pre-construction stage, construction stage, operation stage, and post-operation stage. The details of the activities at each stage are explained as follows:

1.1.9.1. PRE-CONSTRUCTION STAGE

1.1.9.1.1. Socialization

The socialization of the planned activities for the 2 x 55 MW Hululais GPP construction was delivered to the surrounding community prior to construction, facilitated by the local village office and sub-district office. The socialization materials included the schedule of material mobilization, the process of labor recruitment, the process of land acquisition, environmental management to be carried out including to reduce the trauma of the community against landslide events.

1.1.9.1.2. Land acquisition

The 2 x 55 MW Hululais Geothermal Power Plant (GPP) requires a land area of 15 ha. The land of the power plant plan is the land owned by the community, land in the form of bushes, coffee plants, and other perennials.



Picture 1-4 GPP Plan Location contains rubber plants, coffee, shrubs

Land acquisition activities will refer to Law Number 2 of 2012 concerning Land Procurement for Development in the Public Interest, Presidential Regulation Number 71 of 2012 concerning Land Procurement for Development in the Public Interest, Presidential Regulation Number 40 of 2014 concerning Amendments to Presidential Regulation Number 71 In 2012 concerning the Implementation of Land Procurement for Development in the Public Interest, and the Regulation of the Head of the National Land Agency Number 5 of 2012 concerning Technical Guidelines for the Implementation of Land Acquisition.

Land acquisition activities for the public interest covering an area of 5 Ha through stages:

1. Planning;

At this stage, PT PLN (Persero) UIP KITSUM (Sumatra Generator) will make a land procurement plan in the form of a Land Procurement Planning Document, and is determined by the General Manager of PT PLN (Persero) UIP KITSUM or appointed official. Furthermore, General Manager of PT PLN (Persero) UIP KITSUM will deliver the Land Acquisition Planning Document to the Lebong

District Head to obtain a Decision on the Determination of the Location for the 2 x 55 MW Geothermal Power Plant (GPP).

2. Preparation;

In accordance with Presidential Regulation No. 71 In 2012, the District Head of Lebong District will carry out the stages of Land Procurement Preparation activities after receiving the Land Procurement Planning Document for 2 x 55 MW Geothermal Power Plant (GPP). At this stage, activities will be carried out in the notification of development plans, preliminary data on the location of the development plan, public consultation of the development plan, preparation of the establishment of the construction site, establishment of the construction site, announcement of the establishment of the construction site.

If there is a refusal in the process of determining the location of development by the community, especially from the entitled Parties, a series of public consultation activities will be carried out in which the mechanism for resolving the refusal or objection is carried out as stated in Article 34 up to Article 40 of Perpres No. 71 of 2012. To avoid land speculators, in the process of development location establishment, the Head District with PT PLN (Persero) UIP KITSUM will announce the establishment of development sites in village offices and print and / or electronic media. With this approach, it is expected that the community will know the development location plan and not be affected to sell the land to other parties (land speculators).

3. Implementation;

The implementation of land acquisition will be carried out by the National Land Bureau (BPN) Head Regional Office of Lebong District as the Chairperson of the Land Procurement Committee who can assign to the Head of the District / City Land Office. The Head of the Land Office will form a Land Procurement Agency. Based on the determination of the location of the development plan, PT PLN (Persero) UIP KITSUM will propose the implementation of land acquisition to the Chairperson of the Land Procurement Agency. In this stage it is carried out: inventory and identification, determination of the Appraiser, deliberation on the form of compensation, compensation, and the release of land acquisition objects

4. Submission of results.

At this stage the Chairperson of the Land Procurement Agency will submit the land acquisition result to PT PLN (Persero) UIP KITSUM. Based on the results, PT PLN (Persero) UIP KITSUM will register (certify) and will begin the construction of a Geothermal Power Plant (GPP).

1.1.9.2. CONSTRUCTION STAGE

1.1.9.2.1. Labor Recruitment

The construction labor recruitment will be carried out by the implementing contractor. The Labors needed as presented in the following table.

Table 1-4 Construction labors of 2 x 55 MW Hululais Geothermal Power Plant (GPP)

No	Position	Qualification	Number of people
I	Skilled Staff		
1	Project manager	Bachelor Degree	1
2	Site Manager	Bachelor Degree	1
3	Engineer	Bachelor Degree	4
4	Surveyor	Bachelor /Associate/Vocational School	4
5	Electrical	Bachelor / Associate / Vocational School	5
6	Plumbing	Bachelor / Associate / Vocational School	5
7	Administration Manager	Bachelor	1
8	financial manager	Bachelor	1
9	Administrative staff	Bachelor / Associate	2
10	financial staff	Bachelor / Associate	2
11	Environment expert	Bachelor	1
12	Environmental Staff	Bachelor / Associate	2
13	Heavy equipment operators	Vocational School /Highschool	10
14	Driver	Vocational School /Highschool	5
II	Unskilled Staff		
1	Plumber	-	20
2	Blacksmith	-	10
3	Electrician	-	10
4	Bricklayer	-	30
5	Carpenter	-	20
6	Prentice	-	50
7	Security	Highschool/Vocational School	6
8	Office Boy	-	3
		Total	193

Source: PT PLN (Persero) UIP Kitsum, 2017

The acceptance of the construction labor will prioritize the surrounding community through:

- Socialization of specifications and the amount of labor needed;
- Explanation of the rights and obligations of workers and the making of work agreements.

The work system of construction workers is regulated according to the applicable laws and regulations, and the project work planning so that work safety is guaranteed. Certain time work agreements will be coordinated with the Lebong District Office of Labor and Transmigration, and the labor recruitment process is coordinated by the local Village / Sub-district office.

For Inter-Regional Labor (AKAD) who come from other districts or provinces, they can be accepted through certain requirements for more than one region. Coordination with the Bengkulu Province Manpower and Transmigration Service will be carried out before the recruitment of workers from other Districts and Provinces, prioritizing those who have special experience and skills in their fields.

PT PLN (Persero) at the time of the recruitment activities of construction labor will apply the applicable regulations:

- Presidential Decree Number 4 of 1980 concerning the obligation to report job vacancies;
- Minister of Manpower Regulation No. 39 of 2016 concerning Manpower Placement.

1.1.9.2.2. Equipment and Material Mobilization

Equipments to be mobilized includes equipments for construction and for operation. Equipments for construction come from domestic and overseas. It will be transported to the project location by road, taking into account the capacity of the road. The construction equipment to be mobilized is presented in the following table.

Table 1-5 GPP Construction Equipment

No	Equipment	Amount
1.	<i>Crawlers cranes (70 – 300 ton)</i>	2
2.	<i>Truck cranes (50 – 250 ton)</i>	3
3.	<i>Hydraulic cranes (15 – 150 ton)</i>	2
4.	<i>Rail mounted gantry (up to 600 ton)</i>	1
5.	<i>Tower cranes (up to 120 ton)</i>	1
6.	<i>Pedestal mounted cranes (15 – 90 ton)</i>	1
7.	<i>Guyed derrick</i>	1
8.	<i>Stiff le derrick</i>	1
9.	<i>Pick up trucks</i>	1

No	Equipment	Amount
10.	<i>Flatbed trucks</i>	2
11.	<i>Trailers</i>	3
12.	<i>Utility wagon/jeeps</i>	2
13.	<i>Tractors</i>	2
14.	<i>Dump trucks</i>	2
15.	<i>Cheery pickers</i>	10
16.	<i>Bulldozers</i>	2
17.	<i>Trenchers/Back hoe</i>	4
18.	<i>Compactor/motor grader</i>	4
19.	<i>Hydraulic shovels</i>	2
20.	<i>Forklifts</i>	1
21.	<i>Rotary blast hole drills</i>	2
22.	<i>Crusher</i>	3
23.	<i>Transit mixers</i>	1
24.	<i>Concrete pumps</i>	3
25.	<i>Concrete mixing plants</i>	1
26.	<i>Concrete buggies</i>	1
27.	<i>Asphalt paver</i>	2
28.	<i>Hydraulic Submersible pumps</i>	1
29.	<i>Barge mounted dredgers</i>	1
30.	<i>Compressors</i>	1
31.	<i>Welding machines</i>	2
32.	<i>Generators</i>	10
33.	<i>Misc. Motor</i>	4
34.	<i>Scraper</i>	10
35.	<i>Pile driver/hammer</i>	1
36.	<i>Wheel loader</i>	4
37.	<i>Slip form and aux equipment</i>	4

Source: PT PLN (Persero) UIP Kitsum, 2017

Material for building sand, coral, wood will be purchased from local building materials entrepreneurs or the surrounding community.

The equipment to be mobilized for the operation phase is the power plant and all the supporting facilities. Some equipment weighs 100 tons with a length of 10 meters. This equipment will be brought by road across Sumatra. For transportation, flat bed trailers, low bed trailers, U-bed trailers and gold hofers will be used. For this there

will be repair and hardening of the road in some parts of the road and bridge that to be passed. Schedule of equipment mobilization and materials during quite hours.

For equipment and material mobilization lines there are two alternatives, namely: through Baai Island Port in Bengkulu or through ports in the Palembang region. Work equipment mobilization refers to the General Decree of Land Transportation Number: SK.726 / AJ.307 / DRJD / 2004 concerning Technical Guidelines for the Implementation of Heavy Equipment Transport on the Road, namely the technique of binding equipment to transport vehicles to ensure safety and security on the road.

Here are some things that will be considered in transporting heavy equipment, namely:

- a. a. The total control system consists of:
 1. tie the load to the place to attach the strap;
 2. placing loads safely, including supplementing with transverse beams;
 3. pay attention to the possibility of shifting the load when the vehicle is running.
- b. Straps and fastening equipment must be in good condition, can withstand cargo transfer, protected from abrasion and cuts;
- c. Buffer equipment must be sturdy and safe for the vehicle;
- d. There is no friction between the cargo and the body of the vehicle;
- e. Pay attention to the strength of the place linking the straps;
- f. Drivers know the weight, width and height of the cargo carried;
- g. Equipped with a material loaded list;
- h. Through the path specified in the approval letter;
- i. Conducted in places that do not interfere with the security, smoothness and orderliness of traffic;
- j. If the heavy equipment which is transported protruding beyond the outer part of the back of the transport vehicle, is marked as referred to in the Appendix to this Decree.

1.1.9.2.3. Basecamp Operations

The construction of a basecamp includes a temporary building as a means for the construction of a 2 x 55 MW Geothermal Power Plant (GPP). Basecamp will be built at the project site. Basecamp infrastructure includes: project offices, directors' offices, warehouses, workshops, stockpiles/yard of material stacking / warehouses, fuel depots and workers' barracks. Basecamp will be equipped with sanitation facilities and places of worship.

Table 1-6 Construction stage water requirements

Component	Description		Water Requirement (liter / day)	Water Requirement (m3 / day)
	Person	liter / day		
Water Requirement for labor	193	40	7720	7,7
Water Requirement for construction activities				2,3
Total Water Requirement				10

Estimation of waste generation from domestic labor activities at basecamp is presented in the following table.

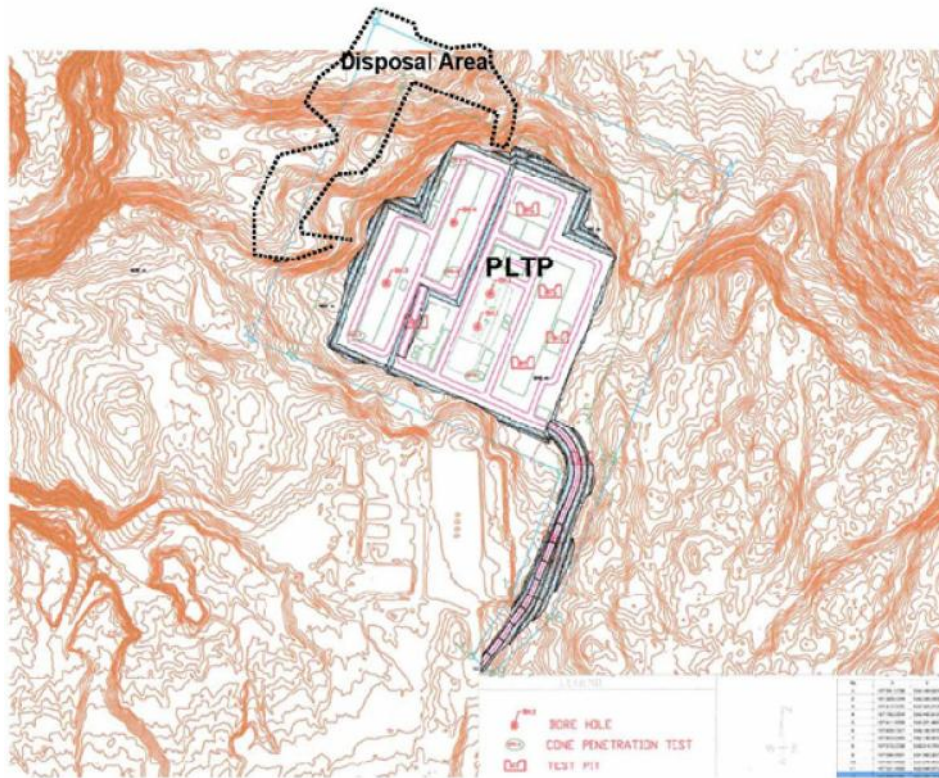
Table1-7 Estimation of solid waste during construction

Component	Description		Garbage (Liter / day)	Garbage (m3 / day)
	Person	Liter / day		
Waste generation from domestic work activities	193	1	193	0,2
Garbage generation from construction activities				0,3
Total				0,5

Waste management will be carried out by providing garbage bins and TPS, then waste from the TPS will be transported to the landfill.

1.1.9.2.4. Land Preparation

Land preparation activities include cleaning work from vegetation including logging of trees and shrubs. The results of felling trees will be collected for further transport to the disposal area, or can be utilized by the surrounding community. After land clearing work, the land will be matured in the form of digging and dumping work. Excavation work is carried out to lift soft / loose soil. Soft / loose soil excavation results will be discharged to the disposal area. The volume of soft / loose soil excavation is estimated at $\pm 610,000 \text{ m}^3$. The disposal area is planned to be northwest of the GPP location as shown below. The Disposal Area has a storage capacity of soft / loose soil excavation $\pm 680,000 \text{ m}^3$.



Picture 1-5 Disposal of Land Area Excavation from GPP Locations

This land preparation activity uses hydraulic excavator (back hoe), scraper, grader, bulldozer, truck. The land maturation work is intended for the preparation of foundation structures, drainage, driveways, surface leveling.

When the soil leveling activity is carried out, it is done by laying the soil from the excavation using a bulldozer, then compacting it using a vibrator (vibrator roller). After compaction, an examination of the density level is carried out. Density checks are carried out by means of the Sand Cone Method (ASTM D1556) or Rubber Ballon Method (ASTM D2167). The compactor of the Dynapac CK 50 milling machine causes a wave velocity of up to 4 mm / second at a distance of 10 m (Source: Compaction of Soil and Rock Urge with Vibration, Lars Forrblad, 1988).

The speed of vibration generated during construction activities based on vibration level standard according to Appendix II to the Decree of the Minister of Environment No. Kep-49 / MENLH / II / 1996, dated November 25, 1996 is still below the established quality standard, as presented in the table below this.

Table 1-8 Mechanical Vibration Levels by Building Type

Class	Building Type	Vibration Speed (mm / second)			
		On foundation			In the Flat Surface on the Top Floor Frequency Mix
		Frequency			
<10 Hz	10-50 Hz	50-100 Hz*			
1	Buildings for	<10	10 - 40	40 - 50	40

Class	Building Type	Vibration Speed (mm / second)			
		On foundation			In the Flat Surface on the Top Floor Frequency Mix
		Frequency			
		<10 Hz	10-50 Hz	50-100 Hz*	
	commercial purposes, industrial buildings and similar buildings				
2	Housing and buildings with similar designs and uses	5	5 - 15	15 - 20	15
3	Structures that are sensitive to vibration, unlike those no. 1 and 2, and have high cultural values, such as buildings that are preserved	3	3 - 8	8 - 10	8.5

* For frequencies > 100 Hz, at least the values in the column must be used

1.1.9.2.5. GPP construction

GPP construction includes the main building including steam generators, demineralization plants, steam turbines, cooling water systems, wastewater treatment plants and offices and other supporting facilities.

1. Making foundation

Making the foundation is adapted to the condition of the soil by considering the morphology and carrying capacity of the soil and taking into account the resistance to the possibility of an earthquake.

The vibration generated by the pile erection refers to the formula used in calculating the magnitude of the impact of using pile hammer (100 Hz) is:

$$PPV_{Impact} = 0,65_{Ref} (25/D)^n \times (E_{equip}/E_{Ref})^{0,5} \text{ (in/sec)}$$

(Source: *Transportation- and Construction-Induced Vibration Guidance Manual California Department of Transportation Environmental Program Environmental Engineering Noise, Vibration, and Hazardous Waste Management Office. California Department of Transportation.2004*).

Where:

PPV_{Impact} = level of vibration speed at distance D (in / sec)

PPV_{Ref} = 0.65 (in / sec) at a distance of 25 ft for impact pile driving is 0.65 in / sec

D = distance of the test point to the vibration source (ft)

n = propagation coefficient

E_{Ref} = 36.000 ft-lbs (*rated energy of reference pile driver*)

E_{equip} = 80.000 ft-lbs (*rated energy of impact pile driver*)

Table 1-9 "n" Base Value based on Land Class and "n" Proposed Value

Land Class	Description of Soil Materials	The value of "n" is measured by Woodsand Jedele	"n"Proposed Value
I	<i>Soft soil: loose soil, partially dried peat, mud, loose beach sand, and sand dunes, newly logged soil, organic soil, top soil. (shovel penetrates easily)</i>	Data is not available	1,4

Source: *Transportation- and Construction-Induced Vibration Guidance Manual California Department of Transportation Environmental Program Environmental Engineering Noise, Vibration, and Hazardous Waste Management Office. California Department of Transportation.2004*

The results of the calculation of the formula above are as follows:

Table 1-10 Vibration Calculation Results

D		PPV _{Ref}	(25/D) ⁿ	(E _{equip} /E _{ref}) ^{0,5}	PPV _{Impact} (in/det)	
cm	feet				in/det	mm/det
5.000	166,6667	0,65	0,07023082	1,490711985	0,0680	1,7285
10.000	333,3333	0,65	0,02661251	1,490711985	0,0258	0,6550
15.000	500	0,65	0,01508544	1,490711985	0,0146	0,3713
20.000	666,6667	0,65	0,01008425	1,490711985	0,0098	0,2482

Source: calculation with formula $PPV_{Impact} = 0,65_{Ref} (25/D)^n \times (E_{equip}/E_{Ref})^{0,5}$ (in/sec).

The speed of vibration that occurs at a distance of 100 m from the distance of the erection is equal to 0.00258 in / det or 0.6550 mm / sec, thus the vibration caused by the piling erection does not affect the building around and around the location of the activity there is no building.

2. Generators and cooling towers (cooling water)

The generator house building is made to take into account the ability to withstand vibrations that may arise from GPP equipment during operation. The cooling tower building is made from materials that are resistant to acidic water.

1.1.9.2.6. GPP Equipment Installation

Installation of main equipment and supporting GPP consists of machine work and electrical work. Engine work includes the installation of turbine and its supporting equipment, cooling towers, steam and water pipes, fire engines, over head cranes. Electrical work includes the installation of equipment: generators, controls and relays, transformers, switchyards, and lighting.

Technical specifications for equipment are:

a. Specifications of generating facilities

- Generator capacity 2 x 55 MW
- Parasitic load 7%
- Capacity factor 90%

- Technical age = 30 years
- Annual generation 867,24 GWh
- Annual energy sold (consumenend) 733,69 GWh

b. Steam Turbine

- The steam turbine used is the type of the bottom exhaust, which is installed on the ground floor;
- Turbinetype: single casting, multi stage, double flow condensing;
- Steam pressure: 8,0 bar abs;
- Steam temperature: 170,4 0C (saturated);
- Exhaust steam pressure: 0,10 bar abs;
- Speed: 3000 rpm.

c. Condensing system

Steam turbine contains non condensable gas which is mainly carbon dioxide. For this reason, non condensable gas extraction systems will be installed to maintain system pressure. Condensing system specifications:

- Condenser type: direct contact, spray jet, low level.
- Type of cooling water: cooling tower water
- Cooling water temperature: 28.5°C
- Design of wet ball temperature: 18.5°C
- Condenser pressure: 0.1 abs bar
- Type of extraction gas: two stage steam jet ejector
- Steam pressure: 8.0 abs bar.

d. Generator

- Tipe: totally enclosed water, to air cooled type
- Rating: Continuous
- Output: 69 kVA
- Voltage: 11 kV
- No. of stage: 3
- Power factor: 0,8 (lagging)
- Frequency: 50 Hz
- Speed: 3000 rpm
- Connection: star
- Neutral point grounding: transformer
- Cooling system: totally enclosed type with air cooler
- Coupling method: direct coupling
- Excitation system: brushless
- Insulation: F class
- Temperature rise: F class

1.1.9.2.7. Construction Labor Downsize

With the completion of construction activities there will be a downsizing in labor. The labor that is still needed according to its expertise can be reused in the operation phase. Provisions regarding the downsizing of labor are first delivered at the construction phase of the labor recruitment, in order to avoid labor problems at the end of the construction phase. Provisions on the downsizing of labor refer to Law Number 13 of 2003 concerning Manpower.

1.1.9.2.8. Commissioning or Testing

Operational testing / commissioning of the Hululais geothermal power plant will be carried out at the end of the construction and installation of GPP equipment. At this stage the geothermal power plant is operated as a testing part to ensure that the installation of the geothermal power plant has functioned to produce electricity according to planning.

1.1.9.3. OPERATION STAGE

1.1.9.3.1. Operational Labor Recruitment

The number of workers needed in the operation phase of 2 x 55 MW GPP Hululais are approximately ± 80 people with qualification as manager, supervisor, technical personnel, support personnel as in following table.

Table 1-11 Labor Requirements for GPP Hululais Operation 2 x 55 MW

No	Position	total	Qualification
1	General manager	1	Manager
2	Operations manager	1	Manager
3	Maintenance manager	1	Manager
4	Engineering manager	1	Manager
5	Administration and office manager	1	Manager
6	Personnel manager	1	Manager
7	Financial manager	1	Manager
8	HSE Manager (Safety of Occupational Health and Environmental Protection)	1	Manager
9	Supervisor of Operator Group	1	Supervisor
10	Maintenance supervisor	1	Supervisor
11	Warehouse supervisor	1	Supervisor
12	Security supervisor	1	Supervisor
13	3 HSifts per day Operators	18	Technical Staff
14	Maintenance staff	11	Technical Staff
15	Power instrumentation test	1	Technical Staff
16	Electrical test	1	Technical Staff

No	Position	total	Qualification
17	Accounting staff	2	Technical Staff
18	Administrative and office staff	2	Technical Staff
19	Procurement staff	1	Technical Staff
20	Warehouse clerk	3	Support
21	Secretary	1	Support
22	Computer operator	2	Support
23	Security personnel	12	Support
24	Health workers	3	Doctor and nurse.
25	HSE workers (Safety of Occupational Health and Environmental Protection)	2	Support
26	Driver	3	Support
27	Office boy, cleaning service, helper	6	Support
	Total	80	

Source: PT PN (Persero) UIP Kitsum, 2017

The recruitment of workers will prioritize the local labor of Lebong District.

Labor recruitment will be regulated by a work contract. The rights and social security of workers will be regulated in accordance with the laws and regulations of Law Number 13 of 2003 concerning Manpower.

Foreign Workers (TKA) if used will be reported to the Social Work and Transmigration Office of Lebong District and the Manpower and Transmigration Office of Bengkulu Province.

1.1.9.3.2. GPP operation

Steam from production wells is channeled to GPP through pipelines connected from production wells to GPP. The amount of steam needed is 865 tons / hour to produce 110 MW of electricity.

Geothermal steam before entering the turbine is flowed through equipment such as scrubbers and demisters. It was done so that the steam condition is clean and dry. Steam is turning the turbine with a certain pressure and temperature. Turbines and turbine shafts are coupled directly with the generator shaft so as to produce electricity.

Gas from the turbine will be sucked using a steam ejector and vacuum pump. In this process, the non-condensed gases are then discharged into the air through the chimney of the cooling tower with the aim that the dispersion of the gas is not concentrated in one place, there is still a spread of gas concentration evenly in the air. In the condensation process will be produced condensate that will be pumped to the cooling tower to be cooled, then the water is used as a condenser cooler and other machine tools. During the cooling process, the cooling water is kept acidic (pH

= 6-8) by injecting NaOH. In the cooling process there will be the discharge of excess water from the condensate vapor (± 40 liters / second). The water will be reinjected into the earth through a reinjection well. In the steam condensation process, there is a portion of the gas that cannot be condensed so that it remains in the form of gas which is in the form of CO₂ and H₂S gas, but the probability is very small. The chimney diameter is ± 9.2 meters with a height of ± 23 meters and the flow velocity in the chimney mouth is ± 11 meters / second. The Cooling tower types being used are mechanical draft cross flow double section, generators equipped with 3 stage air conditioning systems.

To avoid the problem of hydrogen sulfide gas, the generator is equipped with oxidation catalytic filters. The control system is needed for plant management, using a Distributed control system.

In the plant operation, corrosion problems due to H₂S gas are handled by:

- Avoiding direct contact between equipment systems with H₂S gas exposed to air by reducing the concentration of H₂S gas and protecting the surface of the equipment by being coated with lead, zinc or anti-rust paint.
- Using anti-corrosion material, especially on equipment that will be in direct contact with H₂S gas.
- Keeping H₂S gas from entering the control room and electrification chamber by installing a gas absorbent filter.

1.1.9.3.3. GPP Maintenance

Maintenance of GPP aims to keep the GPP operational system working properly. GPP maintenance includes lubrication activities, replacement of engine lubricating oil, and so on.

1.1.9.4. POST OPERATION STAGE

Post-operation stage activities will be adjusted to the provisions of policies and regulations in the future after 30 years of the Hululais geothermal power plant operation. It is probable that the GPP will be operated continuously to meet electricity needs.

1.1.10. ALTERNATIVE THAT WILL BE ASKED IN EIA

The Hululais GPP construction activity's location which is reviewed in this Amdal is the selection result of 2 (two) alternative locations. The choice of GPP locations reviewed in this AMDAL is the best sequence of environmental aspects compared to other alternative location. Thus, what is examined in this AMDAL is an alternative chosen. The criteria for selecting GPP locations are as follows.

Table 1-12 Selection Criteria for GPP Locations

NO.	FACTOR	LOCATION SELECTION CRITERIA GPP
1	Air quality pollution	Distance from the nearest settlement and wind direction

NO.	FACTOR	LOCATION SELECTION CRITERIA GPP
2	Visual quality	Consideration of beauty and landscape
3	Vegetation Cover	Type of vegetation and density
4	Geology and location stability	The strength of the geological formation that is suitable for heavy building foundation GPP
5	Pipeline security	Pipeline considerations with the smallest potential crossing
6	Wastewater	The distance of the GPP location to the injection well
7	Noise impact	The smallest impact of noise on the environment
8	Land slope and stability	Land stability
9	Access road	Availability of access roads
10	Distance to production wells	Distance to production wells
11	Transmission network	Distance to transmission network

Source: Consultancy Services For Site Investigation Of Hululais Geothermal Power Plant 2 X 55 MW)

1.2. SUMMARY OF HYPOTHETICAL SIGNIFICANT IMPACTS

1.2.1. POTENTIAL IMPACT IDENTIFICATION

Identification of potential impacts results from the interaction between activity components and the initial environmental hue component. At this stage the scoping is intended to identify potential environmental impacts that may arise due to the construction of the 2 x 55 MW Hululais geothermal power plant.

Identification of potential impacts is carried out through a series of consultations and discussions results of the initiating AMDAL Study Team, responsible government agencies and affected communities.

The response of the community to the announcement of planned activities in the mass media (newspapers) and direct opinions submitted at the time of the public consultation is one way to discuss / consult with interested communities. In addition, identification of potential impacts is also carried out through literature review, field observations. The results of identification of potential impacts are presented in the matrix below.

Table 1-13 Potential Impact identification Matrix

No	Environmental Component	Preconstruction		Construction stage activities								Operation		
		1	2	1	2	3	4	5	6	7	8	1	2	3
		Socialization	Land acquisition	Labor recruitment	Mobilization of tools and materials	Basecamp Operation	Land preparation	GPP construction	GPP equipment installation	Labor Downsizing	Commissioning (Testing)	Labor recruitment	GPP operation	GPP Maintenance
A	Chemical Geophysics													
1	Air quality				√		√	√	√		√		√	
2	Noise				√		√	√	√		√		√	
3	Vibration										√		√	
4	Surface water quality					√	√							√
5	Groundwater quality					√								
6	Groundwater quantity					√								
7	Traffic				√									
8	Road damage				√									
9	Run off water and flood water speed						√							
10	Erosion						√							
11	Reduced productive land		√											
B	Biology													
1	Flora						√							
2	Fauna						√							
3	Aquatic Biota					√	√							√
C	Cultural Social Economy													
1	Employment Opportunity			√						√		√		
2	Business opportunities			√				√				√		
3	Community income			√				√				√		
4	Community perception	√	√	√				√				√		
D	Public Health													
1	Environment sanitation					√							√	
2	Morbidity Rate				√	√	√	√	√		√		√	

From the table above, the potential impact of the construction of 2 x 55 MW Hululais GPP :

- I. Potential Impact of the Preconstruction Stage:
 1. Reduced productive land;
 2. Positive / negative perception of society;

-
- II. Construction Stage Potential Impact:
1. Decreasing air quality;
 2. Noise increase;
 3. Decrease in surface water quality;
 4. Decrease in groundwater quality;
 5. Decrease in the quantity of ground water;
 6. Traffic congestion;
 7. Road damage;
 8. Increase in runoff water and flood water speed;
 9. Erosion;
 10. Reduced productive land;
 11. Reduced flora;
 12. Reduced fauna;
 13. Decrease in aquatic biota quality;
 14. Increase in employment opportunities;
 15. Increase in business opportunities;
 16. Increase in revenue
 17. Positive / negative perception of society;
 18. Decrease in environmental sanitation;
 19. Morbidity Rate;
- III. Potential Impact of Operation Stage:
1. Decrease in air quality;
 2. Noise increase;
 3. Increase in vibration;
 4. Decrease in surface water quality;
 5. Decrease in groundwater quality;
 6. Decrease in the quantity of ground water;
 7. Traffic congestion;
 8. Decrease in aquatic biota quality;
 9. Increase in employment opportunities;
 10. Increase business opportunities;
 11. Increased revenue
 12. Positive / negative perception of society;
 13. Decrease in environmental sanitation;
 14. Increase in Morbidity Rate;

1.2.2. POTENTIAL IMPACT EVALUATION

Scoping at this stage aims to eliminate potential impacts that are considered insignificant, so that a list of hypothetical significant impacts is deemed necessary to be explored in depth in the EIA study. Potential impact evaluations consider the results of public consultations and input from responsible agencies, as well as interested communities.

Potential impact evaluations use criteria such as: whether the proponent has planned to manage a potential impact in ways that refer to certain Standar Operational Procedures (SOPs), management that is part of the activity plan, certain technical guidelines issued by the government and / or international standards (source : Regulation of the Minister of Environment No. 16 of 2012 concerning Guidelines for Preparation of Environmental Documents)

In addition, the evaluation of potential impacts uses the criteria of the following questions (source: Guidance Guidelines, KLH):

1. Is the burden on certain environmental components high? (review of secondary data and review of literature studies)
2. Do these environmental components play a role in people's daily lives and ecological components? (review of preliminary surveys)
3. Are there public concerns about the environmental component? (results of public consultation)
4. Are there rules or policies violated by the impact? (review environmental regulations and quality standards).

Every potential impact is filtered by the criteria for the above question. If it meets a minimum of one of the questions above, then the potential impact becomes an significant hypothetical impact (HSI) which will be further examined in the EIA.

Table 1-14 Summary of Scoping Process

No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
I	Preconstruction Stage							
1	Land acquisition	GPP locations use plantation land (coffee), not using productive paddy fields.	Reduced productive land	Reduced productive land	The results of the public consultation suggested the location of activities to avoid productive land use. Productive land plays a significant role in people's lives, an significant impact.	HSI	Local villages of Mubai, Turan Lalang, Danau Liang.	3 months according to the period of land acquisition.
2	Socialization	Socialization will be carried out before the implementation of activities.	Perception	Perception of positf/ negative	The results of the public consultation was the public expected the management of negative impactsdf. There are negative perceptions of people's concerns about potential negative impacts, significant impacts.	HSI	District of Lebong Tengah and Lebong Selatan.	3 months in the pre-construction period.
3	Land acquisition	Land acquisition activities will go through the stages of notification of the development plan, preliminary data on the location of the development plan, public consultation of the development plan, preparation of	the community	Positive / negative	The results of the public consultation that the community expects that land acquisition can provide adequate compensation to the community. Land plays an significant role in life, an significant impact.	HSI	Local villages of Mubai Turan Lalang, Danau Liang	3 months according to the period of land acquisition.

No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
		the establishment of the construction site, establishment of the construction site, announcement of the establishment of the construction site.						
II	Construction Stage							
1	Equipments and materials mobilization	-	Air quality	Decrease in air quality	Decreased air quality by mobility activities is possible from vehicle emissions and dust. The emission factor of diesel fuel equipment is CO 35.57 grams / liter; NO2 39.53 gram / liter; HC 8.15 grams / liter. The emission factor of gasoline-fueled equipment is CO 462.63 grams / liter; NO2 21.35 grams / liter; HC 54.09 gram / liter (Source: Estimating the Environmental Impact of Air Quality, KLH, 2007). On the left and right of some of the mobilization routes there are settlements, some routes are potentially dusty dirt roads.	HSI	Left and right of the tool and material mobilization pathway in the Lebong Tengah Sub-district and Lebong Selatan Sub-district.	1 day with consideration during the 12 months period of Equipments and materials mobilization, the number of vehicle mobilization in each day is the same.

No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
					The results of public consultations, the public is concerned about the impact of dust, significant impacts.			
2	Equipments and materials mobilization	Using a vehicle that meets the requirements for operational feasibility.	Noise	Noise increase	Truck dump vehicles cause \pm 85 dBA noise at a distance of 15 meters. Noise quality standard for industrial area 70 dBA (Kep Men LH No.48 / 1996 concerning Standard Noise Level). There is potential for noise to exceed the provisions of quality standards, significant impacts.	HSI	GPP locations and around the road that being passed through the equipment and materials mobilization were within the area of Lebong Tengah Sub-district and Lebong Selatan Sub-district.	1 day with consideration for 12 months of material mobilization, the total number of vehicles in each day is the same.
3	Equipments and materials mobilization	-	Traffic	Traffic congestion	Traffic congestion is possible from the mobilization of equipment and materials that use heavy vehicles which its width almost meets the width of the road body. At certain hours the traffic conditions are crowded, such as in the morning when children go to school, the traffic component plays a significant role in people's lives, the impact is significant	HSI	The route that being passed through by the Equipments and materials mobilization are in the area of Lebong Selatan Sub-district and Lebong Tengah Sub-district.	1 day with the consideration of daily rite is the same.

No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
4	Equipments and materials mobilization	-	Road damage	Road damage	The potential for road damage is made possible by the equipments and materials mobilization that use heavy vehicles. As a result of the public consultation, there were participants who informed that there were some damaged road conditions. Road damage was worrisome by some respondents, a significant impact.	HSI	The paths that being passed through by the Equipments and materials mobilization are within the area of Lebong Selatan Sub-istrict and Lebong Tengah Sub-district.	6 months according to the period of material mobilization.
5	Equipments and materials mobilization	-	Public health	Increased Morbidity Rate	The impact of equipment and material mobilization activities is predicted to cause changes in air quality along the road traversed by heavy equipment and material vehicles. This has the potential to cause a derivative impact on public health, namely an increase in the number of ARI diseases. The health component plays an significant role in people's lives, considered significant.	HSI	Around the tool and material mobilization route in the Lebong Tengah and Lebong Selatan Sub-districts.	1 day with consideration during the 12 months period of Equipments and materials mobilization, the number of vehicle mobilization in each day is the same.
6	Land	Land preparation	Air quality	Decrease in air	Decreased air quality by land	Non HSI	-	-

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No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
	preparation	using a tool which emissions meet the requirements for operational feasibility.		quality	preparation work is possible came from equipment emissions and dust. The emission factor of diesel fuel equipment is CO 35.57 grams / liter; NO2 39.53 gram / liter; HC 8.15 grams / liter. The emission factor of gasoline-fueled equipment is CO 462.63 grams / liter; NO2 21.35 grams / liter; HC 54.09 gram / liter (Source: Estimating the Environmental Impact of Air Quality, KLH, 2007). The nearest settlement of GPP Hululais is ± 1 km away. Land preparation using tools which its emissions meet the requirements for operational feasibility, insignificant impact			
7	Land preparation	Land preparation using equipment that noise meets the requirements for operational feasibility.	Noise	Noise increase	Noise impact from land preparation is made possible by equipment. Noise can reach ± 85 dBA at a distance of 15 meters. Noise quality standard for industrial area 70 dBA (Kep Men LH No.48 / 1996 concerning Standard	HSI	Land preparation location	1 day with consideration for 6 months of land preparation period, the equipment operation in

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No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
					Noise Level). The potential for noise exceeds the provisions of the quality standard rules, significant impacts.			each day is the same.
8	Land preparation	-	Surface water quality	Decrease in surface water quality	Decrease in the quality of surface water (rivers) is possible to come from soil grains that enter the river. GPP location near the Air Kotok river, an significant impact. Decrease in surface water quality has the potential to exceed the provisions of quality standards, significant impacts.	HSI	Sungai Air Kotok, up to 300 meters upstream from the GPP location.	1 day with consideration of granules entering the river during the rainy season, every day is the same.
9	Land preparation	-	Erosion	Erosion	Erosion was made possible by changes in land cover at a 15-hectare geothermal power plant location from the beginning there were plants being open without plants. The eroded soil in the rainy season will enter the Air Kotok river, and the surrounding environment. The potential for eroded soil to enter the river during the	HSI	Location around GPP.	1 month in the rainy season with consideration to the period of accumulation of eroded soil.

No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
					rainy season is feared by some communities, an significant impact.			
10	Land preparation	-	Runaway & flood water rates	Increased runoff water & flood rate	Increase in the rate of water run-off and flooding is made possible by changes in land cover at the 15-hectare geothermal power plant location from the beginning there were plants become open without plants. Runoff water in rainy season will enter the Air Kotok River and surrounding area. At the public consultation, participants were concerned about the potential impact of floods, significant impacts.	HSI	Location around GPP.	1 month in the rainy season with consideration in accordance with the accumulation of runaway water period that has the potential to cause flooding.
11	Land preparation	-	Flora	Reduced flora cover	Reduced flora cover is made possible by the felling of trees at 15 hectares of GPP. Plants found in GPP locations are cultivated (coffee) plants and there are no protected species, impacts are not significant.	Non HSI	-	-
12	Land preparation	-	Fauna	Reduced presence of fauna	Reduced fauna is a derivative impact of reduced trees impact as part of their	Non HSI	-	-

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No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
					habitat in the 15 Ha GPP site. There are still trees around the GPP site as habitat for fauna. The potential for fauna impacts is not feared by the community, no rules are violated, impacts are not significant.			
13	Land preparation	-	Aquatic biota	Reduced diversity index	Decrease in the quality of aquatic biota (river) is a secondary impact of decreasing the quality of surface water (rivers) by land preparation activities, including significant impacts.	HSI	Air Bungai River, up to 300 meters upstream from the position of the GPP location.	1 day with consideration of granules entering the river during the rainy season, every day is the same.
14	Land preparation	Land preparation using equipment that is operationally feasible.	Public health	Increased Morbidity Rate	Land preparation activities are predicted to potentially cause changes in ambient air quality, but the equipment to be used is equipment that has been tested for emissions and is feasible to operate. Then the derivative impact on the public health component is insignificant impact.	Non HSI	-	-
15	GPP construction	GPP construction uses equipment	Air quality	Decrease in air quality	The decrease in air quality by the GPP construction work is	Non HSI	-	

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No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
		that is operationally feasible.			possible to come from equipment emissions. The emission factor of diesel fuel equipment is CO 35.57 grams / liter; NO ₂ 39.53 gram / liter; HC 8.15 grams / liter. The emission factor of gasoline-fueled equipment is CO 462.63 grams / liter; NO ₂ 21.35 g			
16	GPP construction	Using a tool that meets the requirements for operational feasibility.	Noise	Noise increase	Noise impact from the construction of geothermal power plants is made possible by equipment. Noise can reach ± 85 dBA at a distance of 15 meters. Noise quality standard for industrial area 70 dBA (Kep Men LH No.48 / 1996 concerning Standard Noise Level). The impact of noise increases has the potential to exceed the quality standard rules, significant impacts.	HSI	GPP construction site	1 day with consideration during the 12 months of the construction period, equipment operations in each day are the same.
17	GPP construction	-	Business opportunities	Business Opportunity Improvement	The creation of business opportunities is the impact of the construction materials procurement. Business opportunities include	HSI	Lebong Tengah and Lebong Selatan Sub-districts	24 months construction period.

No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
					providing GPP construction materials. The use of local materials is expected by some participants of public consultation, significant impacts.			
18	GPP construction	-	Community income	Increase in community income	Increased income is a derivative impact of business opportunities improvement from GPP construction activities (procurement of construction materials), considered as significant impacts.	HSI	Lebong Tengah and Lebong Selatan Sub-districts	24 months construction period.
19	GPP construction		Community perception	Positive / negative perception	Positive perception is a derivative impact of increasing business opportunities from GPP construction activities (procurement of construction materials), considered as significant impacts.	HSI	Lebong Tengah and Lebong Selatan Sub-districts	24 months construction period.
20	GPP construction	-	Public health	Increased Morbidity Rate	Increased Morbidity Rate is a derivative impact of the primary impact of air quality degradation by geothermal power plant construction activities, the impact is not significant.	Non HSI	-	-
21	GPP equipment	Installation of	Air quality	Decrease in air	The decrease in air quality by	Non HSI	-	-

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No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
	installation	geothermal power equipment using tools which its emissions meet the feasibility.		quality	the installation of geothermal power equipment is possible from the emission of equipment. The emission factor of diesel fuel equipment is CO 35.57 grams / liter; NO ₂ 39.53 gram / liter; HC 8.15 grams / liter. The emission factor of gasoline-fueled equipment is CO 462.63 grams / liter; NO ₂ 21.35 grams / liter; HC 54.09 gram / liter (Source: Estimating the Environmental Impact of Air Quality, KLH, 2007). The nearest settlement to the GPP location is ± 300 meters. Installation of geothermal equipment using tools which its emissions meet feasibility, impact is not significant			
22	GPP equipment installation	Using a tool that meets the requirements for operational feasibility.	Noise	Noise increase	The noise impact is made possible by equipment. Noise can reach ± 85 dBA at a distance of 15 meters. Noise quality standard for industrial area 70 dBA (Kep Men LH No.48 / 1996 concerning Standard Noise Level).	HSI	GPP equipment installation location	1 day with consideration for 6 months of equipment installation period, equipment operations in

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No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
					Significant impact.			each day are the same.
23	GPP equipment installation	-	Public health	Increased Morbidity Rate	Increase in the Morbidity Rate rate is a secondary impact of decreasing air quality by GPP equipment installation, the impact is not significant.	Non HSI	-	-
24	Testing / Commissioning	-	Air quality	Decrease in air quality	The decrease in air quality by the GPP testing work is possible came from non-condensable gases. To maintain the vacuum of the condenser, uncondensed gas is released continuously by the gas extraction system. These gases contain: CO ₂ 85-90% wt; 3.5% H ₂ S wt; N ₂ gas and other gases, which have the potential to exceed the quality standard rules, significant impacts.	HSI	GPP location	1 day with consideration for 1 month of the GPP testing period, the emissions in each day are the same.
25	Testing / Commissioning	-	Noise	Noise increase	Noise impact is made possible by GPP testing / commissioning activities. Noise can reach ± 85 dBA at a distance of 15 meters. Noise quality standard for industrial area is 70 dBA	HSI	GPP location	1 day with consideration for 1 month of the GPP testing period, the emissions in each day are

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No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
					(Kep Men LH No.48 / 1996 concerning Standard Noise Level). Significant impact.			the same.
26	Testing / Commissioning	Power house (power plant building) is made with the strength to be able to withstand vibrations arising from GPP equipment operations.	Vibration	Increased vibration	The impact of vibration is made possible by testing / commissioning of GPP equipment. The vibrations generated can reach 4 mm / s at a distance of 20 meters and decrease to 2 mm / s at a distance of 50 meters. The vibration quality standard is 2 mm / meter (Kep Men LH No.49 / 1996 Regarding the Raw Level of Vibration). GPP location is relatively far from the settlement, the nearest settlement is \pm 1 km from the GPP location, the impact is not significant.	Non HSI, managed is monitored	-	-
27	Testing / Commissioning		Public health	Increased Morbidity Rate	Increased Morbidity Rate rates are a secondary impact of air quality degradation by GPP testing / commissioning activities, significant impacts.	HSI	-	-
28	Basecamp operational	The labor basecamp will be equipped with a septic tank to treat	Surface water quality	Decrease in surface water quality	The labor basecamp will be equipped with a septic tank to treat black water domestic wastewater. While gray water	Non HSI is managed and monitored	-	-

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No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
		black water domestic wastewater. While gray water liquid waste will be channeled through settling tanks before being released into the drainage channel.			liquid waste will be flowed through settling tanks before being released into the environment. Thus the impact of decreasing surface water quality is not HSI, but it is managed and monitored.			
29	Basecamp operational	The labor basecamp will be equipped with a septic tank to treat black water domestic waste.	Groundwater quality	Decreasing groundwater quality	The decrease in the quality of groundwater is likely to come from domestic wastewater at the basecamp. The location of the basecamp is relatively far from the settlement, where the nearest settlement is ± 1 km from the GPP location, the impacts are not significant, but are managed and monitored.	Non HSI is managed and monitored	-	-
30	Basecamp operational		Groundwater quantity	Decreasing the quantity of ground water	The decrease in the quantity of groundwater is possible to come from groundwater extraction for basecamp operations, which has the potential to affect the population's well water	Non HSI is managed and monitored	-	-

No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
					reserves. The need for clean water for labor basecamp is $\pm 20 \text{ m}^3 / \text{day}$. The location of the activity is relatively far from the settlement, where the nearest settlement is $\pm 1 \text{ km}$ from the GPP location, the impact is not significant, but is managed and monitored.			
31	Basecamp operational		Aquatic biota	Reduced diversity index	Decrease in aquatic biota is a secondary impact of decreasing surface water quality by basecamp operational activities, the impact is not HSI, but is managed and monitored.	Non HSI is managed and monitored	-	-
32	Operational basecamp	Disaggregated bins for organic waste and inorganic waste were provided within the basecamp. Organic waste is then collected at the Temporary garbage storage and then transported to the	Environment sanitation	Decreasing environmental sanitation	The decline in environmental sanitation were due to waste generation from labor activities in the basecamp. Disaggregated bins for organic waste and inorganic waste were provided within the basecamp. Organic waste is then collected at the Temporary garbage storage and then transported to the landfill. While inorganic	Non HSI is managed and monitored	-	-

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No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
		landfill. While inorganic waste is collected for recycling.			waste is collected for recycling. Unsignificant impacts but were managed and monitored			
33	Operational basecamp		Morbidity Rate	Increased Morbidity Rate	Increase in Morbidity Rate rate is a tertiary impact of decreasing environmental sanitation caused by the generation of solid / liquid waste by labor activities at the basecamp, the impact is Not Significant but is managed and monitored .	Non HSI is managed and monitored.	-	-
34	Labor recruitment	Labor recruitment is prioritized from the local community (Lebong Tengah and Lebong Selatan Sub-districts)	Employment Opportunity	Increased employment opportunities	Input from the results of public consultations, it is suggested to prioritize the recruitment of labor from the local community of Lebong Tengah Subdistrict and Lebong Selatan Subdistrict, the impact is considered significant.	HSI	Lebong Tengah and Lebong Selatan Sub-districts	3 months period of construction workers recruitment
35	Labor recruitment	Labor recruitment is prioritized from the local community (Lebong Tengah and Lebong Selatan Sub-	Business opportunities	Business Opportunity Improvement	The creation of business opportunities is a secondary impact of increased employment opportunities. Business opportunities include restaurant business and transportation services,	HSI	Lebong Tengah and Lebong Selatan Sub-districts	24 months construction period.

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No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
		districts)			impacts were considered significant.			
36	Labor recruitment	Labor recruitment is prioritized from the local community (Lebong Tengah and Lebong Selatan Sub-districts)	Community income	Increase in community income	Increased income is a secondary impact of increasing income from recruitment activities, including significant impacts.	HSI	Lebong Tengah and Lebong Selatan Sub-districts	24 months construction period.
37	Labor recruitment	Labor recruitment is prioritized from the local community (Lebong Tengah and Lebong Selatan Sub-districts)	Community perception	Positive / negative perception	Positive perception is a secondary impact of increase in work opportunity and business opportunity from labor recruitment. Considered significant impact	HSI	Lebong Tengah and Lebong Selatan Sub-districts	24 months construction period.
38	Downsizing of labor	Making work contracts between time between the proponent (contractor) and the construction labor, who agree on the period of the work contract and other related matters.	Employment Opportunity	Decreasing employment opportunities	Decrease in employment opportunity is the impact of labor downsizing on the end of construction period. Labor downsizing refers to the work contract that had been agreed upon in the beginning of the contract. Insignificant impact.	Non HSI	-	-

No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
III	Operation Stage							
1	GPP operation	-	Air quality	Decrease in air quality	Decreased air quality by GPP operation activities is possible come from non-condensable gases. To maintain the vacuum of the condenser, uncondensed gas is released continuously by the gas extraction system. These gases contain: CO ₂ 85-90% wt; 3.5% H ₂ S wt; the rest are N ₂ and other gases. The dominant wind direction is from the west and from the south. The nearest settlement is ± 300 meters to the east, a significant impact.	HSI	Within a 1 km radius of the GPP location reaches a settlement to the east of the GPP.	1 day with consideration that during the GPP operation period, non-condensed gas released is the same every day.
2	GPP operation	-	Noise	Noise increase	The impact of noise is made possible by GPP operation activities. Noise can reach ± 85 dBA at a distance of 15 meters. Noise quality standard for industrial area is 70 dBA (Kep Men LH No.48 / 1996 concerning Standard Noise Level). Significant impact.	HSI	GPP location	1 day with consideration that during the operation period of GPP, the noise in each day is the same.
3	GPP operation	Power house (power plant	Vibration	Vibration increase	The impact of vibration is possible from the operation	Non HSI is managed	-	-

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No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
		building) is made with the strength to be able to withstand vibrations arising from GPP equipment operations.			of the GPP. The vibrations generated can reach 4 mm / s at a distance of 20 meters and decrease to 2 mm / s at a distance of 50 meters. The vibration quality standard is 2 mm / meter (Kep Men LH No.49 / 1996 Regarding the Raw Level of Vibration). The nearest settlement to the GPP ± 1 km location, the impact is not significant.	and monitored		
4	GPP operation	At the GPP location, a septic tank will be provided to manage domestic liquid waste (black water) from labor activities	Groundwater quality	Groundwater quality degradation	Decrease in groundwater quality is made possible by the influence of domestic wastewater from GPP operational's workers activities. At the GPP location a septic tank will be provided for the management of domestic liquid waste (black water) from the labor activities, the impact is not significant but is managed and monitored.	Non HSI is managed and monitored.	-	-
5	GPP operation	-	Groundwater quantity	Decreasing groundwater quality	Decreasing the quantity of ground water is made possible by taking groundwater for clean water	Non HSI is managed and monitored.	-	-

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No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
					needs of GPP operational labor. Clean water needs of workers is 80 people x 50 liters / person / day = 4 m ³ / day. impacts are Not Significant but are managed and monitored.			
6	GPP operation	Labor transportation will be provided by vehicles (mini buses) for employees, to reduce traffic volume.	Traffic	Traffic congestion	Traffic congestion is made possible by GPP operational labor vehicles. To reduce the volume of traffic, a vehicle (mini bus) will be provided to transfer employees. Estimated vehicle traffic is ± 10 units / day. Current traffic conditions are smooth, vehicle speed is ± 40 km / hour. Insignificant, but impacts were managed and monitored.	Non HSI is managed and monitored.	-	-
7	GPP operation	-	Aquatic biota	Decreased biota diversity index	The decrease in the quality of aquatic biota is a secondary impact on the decline in surface water quality (river), considered insignificant, but impact is managed and monitored.	Non HSI is managed and monitored.	-	-
8	GPP operation	At the GPP location there is a	Environment sanitation	Decreasing environmental	Decreasing environmental sanitation is caused by waste	Non HSI is managed	-	-

EIA

Development Plan of 2 x 55 MW Hululais Geothermal Power Plant (GPP)
in Lebong Selatan and Lebong Tengah Sub-districts, Lebong District, Bengkulu Province

No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
		disaggregated trash bin for organic waste and inorganic waste. Organic waste is then collected at the TPS and then transported to the landfill. While inorganic waste is collected for recycling.		sanitation	generation from GPP operation activities. At the GPP location there is a disaggregated trash bin for organic waste and inorganic waste. Organic waste is then collected at the Temporary Garbage Storage and then transported to the landfill. While inorganic waste is collected for recycling. considered insignificant, but impact is managed and monitored..	and monitored		
9	GPP operation	-	Morbidity Rate	Increased Morbidity Rate rates	The operation of GPP has the potential to cause changes in ambient air quality, this has the potential to cause a derivative impact on the public health component, namely increasing the number of ARI diseases. The health component has an significant role in people's lives, significant impact.	HSI	Lebong selatan District and North Lebong District	6 months according to the period of the potential effect of decrease in air quality on increasing Morbidity Rate.
10	GPP Maintenance	Liquid waste from GPP maintenance activities (used oil)	Surface water quality	Decrease in surface water quality	Decrease in surface water quality is possible from the influence of liquid waste	Non HSI is managed and	-	-

EIA

Development Plan of 2 x 55 MW Hululais Geothermal Power Plant (GPP)
in Lebong Selatan and Lebong Tengah Sub-districts, Lebong District, Bengkulu Province

No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
		is collected at the B3 Waste TPS for further submission to authorized third parties.			generated from GPP maintenance activities. Liquid waste from GPP maintenance activities (used oil) is collected at the B3 Waste TPS for further submission to authorized third parties. considered insignificant, but impact is managed and monitored.	monitored.		
11	Labor recruitment	Labor recruitment is prioritized from the local community (Kecamatan Lebong Tengah and Kecamatan Lebong Selatan)	Employment Opportunity	Increased employment opportunities	Input from the results of public consultations, it is suggested to prioritize the recruitment of labor from the local community of Lebong Tengah Subdistrict and Lebong Selatan Subdistrict, considered significant impacts	HSI	Lebong selatan District and North Lebong District	3 months period of operational labor recruitment
12	Labor recruitment	Labor recruitment is prioritized from the local community (Lebong Tengah and Lebong Selatan Sub-districts)	Business opportunities	Increased business opportunities	The creation of business opportunities is a secondary impact of increased employment opportunities. Business opportunities include restaurant business and transportation services, considered significant.	HSI	Lebong selatan District and North Lebong District	3 months period of operational labor recruitment
13	Labor recruitment	Labor recruitment is prioritized from	Community income	Increased revenue	Increased income is a secondary impact of increase	HSI	Lebong selatan District and North	3 months period of

EIA

Development Plan of 2 x 55 MW Hululais Geothermal Power Plant (GPP) in Lebong Selatan and Lebong Tengah Sub-districts, Lebong District, Bengkulu Province

No	Description of Activity Plans that are Potential for Environmental Impact	Environmental Management That Has Been Planned Early As Part of the Action Plan	Affected Environmental Components	Scoping			Study Area Limit	Study Deadline
				Potential Impact	Evaluate Potential Impacts	Hypothetical Significant Impact (HSI)		
		the local community (Lebong Tengah and Lebong Selatan Sub-districts)			in income from recruitment activities, considered significant impacts.		Lebong District	operational labor recruitment
14	Labor recruitment	Labor recruitment is prioritized from the local community (Lebong Tengah and Lebong Selatan Sub-districts).	Community perception	Positive / negative perception	Positive perception is a secondary impact of increased employment opportunities and business opportunities from recruitment activities, considered significant impacts.	HSI	Lebong selatan District and North Lebong District	3 months period of operational labor recruitment

1.2.3. HYPOTHETICAL SIGNIFICANT IMPACT

From the results of the potential impact evaluation in the table above, it is obtained that a Hypothetical Significant Impact (HSI) and non HSI are managed and monitored as the table below.

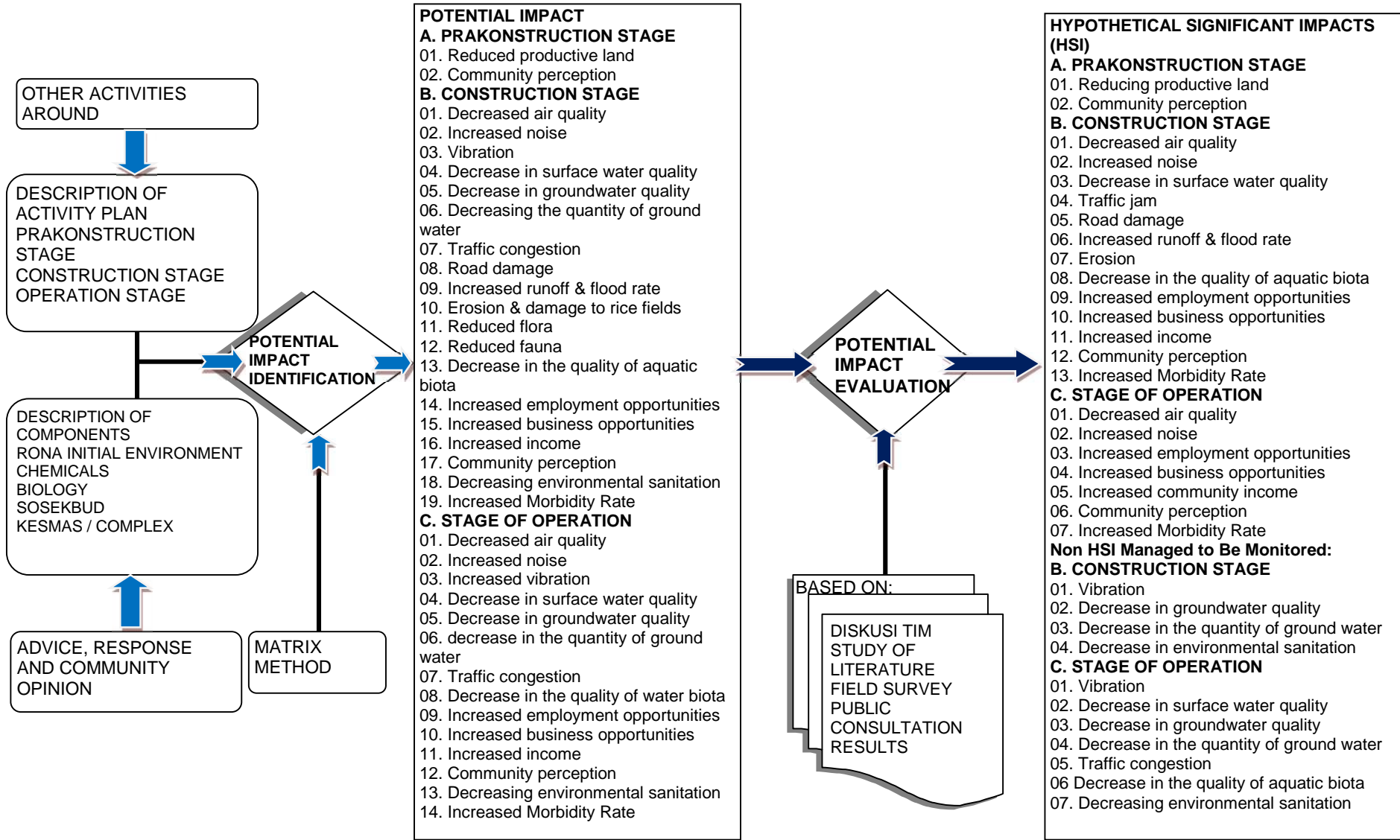
Table 1-15 Hypothetical Significant Impact (HSI) and not HSI But Managed and Monitored

No	Environmental Component	Pre-const		Construction Stage Activities								Operation		
		1	2	1	2	3	4	5	6	7	8	1	2	3
		Socialization	Land acquisition	Labor recruitment	Equipments and Materials mobilization	Basecamp Operation	Land preparation	GPP construction	GPP equipment installation	Reduction of labor	Commisioning/ Testing	Labor recruitment	GPP operation	GPP Maintenance
A	Chemical Geophysics													
1	Air quality				1		3	3	3		1		1	
2	Noise				1		3	3	1		1		1	
3	Vibration										2		2	
4	Surface water quality					2	1							2
5	Groundwater quality					2							2	
6	Groundwater quantity					2							2	
7	Traffic				1								2	
8	Road damage				1									
9	Runoff water & flood water speed						1							
10	Erosion						1							
11	Reduced productive land		1											
B	Biology													
1	Flora						3							
2	Fauna						3							
3	Aquatic Biota					2	1						2	2
C	Socio-Economy and Cultural													
1	Employment Opportunity			1						3		1		
2	Business opportunities			1				1				1		
3	Community income			1				1				1		
4	Community perception	1	1	1				1				1		
D	Public Health													
1	Environment sanitation					2							2	
2	Morbidity Rate				1	2	3	3	3		1		1	

1 HSI

2 Non-HSI Managed and Monitored

3 Non HSI



Picture 1-6 Scoping Flow Chart

Table 1-16 List of Hypothetical Significant Impacts (HSI) and Parameters:

No.	Types of Hypothetical Significant Impacts (HSI)	Parameter
Preconstruction Stage		
1.	Reduced productive land	There is a decrease in the productivity of plantation land
2.	Changes in public perception	Community perception (positive or negative)
Construction Stage		
1.	Decrease in air quality	Dust content in ambient air
2.	Noise increase	Noise level
3.	Decrease in surface water quality	River water turbidity and TSS.
4.	Increase in runoff water and flood water speed	The availability or not that an emergency rainwater duct around the land preparation location, which at the end of the duct a settling hole is made to allow rainwater to seep into the ground
5.	Erosion	The availability or not that at the sloping section at the disposal site of the retaining wall (DPT) wall or wire gabion to prevent erosion in the rainy season
6.	Decrease in aquatic biota	There is no spillage of soil that enters the water body; Value index of diversity of aquatic biota (plankton and benthos): $H' \geq 2$
7.	Increased employment opportunities	Number of workers who come from local villages
8.	Increased business opportunities	The number of residents of the local village who get business opportunities.
9.	Increased community income	The number of residents of the local Villages who get an increase in income.
10.	Changes in public perception	Community perception
11.	Traffic congestion	Traffic disruptions include traffic jams and accidents
12.	Road damage	Damage especially to the access of the project site (Taba Anyar Village)
13.	Increased Morbidity Rate rates	Morbidity Rate Number of environment-based illness (ARI)
Operation Stage		
1.	Decrease in air quality	Air emission quality parameters, ambient air, air of ignition.
2.	Noise increase	Noise level
3.	Increased employment opportunities	The number of workers coming from the local village / village.
4.	Increased business opportunities	The number of residents of the local village who get business opportunities related to GPP activities
5.	Increased community income	The number of respondents who obtained an increase in income related to GPP activities
6.	Changes in public perception	The number of respondents according to

No.	Types of Hypothetical Significant Impacts (HSI)	Parameter
		their perception (positive or negative) of GPP activities
7.	Increased Morbidity Rate rates	Morbidity Rate Number of environment-based illness (ARI)

1.3. LIMITS OF STUDY AREAS AND LIMITS OF STUDY TIME

1.3.1. STUDY AREA LIMITS

The boundary of the study area is the outermost line of overlapping the above boundaries.

1.3.1.1. PROJECT LIMITS

GPP borders:

- North: garden
- South: Cluster B Steam Production Field
- West: garden
- East: garden

1.3.1.2. ECOLOGICAL LIMITS

The ecological boundary is the extent of the impact distribution of the 2 x 55 MW Hululais geothermal power plant activity according to the liquid waste transportation media on the river around ± 400 meters from the GPP location upstream. The air ecology limit is approximately ± 1 km from the GPP location reaching the nearest settlement; and around the road that being through by the Mobilization of equipments and materials.

1.3.1.3. SOCIAL LIMITS

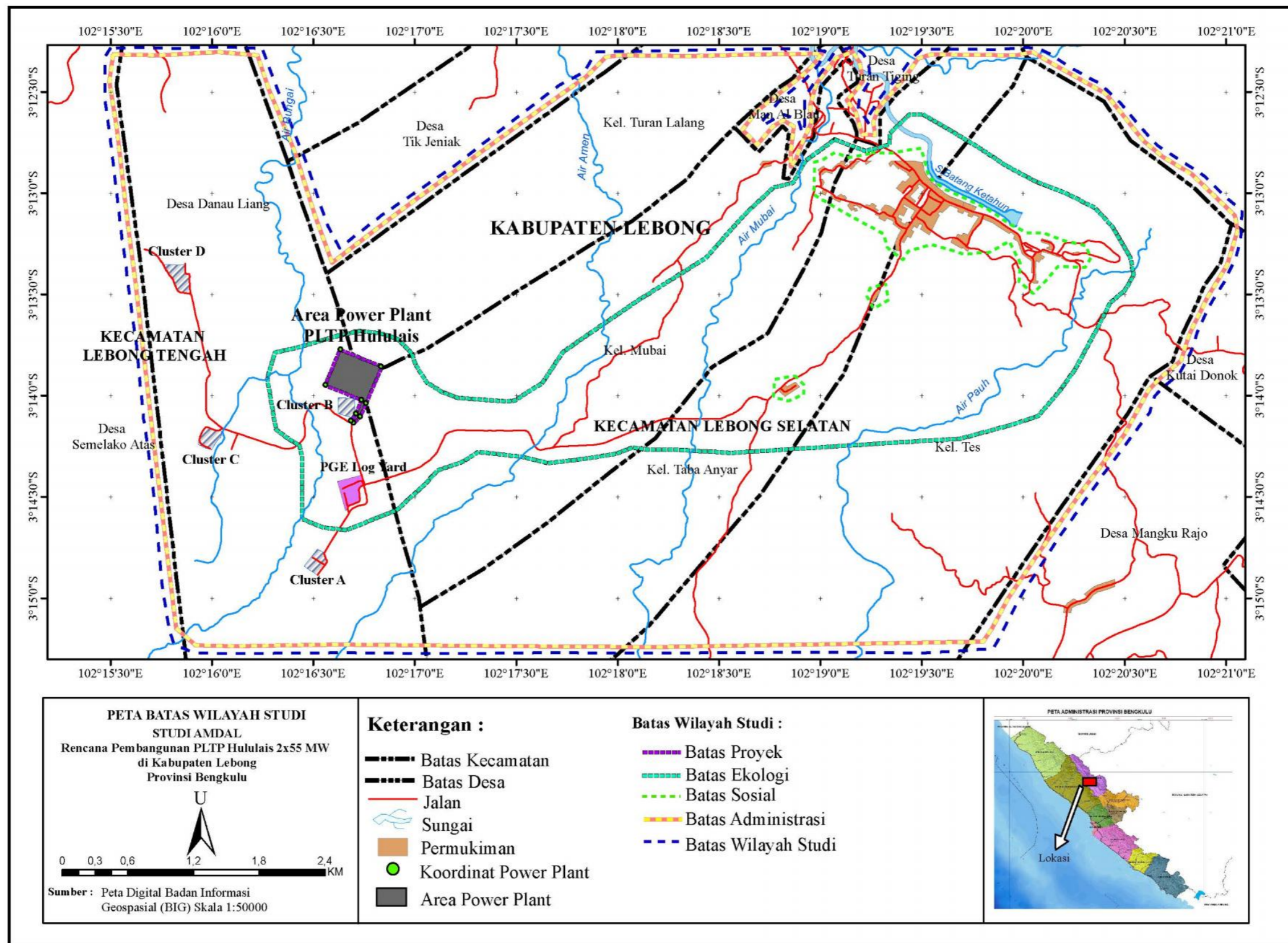
Administratively the location of the 2 x 55 MW Hululais GPP activity site is in Mubai Village, Lebong Selatan Sub-district, Lebong District, Bengkulu Province. However, the location of this activity is also close to the surrounding villages so that the social boundary covers 4 urban village areas, 2 village areas in 2 sub-districts in Lebong District, namely Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village, and Manai Blau Village in Lebong Selatan Sub-district and Danau Liang Village in Lebong Tengah Sub-District.

1.3.1.4. ADMINISTRATION LIMIT

Administrative boundaries are the administrative boundaries of the above boundaries, namely Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village and Manai Blau Village in Lebong Selatan Sub-district and Danau Liang Village in Lebong Tengah Sub-District.

1.3.2. STUDY TIME LIMIT

The study deadline for each hypothetical significant impact (HSI) is presented in Table 1-14 above.



Picture 1-7 Map of Study Area Limits

CHAPTER 2
DETAILED DESCRIPTION OF
ENVIRONMENT BASELINE

CHAPTER 2. DETAILED DESCRIPTION OF ENVIRONMENT BASELINE

2.1. SIGNIFICANT IMPACT AFFECTING THE ENVIRONMENTAL COMPONENTS

2.1.1. CHEMICAL GEOPHYSICAL COMPONENTS

2.1.1.1. CLIMATE

2.1.1.1.1. AIR TEMPERATURE

The highest average temperature of 27.8⁰C was recorded in May 2016 and the lowest was 26.3⁰C recorded in December 2017 (source BPS of Lebong District in Figures in 2017).

2.1.1.1.2. HUMIDITY

The highest average humidity is 86% recorded in November 2016 and the lowest is 81% recorded in June 2017 (source BPS of Lebong District in Figures in 2017).

2.1.1.1.3. RAINFALL

Rainfall and rainy day data are presented in the table below. The study area climate, according to Schmidt and Ferguson is include in type A (very wet), with a value of Q = 0.13. The Q value is the ratio between the number of dry months and the number of wet months. Rainfall dry month is 1 month <60 mm, and wet month is 1 month > 100 mm. From the average monthly rainfall data, the study area is include in the rainy season throughout the year.

Table 2-1 Rainfall of Study Areas in 2006 – 2017

YEAR	MONTH											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2006	591	449	345	284	76	346	65	2	29	14	74	340
2007	520	164	452	124	318	184	208	38	127	177	223	455
2008	174	205	475	226	84	79	62	221	190	294	758	796
2009	450	237	323	572	194	297	246	178	211	334	459	345
2010	235	385	396	239	197	213	326	235	343	555	362	349
2011	270	115	281	374	192	428	142	75	53	105	232	211
2012	198	101	131	340	182	174	141	95	37	200	538	496
2013	443	342	306	227	265	256	509	194	371	154	486	388
2014	344	207	215	494	282	100	168	297	79	97	717	336
2015	369	56	57	323	43	145	1	9	80	0,1	101	224

DETAILED DESCRIPTION OF THE ENVIRONMENT BASELINE

YEAR	MONTH											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2016	263	225	638	246	281	129	116	423	209	366	555	280
2017	379	472	311	326	236	212	91	318	480	342	315	
Average	353	247	328	315	196	214	173	174	184	220	402	384

Source: P. Baai Bengkulu Climatology Station

From the table above, it can be seen that the highest average rainfall in 2006 to 2016 was in November, and the lowest average rainfall was in July.

2.1.1.1.4. THE NUMBERS OF RAINY DAYS

The data on the number of rainy days in the study area from 2006 to 2017 are presented in the table below.

Table 2-2 Rainy Day Study Areas 2006 – 2017

YEAR	MONTH											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2006	23	16	16	20	8	15	11	4	6	4	17	19
2007	23	11	17	18	16	13	12	8	9	13	13	23
2008	15	14	19	10	3	7	5	13	17	20	23	25
2009	23	17	16	15	12	14	8	12	9	20	21	23
2010	19	17	21	18	15	18	15	12	19	22	26	18
2011	15	9	23	16	12	8	12	6	12	14	17	21
2012	17	12	17	19	11	10	12	6	1	15	24	21
2013	24	23	11	14	19	14	19	15	23	13	24	19
2014	23	13	13	21	17	11	11	16	7	11	21	24
2015	16	1	5	16	3	7	1	1	4	1	10	8
2016	19	18	21	17	21	18	16	20	23	24	28	25
2017	22	24	19	23	22	18	23	20	22	19	25	
Average	20	15	17	17	13	13	12	11	13	15	21	21

Source: P. Baai Bengkulu Climatology Station

From the table above, it can be seen that the average rainy day of 2006 until 2017 was the highest in November, and the average lowest rainy day was in August.

2.1.1.1.5. WIND VELOCITY

Wind direction and speed data are presented in the table below. The wind direction is dominant from the South, as the picture of windrose below. The direction of the wind is not dominant, there are those that blow from the northeast, east, northwest, west.

Table 2-3 Wind Speed Study Area 2006 – 2017 (Knots)

YEAR	MONTH											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2006	2,7	2,1	3,5	3,9	3,4	3,7	3,8	5,3	6,4	6,9	5,4	3,3
2007	3,8	4,1	3,9	4,1	3,5	3,8	3,4	4,0	5,0	6,7	4,5	5,2
2008	5,6	5,3	5,4	4,6	4,6	3,9	4,4	4,3	2,7	4,0	2,8	2,9
2009	3,8	4,6	3,0	2,6	4,6	5,8	5,0	5,6	6,5	4,8	6,1	9,3
2010	4,8	7,0	5,0	7,8	8,0	7,5	3,1	4,3	3,9	3,9	5,6	6,4
2011	5,9	8,4	9,2	8,1	7,6	7,7	3,4	4,9	5,5	4,6	3,3	3,4
2012	3,8	2,8	4,3	2,7	2,5	X	3,5	5,2	4,9	3,7	2,4	3,2
2013	3,8	3,8	2,9	3,6	2,6	3,5	2,2	1,7	1,7	1,8	1,8	2,0
2014	2,0	2,4	1,6	2,1	1,9	2,2	2,0	2,1	2,5	2,3	2,1	2,3
2015	2,0	1,6	2,2	1,8	2,0	2,0	3,0	3,5	3,7	3,5	2,5	2,4
2016	4,1	4,0	4,0	3,9	3,6	4,0	4,2	4,0	4,7	4,3	4,4	5,0
2017	4,6	4,3	4,5	4,2	4,1	3,6	4,3	5,0	4,9	4,1	4,4	4,1

Source: P. Baai Bengkulu Climatology Station

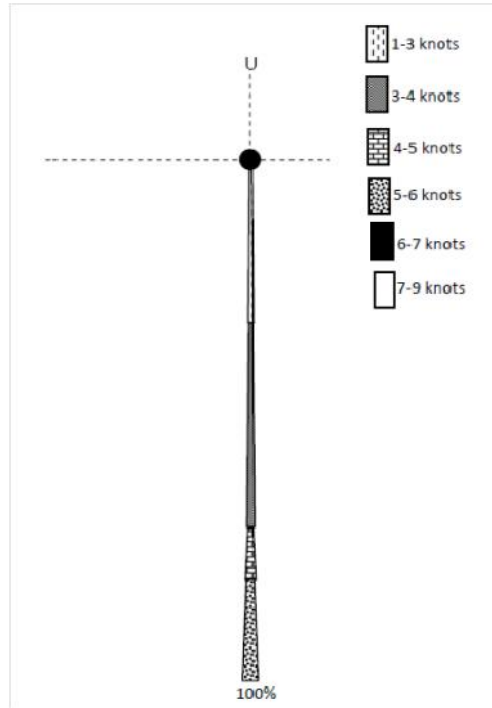
From the table above, it can be seen that the 2006 wind speed up to 2017 was the highest in August, and the lowest average wind speed was in June.

2.1.1.1.6. DOMINANT WIND DIRECTION

Table 2-4 Wind Direction in Study Area year 2006 – 2017 (°)

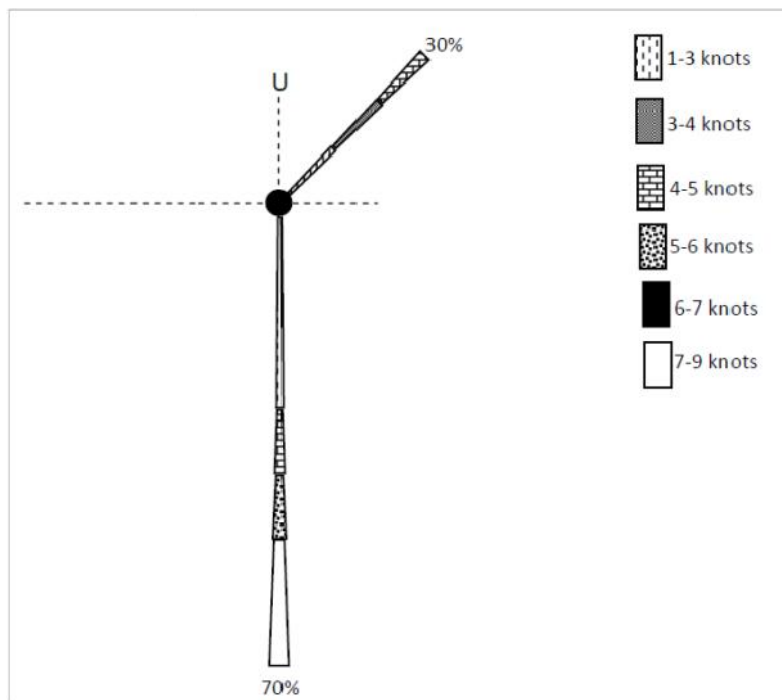
YEAR	MONTH											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2006	270	270	315	270	135	270	135	135	135	135	135	270
2007	270	45	270	270	270	270	180	180	180	180	180	270
2008	270	270	270	270	180	180	135	180	180	180	270	270
2009	270	270	360	360	360	360	360	360	360	360	270	270
2010	270	270	270	270	270	270	270	270	270	270	270	270
2011	270	270	270	270	270	45	45	135	135	135	45	270
2012	270	45	270	45	45	-	135	90	90	90	45	270
2013	270	45	360	90	90	135	45	180	180	180	270	270
2014	270	270	270	270	270	270	270	270	180	180	270	270
2015	270	270	270	270	270	180	180	180	180	180	270	270
2016	NW	W	W	W	W	W	W	W	W	W	W	W
2017	W	W	W	W	SW	W	SW	SW	SW	W	W	

Source: P. Baai Bengkulu Climatology Station



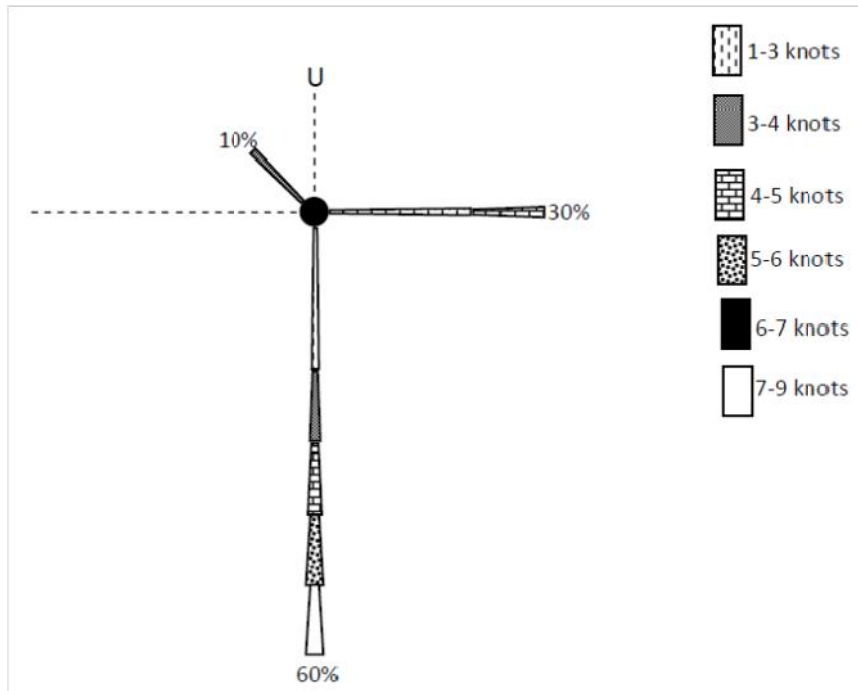
Picture 2-1 Windrose study area in January

The windrose image above is the recapitulation results in January from 2006 to 2017, it shows that in January, the dominant wind direction was 100% to the south with a maximum speed of 5 to 6 knots.



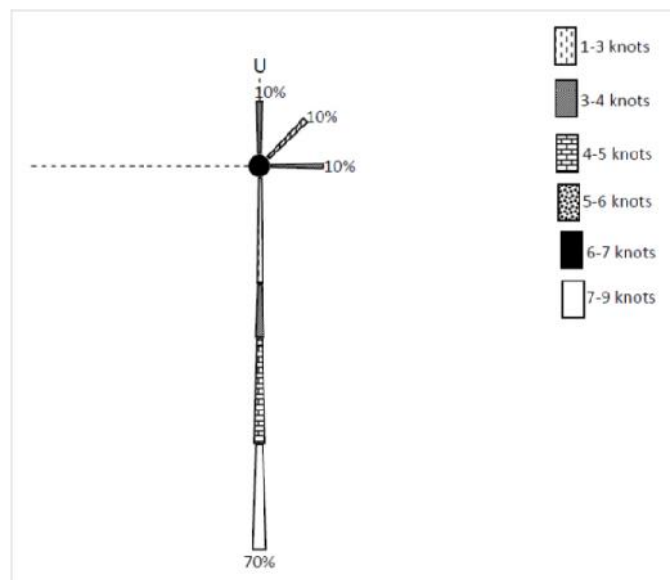
Picture 2-2 Windrose study area in February

The windrose image above is the recapitulation results from February to 2006, it shows that in February, the dominant wind direction was 70% to the south with a maximum speed of 7 to 9 knots.



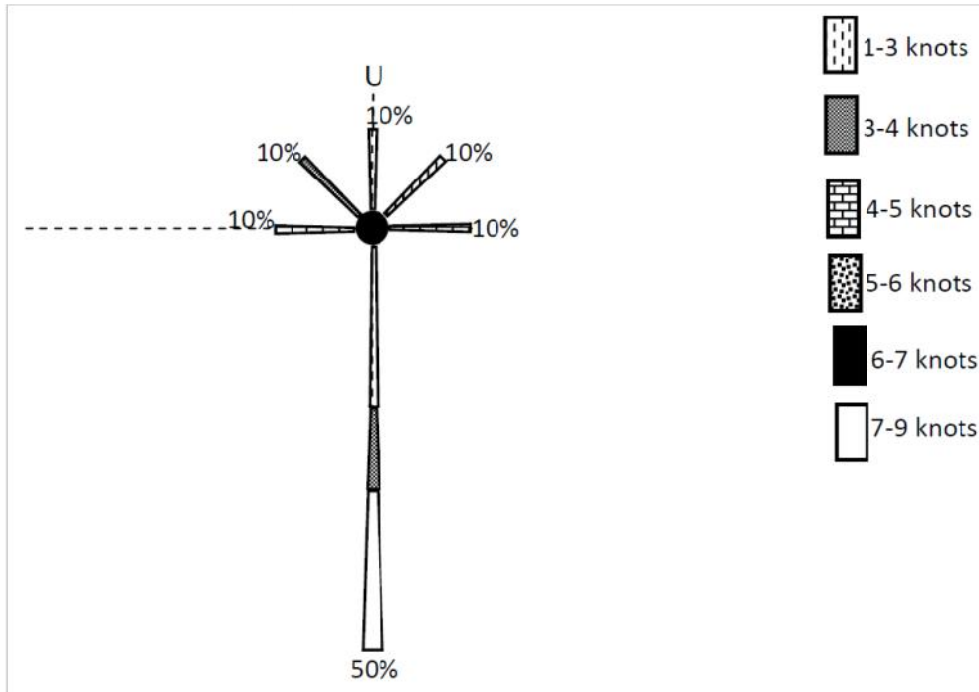
Picture 2-3 Windrose study area in March

The windrose image above is the recapitulation results in March from 2006 to 2017, it shows that in March, the dominant wind direction was 60% to the south with a maximum speed of 7 to 9 knots.



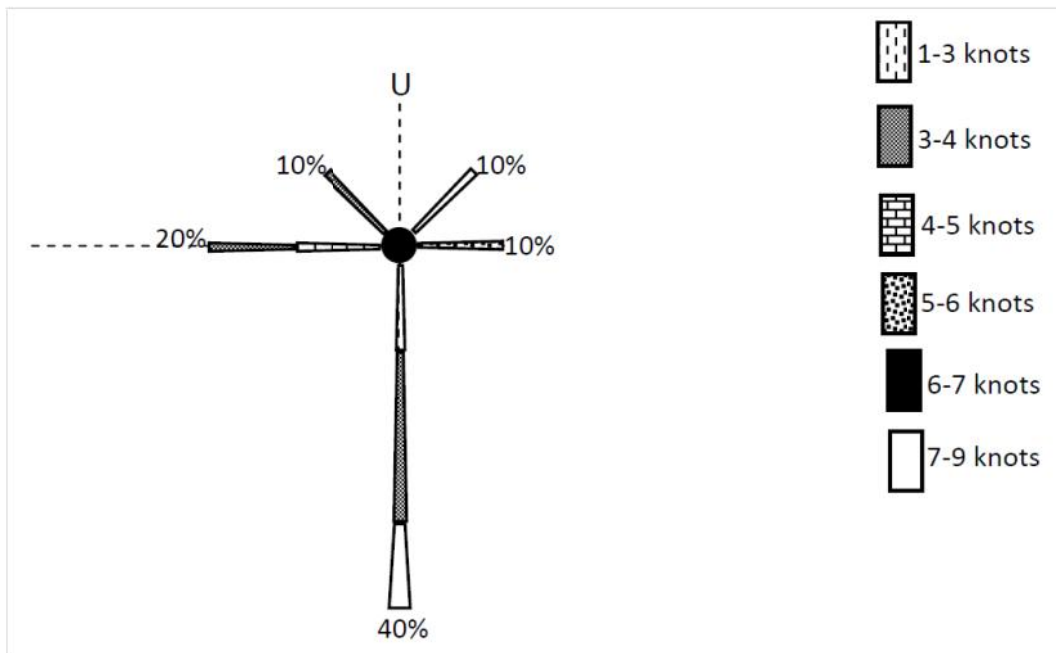
Picture 2-4 Windrose study area in April

The windrose image above the recapitulation results in March from 2006 to 2017, it shows that in March, the dominant wind direction was 60% to the south with a maximum speed of 7 to 9 knots.



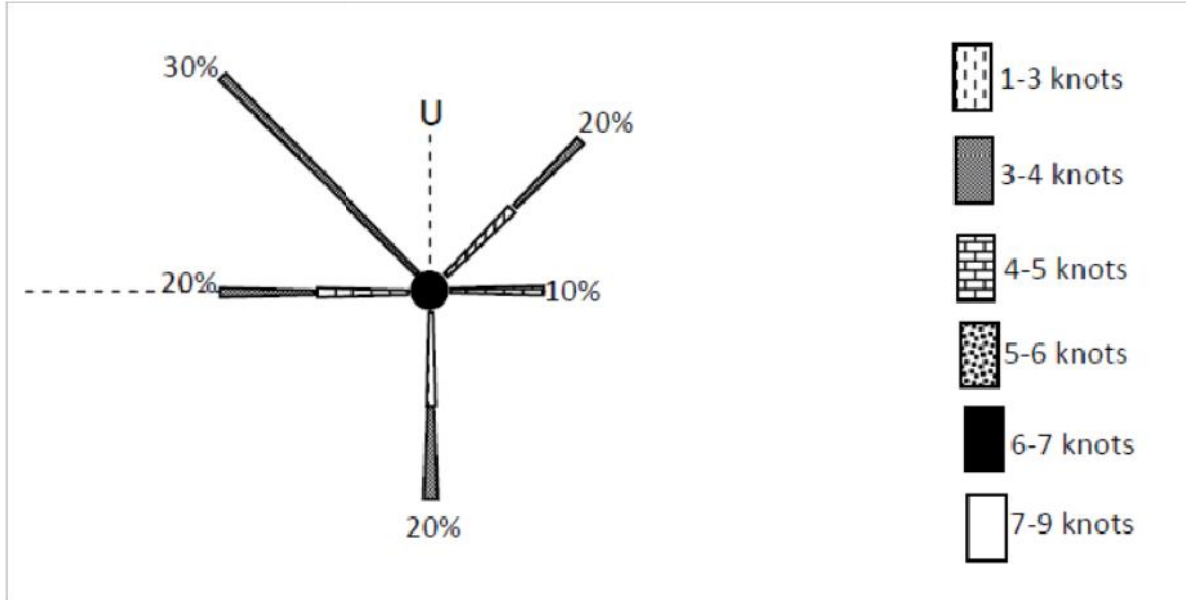
Picture 2-5 Windrose study area in May

The windrose image above is the May recapitulation results from 2006 to 2017, it shows that on the May month, the dominant wind direction is 50% to the south with a maximum speed of 7 to 9 knots.



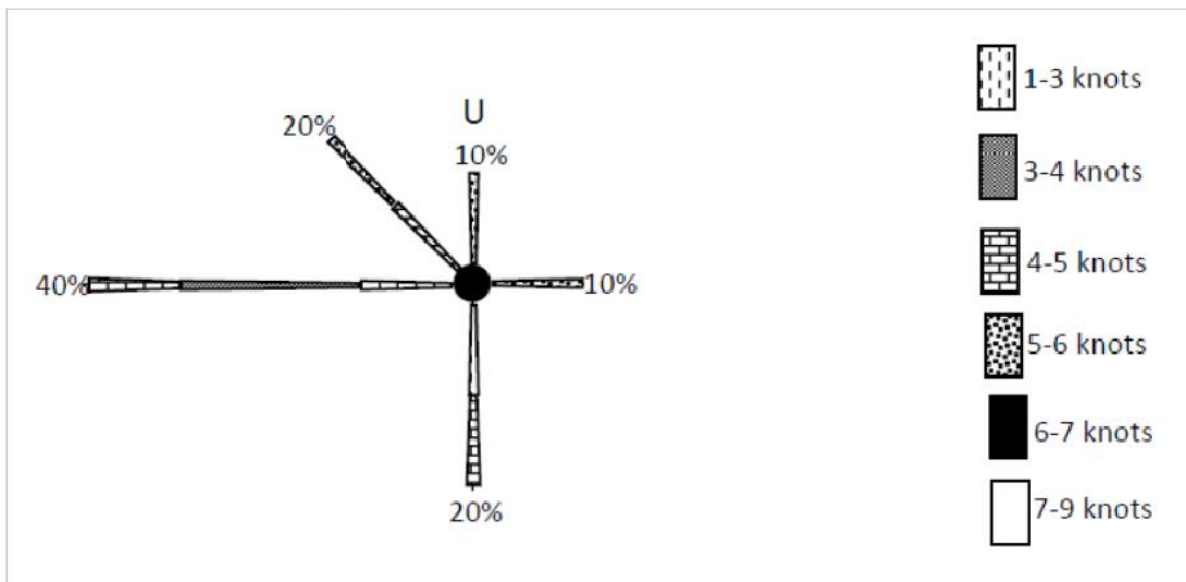
Picture 2-6 Windrose study area in June

The windrose image above is the June recapitulation results from 2006 to 2017, it shows that in June, the dominant wind direction was 40% to the south with a maximum speed of 7 to 9 knots.



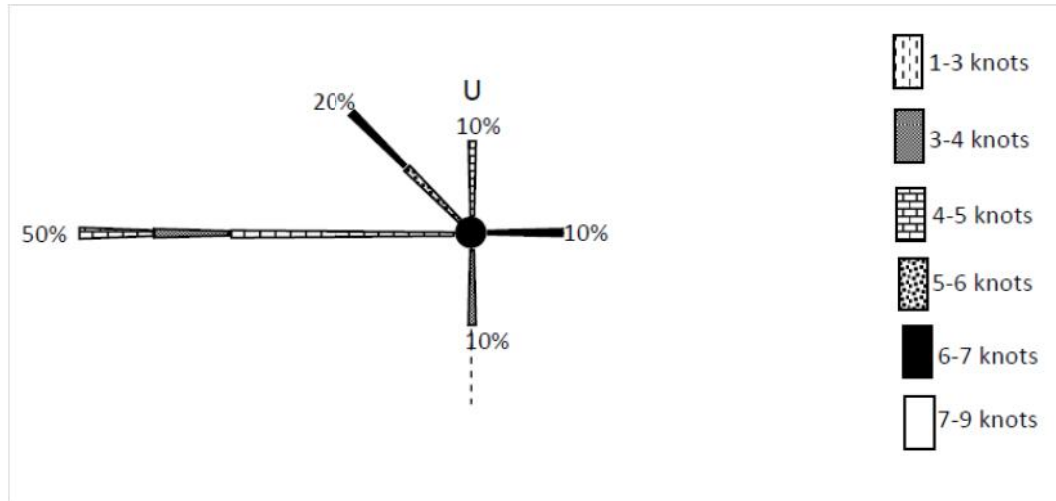
Picture 2-7 Windrose study area in July

The windrose image above is the July recapitulation results from 2006 to 2017, it shows that in July, the dominant wind direction was 30% to the northwest with a maximum speed of 3 to 4 knots.



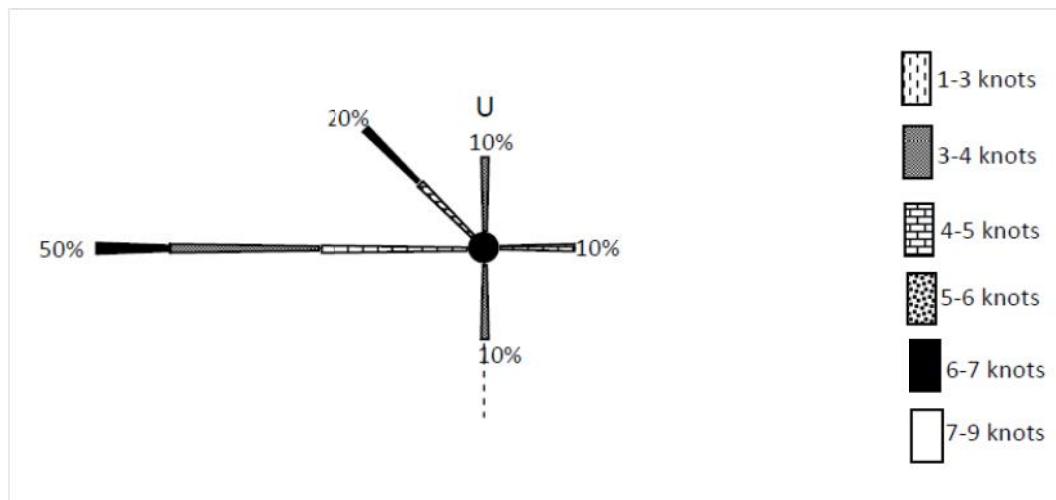
Picture 2-8 Windrose study area in August

The windrose image above is the August recapitulation results from 2006 to 2017, it shows that in August, the dominant wind direction was 40% to the west with a maximum speed of 4 to 5 knots.



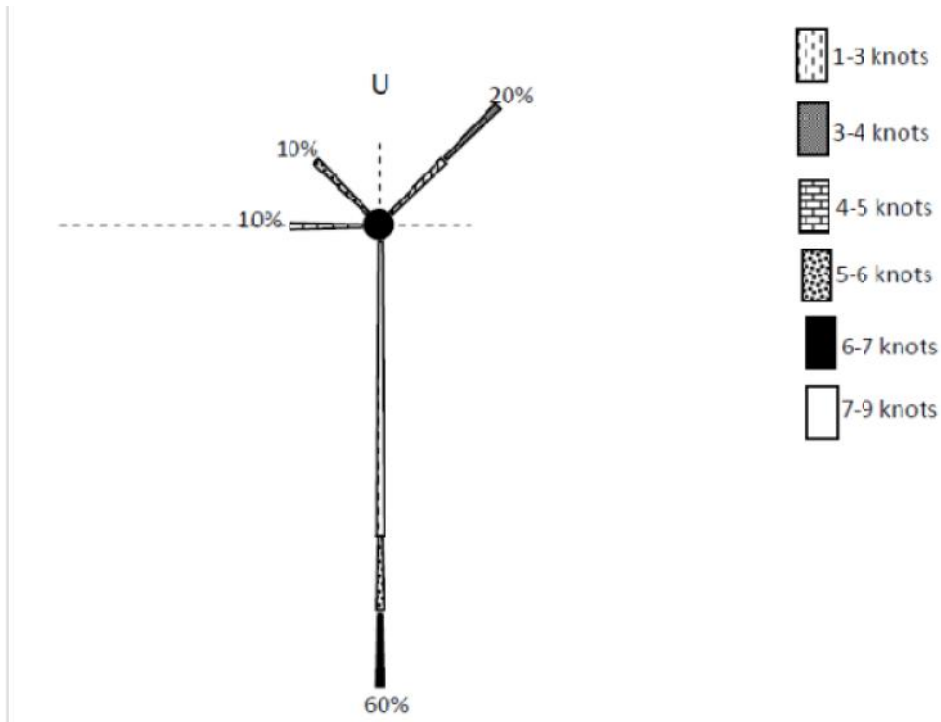
Picture 2-9 Windrose study area in September

The windrose image above is the recapitulation results in September from 2006 to 2017, it shows that in September, the dominant wind direction was 50% to the west with a maximum speed of 4 to 5 knots.



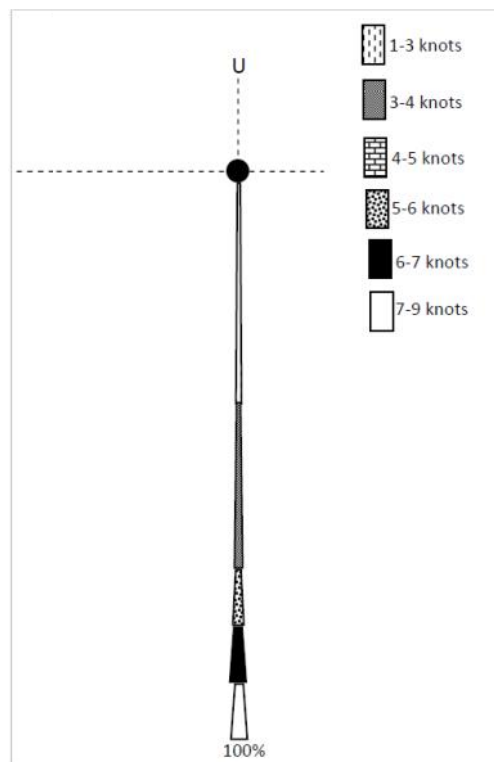
Picture 2-10 Windrose study area in October

The windrose image above is the recapitulation results of October from 2006 to 2017, it shows that in October, the dominant wind direction was 50% to the west with a maximum speed of 6 to 7 knots.



Picture 2-11 Windrose study area in November

The windrose image above is the November recapitulation results from 2006 to 2017, it shows that in November, the dominant wind direction was 60% to the south with a maximum speed of 6 to 7 knots.



Picture 2-12 Windrose study area in December

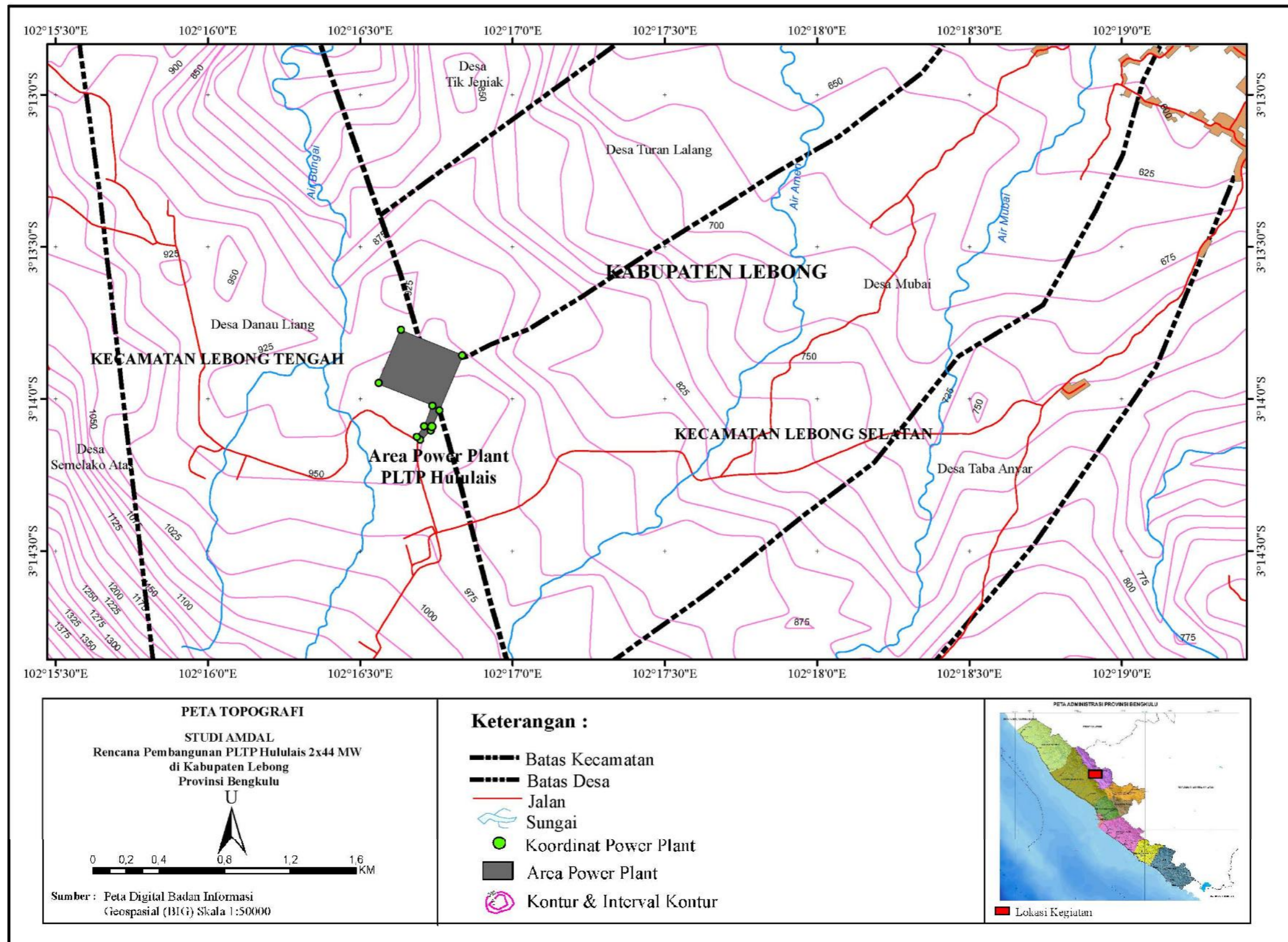
The windrose image above is the December recapitulation results from 2006 to 2017, it shows that in December, the dominant wind direction was 100% to the south with a maximum speed of 7 to 9 knots.

2.1.1.2. TOPOGRAPHY

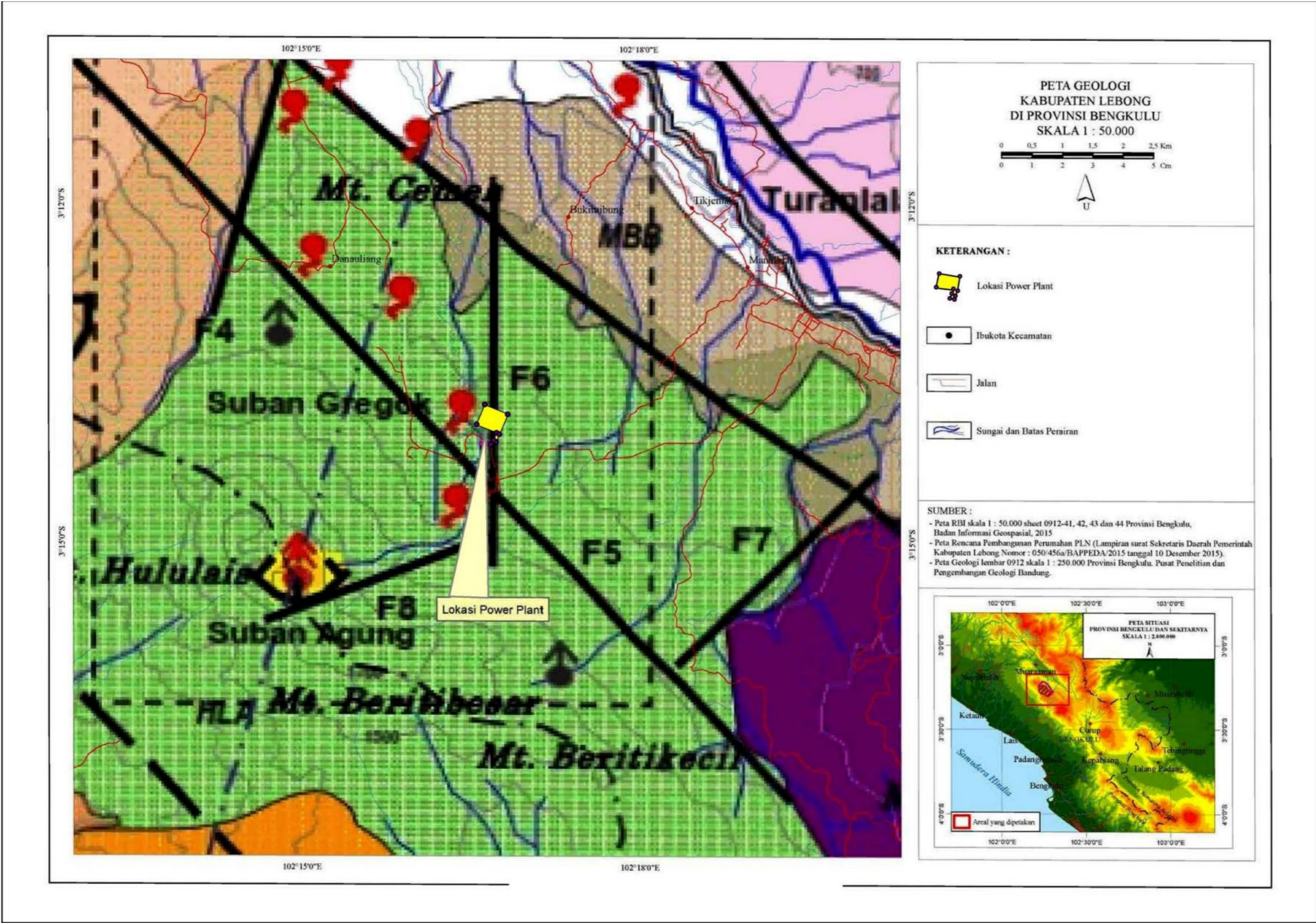
Based on Picture 2-13, the activity location site is at an altitude of 925 meters above sea level up to 950 meters above sea level. The land contour to the west of the location site is rising to 1175 meters above sea level, and the highest is in the southwest which is up to 1375 meters above sea level. While the contour of the land to the north, east and southeast is decreasing.

2.1.1.3. GEOLOGY

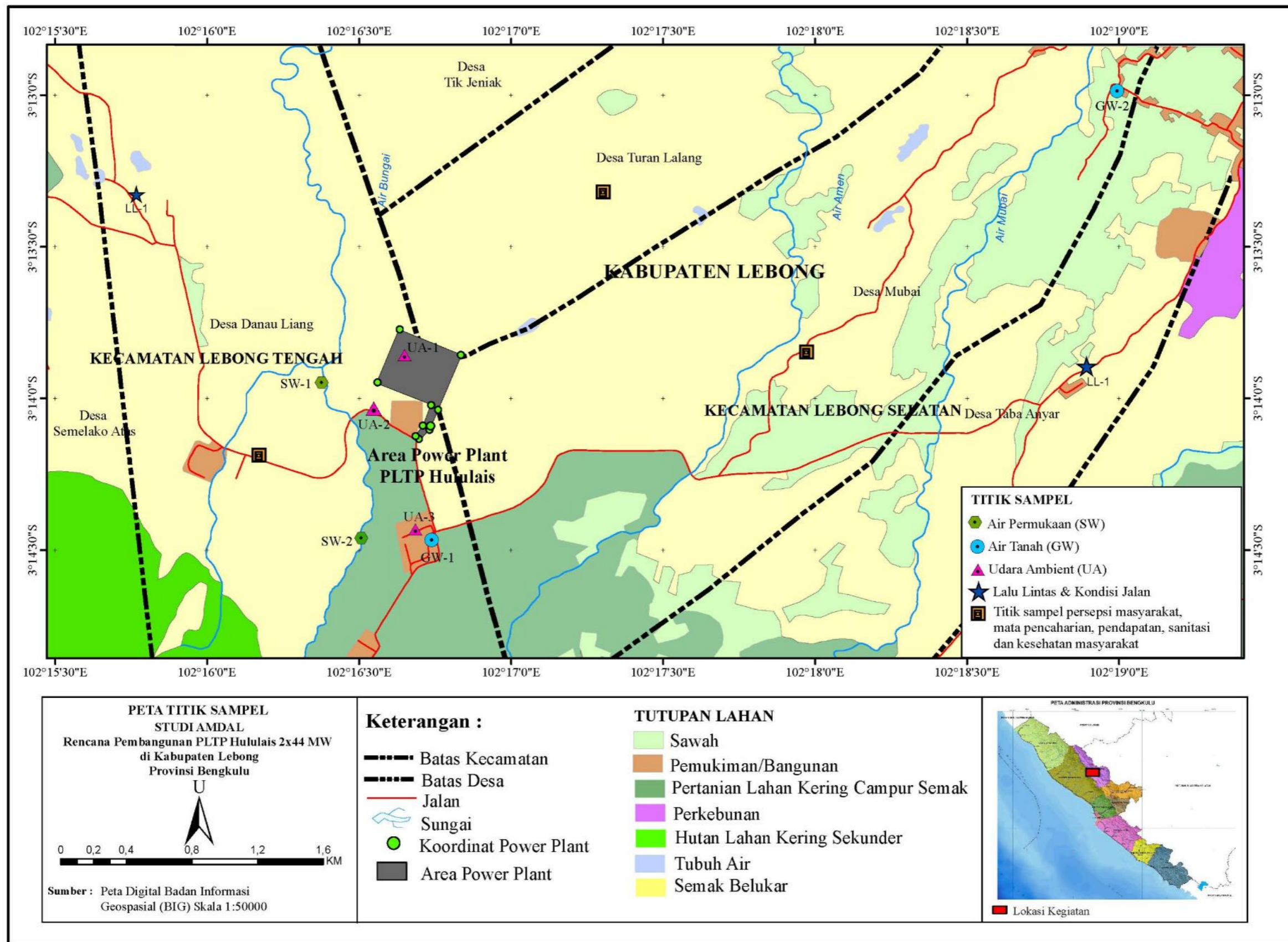
The location of the Hululais geothermal prospect is in the Bukit Barisan mountains. The stratigraphy of the Hululais geothermal location is Tertiary - Quarternary volcanic rock (basalt, andesite, dacite and pyroclastics).



Picture 2-13 Topography Map



Picture 2-14 Geological Map



Picture 2-15 Location Map of Environmental Quality Sample Points

2.1.1.4. AIR QUALITY

The primary data from air quality laboratory analysis at 3 points meets the quality standards as stated in the table below. The map of the air quality measurement points location are listed in the picture below.

Table 2-5 Environmental Baseline of Air Quality

No.	Parameter	Unit	Quality standards	Location		
				Site Location S: 03° 13' 51,6"; E: 102° 16' 47,2"	Access Road S: 03° 14' 02,4"; E: 102° 16' 33,6"	Settlement S: 03° 12' 44,1"; E: 102° 18' 53,2"
1	Temperature	°c	-	32,6	31,7	30,0
2	Humidity	%	-	59,2	61,8	62,8
3	Wind velocity	m/s	-	1,0- 3,0	0,0 - 1,5	0,1 - 0,2
4	Wind direction	-	-	West	South	South
5	Pressure	mmHg	-	764	763	762,7
6	SO ₂	µg/Nm ³	900	<33	<33	<33
7	O ₃	µg/Nm ³	235	66	53	49
8	NO ₂	µg/Nm ³	400	<17	<17	<17
9	TSP	µg/Nm ³	230	18	16	24
10	Pb	µg/Nm ³	2	<0,01	<0,01	<0,01
11	CO	µg/Nm ³	30.000	<114	<114	<114
12	HC	µg/Nm ³	160	<1,6	<1,6	<1,6

Source: March 2018 Primary Data.

2.1.1.5. NOISE

The primary data from the noise measurements result at 3 points are listed below. The noise on the project plan site, and on the access road meets the standard noise level. Whereas in settlements exceed the standard noise level

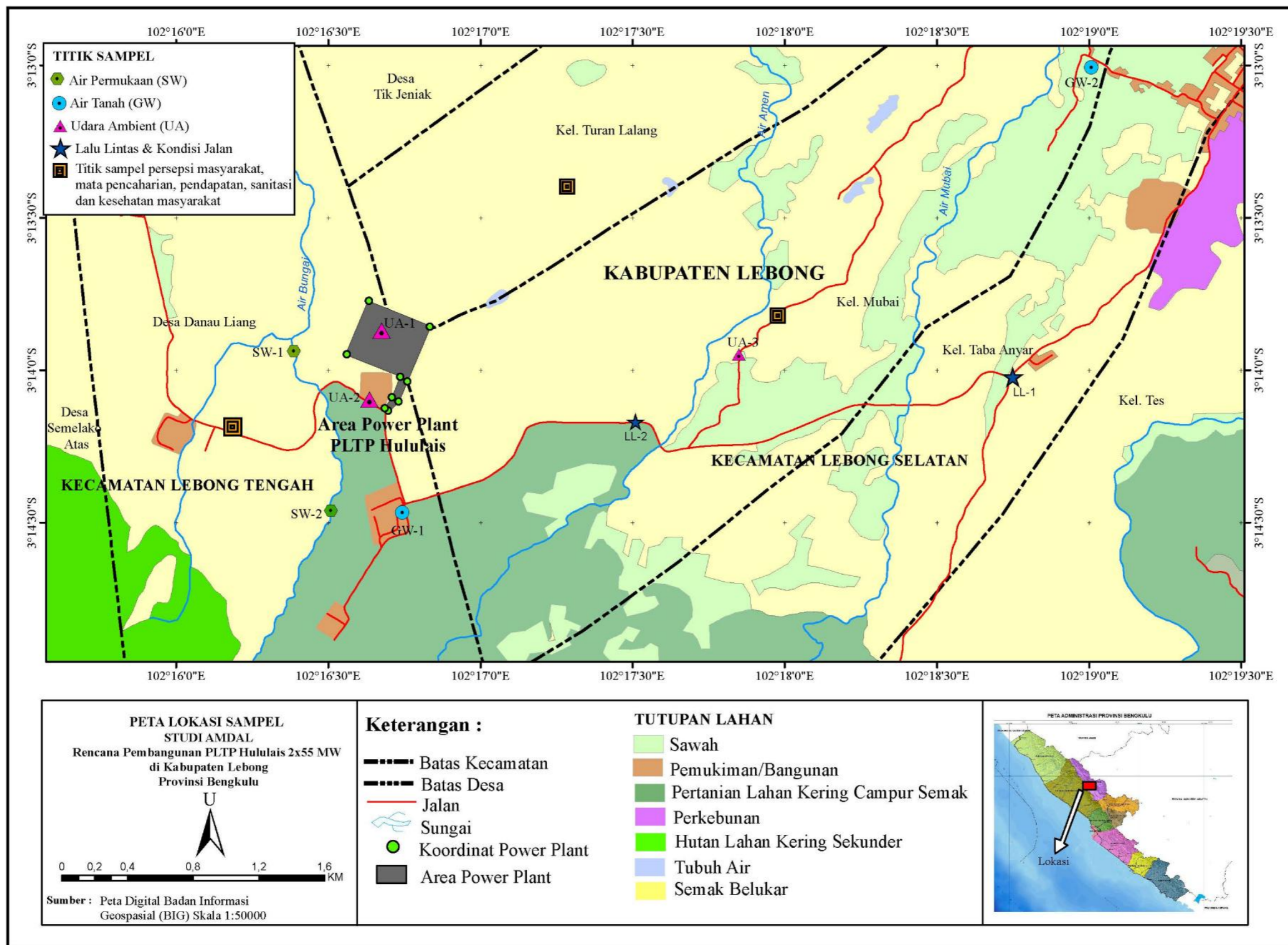
Table 2-6 Environmental Baseline of Noise Level

No.	Parameter	Unit	Quality standards	Location		
				Site Location S: 03° 13' 51,6"; E: 102° 16' 47,2"	Access Road S: 03° 14' 02,4"; E: 102° 16' 33,6"	Settlement S: 03° 12' 44,1"; E: 102° 18' 53,2"
1	Noise	dB(A)	-	62	59	70

Source: March 2018 Primary Data.

2.1.1.6. SURFACE WATER QUALITY

Primary data from laboratory analysis of river water quality are listed in the table below. Some parameters of river water quality do not meet quality standards, namely Copper, Zinc. The map of the location of the water quality sampling point is listed in the picture below.



Picture 2-16 Sample Point Map

Table 2-7 Environmental Baseline of Surface Water Quality in Air Kotok River

No.	Parameter	Unit	Quality standards	Upstream Air Kotok River S: 03° 14' 09,3"; E: 102° 16' 30,4"	Downstream Air Kotok River S: 03° 10' 52,7"; E: 102° 16' 00,8"
	Physics				
1	Temperature	°C	±3	26,7	25,6
2	Dissolved Solids (TDS)	mg/L	1.000	926	920
3	Suspended Solids (TSS)	mg/L	400	145	180
	Chemistry				
4	pH (Insitu)	-	6-9	2,76	2,92
5	Dissolved oxygen (DO)	mg/L	3	6,6	7,3
6	Fluoride (F)	mg/L	1,5	0,4	0,2
7	Fenol	mg/L	0,001	<0,001	<0,001
8	Total phosphate (PO ₄)	mg/L	1	<0,03	<0,03
9	Chlorine is free (Cl ₂)	mg/L	-	<0,01	<0,01
10	Oil & Fat	mg/L	1	<0,2	<0,2
11	Nitrate (NO ₃ -N)	mg/L	20	<0,1	0,2
12	Nitrite (NO ₂ -N)	mg/L	0,06	<0,002	<0,002
13	Sulfide (H ₂ S)	mg/L	0,002	<0,002	<0,002
14	Cyanide (CN)	mg/L	0,02	<0,005	<0,005
15	Detergent (MBAS)	mg/L	0,2	<0,01	<0,01
16	BOD ₅	mg/L	6	5	5
17	COD	mg/L	50	14	17
18	Chromium Hexavalent	mg/L	0,05	<0,010	<0,010
19	Mercury	mg/L	0,002	<0,00005	<0,00005
21	Boron	mg/L	1	0,0985	0,305
22	Cobalt	mg/L	0,2	0,0450	0,0226
23	Copper	mg/L	0,02	0,0234	0,0121
24	Zinc	mg/L	0,05	0,248	0,120
25	Arsenic	mg/L	1	0,0020	<0,0010
26	Selenium	mg/L	0,05	<0,0050	<0,0050
27	Cadmium	mg/L	0,01	<0,0010	<0,0010
28	Lead	mg/L	0,03	<0,0050	<0,0050
	Microbiology				
29	Fecal Coliform	mg/L	2.000	<1,8	<1,8
30	Total Coliform	mg/L	10.000	<1,8	<1,8

Source: March 2018 Primary Data.

2.1.1.7. CLEAN WATER QUALITY

The primary data from laboratory analysis of clean water quality are listed in the table below. Some parameters of clean water quality do not meet the quality standards, such as pH. The location of the water quality sampling point is listed in the picture above.

Table 2-8 Environmental Baseline of Clean Water

No.	Parameter	Unit	Baku Mutu	GW-1 S: 03° 12' 30,3"; E: 102° 15' 17,8"	GW-2 S: 03° 12' 42,2"; E: 102° 18' 52,9"
	Physics				
1	Turbidity	NTU	25	1	<1
2	Color	Pt-co	50	<1	<1
3	Dissolved Solids (TDS)	mg/L	1.000	56	65
4	Temperature	°C	±3	26,4	25,6
5	Taste	mg/L	Tasteless	Tasteless	Tasteless
6	Odor	mg/L	Odorless	Odorless	Odorless
	Chemistry				
7	pH (Insitu)	-	6,5 - 8,5	5,38	6,82
8	Fluoride (F)	mg/L	1,5	<0,01	<0,01
9	Total CaCO ₃ hardness	mg/L	500	37	47
10	Nitrate (NO ₃ -N)	mg/L	10	1	0,4
11	Nitrite (NO ₂ -N)	mg/L	1	<0,002	<0,002
12	Cyanide (CN)	mg/L	0,1	<0,005	<0,005
13	Surfactan Anion (MBAS)	mg/L	0,05	<0,01	<0,01
14	Sulphate (SO ₄)	mg/L	400	15	36
15	Permanganate Value (KMnO ₄)	mg/L	10	0,9	1
16	Chromium Hexavalent	mg/L	0,05	<0,010	<0,010
17	Mercury	mg/L	0,001	<0,00005	<0,00005
18	Manganese	mg/L	0,5	0,102	0,0311
19	Iron	mg/L	1	0,511	0,0245
21	Zinc	mg/L	15	0,0201	0,0060
22	Arsenic	mg/L	0,05	<0,0010	<0,0010
23	Selenium	mg/L	0,01	<0,0050	<0,0050
24	Cadmium	mg/L	0,005	<0,0010	<0,0010
25	Lead	mg/L	0,05	<0,0050	<0,0050
	Microbiology				
26	Total Coliform	mg/L	50	<1,8	<1,8

Source: March 2018 Primary Data.

2.1.1.8. EROSION

Soil erosion is calculated using the USLE (Universal Soil Loss Equation) method developed by WischMAYer and Smith (1978) in Arsyad, (2000) with the following equation:

$$A = R \times K \times LS \times C \times P$$

Where :

- A = Maximum soil erosion rate (ton / ha / year)
- R = Rain erosivity factor = $0,41 \times H^{1,09} = 2643$.
- H = Average annual rainfall (mm / year)

- K = The soil erodibility factor = value that indicates the ease of erosion of the soil = 0,2:
- LS = Factor index of length and slope = 2,9
- C = Crop management factor index = 0.2 (medium density garden)
- P = Index of soil conservation techniques = 0,5
- A = Maximum soil erosion rate = 154 tons / ha / year including moderate erosion rate classification.

Large erosion classifications are presented in the table below.

Table 2-9 Classification of Erosion Levels

No	Large Classification of Erosion	Erosion rate (tons / ha / year)
1	Very light (VL)	<15
2	Light (L)	15 to <60
3	Medium (M)	60 to <180
4	Heavy (H)	180 to <480
5	Very Heavy (VH)	480

2.1.2. BIOLOGICAL COMPONENTS

2.1.2.1. AQUATIC BIOTA

Diversity index at the upstream point of Sungai Kotok River is 2,301. According to Lee et. al. (1978) if waters have a diversity index value of more than 2, it can be interpreted that the body of water is not polluted (natural).

Table 2-10 Initial Condition of Aquatic Biota

No.	Parameter	Upstream Air Kotok River S: 03° 14' 09,3"; E: 102° 16' 30,4"
I	Phytoplankton	
A	Cyanophyceae	
1	<i>Oscillatoria</i> sp	60
B	Chlorophyceae	
2	<i>Scenedesmus</i> sp	75
C	Bacillariophyceae	
3	<i>Cymbella</i> sp	30
4	<i>Fragilaria</i> sp	45
5	<i>Coscinodiscus</i> sp	45
6	<i>Navicula</i> sp	75
7	<i>Nitzchia</i> sp	30
II	Zooplankton	
D	Monogononta	
8	<i>Lepadella</i> sp	20
9	<i>Monostyla</i> sp	20
10	<i>Notholca</i> sp	30

No.	Parameter	Upstream Air Kotok River S: 03° 14' 09,3"; E: 102° 16' 30,4"
E	Crustaceae	
11	<i>Nauplius</i> sp	30
F	Rotatoria	
12	<i>Philodina</i> sp	45
	Plankter abundance / liter	445
	Taksa Amount	12
	Diversity Index	2,301
	H' Maksimum	2,485
	Equitability Index	0,926

Sumber: Data Primer Maret 2018.

2.1.3. SOCIO-ECONOMIC AND CULTURAL COMPONENTS

The 2 X 55 MW Hululais Geothermal Power Plant Development Project location is administratively located in Mubai Village, Lebong Selatan Subdistrict, Lebong District. However, the location of the activity is also close to the surrounding villages, including other districts such as the area passed by the transportation route (Mobilization-Demobilization), so that the socio-economic cultural study area consists of 4 (four) urban villages, 2 (two) villages in 2 (two) sub-districts, namely Mubai Village, Taba Anyar Village, Tes Village, Turam Lalang Village and Manai Blau Village of Lebong Selatan Sub-district, and Danau LiangVillage of Lebong Tengah District.

In general, the natural conditions of the villages around the location of the activity (including Mubai Village, Taba Anyar Village, Turan Lalang Village, Tes Village, Manai Blau Village in Lebong Selatan Sub-district and Danau LiangVillage in Lebong Tengah Sub-district, Lebong District, Bengkulu Province is on average at an altitude of ± 500-600 m above sea level. Most of the topography of the location is on a stretch of hills, rice fields, plantations and housing with the flow of the Mubai River and the Ketahun River. In general, the villages around the activities locations are settlements on the edge of the forest area. The average daily temperature ranges from 20^o-35^o C.

The data sources in this paper come from secondary data in the form of statistical data from Lebong District in Figures 2017, Lebong Selatan Subdistrict in Figures 2017, Lebong Tengah Subdistrict in Figures 2017, Villages' Monographs of 2017 and other books and literature. In addition, also conducted structured interviews with questionnaires on 100 respondents in the study area with the Head of Family (KK) as analysis unit. The sampling is using Cluster Random Sampling method with administrative area, which are village and hamlet / village / block.

2.1.3.1. DEMOGRAPHY

2.1.3.1.1. Population Structure

2.1.3.1.1.1. Population by Age Group

In general, the population in villages in the study area is based on uneven administrative areas, although the four village in Lebong Selatan Sub-district are close together but the population is significantly different. Based on data from Village Monographs, it shows that in Mubai Village the population is 1,447 people, Taba Anyar Village 2,775 people, Tes Village 3,293 people, Turam Lalang Village 1,403 people, Manai Blau Village 983 people and Danau Liang Village 550 people. Based on Table 2 11, it shows that the tendency of the age interval is to be higher (old) and the number of numbers of the population is getting smaller. Most of the population in the study area are in productive age or working age (15 years - 64 years). The number of working-age population in Mubai Village is 822 people (56.81%), Taba Anyar Village 1,589 people (57.68%), Tes Village is 1,991 people (60.46%), Turam Lalang Village is 926 people (66.00%), Manai Blau Village is 623 people (63.38%) and Danau Liang Village 378 people (68.73%).

From the population data according to age groups, we can calculate the ratio of dependents in each village, which is the number of non-productive age (0-14 years and above) divided by the productive age (15 - 64 years) multiply by 100%. In Mubai Village, the ratio of dependents is 76.03%, meaning that every 100 people of the productive age population bear around 76 non-productive age people; Taba Anyar village, the ratio of dependents is 73.38%, meaning that every 100 people of the productive age population bear around 73 non-productive ages; Tes Village, the dependency ratio is 65.39%, meaning that every 100 people of the productive age population bear around 65 non-productive people; Turan Lalang Village, the dependency ratio is 51.51%, meaning that every 100 people of the productive age population carry around 52 non-productive age people; Manai Blau Village, the dependency ratio is 57.78%, meaning that every 100 people of the productive age population cover around 58 people of non-productive age; and Danau Liang Village the dependency ratio is 45.50%, meaning that every 100 people of the productive age population bear around 46 non-productive age people. Data on the number and percentage of residents in the study area by age group are presented in the table below.

Table 2-11 Number and Percentage of Population in Study Area by Age

No.	Age	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Live	%	Live	%	Live	%	Live	%	Live	%	Live	%
1	0 - 4	152	10,50	192	6,97	330	10,02	201	14,33	45	4,58	40	7,27
2	5 - 9	176	12,16	215	7,80	435	13,21	114	8,13	38	3,87	52	9,45

No.	Age	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Live	%	Live	%	Live	%	Live	%	Live	%	Live	%
3	10 - 14	252	17,42	187	6,79	305	9,26	129	9,19	47	4,78	51	9,27
4	15 - 19	109	7,53	140	5,08	252	7,65	149	10,62	34	3,46	49	8,91
5	20 - 24	140	9,68	201	7,30	282	8,56	98	6,99	27	2,75	46	8,36
6	25 - 29	97	6,70	184	6,68	249	7,56	116	8,27	17	1,73	48	8,73
7	30 - 34	83	5,74	184	6,68	212	6,44	118	8,41	25	2,54	47	8,55
8	35 - 39	98	6,77	105	3,81	239	7,26	105	7,48	40	4,07	45	8,18
9	40 - 44	94	6,50	195	7,08	224	6,80	90	6,41	150	15,26	36	6,55
10	45 - 49	68	4,70	189	6,86	243	7,38	78	5,56	165	16,79	34	6,18
11	50 - 59	98	6,77	199	7,22	201	6,10	103	7,34	75	7,63	59	10,73
12	60 - 64	35	2,42	192	6,97	89	2,70	69	4,92	90	9,16	14	2,55
13	65 - 69	13	0,90	192	6,97	89	2,70	25	1,78	115	11,70	13	2,36
14	70 - 74	14	0,97	196	7,11	84	2,55	7	0,50	95	9,66	10	1,82
15	75 +	18	1,24	184	6,68	59	1,79	1	0,07	20	2,03	6	1,09
	Total	1.447	100,00	2.755	100	3.293	100	1.403	100	983	100	550	100

Source: Monograph of Mubai Village, Taba Anyar, Tes, Turan Lalang, Manai Blau Village, Lebong Selatan Sub-district, 2017 and Monograph of Danau Liang Village in Lebong Tengah District in 2017.

2.1.3.1.2. Population According to Gender

The population of villages and villages in the study area is mostly more male population than female population, only in Mubai Village, where there are more women than men. The sex ratios in villages and villages which are the study areas are as follows: the sex ratio in the Mubai Village is 99, meaning that every 100 inhabitants of the female population are 99 male inhabitants; there is 101 sex ratio in Village Taba Anyar, meaning that every 100 inhabitants of a female population are 101 male inhabitants; the sex ratio in the Test Village was 106, meaning that every 100 inhabitants of the female population contained 106 male residents; the sex ratio in Turan Lalang Village is 119, meaning that every 100 inhabitants of the female population are 119 male inhabitants; the sex ratio in Manai Blau Village is 107, meaning that every 100 inhabitants of the female population are 107 male inhabitants; and the sex ratio in Danau Liang Village is 116, meaning that every 100 inhabitants of the female population have 116 male inhabitants. Data on the number and percentage of population in the study area for sexes as presented in the table below.

Table 2-12 Amount and Percentage of Population in Study Area by Gender

No.	Gender	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Live	%	Live	%	Live	%	Live	%	Live	%	Live	%
1	Male	719	49,69	1.385	50,27	1.691	51,35	763	54,38	487	51,64	295	53,64
2	Female	728	50,31	1.370	49,73	1.602	48,65	640	45,62	456	48,36	255	46,36
3	Total	1.447	100	2.755	100	3.293	100	1403	100	943	100	550	100
4	Sex Ratio	99		101		106		119		107		116	

Sources: Monography of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village, Lebong Tengah District, 2017.

2.1.3.1.3. Population According to Types of Livelihoods

The livelihoods of the population in the study area can be seen from the types of work carried out daily to fulfill their economic needs. Based on monographic data, it shows that the majority of the population in the study area work in the agricultural sector both as farmers (owners or cultivators) and farm laborers, which is more than 80% of the total population in villages in the study area. The population working in the agricultural sector in Mubai Urban Village is 93.66%; in Taba Anyar Village, 85.62%; in Tes Village, 87.90%; in Turan Lalang Village, 84.94%; in Manai Blau Village 79.82% and 85.71% in Danau Liang Village. Another sector that is in great demand by the population as a livelihood is traders, this is related to the fact that there are markets in the study area.

For some people who do not have agricultural land they become farmers working on a system of profit sharing or wages, or rent per planting period. In the Tes Village there are also those who work as fishermen, but they do not fish in the sea but in the Tes Lake or Hydroelectric Dam which water is used for hydroelectric power and irrigation. The number and percentage of residents in the Study area according to the type of work as presented in the table below.

Table 2-13 Number and Percentage of Population in Study Areas by Type of Occupation

No.	Type of work	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Live	%	Live	%	Live	%	Live	%	Live	%	Live	%
1	Farmers	382	56,34	1.136	55,74	1693	87,90	458	56,54	315	69,84	321	81,89
2	Farm workers	253	37,32	609	29,88	-	-	230	28,40	45	9,98	15	3,83
3	Traders	22	3,24	126	6,18	201	10,44	46	5,68	28	6,21	18	4,59
4	Workshop	3	0,44	21	1,03	-	-	15	1,85	25	5,54	-	-
5	Civil Service/ Police Force / Military Service	18	2,65	63	3,09	-	-	33	4,07	30	6,65	5	1,28
6	Transportation	-	-	7	0,34	-	-	6	0,74	8	1,77	2	0,51
7	Carpentry	-	-	16	0,79	-	-	10	1,23	-	-	5	1,28

No.	Type of work	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Live	%	Live	%	Live	%	Live	%	Live	%	Live	%
8	Private company's employee	-	-	23	1,13	17	0,88	12	1,48	-	-	25	6,38
9	Fisherman	-	-	-	-	15	0,78	-	-	-	-	-	-
10	Others	-	-	37	1,82	-	-	-	-	-	-	1	0,26
	total	678	100,00	2.038	100,00	1926	100,00	810	100,00	451	100,00	392	100,00

Sources: Monograph of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village, Lebong Tengah District, 2017.

2.1.3.1.4. Population by Education Level

Based on monograph data from villages in the study areas, it is shown that the education level of the population is predominantly high school graduates, and there are even a number of villages where many have graduated from undergraduate programs such as Tes, Taba Anyar and Turan Lalang Villages. However, there are still some residents who are not in school or do not complete elementary school, namely in the Taba Anyar Village, Tes Village and Danau Liang Village.

From the statistical data, it shows that the level of education of the population in the study area can be said to be quite good.

The level of education participation calculated based on the population who graduated from elementary school and above of the total population in villages in the study area showed a quite high number, except in the villages of Danau Liang and Manai Blau. In Mubai Village, the level of education participation was 78.92%, in Taba Anyar Village, the level of education participation was 84.17%, in Tes Village the level of education participation was 66.99%, in Turan Lalang Village level of education participation was 82.39%, in Manai Blau Village the level of education participation was 35.63% and in Danau Liang Village, the education participation rate was 18.55%. Data on the number and percentage of population based on the level of education in the study area as presented in the table below.

Table 2-14 Numbers and Percentage of Population in Study Area by Level of Education

No.	Education	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Live	%	Live	%	Live	%	Live	%	Live	%	Live	%
1	Not in school	108	7,46	192	6,97	756	22,96	190	13,54	35	3,71	50	9,09
2	Kindergarten	84	5,81	23	0,83	-	-	57	4,06	34	3,61	40	7,27

No.	Education	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Live	%	Live	%	Live	%	Live	%	Live	%	Live	%
3	No School / Not Graduated from Elementary School	-	-	221	8,02	331	10,05	-	-	70	7,42	120	21,82
4	Graduated from elementary / equivalent	324	22,39	680	24,68	967	29,37	695	49,54	115	12,20	30	5,45
5	Graduated from Junior high / equivalent	439	30,34	906	32,89	455	13,82	209	14,90	75	7,95	50	9,09
6	Graduated from high school / equivalent	355	24,53	508	18,44	593	18,01	193	13,76	126	13,36	20	3,64
7	Graduated from the Academy / equivalent	7	0,48	182	6,61	113	3,43	37	2,64	5	0,53	-	-
8	Graduated from Undergraduate level / equivalent	17	1,17	34	1,23	58	1,76	17	1,21	15	1,59	2	0,36
9	Graduated from Graduate level / equivalent	-	-	9	0,33	20	0,61	5	0,36	-	-	-	-
10	Others (not recorded)	113	7,81	-	-	-	-	-	-	468	49,63	238	43,27
	total	1.447	100	2.755	100	3293	100	1403	100	943	100	550	100

Sources: Monography of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monograph of Danau Liang Village, Lebong Tengah District, 2017.

2.1.3.1.5. Population According to Religion

Before the inclusion of Islam in Bengkulu, the Rejang tribe still held animistic and dynamism beliefs that believed in objects believed to have mystical powers and spirits of ancestral spirits. In his book, Antonie Cabaton (2015) mentions that the Rejang people in a certain period give offerings in the form of rice and fruit on Mount Kaba which is honored by the Rejang tribe. Entering the 16th century Islam began to enter Bengkulu from Banten, especially from the South, it was thought that Islam also entered from Aceh and Minangkabau (West Sumatra). As for the Rejang area, Islam is likely to enter from Palembang. In this area Islam is the biggest religion followed, which is more than 99%. Apart from the Islam, Christianity and Catholicism came in Bengkulu deliberately spread by Catholic Zending. Until the middle of the nineteenth century there were still remnants of old beliefs in the interior, but by the end of the 19th century there were no perfect adherents. The Rejang people have embraced either Islam or Christianity, even though the old method is still carried away too.

Based on monographic data in the study area, the majority of the population in the study area embraced Islam, which is more than 99% of the population of the villages in the area of study, even in the Mubai Village, Turan Lalang Village, Manai Blau Village and in the Danau Liang Village, 100% of the population are Moslems. This data shows that at this time in the study area it can be said that the homogeneity of religious believers is quite high, namely Islam.

Table 2-15 Number and Percentage of Population in Study Areas by Type of Religion

No.	Types of Religion	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Live	%	Live	%	Live	%	Live	%	Live	%	Live	%
1	Islam	1.447	100,00	2.748	99,75	3272	99,36	1.403	100,00	943	100,00	550	100,00
2	Christian	-	-	-	-	-	-	-	-	-	-	-	-
3	Catholic	-	-	7	0,25	21	0,64	-	-	-	-	-	-
	total	1.447	100,00	2.755	100,00	3293	100,00	1.403	100,00	943	100,00	550	100,00

Sources: Monography of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village, Lebong Tengah District, 2017.

2.1.3.1.6. Population According to Density Level

Population distribution in the study area can be said to be uneven, but in general it can be said that the density level is still low, except in Taba Anyar which reaches around 1,531 inhabitants per km² and Manai Blau Village which reaches 5,239 inhabitants per km², while in other study areas the level the density is still low as in the Mubai Village around 168 inhabitants per km²; in Tes village there are only about 66 inhabitants per km² and in Danau Liang Village only about 69 inhabitants per km², while in Turan Lalang Village there is no area data.

Table 2-16 Number and Percentage of Population in the Study Area According to the Density Level

No.	Population, Area & Density	Lebong Selatan Sub-district					Lebong Tengah Sub-district
		Mubai Vil.	Taba Anyar Vil.	Tes Vil.	Turan Lalang Vil.	Desa Manai Blau	Danau Liang Vil.
1	Total Population (Live)	1.447	2.755	2.393	1.403	943	550
2	Area Size (km ²)	8,60	1,80	36,22		0,18	7,95
3	Density (Live / Km²)	168	1.531	66	-	5.239	69

Source: Processed from Monographic Data of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village, Lebong Tengah District, 2017.

2.1.3.1.7. Population growth

Based on the projected population over the past 6 years, it shows that the average population growth in Lebong District is around 1.7% per year. According to data from Lebong District in Figures 2010, the population is 99,599 and in 2016 there were 111,063 people. From this average population growth, in the next 10 years (in 2026), the population of Lebong District is around 129,488 people. If the population growth rate is to be calculate, the projected population growth in the study area then it shows that in the next 10 years or 2025, the population of Mubai Village will be as many as 1,687 people, Taba Anyar Village will be 2,846 people, the Tes Village will be 3,348, Turan Lalang became as many as 1,636 people, Manai Blau Village became as many as 1,431 people and in Danau Liang Village became as many as 641 people. Projected population development data as presented in the table below.

Table 2-17 Population Development in Study Areas According to Growth Projections

No	Villages	Growth Projection / Tahum (Live)									
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Mubai Vil.	1447	1.472	1.497	1.523	1.549	1.576	1.603	1.630	1.659	1.687
2	Taba Anyar Vil.	2755	2.764	2.774	2.784	2.794	2.804	2.814	2.825	2.835	2.846
3	Tes Vil.	3293	3.302	3.312	3.322	3.332	3.342	3.352	3.363	3.373	3.384
4	Turan Lalang Vil.	1403	1.427	1.452	1.477	1.502	1.528	1.554	1.581	1.608	1.636
5	Manai Blau Vil.	943	968	994	1.020	1.047	1.074	1.101	1.129	1.158	1.431
6	Danau Liang Vil.	550	559	569	579	589	599	609	620	630	641

Source: Processed from Monographic Data of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village in Lebong Tengah District 2017 and Lebong District in Figures 2017.

2.1.3.1.8. Labor

2.1.3.1.8.1. Job seekers

Based on data from Lebong District in Figures 2017 the number of job seekers in this district is 786 people or about 1% of the population aged 15 years and over (79,601 people). Job seekers in this district are dominated by ages 20-29 who reach almost 60%. This data is only registered job seekers data while the unregistered could be more or because this area is include in agriculture with employment as farmers are wide open (because some people own their own land) so they generally seek work only to increase or change the status to not a farmer.

Table 2-18 Number and Percentage of Job Seekers in Study Areas by Age Group

No	Age	NUMBER OF REGISTERED JOB SEEKERS	
		LIVE	%
1	15 - 19	112	14,25
2	20 - 29	468	59,54

No	Age	NUMBER OF REGISTERED JOB SEEKERS	
		LIVE	%
3	30 - 44	153	19,47
4	45 - 54	40	5,09
5	55 +	13	1,65
	total	786	100,00

Source: Lebong District in 2017 Figures.

There is no data on job seekers recorded at the village level, but it is certain that there are actually many job seekers in the villages in the study area, this is related to the working age population in the range of above 50% of the total population in villages in the study area.

2.1.3.1.8.2. Labor Force Participation Rate

The labor force participation rate is calculated based on the population of the productive age (15 - 64 years) divided by the total population multiplied by 100%. From the population data based on age, there are 56.81% in Mubai Village, 57.68% in Taba Anyar Village, 60.46% in the Tes Village, 66.00% in Turan Lalang Village, 66.07% in Manai Blau Village, and in Danau Liang Village there are 68.73%. This data shows that the labor force in the study area is quite large, ranging from 56% - 66%. The number and percentage of labor force participation in the study area as presented in the table below.

Table 2-19 Amount and Percentage of Work Force Participation in the Study Area

No	Labor Force Participation Rate	Lebong Selatan Sub-district					Lebong Tengah Sub-district
		Mubai Vil.	Taba Anyar Vil.	Tes Vil.	Turan Lalang Vil.	Desa Manai Blau	Danau Liang Vil.
		total	total	total	total	total	total
1	Population aged 15 - 64 Year (live)	822	1.589	1.991	926	623	378
2	Total Population (Live)	1.447	2.755	3.293	1.403	943	550
	Work Force Participation (%)	56,81	57,68	60,46	66,00	66,07	68,73

Source: Processed from Monographic Data of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village, Lebong Tengah District, 2017.

2.1.3.1.8.3. Unemployment Rate

In general, the unemployment rate in the study area varied, namely in the range of 3.69% to 47.13%. The unemployment rate is calculated based on the number of people aged 15 years and over who have worked minus the total population at the same age. The calculation shows that the highest unemployment rate is in Manai Blau Village which is

47.13% and Mubai Village is 21.80%, while the lowest unemployment rate is in Danau Liang Village which is 3.69%, and in Taba Anyar Urban Village the open unemployment rate is 5, 69%, in the Tes Village 13.36%, Turan Lalang Village 15.54% and 18.24% in Manai Blau Village. Unemployment rates in Mubai, Tes and Turan Lalang Villages are higher than the average unemployment rate in Lebong District, based on data from Lebong District in 2017 the number of open unemployment in the District is around 6.81%. There are still many open unemployment in the study area, especially in Mubai Village, Tes Village, Manai Blau Village and Danau Liang Village. It can be seen from the results of interviews with the community that most are expecting the GPP activities to absorb labor from the local area especially in the study area. Number and Percentage of Open Unemployment in the Study Area as presented in the table below.

Table 2-20 Amount and Percentage of Open Unemployment in the Study Area

No.	Description	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Live	%	Live	%	Live	%	Live	%	Live	%	Live	%
1	Population aged 15 years and above	867	100	2.161	100	2.223	100	959	100	853	100	407	100
2	Ages 15 and above Who Work	678	78,20	2.038	94,31	1.926	86,64	810	84,46	451	52,87	392	96,31
3	Age of 15 years does not work	189	21,80	123	5,69	297	13,36	149	15,54	402	47,13	15	3,69

Source: Processed from Monographic Data of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and as well as Monographs of Danau Liang Village, Lebong Tengah District, 2017.

2.1.3.2. ECONOMY SOCIAL

2.1.3.2.1. Community Income Level

Most of the people in the study area are working in the agricultural sector both wetland agriculture such as planting rice and dry land such as coffee and cocoa farming and utilizing forest products such as wood. As an illustration of the community income in the study area for farm laborers who work for an average of 20 days a month with a daily wage of Rp. 50,000, - it will get a monthly wage of Rp. 1,000,000; for the average income of rice farmers producing 6 tons per hectare per harvest period with 2 planting periods per year, a rice farmer who has an area of 1 ha will produce an average of around Rp.5,500,000 per month assuming the price of rice per quintal Rp. 550,000, -; while coffee and cocoa farmers yield per hectare can reach Rp. 20 million per year, so that an average of about Rp. 1.7 million per month.

From the results of the questionnaire data tabulation, it shows that most respondents answered the average income per month with a range of less than Rp. 1000,000 to more than 5 million as Table 2-20. From the table, it can be seen that most of the respondents answered monthly income between Rp. 1,500,001, - - Rp.2,000,000, - while those who answered earn less than Rp. 1,000,000, - per month are only about 8 respondents.

From this data, it is illustrated that most of the population in the study area ranges from Rp. 1000,000, - up to Rp. 3,000,000. In general, when interviews were conducted, they did not want to mention monthly income because most farmers and farm workers felt they had never calculated the results and only mentioned enough or could meet their daily needs.

Table 2-21 Amount and Percentage of Average Monthly Income of Respondents in the Study Area

No	Income Level / Month	Total	
		Respondents	%
1	Less than Rp. 1,000,000	8	8
2	Rp. 1.000.001 - 1.500.000	19	19
3	Rp. 1.500.001 - 2.000.000	27	27
4	Rp. 2.000.001 - 2.500.000	17	17
5	Rp. 2.500.001 - 3.000.000	12	12
6	Rp. 3.000.001 - 3.500.000	7	7
7	Rp. 3.500.001 - 4.000.000	6	6
8	Rp. 4.000.001 - 4.500.000	2	2
9	Rp. 4.500.001 - 5.500.000	1	1
10	More than Rp. 5,000,000	1	1
	total	100	100

Source: Primary Data Tabulation.

2.1.3.2.2. Community Expenditure Level

The level of public expenditure on the majority of respondents can be used to estimate the income of the population in the study area which is more real when guided to calculate their daily expenses such as to buy rice, side dishes, school fee and snacks for children, social needs, electricity payment etc. . From the tabulation results show that most of them claimed that the average monthly expenditure ranged from Rp. 1,500,001 - 2,000,000, - generally these respondents have agricultural land 0.3 ha - 3 ha. While respondents from farm laborers and cultivators answered that the average monthly expenditure ranged between Rp. 1,000,000, - up to Rp. 1,500,000. Data on the number of respondents based on monthly average expenditure as presented in the table below.

Table2-22 Amount and Percentage of Monthly Average Expenditures of Respondents in the Study Area

No	Expenditure Level / Month	total	
		Respondents	%
1	Less than Rp. 1,000,000	6	6
2	Rp. 1.000.001 – 1.500.000	22	22
3	Rp. 1.500.001 - 2.000.000	36	36
4	Rp. 2.000.001 - 2.500.000	15	15
5	Rp. 2.500.001 - 3.000.000	12	12
6	Rp. 3.000.001 - 3.500.000	5	5
7	Rp. 3.500.001 - 4.000.000	3	3
8	Rp. 4.000.001 - 4.500.000	1	1
9	Rp. 4.500.001 - 5.500.000	0	0
10	More than Rp. 5,000,000	0	0
	Total	100	100

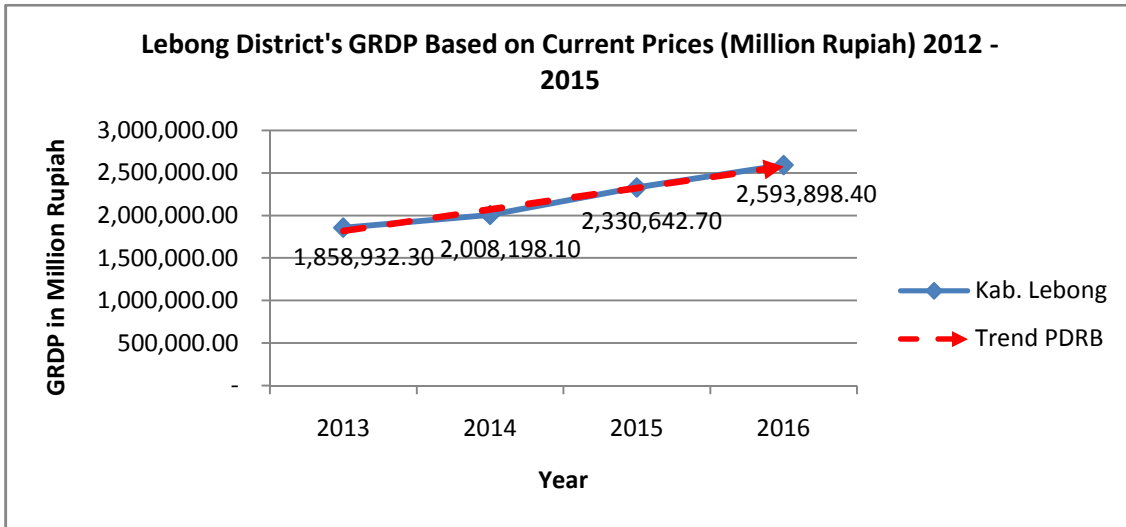
Source: Primary Data Tabulation

2.1.3.2.3. Economic Facilities

Villages in the study area that have traditional markets are Turan Lalang and Taba Anyar villages. This traditional market operates once a week, for Traditional Markets in Turan Lalang operates every Monday, while for Traditional Markets in Taba Anyar operates every Wednesday. In addition to the traditional market, there is also a modern market in the form of Convenient Store, namely in the Tes Village. In addition there are also many shops, kiosks and restaurants or food stalls in Tes, Taba Anyar, Mubai, Turan Lalang, and Manai Blau Village because the four regions are traversed by provincial roads that connect Lebong District with North Bengkulu District. At the location around the study area, precisely in the Tes Village there are Lake or Tes Dam tourism objects which also function as hydropower and irrigation. This condition has long enlivened the study area.

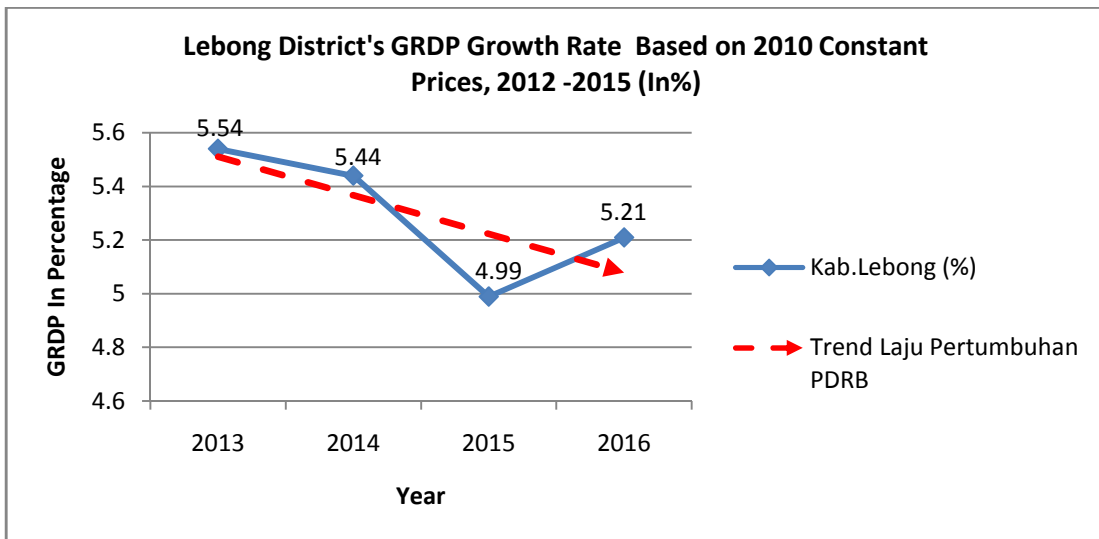
2.1.3.2.4. Gross Regional Domestic Product (GRDP)

Gross Regional Domestic Product (GRDP) is an indicator to measure economic growth in a region. Based on data from Lebong District in Figures 2017, the GRDP of Lebong District in 2016 at current prices reached Rp. 2,593,898,400,000, - while the GRDP based on constant 2010 prices was Rp. 1,836,451,700,000, - and GRDP growth at the 2010 constant price growth rate of 5.2%. During the last 4 years the GRDP growth of Lebong District at current prices has generally increased, meaning that there is always an increase in each year but fluctuating with an increasing tendency as presented in the figure below.



Picture 2-17 Trend of Leborg District GRDP on the basis of current prices in 2012 - 2015

However, Leborg District's GRDP growth rate on the basis of the constant price of 2010 in the last 4 years is fluctuating every year, although it still grows but tends to decline as the graph in the picture below.



Picture 2-18 Leborg District GRDP Growth Rate Trend at 2010 Constant Prices Based on 2012 – 2015

The biggest contribution of the Leborg District GRDP is from the Agriculture, Forestry and Fisheries sectors. The amount of donations from this sector reached 43% or Rp. 1,119,149,200,000, -.

2.1.3.3. SOCIO-CULTURAL

2.1.3.3.1. Tribe

Judging from the social structure of the community, the majority of the people come from the Rejang Tribe (Orang Rejang), Rejang Language Speaker, and are Muslim. Nevertheless, there were also new comers from migrants and transmigrants from Java. Some migrants came from Padang (Padang people), Palembang and Bengkulu City. In general, there are those who trade and become employees. For transmigrant communities from Java, it is almost certainly not around the location of the activity. They are many in the Topos Village area, Central Lebong District. In general, people make a living as field farmers, traders (entrepreneurs) and employees. In the social structure they occupy positions and significant roles in the social process in the area where the activity is located.

The Rejang tribe or the Rejang people who live in the Lebong Selatan sub-district are usually also called as Lebong people. According to some information and respondents interviewed, they prefer to be referred to as descendants of the Rejang Tribe. This tribe is considered a tribe inhabiting the eastern part of Bengkulu Province. This region covers part of the Bukit Barisan mountains and is spread throughout the South Sumatra region. The Rejang tribe occupies various regions in the Bengkulu Province, namely: Lebong District, Rejang Lebong District, Kepahiang District, North Bengkulu District and Bengkulu Tengah District. Many say that the history of the origin of Rejang which really is very unlikely to be narrated correctly based on evidence and facts. This is due to several factors that resulted in the history of the origin of Rejang which was lost "swallowed" in the past. Even so, there is still one legacy that is still inherited in real terms and still exists today. The legacy is the Rejang language and the writing (Ka Ga Nga), a unique language that has not become extinct until now. Although archaeological evidence has not shown Rejang culture, linguistically it can be used as a guide to tracing the history of Rejang (Feri van Delis, 2017).

From monographic data, it shows that the original Rejang tribe is still dominating or homogeneous because in the study area it is generally more than 90%. Other tribes that are quite a lot are from Padang and Java. Padang people generally come to be civil servants or traders, while from Javanese people other than nomads or workers in the Tes Hydroelectric Power Plant also from transmigrants around this area (Tapos Village, Lebong Tengah Sub-district) who move to the study area.

Homogeneity of the Rejang Tribe in the study area can be seen from the number and percentage as in monograph data, in the Mubai Village, Rejang Tribe as much as 90.19%, Taba Anyar Village as much as 93.10%, Tes Village as much as 95.02%, Turan Lalang Village as much as 94.22 % and in the Danau Liang Village as much as 97.82%. Detailed data on the tribes of villages in the region as presented in the table below.

Table 2-23 Number and Percentage of Tribes in the Study Area

No.	Ethnic type	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Live	%	Live	%	Live	%	Live	%	Live	%	Live	%
1	Rejang	1.305	90,19	2.565	93,10	3129	95,02	1.321	94,22	923	97,88	538	97,82
2	Padang	58	4,01	82	2,98	62	1,88	28	2,00	5	0,53	5	0,91
3	Jawa	36	2,49	42	1,52	42	1,28	21	1,50	10	1,06	4	0,73
4	Batak	13	0,90	16	0,58	18	0,55	7	0,50	3	0,32	-	-
5	Palembang	29	2,00	34	1,23	34	1,03	17	1,21	2	0,21	3	0,55
6	Others	6	0,41	16	0,58	8	0,24	8	0,57	-	-	-	-
	total	1.447	100	2.755	100	3293	100	1.402	100	943	100	550	100

Sources: Monographic Data of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village, Lebong Tengah District, 2017

2.1.3.3.2. Customs

Customs or traditions are cultures that are still associated with agriculture and are integrated in the religious life of the community. Although the majority of the population are Moslems, there are still several traditional ceremonies related to thanksgiving and rejecting bad omen, such as Buang Apem and Kedurai. Buang Apem Ceremony is a once a year ceremony which is interpreted as an earth alms ceremony. This ceremony is a form of community gratitude for the produce of the earth. This ceremony has now been abandoned. Based on the respondents' information, this ceremony was still held in the Bingin Kuning area, Lebong Tengah Sub-district, while the Kedurai Ceremony was a ceremony held by residents as a form of rejecting bad omen. This ceremony has also been abandoned by residents because it is considered idolatrous (associating partners with Allah in the teachings of the Islamic law). This ceremony can be in the form of spirits evictions that are considered bad and entering the body or make damage to residents. But unfortunately this ceremony has been abandoned by the people of Rejang. The kinHSIp pattern is still based on male lineage (patrilineal) and recognizes a broad family (extended family) and living in one house, even though many have lived in the nuclear family (father, mother and child) in one house (neolokal).

Besides that, other community activities that are still going on are mutual cooperation, especially if there are neighbors who have big events or condolences such as death. Customary habits that are still valid are giving donations in the form of material and energy.

2.1.3.3.3. Cultural Site

This cultural site is located administratively in Tes Village, Lebong selatan District. This site is located at an altitude of about ± 600 m above sea level and is astronomically located at 3°13.657 'LS and 102°20.614' BT. This site is a tomb with Southwest-Northeast orientation. According to local residents, the tomb is an Islamic tomb which is considered

sacred by some people who still believe in the spirits of their ancestors. The prehistoric people of the archipelago believe that sacred places and ancestral spirits and spirits are in high places or mountains or hills or islands across. Like some examples of regions in the archipelago such as West Sumatra; Mount Sago, is considered as the place for the spirits of deceased ancestors, so there are many menhir and forest sites considered sacred. The ancestors of the Kuningan community, West Java, regarded Mount Ciremai as a holy place, so that the sites of the stone coffin graves were found and in the direction facing it (Sukendar, 1993: 18-19). Even after the inclusion of Hindu-Buddhist culture in the 4-15th century, the holy places are still in high areas, Borobudur Temple in Menoreh hills, temples on Mount Penanggungan in East Java, and many more. Until the Islamic period of the 15-18th century AD, the burial of the kings of Yogyakarta and Surakarta in Imogiri were placed in the mountains or high areas. Even the second Indonesian President, Suharto was buried in Astana Giri Bangun on the slopes of Mount Lawu, Karang Anyar District, Central Java with an altitude of 660 m above sea level. From the indication this site is a tomb that has been tiled with names on the gravestone of Mina Sadikin, Nusah Nikun, and Bikau. The history and further evidence of the existence of this site have not been known, especially who is buried. And there is one semi-permanent building, which is estimated to be a place of worship (prayer room) for residents who still visit this tomb. The residents called it the name 'Kutai Ukem'. The environment around this site is a pine forest managed by Perhutani. The location is exactly about 100 m up the hill facing the Office of Agricultural and Forestry Extension Offices (BPPK) of Tes, Jalan Muara Aman-Curup, Lebong Selatan Sub-district, Lebong District, Bengkulu Province. Therefore, it is expected that further action can involve the Lebong District Culture and Tourism Office as well as for research through the Palembang Archeology Center (Palembang-Bengkulu-Jambi-Padang-Riau Region), Ministry of Education and Culture to determine the cultural significance of the existence of this site. This site is located about 14 km to the north of the Hululais GPP location. Based on data from Lebong Selatan Subdistrict in Figures 2017 in this sub-district there are 2 locations of cultural heritage, namely Kramat Tik Ukem which is about 26 km from the Tes Village and the Kris Luk 9 Site which is about 14 km from Tes Village.

2.1.3.3.4. Land Use Pattern

The relationship between humans and nature is very close, the environmental quality will be determined by human behavior and vice versa, the environment influences human behavior. Humans can choose the form of business in utilizing the natural environment. The Lebong community or more accurately called the Rejang Tribe or the Rejang People. Communities in Mubai, Taba Anyar, Turan Larang, Tes, and Danau Liang Villages divide the land allotment in general in the form of hills (forests), plantations (coffee and chocolate), rice fields, and settlements / houses. Most of the livelihoods are coffee and chocolate gardeners (or farming), traders, and a small number of employees. With many gardening communities, especially coffee, this indicates that human relations with the

environment are still closely intertwined. Environmental nature no longer affects humans directly but humans are able to process nature according to its purpose or what is known as environmental probabilism. This character is evident from the characteristics of the permanent farming community and limited agriculture.

In terms of land use and land owner HSlp structure, the community around the activity location generally divides land use into 3 (three). Firstly, hill (forest) land. This is usually an old secondary forest, some of which are still in used but some are not. There is also a hilly area (forest) owned by Perhutani which is planted by pine trees or other. Second, plantations and rice fields owned by the community are usually planted by economically valuable crops such as coffee, cocoa and rice. For some people who do not have agricultural land they become farmers working on a system of profit sharing or wages. Third, the garden that is owned by a household head or those who does not have a garden. In this garden, ordinary people plant various types of supporting plants, such as duku, rambutan, durian, papaya, and spices/ ingredients plants and medicinal plants. Based on interviews with respondents, in general the average citizen has a coffee or cocoa plantation area of 1 (one) hectare to 10 hectares with the yield per hectare can reach Rp. 20 million per year. However, this is influenced by the yield and price of coffee in the market.

Not all villages in the study area of Lebong Selatan Subdistrict have land use data, but 2 villages namely Mubai and Tes have data that can represent an overview of land use in the study area, essentially all villages have state forest land, in some region, the area was larger than the land managed / owned by the community. Generally, state forests in the study area are managed by Perhutani. Most of the land owned by the community is for agricultural land in the form of rice fields for rice crops and gardens and fields which are generally planted with coffee or chocolate. Lebong District is a coffee producer in Bengkulu Province. Detailed land use data as presented in the table below.

Table 2-24 Type, Amount and Percentage of Land Use in the Study Area

No.	Types of Land Use	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Ha	%	Ha	%	Ha	%	Ha	%	Ha	%	Ha	%
1	Rice fields	200	23,26	-	-	707	19,52	-	-	8	44,44	60	7,55
2	Garden / Settlement	25	2,91	-	-	20	0,55	-	-	3	16,67	4	0,50
3	Plantation	-		-	-	892	24,63	-	-	4	22,22	-	
4	Dry soil/ moor / fields	78	9,07	-	-	6	0,17	-	-	1	5,56	120	15,09
5	Swamps	2	0,23	-	-	6	0,17	-	-	-	-	102	12,83
6	Shrubs	-		-	-	14	0,39	-	-	1	5,56	-	
7	School	-	-	-	-	-	-	-	-	-	-	1	0,13

No.	Types of Land Use	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Ha	%	Ha	%	Ha	%	Ha	%	Ha	%	Ha	%
8	Street	-	-	-	-	-	-	-	-	1	5,56	8	1,01
9	State Forest	555	64,53	-	-	112	3,09	-	-	-	-	500	62,89
10	Others (not detailed)	-	-	180	100,00	1.865	51,49	-	-	-	-	-	-
	total	860	100,00	180	100,00	3.622	100,00	-	-	18	100,00	795	100,00

Sources: Monographic Data of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village, Lebong Tengah District, 2017.

2.1.3.3.5. Education facility

Educational facilities in all study areas that are already available are at the elementary school level, for early childhood education facilities (PAUD) which are only in the Tes and Turan Lalang villages, kindergartens are only available in Taba Anyar and Tes Village, facilities for junior high school education (SMP) are only in Tes and Turan Lalang Villages as well as for educational facilities of Senior High School (SMA) level is only in Taba Anyar Village. From this data, the most complete means of education are only in Tes Village but there are no senior high schools. The distance between villages in the study area, especially the four villages, is relatively close, so that those who attend school, especially PAUD, SMP and SMA generally look for the school location closest to their place of residence, regardless of administrative area. While Danau Liang Village in Lebong Tengah Sub-district which is above the hills around Hululais, the existing educational facilities are only elementary school level, if you want to continue to Middle and Vocational High Schools, you have to go to Semelako. Data on educational facilities from PAUD to high schools in the study area as presented in the table below.

Table 2-25 Number of Education Facilities in the Study Area Based on their Levels

No.	Level of Educational Facilities	Lebong Selatan Sub-district					Lebong Tengah Sub-district
		Mubai Vil.	Taba Anyar Vil.	Tes Vil.	Turan Lalang Vil.	Desa Manai Blau	Danau Liang Vil.
		Unit	Unit	Unit	Unit	Unit	Unit
1	Playgroup	-	-	2	1	1	-
2	Kindergarten	-	1	1	-	-	-
3	Elementary/ Equivalent	2	1	3	1	1	1
4	Junior High/ Equivalent	-	-	1	1	-	-

No.	Level of Educational Facilities	Lebong Selatan Sub-district					Lebong Tengah Sub-district
		Mubai Vil.	Taba Anyar Vil.	Tes Vil.	Turan Lalang Vil.	Desa Manai Blau	Danau Liang Vil.
		Unit	Unit	Unit	Unit	Unit	Unit
5	Senior High/ Equivalent	-	1		-	-	-

Sources: Monographic Data of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village, Lebong Tengah District, 2017.

2.1.3.3.6. Facilities of worship

The facilities of worship in the study area are only for Muslim residents, ie there are only Mosques and prayer hall, all villages have different facilities with different amount. Mubai village has 1 unit of prayer hall and 2 units of mosque; Taba Anyar village has 2 prayer hall units and 3 mosque units; Tes Village has 3 Musholla units; Turan Lalang village has 2 units of paryer hall and 1 unit of mosque; and Danau Liang Village has 1 Prayer hall unit and 1 Mosque unit. Data on worship facilities in the study area as presented in the table below.

Table 2-26 Types and Number of Religious Facilities Available in the Study Area

No.	Types of Worship Facilities	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Unit	%	Unit	%	Unit	%	Unit	%	Unit	%	Unit	%
1	Mosque	2	66,67	3	60	2	40,00	1	33,33	1	100	1	50
2	Prayer Hall	1	33,33	2	40	3	60,00	2	66,67	-	-	1	50
	total	3	100,00	5	100	5	100,00	3	100	1	100	2	100

Sources: Monographic Data of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village, Lebong Tengah District, 2017.

According to the Secretary of the Tes Village, there was a house of worship (or a congregation's house) for followers of Christianity in Tes Village which was carried out in the homes of the residents rather than in the church, in the sense that in this village there was no special church building for Christians.

2.1.3.3.7. Transportation Facilities

The villages in the study area, especially in the Lebong selatan Subdistrict, are all crossed by land transportation line in the form of provincial and district roads. To go to the planned location of the Hululais geothermal power plant, at least have to pass this

provincial road before turning to the district road in the Tes Village adjacent to the Taba Anyar village. Road surface type, road status, road length and percentage datas in detail as presented in the table below.

Table 2-27 Type of Road Surface, Road Length, Road Status and Percentage of Roads in the Study Area

No.	Surface Type and Road Status	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		KM	%	KM	%	KM	%	KM	%	KM	%	KM	%
1	Provincial Asphalt Road	1	8,33	1	6,67	3	15,00	1	9,09	1	20,00	0	-
2	District Asphalt Road	1	8,33	6	40,00	6	30,00	1	9,09	1	20,00	3	60,00
3	Asphalt Village Road	6	50,00	3	20,00	3	15,00	4	36,36	-	-	0	-
4	Village Gravel Road	3	25,00	3	20,00	4	20,00	3	27,27	-	-	0,5	10,00
4	Village Dirt Road	2	16,67	2	13,33	4	20,00	2	18,18	1	20,00	0,5	10,00
5	Environmental Path	-	-	-	-	-	-	0	-	2	40,00	1	20,00
	total	12	100	15	100,00	20	100,00	11	100,00	5	100,00	5	100,00

Sources: Monographic Data of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village, Lebong Tengah District, 2017.

Land transportation facilities in the study area are dominated by two-wheeled motorized vehicles, which is more than 65% in each village in the studi area. Two-wheeled vehicles in Mubai Village are 116 units (65.91%); in Taba Anyar Village, there were 250 units (85.91%); in the Test Village there were 910 units (93.43%); in Turan Lalang Village, 260 units (84.69%); and in the Danau Liang Village 87 units (70.73%). Cross-district public transport in the form of Microbus also passes through provincial roads in the villages in the study area in addition to local Minicup transportation from Muara Anam Market to Tes Village. The cost of local Minicup transportation from Muara Anam Market to the Tes Village is Rp. 10,000. Data on types of land transportation in the study area as in table below.

Table 2-28 Types, Amounts and Percentage of Land Transportation Tools in the Study Area

No.	Types of Land Transportation	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Unit	%	Unit	%	Unit	%	Unit	%	Unit	%	Unit	%
1	Truck	5	2,84	4	1,37	3	0,31	1	0,33	-	-	-	-
2	Private car	35	19,89	10	3,44	25	2,57	15	4,89	4	3,33	-	-

No.	Types of Land Transportation	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Unit	%	Unit	%	Unit	%	Unit	%	Unit	%	Unit	%
3	4 wheels taxi (public transportation)	5	2,84	6	2,06	10	1,03	7	2,28	6	5,00	1	0,81
4	Motorcycle	116	65,91	250	85,91	910	93,43	260	84,69	95	79,17	87	70,73
5	Bike	15	8,52	21	7,22	26	2,67	24	7,82	15	12,50	35	28,46
	total	176	100	291	100	974	100	307	100	120	100	123	100

Sources: Monographic Data of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village, Lebong Tengah District, 2017.

In general the provincial road conditions were quite good although there were some holes, while the district roads that crossed in the villages were quite good, but the road to the Hululais GPP location from the T-junction of the Tes Village was severely damaged, asphalt peeling and the road was bumpy and hollow. During interviews with the community of Tes Village and Taba Anyar Village (this road section is the Tes and Taba Anyar urban boundaries) expects that new Hululais GPP activities can participate in repairing the road before the project starts.

2.1.3.3.8. Social Process

2.1.3.3.8.1. Pattern of Social Interaction

Relationships between villagers, between religious groups, between social organizations, and between tribes are well and harmonious, respect and tolerance toward each other. Even though the majority of the residents are moslems but there are houses of worship (According to the testimony of ts, in the village the secretary of Tes Village office there is a house of worship (or the house of the congregation) for followers of Christianity which is carried out at the residents' houses not in the church in the sense that it is not a church building in the Tes Village, this means that there are non-Muslim citizens in the region. The relationship between religious and social organizations is also established quite well and even complement each other, for example every social activity is usually opened by religious leaders (Ustadz and Kyai) in the speech and prayers. Although migrants are a minority in this area, but because they have been established for a long time such as through marriages or population migration, and do not disturb security and order in the community, the kinhsip between the people in the community and the environment outside the community is also well established. Many have a garden outside the their own village area, so inevitably they also follow or obey any agreement activities in the neighboring village. The study area in Mubai, Taba Anyar, Tes, Turan Lalang and

Manai Blau Villages in Lebong Selatan Sub-district are adjacent communities, as well as Danau Liang Village in Lebong Tengah District, the settlement is also near the area.

2.1.3.3.8.2. Community Social Institution

In relation to social organizations, it can be grouped into 2 (two), namely informal social organizations and formal social organizations. Informal social organizations such as the Housewife gathering Group, Al Quran Recital Groups, Neighborhood Groups, and Farmers Groups (Gapoktan). While formal social organizations, such as Women Association, NGOs, and Youth Club. Informal institutional activities are more related to sociocultural activities on a small scale (between families, between neighborhood), while formal institutions are more related to social activities (inter-village) and physical development (roads, bridges, public facilities and other social facilities).

Social activities that are quite influential in daily life are Al Quran recitation groups. This is evidenced by the number of prayer halls and mosques which are found in every village and village at the location of the activity. The socio-cultural life of the people is inseparable from the Islamic religion which is adopted by the community as well as being significant, because it is related to the life cycle, and to economic problems.

Based on monograph data there are at least 5 recorded social activities even though not all villages have complete data. According to the community, of the 5 social activities the most active is the Quran recitation group. The social institutional data in the study area are presented in the table below.

Table 2-29 Number and Members of Social Institutions in the Study Area

No.	Type of organization	Lebong Selatan Sub-district										Lebong Tengah Sub-district	
		Mubai Vil.		Taba Anyar Vil.		Tes Vil.		Turan Lalang Vil.		Desa Manai Blau		Danau Liang Vil.	
		Group	Number of Members	Group	Number of Members	Group	Number of Members	Group	Number of Members	Group	Number of Members	Group	Number of Members
1	The Quran Recitation Group	1	171	1	285	3	300	2	250	1	25	1	26
2	Islamic Youth Mosque	2	35	1	44	2	64	-	-	1	48	1	15
3	Youth organization	1	219	1	95	1	250	-	-	1	30	1	42
4	Sarapal Anam	-	-	1	16	1	20	1	50			-	-
5	Tambourine	-	-	-	-	2	20	-	-			-	-
	total	4	425	4	440	873	654	3	300	3	103	3	83

Sources: Monographic Data of Mubai Village, Taba Anyar, Tes, Turan Lalang and Manai Blau Village, Lebong Selatan Sub-district 2017 and Monographs of Danau Liang Village, Lebong Tengah District, 2017.

The role of significant figures in the community can be divided into informal figures and formal figures. Formal figures such as Village Heads, Neighborhood Heads, and

Teachers, as well as informal figures such as Islamic Religious Leader or Customary Leaders still dominate in the decision-making process related to regional development and which are considered significant for the progress of their region. Custom leaders still have a very significant role in social life, in making decisions aligned with formal institutions. In the education sector, some people have advanced education even higher education (high schools and universities) obtained from coffee plantations or entrepreneurs. Based on interviews with the community, they assumed that the higher the level of education the higher the level of income.

2.1.3.3.8.3. Perception of Activity Plans

Landslides that caused flash floods in the study area and surrounding areas in 2016 provided a fairly negative perception of new activities in the region. In general, most respondents gave their consent to the plan for the development of the Hululais GPP on the grounds that the PLN project was a government project so the community could not refuse and the community also needed electricity. This perception has an effect on some of the respondents who did not want to give an answer to the agreement on the planned activities of the Hululais GPP. All respondents who answered, agreed, disagreed, disagreed, and did not answer gave notes, among others :

1. Development does not damage existing forests which can cause landslides considering this area is in the category of prone to landslides.
2. All potential negative impacts that can harm the community to be avoided.
3. Prioritizing local labor in the recruitment of workers. The labor recruitment system must be open to the community.
4. Creating a CSR program that is in accordance with the conditions of the community around the location of the Hululais GPP Development.
5. Repairing the damaged road to the location of Hululais GPP development, especially from the Tes and Taba Anyar village crossing that passed through the Manai Blau Village area, at present the condition was severely damaged.

From the results of the questionnaire tabulation, it can provide an overview of the community's perception of the plan for the development of the Hululais GPP. 74% of respondents agreed; 4% of respondents stated they did not agree; 2% of respondents said they did not agree; and the remaining 20% of respondents did not answer.

Table 2-30 Amount and Percentage of Respondent’s Perception in the Study Area Against the Construction of the Hululais GPP Plan

No	Approval of the Project	total	
		Respondents	%
1	Agree	74	74
2	Less agree	4	4
3	Disagree	2	2
4	No answer	20	20
	total	100	100

Source: Primary Data Tabulation.

2.1.3.3.8.4. Perception of the Potential Impact

In general, the community does not know about the Geothermal Power Plant (GPP) so they feel they do not know the potential impact that will occur in the future, what they were still remembered is a landslide from the Hululais Hill (in 2016) that afflicts community-owned rice fields along the river to rice fields in Bingin Kuning Subdistrict. This condition has left the community to finally assume that land clearing can trigger flooding due to landslides. Land in the study area is landslide prone. Some people already consider that flash floods due to landslides are caused by clearing forest land by geothermal drilling activities that have been, are being and will be carried out for the exploitation of non-fossil energy sources.

In the end the respondents only hoped that from the Hululais hydropower development activities, among others, the recruitment of workers from the local community, then hoped that local contractors would be involved so that the local economy would participate in new activities, but the community also hoped that this activity would not have a negative impact as their thought so far toward the existing geothermal drilling and restrictions on labor from outside.

2.1.3.3.9. Traffic

It is planned that alternative means of mobilizing tools and materials either through the Baai Island Port in Bengkulu or through ports in the Palembang region, will pass through the South Sumatra Province (Lubuk Linggau) Road segment. The scenario of equipment mobilization is :

- Mobilization of equipment (heavy equipment through the boundary of the South Sumatra Province (Lubuk Linggau) (Lubuk Linggau - Curup - Kota Donok) road, considering that the construction equipment to be used is mostly in Palembang.
- Mobilization of power plan units through Bengkulu Baai Island Port - Kepahiang - Donok City.

In general, national roads generally have a technical standard of 7 m wide. the national road segment is a road that can be traversed by heavy vehicles. Furthermore, from Curup to the City of Donok, the road that will be passed is the district road section. The condition of the access road to the GPP location in the Taba Anyar Village is good condition asphalt road (picture below). However after the settlement border going up to the Y intersection of Manai Balu village toward the PGE wells the road condition are heavily damaged, such as holed and peeled off. Whereas the roads around the GPP location from the PGE Wells Road are still dirt road (conditions in March 2018).



Picture 2-19 Photo of Road Access to GPP Location in Taba Anyar Sub-District Area (Photo dated April 2018)

Regarding the plan for mobilizing equipment and materials, road section for both national and district roads can be traversed by heavy vehicles. This is proven by the successful mobilization of equipment and materials carried out for the Pertamina project which will become a source of geothermal energy.

Overview of traffic conditions on the Sp. Nakau - Lubuk Linggau road section is quite dense especially in the city center. At some point there is a landslide so that the traffic flow is disrupted. From EIA Document: Improvement of Road Section Sp. Nakau - Bts. Prov. South Sumatra (Curup) In the Bengkulu Province Region in 2015 the traffic volume conditions along the road Sp. Nakau - Lubuk Linggau is presented in the Table below, the traffic volume on the Sp. Nakau-Bts. Prov. South Sumatra is quite crowded because it is a national road (cross-province).

The length of the road in Lebong District is listed in the table below:

Table 2-31 Length of Road in Lebong District in 2016

Road Type	2012	2013	2014	2015	2016
Country road	-	-	-	-	-
Provincial road	139	139	139	139	139
District Street	376,17	385,37	512,31	512,31	546,19
total	515,17	524,37	651,31	651,31	685,198

Source: Lebong District in 2017 Figures.

Table 2-32 Traffic volume on the road section Sp. Nakau - Bts. Prov. South Sumatra

No	Roads	VEHICLE CLASSIFICATION (BINA MARGA)											AADT
		Gol 1	Gol 2	Gol 3	Gol 4	Gol 5A	Gol 5B	Gol 6A	Gol 6B	Gol 7A	Gol 7B	Gol 7C	
1	Sp. Nakau – City border of Kepahiang	4	181	93	212	55	0	118	42	4	0	14	805
2	City border of Kepahiang – Sp. Tabamulan (Curup)	69	1.250	639	1.490	248	25	529	97	39	0	33	2.393
3	Sp. Tabamulan – City border of Curup	55	911	468	1.084	59	4	121	27	9	0	12	3.018
4	Curup – S. Nangka (Curup)	2.614	965	496	1.152	90	14	189	44	17	0	27	3.353
5	Sp. Nangka – Province border South Sumatra	181	1.881	970	2.236	257	21	543	157	26	0	62	3.384

Source: ANDAL Document Improvement of Section Road Sp. Nakau - Bts. Prov. South Sumatra (Curup) in Bengkulu Province. 2015

Information:

Vehicle calcification:

- Group 1 = private car, taxi, jeeb
- Group 2 = small truck
- Group 3 = truck being single
- Group 4 = medium truck
- Group 5A = medium bus
- Group 5B = big bus
- Group 6A = big truck
- Group 6B = truck tronto
- Group 7A = 10 wheeled big truck
- Group 7B = 14 wheeled truck
- Group 7C = trailer truck

AADT = average annual daily traffic, known as LHRT (annual average daily traffic), which is the total daily average volume for which data is collected > 365 days.

2.1.3.3.10. Road Damage

In general, the road segments that will be passed by equipment carriers and work materials are national roads between the boundaries of the South Sumatra Province (Lubuk Linggau - Curup - Donok City or from the direction of Baai Island Bengkulu Port - Kepahiang - Curup - Donok City) . Lubuk Linggau-Curup Road or Baai Bengkulu Island Port - Kepahiang - Curup is in good condition, while the road from Curup to Donok City via district roads with general conditions is good, but there are some unfavorable segments, which have suffered a little damage.

2.1.4. COMMUNITY HEALTH COMPONENTS

2.1.4.1. HEALTH FACILITY

There are no hospital as health facilities in the Lebong Selatan Sub-district and Lebong Tengah Sub-district at the beginning of 2018. While first-rate health facilities are of a basic nature such as Puskesmas (Public Health Centre), Pustu (Auxiliary Health Centre), village midwives are required to provide quality, affordable, fair and equitable health services in their regions.

The availability of health facilities in the Lebong Selatan Subdistrict in early 2018 there is 1 unit of the Puskemas (Public Health Centre), 1 Unit of the Auxiliary Health Centre, and 1 unit of the Puskesmasdes (Village Health Centre) and assisted by 12 Posyandu (Integrated Service Post) units. Whereas the health facilities in Lebong Tengah Subdistrict have 1 main Puskesmas unit, 3 Pustu, 2 Puskesmasdes units and also assisted with 11 Posyandu units, all of which are scattered in Lebong Selatan Sub-Districts and Lebong Tengah Districts. in society.

The following are the data on health facilities in the Lebong Selatan and Lebong Tengah Sub-districts which are included in the plans for the construction of the Hululais GPP.

Table 2-33 Health Facilities in the Study Area in 2018

No	Health facility	Kecamatan	
		Lebong Selatan	Lebong Tengah
1	Public Health Centre	1	1
2	Auxiliary Health Centre	1	3
3	Village Health Centre	1	2
4	Integrated Service Post	12	11
5	Physician Practice Office	2	1
6	Nurse Office	3	5
7	Mindwife Practice	-	5

Source: Puskesmas data, 2018

2.1.4.2. HEALTH WORKERS

Health workers are all people who work actively and professionally in the health sector, whether they have formal health education or not, which for certain types requires authority in carrying out health efforts.

In the National Health System (SKN), health workers are the subject of the health human resources subsystem, namely the order that brings together various planning, education and training efforts, as well as integrated and mutually supportive health utilization, to ensure the achievement of the highest level of public health.

Based on Puskesmas data, the number of health workers in Lebong Selatan Subdistrict at the end of 2018 was 28 people, consisting of 3 general practitioners, 11 nurses, 6 midwives. Public Health 5 people, Nutritionist 1 person and pharmacist 2 people. While the health workers in the Lebong Selatan Subdistrict are 20 people, consisting of general practitioners 1 person, nurses 4 people, midwives 10 people, Public Health 4 people and Nutritionist 1 person.

Table 2-34 Health Workers in the Study Area in 2018

No	Health workers	Kecamatan	
		Lebong Selatan	Lebong Selatan
1	General practitioners	3	1
2	Nurse	11	4
3	Midwife	6	10
4	Public Health	5	4
5	Nutritionist	1	1
6	Pharmacist	2	-

Source: Puskesmas data, 2018

2.1.4.3. MORBIDITY RATE

Based on the 2017 Puskesmas data on the distribution of the ten most types of diseases in the Lebong Selatan Sub-district Health Center in 2017 which is often contracted by the community in Lebong Selatan Sub-district. The first sequence is a case of ARI with 280 cases (9.30%). In the second place there was Gout Arthritis with a total of 210 cases (6.98%). In the third place there is hypertension with a total of 150 cases (4.98%).

While for the 2017 Puskesmas data in Lebong Tengah Subdistrict, the first sequence was Febris with 100 cases (17.54%). In the second place there was Arthritis with a total of 70 cases (12.28%). In the third place there was rheumatic disease with a total of 70 cases (12.8%). Types of environment-based diseases

such as ARI are in the order of 5, Pneumonia ranks 4, Dermatitis rank 6 and Diarrhea rank 7.

Table 2-35 Distribution of the 10 Most Disease Types in the Lebong Selatan Health Center in 2017

No	Type of disease	Case	%
1	ARI	280	9.30
2	Gout Arthritis	210	6.98
3	Hypertension	150	4.98
4	Gastritis	135	4.49
5	Dermatitis	128	4.25
6	Susp Thypoid	98	3.26
7	Tonsillitis	82	2.72
8	Diabetes mellitus	76	2.52
9	Migraine	51	1.69
10	Other Diseases	1,800	59.80
	Total	3,010	100.00

Source: Puskesmas Data, 2017

Table 2-36 Distribution of the 10 Most Disease Types in Lebong Tengah Health Center 2017

No	Type of disease	Case	%
1	Febris	100	17.54
2	Arthritis	70	12.28
3	Rheumatism	70	12.28
4	Pneumonia	70	12.28
5	ARI	60	10.53
6	Allergic dermatitis	60	10.53
7	Gastritis	50	8.77
8	Diarrhea	40	7.02
9	Diabetes mellitus	30	5.26
10	Hypertension	20	3.51
	total	570	100.00

Source: Puskesmas data, 2017

2.1.4.4. ENVIRONMENTAL HEALTH

Environmental health is an environmental condition that is capable of developing a dynamic ecological balance between humans and their environment to support the achievement of the life quality for healthy and happy people. The scope of environmental health includes air sanitation, noise, clean water supply, human waste disposal (latrine), waste management, waste water disposal and disease vectors.

A. Air Health

Based on the results of surveys and field observations in the villages within the study area that the air condition is still relatively good, there are already sources of air pollution from traffic activities, especially in the Mubai, Taba Anyar, Tes and Turan Lalang Villages, whereas in Manai Blau Village and Danau Liang Village it is still relatively clean, but this two villages are close to PGE wells.

B. Noise

Based on the results of field surveys and observations in the villages within the study area related to noise that would disturb the comfort of the community, there was already a source of noise during the field orientation which could potentially cause hearing discomfort from daily activities such as traffic around the villages of Mubai, Taba Anyar, Tes and Turan Lalang, while in the villages of Manai Blau and Danau Liang the source of the noise comes from the activities of PGE Geothermal Wells.

C. Source of Clean Water

The sources of clean water used by the people in the villages within the study area from the results of surveys and field observations show that the community in general has used PAM (water company) such as in Mubai, Taba Anyar, Tes and Turan Lalang, while in Manai Blau Village and Danau Liang Village are still using dug wells with jet pump machines and utilizing springs around their village.

D. Latrine Sanitation

The community behavior in defecation in the villages within the study area from the results of surveys and field observations are that the community generally has latrines / lavatories in their respective homes, but there are still many who use the River for Bath-wash and toilet, Rivers in the study area are relatively clean.

E. Household Solid Waste Management

Management of solid waste (garbage) of community households in villages within the study area from the results of surveys and field observations are that people in general doing waste management by collecting then burned or composted to fertilize plants in fields / gardens.

F. Management of Household Liquid Waste

Management of wastewater (domestic) of households originating from household activities such as washing, cooking and bathing in villages within the study area from the results of surveys and field observations are that community behavior related to household wastewater management is still not good where the results of

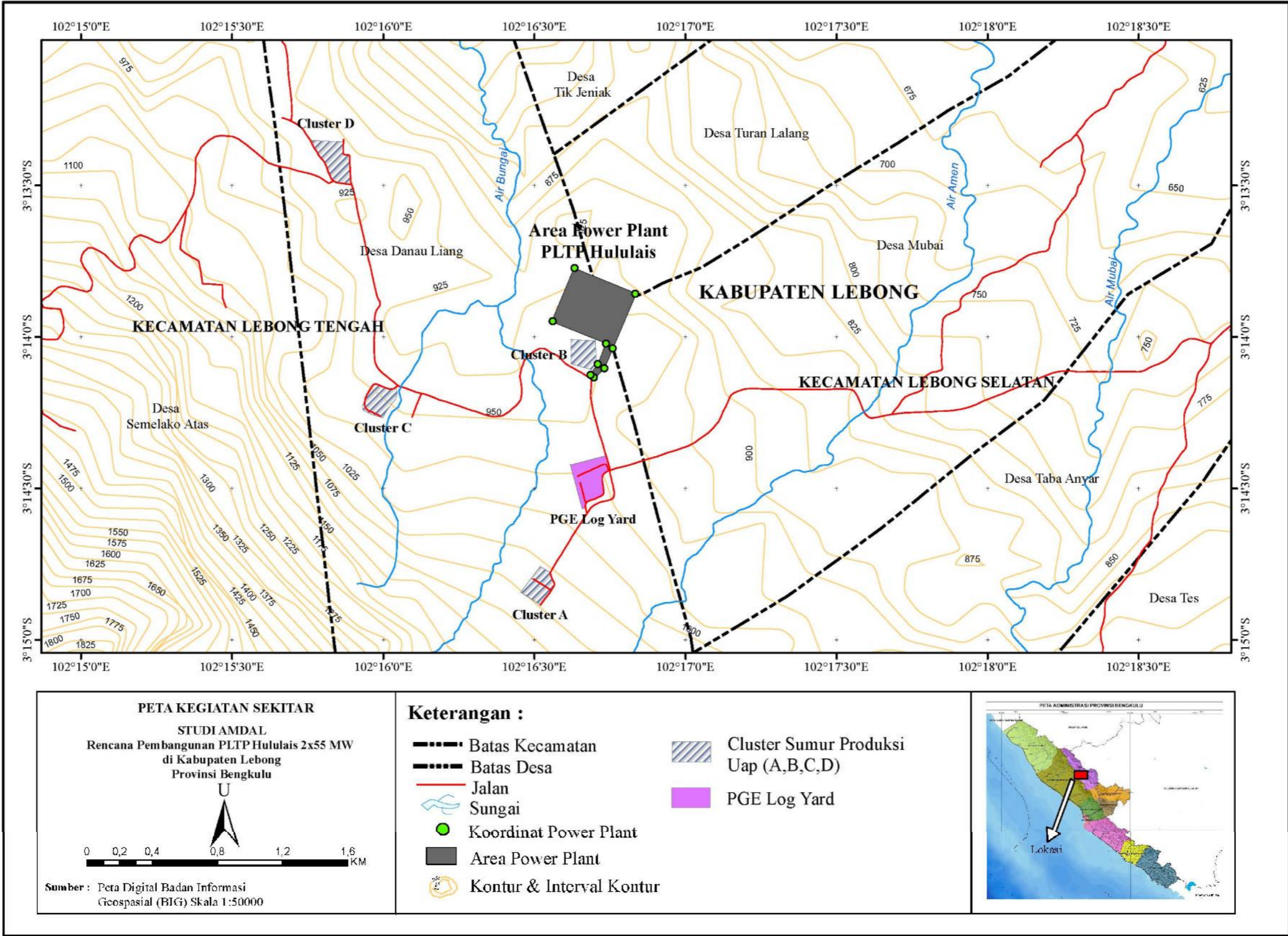
the waste from the bathing, washing and cooking activities are not partially made of a waste water storage hole but are allowed to seep into the ground, but many are also channeled to ponds or ditches around the settlements.

2.2. ACTIVITIES AROUND THE LOCATION OF THE ACTIVITIES PLAN

Other activities around the GPP location are:

- North side: garden.
- South: Cluster B steam production field, within \pm 50 meters.
- West: River Air Bungai.
- East: garden

The surrounding activities are presented in the picture below.



Picture 2-20 Other Activities Around the Activity Location

CHAPTER 3

SIGNIFICANT IMPACTS FORECAST

CHAPTER 3. ESTIMATION OF SIGNIFICANT IMPACT

Significant impact forecast are made on each of the Hypothetical Significant Impacts (SHI) identified in the Reference Framework (RF) document. The forecast of the significant environmental impacts include forecasting the magnitude of the impact and the significant nature of the impact. Based on the Regulation of the Minister of Environment No. 16 of 2012 there are two options for forecasting impacts, namely:

- Impact forecast only compare changes in conditions with activities and conditions without activities. In this option, natural conditions changes are not taken into account; and
- Comparing conditions without activities and with activities, but also taking into account natural changes in conditions, so that for this option there must also be an analysis / calculation of natural condition changes.

The forecast of significant impacts in this study will be carried out with the first approach, namely comparing changes in conditions with activities and conditions without activities (with and without project). The impact forecast scenario is the worst-case scenario. When faced with the limitations of data and information, the forecast of impacts is carried out with approaches before and after the activity, without considering changes in natural environment condition (before and after project).

The magnitude forecast of the impact will be made on each environmental component based on scoping results classified as hypothetical significant impacts. The unit of impact magnitude is in accordance with the units of environmental parameters reviewed. The value of the environment parameter without the project is assumed to be the same as the initial environmental condition. The magnitude of the environmental changes analyzed include the overall environmental components, namely the components of physics-chemistry, biology and social, economic and cultural as well as public health. Before determining magnitude, the relationship between environmental components and development activities needs to be analyzed in depth. The impact forecast also considers existing activities, namely Pertamina Geothermal.

In this connection there are two types of methods for estimating the amount of impact to be used, namely formal methods and non-formal methods:

1. Formal Method

Formal methods are the application of standard formulas and mathematical calculations, used in predicting the magnitude of significant impacts on environmental parameters, then the results of the mathematical calculations are compared with the threshold values or relevant environmental quality standards. Formal methods will be used if sufficient quantitative data is needed. If the quantitative data requirements are not met, the estimated impact will be carried out using non-formal methods.

2. Non Formal Method

Non-formal methods are emphasized on the forecast of impacts that cannot be or are difficult to describe mathematically, so that the predicted impact cannot be done with formal methods. Two types of non-formal methods are used, namely: forecasting the impact by analogy and professional judgment. With the analogy method, the resulting environmental impacts are predicted by studying similar activities in other regions and / or taking place in the past. The assessment of experts in determining impact estimates is based on the knowledge and experience of researchers in their fields. This technique is used when data and information are limited, and phenomenon predicted to occur are poorly understood.

The forecast of the significant nature of impact is based on seven (7) Criteria for significant impacts as stated in the explanation of article 3 paragraph 1 of Government Regulation of the Republic of Indonesia No. 27 of 2012 concerning Environmental Permits and Article 22 paragraph 2 of the Law of the Republic of Indonesia Number 32 of 2009 concerning Environmental Protection and Management. Based on the seven criteria and categories of determining the importance / absence of impact, the drafting team will conduct a review based on a literature review related to the nature of the impact by referring to the seven significant criteria that have been prepared. Guidelines for determining significant and non-significant impacts using the seven criteria are shown in the following Table:

Table 3-1 Guidelines for determining the significant nature of impacts

No	Criteria	tp (if)	p (if)
1	The number of people affected	Number of affected people (not receiving benefits) < number of people who receive benefits	Number of affected people (not receiving benefits) number of people receiving benefits
	The amount of flora / fauna species of	There are no economic value species	There are economic value species

ESTIMATION OF SIGNIFICANT IMPACT

No	Criteria	tp (if)	p (if)
	economic value		
	The number of flora and fauna species endangered and protected	No species is threatened with extinction and is protected by the government	There are endangered species and protected by the government
2	Area of impact distribution	The business or activity plan does not result in the existence of a region experiencing fundamental changes in terms of the intensity of the impact, or the irreversibility of the impact, or the cumulative aspect of the impact.	The business or activity plan results in the existence of a region experiencing fundamental changes in terms of the intensity of the impact, or the irreversibility of the impact, or the cumulative aspect of the impact.
3	The duration of the impact	The duration of the impact does not result in a region experiencing fundamental changes in terms of the intensity of the impact, or the irreversibility of the impact, or the cumulative aspect of the impact.	The duration of the impact results in a region experiencing fundamental changes in terms of the intensity of the impact, or the irreversibility of the impact, or the cumulative aspect of the impact.
	Impact intensity	If the magnitude of the impact does not exceed the quality standard. For impacts that do not have quality standards, use applicable scientific standards.	If the magnitude of the impact exceeds the quality standard. For impacts that do not have quality standards, use applicable scientific standards.
4	The number of other components affected	Only primary impact	Secondary impact and subsequent impacts
5	Cumulative nature of impact	Not accumulative	Accumulative cannot be assimilated by the environment
6	Impacts are turned around or not	Impact can be restored (turned around)	Impact cannot be restored (does not turn around)
7	Other criteria in accordance with the development of science &	The negative significant impacts that are generated can be overcome by the available science and technology.	The negative significant impacts caused cannot be overcome by the available science and technology.

No	Criteria	tp (if)	p (if)
	technology		

Description: p = significant; tp = Not Significant

The significant impacts forecast were made on each hypothetical significant impact of scoping results are as follows:

Table 3-2 Hypothetical Significant Impacts

No.	Types of Hypothetical Significant Impacts (HSI)	Source of Impact
Pre-construction Stage		
1.	Reduced productive land	Land acquisition
2.	Changes in people's perceptions	<ul style="list-style-type: none"> ▪ Socialization ▪ Land acquisition
Construction Stage		
1.	Decreasing air quality	<ul style="list-style-type: none"> ▪ Mobilization of equipments and materials ▪ Commissioning
2.	Increased noise	<ul style="list-style-type: none"> ▪ Mobilization of equipments and materials ▪ Installation of geothermal power equipment ▪ Commissioning
3.	Decreasing the quality of surface water	Land preparation
4.	Increased runoff and flood water speed	Land preparation
5.	Erosion	Land preparation
6.	Decline in aquatic biota	Land preparation
7.	Increased employment opportunities	Construction workers recruitment
8.	Increased business opportunities	<ul style="list-style-type: none"> ▪ Construction workers recruitment ▪ GPP construction
9.	Increased community income	<ul style="list-style-type: none"> ▪ Construction workers recruitment ▪ GPP construction
10.	Changes in people's perceptions	<ul style="list-style-type: none"> ▪ Construction workers recruitment ▪ GPP construction
11.	Traffic congestion	Mobilization of equipments and materials
12.	Road damage	Mobilization of equipments and materials
13.	Increase in Morbidity Rate	<ul style="list-style-type: none"> ▪ Mobilization of equipments and materials ▪ Commissioning (Testing)
Operation Stage		
1.	Decreasing air quality	Operation of GPP
2.	Increased noise	Operation of GPP
3.	Increased employment opportunities	Operation labor recruitment
4.	Increased business opportunities	Operation labor recruitment
5.	Increased community income	Operation labor recruitment
6.	Changes in people's perceptions	Operation labor recruitment
7.	Increased Morbidity Rate	Operation of GPP

3.1. PRE-CONSTRUCTION STAGE

3.1.1. Reduction of Productive Land

3.1.1.1. Land acquisition

Impact Magnitude

The results of public consultations suggested the location of activities to avoid productive land use. The magnitude of the impact of reducing productive land is ± 15 ha according to the productive land of community plantations that will be used for the Hululais GPP. Productive land plays an significant role in people's lives.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	Residents who own the ± 15 ha of plantation lands which will be used for the Hululais GPP	Significant
Impact spread area	± 15 ha	Significant
The intensity and duration of the impact	Productive land plays an significant role in people's lives	Significant
The number of other environmental components affected	Community income	Significant
Cumulative nature of impact	Impact is cumulative	Significant
Reversibility or irreversibility of the impact	The impact is not reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Significant negatives

3.1.2. Changes in Community Perception

3.1.2.1. Activity Socialization

Impact Magnitude

The results of public consultations is that the community is expecting the management of negative impacts. Landslides that caused flash floods in the study area and surrounding areas in 2016 provided a fairly negative perception of new activities in the region. In general, most respondents gave

their consent to the plan for the development of the Hululais GPP on the grounds that the PLN project was a government project so the community could not refuse and the community also needed electricity.

From the results of the questionnaire tabulation, it can provide an overview of the community's perceptions of the Hululais GPP Development plan as shown below.

Table 3-3 Amount and Percentage of Respondent's Perception in the Study Area Against Plans for the Construction of the Hululais GPP

No	Approval of the Project	total	
		Respondents	%
1	Agree	74	74
2	Less Agree	4	4
3	Disagree	2	2
4	No answer	20	20
	total	100	100

Source: Primary Data Tabulation.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	Residents who will be affected are residents who disagree, disagree.	Significant
Impact spread area	Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village, Danau LiangVillage.	Significant
The intensity and duration of the impact	There are respondents who disagree and less agree.	Significant
The number of other environmental components affected	None	Not Significant
Cumulative nature of impact	Impacts are not cumulative	Not Significant
Reversibility or irreversibility of the impact	The impact is not reversed	Not Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Significant negatives

3.1.2.2. Land acquisition

Impact Magnitude

The results of public public consultation expect that land acquisition can provide adequate compensation to the community. Land plays an significant role in life.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	Residents who own the ± 15 ha of plantation land which will be used for the Hululais GPP	Significant
Area of impact spread	± 15 ha	Significant
The intensity and duration of the impact	Productive land plays an significant role in people's lives	Significant
The number of other environmental components affected	Community income	Significant
Cumulative nature of impact	Impact is cumulative	Significant
Reversibility or irreversibility of the impact	The impact is not reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Significant negatives

3.2. CONSTRUCTION STAGE

3.2.1. Decreasing Air Quality

3.2.1.1. Mobilization of equipments and materials

Impact Magnitude

The decrease in air quality by the Mobilization of equipments and materials is possible derived from vehicle emissions. Forecast of the spread of vehicle emissions using the Gaussian equation (line source), as follows:

$$\Delta C_{(x,z)} = \frac{2Q}{(2\pi)^{1/2} \sigma_z U} \exp \left[\frac{-z^2}{2\sigma_z^2} \right]$$

C = Emission concentration (g/m³)

Q = Emission rate from the source per unit road length (g / sec.m) = pollutant emitted per unit time

u = Kecepatan angin dalam arah x atau tegak lurus sumbu jalan (m/det).

= Koefisien dispersi

Z = tinggi lokasi terdampak yang ditinjau (meter).

Table 3-4 Dispersion Coefficient Table

Pasquill Category	Horizontal Dispersion Coefficient σ_y (Meter)	Vertical Dispersion Coefficient σ_z (Meter)
Rural		
A	$0,22x (1+0,0001x)^{0,5}$	0,20x
B	$0,16x (1+0,0001x)^{0,5}$	0,12x
C	$0,11x (1+0,0001x)^{0,5}$	$0,08x (1+0,0002x)^{0,5}$
D	$0,08x (1+0,0001x)^{0,5}$	$0,06x (1+0,0002x)^{0,5}$
E	$0,06x (1+0,0001x)^{0,5}$	$0,03x (1+0,0002x)^{0,5}$
F	$0,04x (1+0,0001x)^{0,5}$	$0,016x (1+0,0002x)^{0,5}$
Urban		
A-B	$0,32x (1+0,0001x)^{0,5}$	$0,24x (1+0,0002x)^{0,5}$
C	$0,22x (1+0,0001x)^{0,5}$	0,20x
D	$0,16x (1+0,0001x)^{0,5}$	$0,14x (1+0,0002x)^{0,5}$
E	$0,11x (1+0,0001x)^{0,5}$	$0,08x (1+0,0002x)^{0,5}$

Sources: Buble et al., 1994 and The Meteorological Resource Center, 2002 (in Diah Wijayanti, Surabaya)

Table 3-5 Classification of Atmospheric Stability

Classification of Atmospheric Stability					
Wind Speed (m / sec)	Day			Night	
	Sunlight Intensity (Insolation)			Cloud Cover	
	Strong	Medium	Weak	4/8 cloudy	3/8 bright
< 2	A	A – B	B	F	F
2 – 3	A – B	B	C	E	F
3 – 5	B	B – C	C	D	E
5 – 6	C	C – D	D	D	D
2 > 6	C	D	D	D	D
Information:	A = Very unstable B = Unstable C = A little unstable		D = Neutral E = A little bit stable F = Stable		
q	= EF x A x (1 – ER/100)				
EF	= Emission Factor = number of pollutants emitted by each unit of activity component from a source of emissions .				
A	= The intensity of activities per unit time				
ER	= Efficiency of reducing pollutants from the emissions control system used				

$$Q = EF \times A \times (1 - ER/100)$$

EF = Emission Factor = number of pollutants emitted by each unit of activity component from a source of emissions, as the table below:

Table 3-6 Emission Factor

Activity type / equipment	Emission Factors for Air Quality Parameters						Unit
	SO ₂	CO	CO ₂	NO _x	HC	Particulate	
Gasoline	-	462,63	2597,86	21,35	54,09	-	Gram / liter of gasoline
Diesel fuel	-	35,57	2924,9	39,53	8,15	-	Gram / liter of diesel fuel

Source: Deputy for Environmental Affairs, Ministry of Environment, 2007

A = intensity of activity per unit time
ER = Efficiency of reducing pollutants from emissions control systems used (exhaust capability as emission control).

The use of diesel fuel for 2 units of truck simultaneously at the same time = 2 x 8 litre / hour = 16 litre / hour, with consideration:

Vehicle speed is 40 km / hour

The use of diesel fuel per truck unit = 1 litre / 5 km

The emission forecast uses a limited line source (100 meter) Gaussian formula with the intensity of diesel fuel on the road location per 100 meters is $A = (100 \text{ m} / 40 \text{ km}) \times 16 \text{ liters} = 0,04 \text{ liters} / \text{hour}$ for 2 trucks simultaneously at the same time same.

Emission forecasting are presented in the tables below. The table presents a mathematical simulation of the boundary distance between air quality that exceeds the quality standard and meets the standard as the impact of vehicle emissions.

Table 3-7 Emission Prediction Table of Solar Usage (at a distance of 5 m from the source)

No	Emission	U (m/sec)	A (solar litre/ h)	EF (gram/ solar litre)	ER (%)	Q (gr/h)	Q (gr/sec)	x (m)	z (m)	z (m)	C (gr/m ³)
1.	CO	2	0,04	35,57	95	0,07114	0,000020	5	1,6	0,6	0,000449
2.	NO _x	2	0,04	39,53	95	0,07906	0,000022	5	1,6	0,6	0,000499
3.	HC	2	0,04	8,15	95	0,0163	0,000005	5	1,6	0,6	0,000103

Table 3-8 Forecast Emissions of Solar Usage (at a distance of 6 m from the source)

No	Emission	U (m/sec)	A (solar litre/ h)	EF (gram/ solar litre)	ER (%)	Q (gr/hour)	Q (gr/sec)	x (m)	z (m)	z (m)	C (gr/m ³)
1.	CO	2	0,04	35,57	95	0,07114	0,000020	6	1,6	0,7	0,000127
2.	NOx	2	0,04	39,53	95	0,07906	0,000022	6	1,6	0,7	0,000141
3.	HC	2	0,04	8,15	95	0,0163	0,000005	6	1,6	0,7	0,000029

Table 3-9 Decreasing Air Quality by Vehicle Emissions

No.	Parameter	Baseline	Impact Magnitude, distance.. m		Air Quality, distance.. m		Quality Standard
			5	6	5	6	
1.	CO (µg/m ³)	114	449	127	563	241	30.000
2.	NO ₂ (µg/m ³)	17	449	141	516	158	400
3.	HC (µg/m ³)	1,6	103	29	105	31	160

Based on the table above the effect of emissions on NO₂ parameters of air at a distance of 5 meters from the source exceeds the quality standard, and at a distance of 6 meters from the source meets the quality standard.

Forecast of dust distribution (from potential spilled soil), using the empirical equation of Emission Factor fugitive dust from the source of activity on the road, for each vehicle mileage:

$$R_{TSP} = 5,9 \times (\text{Silt}/12) \times (\text{Speed}/30) \times (\text{Weight}/3)^{0,7} \times (\text{Wheels}/4)^{0,5}$$

Where : *(Reference source: US EPA 1998).*

- R = Emission Factor, grams / mile
 Silt = Dust content (from potential soil spills) on paved road surface (%)
 Speed = Average vehicle speed (mile / hour)
 Weight = Average vehicle weight (tons / unit)
 Wheels = Average number of vehicle wheels (wheels)

Forecasts of dust distribution are presented in the following table:

Forecast of Dust Distribution at a Distance of 4 m from the Source.

No	Dust	U (m/sec)	A (metre/ hour)	R	Q (gr/hour)	Q (gr/sec)	x (m)	z (m)	z (m)	C (gr/m ³)
1.	Dust	2	32.000	0,0000004	0,013	0,000004	4	1,6	0,5	0,00075

Forecast of Dust Distribution at a Distance of 5 m from the Source

No	Dust	U (m/sec)	A (metre/hour)	R	Q (gr/hour)	Q (gr/sec)	x (m)	z (m)	z (m)	C (gr/m ³)
1.	Dust	2	32.000	0,0000004	0,013	0,000004	5	1,6	0,6	0,00008

Forecast of Increased Air Dust

No.	Parameter	Baseline	Impact Magnitude, distance.. m		Air Quality, distance.. m		Quality Standard
			4	5	4	5	
1.	Debu (µg/m ³)	24	750	82	774	106	230

On the table above at a distance of 4 m from the dust content in air exceeds the quality standard, and at a distance of 5 m from the source of the dust parameter meets the quality standard.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	Residents who will be affected are up to 5 meters from the vehicle or 3 meters from the roadside.	Significant
Impact spread area	Distribution of impacts up to a distance of 5 meters from the vehicle or 3 meters from the roadside	Significant
The intensity and duration of the impact	The NO ₂ content exceeds the quality standard up to a distance of 5 meters from the vehicle or 3 meters from the roadside	Significant
The number of other environmental components affected	Other environmental components affected are health	Significant
Cumulative nature of impact	Impacts are not cumulative	Not Significant
Reversibility or irreversibility of the impact	Impact is reversed	Not Significant
Other criteria in accordance with the development of science and technology		
Conclusion	The impact of decreasing air quality is an significant negative impact	Negative Significant

3.2.2. Noise Increase

3.2.2.1. Mobilization of equipments and materials

Impact Magnitude

The dump truck vehicle causes 85 dBA of noise at a distance of 1 meter.

Forecast noise using the line source model: $L_2 = L_1 - 10 \log (R_2/R_1)$

Where :

L2 = Noise level at distance R2 (dBA)

L1 = Noise level at distance R1 (dBA)

R2 = Distance of listeners from noisy sources (meters)

R1 = Noise distance from the source (meter)

Total noise forecast from several sources with different noise levels:

$$L_{tot} = 10 \log \left(\sum_{i=1}^n 10^{L_i/10} \right) \text{ dBA}$$

The noise forecast is presented in the table below

Table 3-10 Noise Reduction

Noise	Baseline (dBA)	The impact of vehicle noise on the distance ... meters from the source (dBA)			Noise during project implementation at a distance of ... meters from source (dBA)			Quality standard (dBA) *
		1	20	25	1	20	25	
Site location	62	85	72	71	85,0	72,4	71,5	70+3
Access road	59	85	72	71	85,0	72,2	71,3	60+3
Settlement	70	85	72	71	85,1	74,1	73,6	55+3

* Minister of Environment Decree no.48 of 1996

Based on the table above the magnitude of the noise impact reaches a distance of 25 meters from the source beyond the standard noise level for access roads and settlements. Whereas at the location site at a distance of 25 meters it meets the standard noise level.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	Residents who are on the right and left side of the road of equipments & materials mobilization, can be more than 50 people.	Significant
Impact spread area	On the right and left side of the	Significant

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
	road of equipments & materials mobilization.	
The intensity and duration of the impact	Noise trucks on the right and left side of the road of equipments & materials mobilization exceed the quality standard.	Significant
The number of other environmental components affected	Other affected environmental components do not exist.	Not Significant
Cumulative nature of impact	Impacts are not cumulative.	Not Significant
Reversibility or irreversibility of the impact	Impact is reversed.	Not Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Negative Significant

3.2.2.2. Commissioning

Impact Magnitude

The impact of noise is made possible by GPP testing / commissioning activities. Noise can reach ± 85 dBA at a distance of 15 meters.

The noise forecast uses a point source model: $L_2 = L_1 - 20 \log (R_2/R_1)$

Where :

- L_2 = Noise level at distance R_2 (dBA)
- L_1 = Noise level at distance R_1 (dBA)
- R_2 = Distance of listeners from noisy sources (meter)
- R_1 = Noisy distance from the source (meter)

Total noise forecast from several sources with different noise levels:

$$L_{tot} = 10 \log \left(\sum_{i=1}^n 10^{L_i/10} \right) \text{ dBA}$$

The noise forecast is presented in the table below

Table 3-11 Noise Increase

Location	Baseline (dBA)	Noise Commissioning: ... dBA at a distance ... meter			Noise ... dBA at a distance ... meters from commissioning			Quality standards
		15	65	70	15	65	70	
Site location	62	85	72	72	85	73	72	70+3
Access road	59	85	72	72	85	72	72	60+3
Settlement	70	85	72	72	85	74	74	55+3

* Minister of Environment Decree no.48 of 1996

Based on the table above the noise impact is up to a distance of 65 meters from the source beyond the standard noise level. Whereas at the location site at a distance of 70 meters it meets the standard noise level.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	The population of workers who are at a distance of 65 meters from the GPP location can be more than 50 people.	Significant
Impact spread area	at a distance of 65 meters from the GPP location	Significant
The intensity and duration of the impact	noise up to a distance of 65 meters from the source beyond the standard noise level	Significant
The number of other environmental components affected	Other affected environmental components do not exist.	Not Significant
Cumulative nature of impact	Impacts are not cumulative.	Not Significant
Reversibility or irreversibility of the impact	Impact is reversed.	Not Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Significant

3.2.3. Decreasing Surface Water Quality

3.2.3.1. Land Preparation

Impact Magnitude

Decreasing of the surface water quality (river) is possible to come from soil grains that have the potential to enter the river. The land preparation activities to be carried out are cleaning of vegetation, shrubs and grass. With this cleaning, the soil will erode easily, and water run off with erosion material will flow into the river, causing an increase in TSS.

Decreasing the quality of surface water due to the entry of soil grains is predicted by the mixing zone formula as follows:

$$C_3 = \frac{(Q_1 \times C_1) + (Q_2 \times C_2)}{(Q_1 + Q_2)}$$

- Q1 : river water discharge (liters / second) before receiving runoff water.
 C1 : TSS concentration of river water (mg / liter) before receiving runoff water.
 Q2 : the flow of water entering off (liters / second) into the river.
 C2 : TSS concentrations of water run off into the river (mg / liter).
 C3 : TSS concentration of river water (mg / liter) after receiving the entry of run-off water.

Forecast of a decrease in the quality of surface water using data:

- i. River flow speed (when it rains) \pm 10 cm / sec.
- ii. The width of the river is 5 meters, the river depth is 50 cm.
- iii. Discharge of water run off into the river (liters / second).
- iv. TSS from water run off that enters the river \pm 200 mg / l.
- v. TSS initial color of river water 180 mg / l.

Debit air run off: $Q = (C.I.A)/3,6$

C: The coefficient of open surface runoff water (0.4)

I: Rain intensity (= 591/23 mm / day = 26 mm / day = 13 mm / hour)

A: Area of drainage area (15 ha = 0.15 km²)

Q: Running water rate (m³ / sec)

Water debit run off: $Q = (C.I.A)/3,6 = (0,4 \times 13 \times 0,15)/3,6 = 0,2 \text{ m}^3/\text{second} = 200 \text{ liter/second.}$

Table3-12 Estimated increase in surface water TSS

No	Parameter	Dampak		Rona awal		C3 (concentration of river water with the project)	Water river quality standards *
		Q2 (runoff water discharge) l / sec	C2 (TSS concentration of runoff water)	Q1 (river water discharge) l / sec	C2 (concentration of river water)		
1	TSS (mg/l)	200	200	250	180	189	400

* PP 82 of 2001 (Class III)

Significant Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
The number of people who will be affected	TSS parameters meet quality standards, no affected population.	Not Significant
Impact spread area	TSS parameters meet quality standards, there is no distribution of impacts.	Not Significant
The intensity and duration of the impact	TSS parameters meet quality standards.	Not Significant
The number of other environmental components affected	TSS parameters meet quality standards, no other parameters affected.	Not Significant
Cumulative nature of impact	Impacts are not cumulative	Not Significant
Reversibility or irreversibility of the impact	Impact is reversed	Not Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Not Significant

3.2.4. Increased Runoff and Flood Water Rate

3.2.4.1. Land Preparation

Impact Magnitude

Increasing the rate of runoff and flood water was made possible by changes in land cover at the location of the 15 ha GPP from the beginning that there were plants to be open without plants.

Water discharge run off: $Q = (C.I.A)/3,6$

C: The coefficient of open surface runoff water (0.4)

I: Rain intensity (= 591/23 mm / day = 26 mm / day = 13 mm / hour)

A: Area of drainage area (15 ha = 0.15 km²)

Q: Running water rate (m³ / second)

Water discharge run off: $Q = (C.I.A)/3,6 = (0,4 \times 13 \times 0,15)/3,6 = 0,2$ m³/second = 200 liter/second.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	The rate of running water flows to the nearest river, no affected population.	Not Significant
Impact spread area	The rate of running water flows to the nearest river, there is no distribution of impacts.	Not Significant
The intensity and duration of the impact	The flow rate of 200 liters / second flows to the nearest river.	Not Significant
The number of other environmental components affected	The flow rate of 200 liters / second flows to the nearest river, no other parameters affected.	Not Significant
Cumulative nature of impact	Impacts are not cumulative	Not Significant
Reversibility or irreversibility of the impact	Impact is reversed	Not Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Not Significant

3.2.5. Erosion

3.2.5.1. Land Setup

Impact Magnitude

Erosion was made possible by changes in land cover at the location of the 15 ha geothermal power plant from where there were plants to be open without plants. Erosion is calculated by the formula;

Prediction of soil erosion rate using the USLE (Universal Soil Loss Equation) method developed by Wischmeier and Smith (1978) in Arsyad, (2000) with the following equation:

$$A = R \times K \times LS \times C \times P$$

Dimana :

A= Maximum soil erosion rate (ton / ha / year)

R= Rain erosion factor = $0,41 \times H^{1,09} = 2643$.

H= Average annual rainfall (mm / year)

K= Soil erodibility factors = values that indicate whether or not the soil is eroded easily = 0,2:

LS = Long factor index and slope = 2.9

C = Plant management factor index = 1

P = soil conservation technique factor index = 0.5

A = Maximum soil erosion rate = 768 tons / ha / year including classification

The level of erosion is very heavy. Classification of large levels of erosion below:

No	Large Level Erosion Classification	Erosion rate (tons / ha / year)
1	Very light (VL)	<15
2	Light (L)	15 to <60
3	Medium (M)	60 to <180
4	Heavy (H)	180 to <480
5	Very Heavy (VB)	480

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	The number of affected people is the owner of the land around the location of the GPP which is potentially affected by erosion, around ± 50 people.	Significant
Impact spread area	The area of the distribution of impacts includes the fields around the GPP location that are potentially affected by erosion	Significant

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
The intensity and duration of the impact	Maximum soil erosion rate = 768 tons / ha / year including very heavy erosion classification	Significant
The number of other environmental components affected	Another environmental component that is affected is the reduction in field fertility around the GPP location which is potentially affected by erosion.	Significant
Cumulative nature of impact	Impacts are not cumulative	Not Significant
Reversibility or irreversibility of the impact	Impact is reversed	Not Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Significant

3.2.6. Decreasing Aquatic Biota

3.2.6.1. Land Preparation

Impact Magnitude

Decreasing the quality of aquatic biota (river) is a secondary impact of a decrease in the quality of surface water (rivers) by land preparation activities.

Significant Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
The number of people who will be affected	The number of people who will be affected is none	Not Significant
Impact spread area	The extent of the impact distribution follows the broad distribution of the impact of changes in the surface water quality of the Air Kotok River, up to 300 meters downstream from the location position	Not Significant
The intensity and duration of the impact	The intensity and duration of the impact during the construction	Not Significant

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
	stage	
The number of other environmental components affected	Other components affected by the impact do not exist	Not Significant
Cumulative nature of impact	Impact is not cumulative	Not Significant
Reversibility or irreversibility of the impact	The impact will be reversed if the primary impact source is stopped	Not Significant
Other criteria in accordance with the development of science and technology	The impact on components of aquatic biota is a derivative impact of changes in water quality, with the technology of processing the source of impacts, impacts can be minimized	Not Significant
Conclusion		Negatif Not Significant

3.2.7. Increasing Job Opportunities

3.2.7.1. Construction Workers Recruitment

Impact Magnitude

The results of interviews with the community, most of whom hoped that GPP activities could absorb workers from the local area, especially in the study area. There are plan for recruiting 193 construction workers.

The highest unemployment rate is in Mubai Village which is 21.80% and the lowest in Danau Liang Village which is 3.69%, while in Taba Anyar Village Open unemployment rate is 5.69%, in Tes Village 13.36% and Turan Lalang village 15, 54%. The unemployment rate in Mubai Village, Tes village and Turan Lalang Village is higher than the average unemployment rate in Lebong District, based on data from Lebong In Figures 2017 the open unemployment rate in the District is 6.81%.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	The number of affected people according to the number of planned recruitment of 193 workers.	Significant
Impact spread area	Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village, Danau Liang Village	Significant
The intensity and duration of the impact	Local staff recruitment is expected by the community	Significant
The number of other environmental components affected	Income	Significant
Cumulative nature of impact	Impacts are not cumulative	Significant
Reversibility or irreversibility of the impact	Impact is reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Positif Significant

3.2.8. Increasing Business Opportunities**3.2.8.1. Recruitment of Construction Workers****Impact Magnitude**

The interview results is that the respondents suggested a CSR program that was in accordance with the conditions of the community around the location of the Hululais GPP development, and local contractors were involved so that the local economy joined in with the new activities.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	The number of affected people is according to the number of local contractors that can be involved.	Significant
Impact spread area	Mubai Village, Taba Anyar Village,	Significant

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
	Tes Village, Turan Lalang Village, Danau Liang Village	
The intensity and duration of the impact	The involvement of local contractors is expected by the community	Significant
The number of other environmental components affected	Income	Significant
Cumulative nature of impact	Impacts are not cumulative	Significant
Reversibility or irreversibility of the impact	Impact is reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Positif Significant

3.2.8.2. GPP construction

Impact Magnitude

The interview results the respondents suggested a CSR program that was in accordance with the conditions of the community around the location of the Hululais GPP development, and local contractors were involved so that the local economy joined in with the new activities.

Significant Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
The number of people who will be affected	The number of affected people is according to the number of local contractors that can be involved.	Significant
Impact spread area	Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village, Danau Liang Village	Significant
The intensity and duration of the impact	The involvement of local contractors is expected by the community	Significant

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
The number of other environmental components affected	Income	Significant
Cumulative nature of impact	Impacts are not cumulative	Significant
Reversibility or irreversibility of the impact	Impact is reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Positif Significant

3.2.9. Increased Community Income

3.2.9.1. Recruitment of Construction Workers

Impact Magnitude

Increased income is a derivative impact of increased employment opportunities. Impact Magnitude, an increase in income is the amount of additional income, which is according to the amount of regional minimum wage (UMR) in Lebong District.

Significant Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
The number of people who will be affected	The number of affected people according to the number of planned recruitment of 193 workers.	Significant
Impact spread area	Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village, Danau Liang Village	Significant
The intensity and duration of the impact	Local staff recruitment is expected by the community	Significant
The number of other environmental components affected	Positive public perception	Significant
Cumulative nature of impact	Impacts are not cumulative	Significant

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
Reversibility or irreversibility of the impact	Impact is reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Positif significant

3.2.9.2. GPP construction

Impact Magnitude

Increased income is a further impact of increasing business opportunities.

Significant Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
The number of people who will be affected	The number of affected people is according to the number of local contractors that can be involved.	Significant
Impact spread area	Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village, Danau Liang Village	Significant
The intensity and duration of the impact	The involvement of local contractors is expected by the community	Significant
The number of other environmental components affected	Income	Significant
Cumulative nature of impact	Impacts are not cumulative	Significant
Reversibility or irreversibility of the impact	Impact is reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Positif Significant

3.2.10. Changes in Community Perception

3.2.10.1. Acceptance of Construction Workers

Impact Magnitude

Community perception is a further impact of increasing employment opportunities.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	The number of affected people according to the number of planned recruitment of 193 workers.	Significant
Impact spread area	Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village, Danau Liang Village	Significant
The intensity and duration of the impact	Local staff recruitment is expected by the community	Significant
The number of other environmental components affected	Positive public perception	Significant
Cumulative nature of impact	Impacts are not cumulative	Significant
Reversibility or irreversibility of the impact	Impact is reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Positif Significant

3.2.10.2. GPP construction

Impact Magnitude

Community perception is a further impact of increasing business opportunities.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	The number of affected people is according to the number of local	Significant

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
	contractors that can be involved.	
Impact spread area	Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village, Danau Liang Village	Significant
The intensity and duration of the impact	The involvement of local contractors is expected by the community	Significant
The number of other environmental components affected	Income	Significant
Cumulative nature of impact	Impacts are not cumulative	Significant
Reversibility or irreversibility of the impact	Impact is reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Positif Significant

3.2.11. Traffic congestion

3.2.11.1. Mobilization of equipments and materials

The mobilization of equipment is carried out with many wheeled vehicles, while the mobilization of materials in the form of sand, concrete mix, iron frame and others uses 8.3 tons of truck vehicles. Associated with the impact of traffic jams is the trucks carrying power plant equipment.

For mobilization of equipment in the form of heavy equipment such as: bulldozers forklifts, asphalt pavers, pile drivers / hammer etc. will follow the Decree of the General Land Transportation Number: SK.726 / AJ.307 / DRJD / 2004 concerning the Technical Guidelines for Implementing Heavy Equipment Transportation on Roads, namely the technique of binding equipment on transport vehicles to ensure safety and security on the road.

The following are some things that will be considered in the transportation of heavy equipment, namely:

- a. The total control system consists of:
 1. tie the cargo in place to hook the straps;

2. placing cargo safely, including equipping with transverse beams;
 3. pay attention to the possibility of shifting the load when the vehicle is running.
- b. Ropes and binding equipment must be in good condition, can withstand the transfer of cargo, be protected from abrasion and cuts;
 - c. Support equipment must be sufficiently sturdy and safe for the vehicle;
 - d. There is no friction between the load and the body of the vehicle;
 - e. Paying attention to the strength of the place connecting the straps;
 - f. The driver knows the weight, width and height of the cargo being transported;
 - g. Equipped with a charge list letter;
 - h. Through the trajectory specified in the approval letter;
 - i. Performed in places that do not interfere with security, smoothness and traffic order;
 - j. If the heavy equipment transported stands out beyond the outermost part of the transport vehicle, it is marked as referred to in the Appendix to this Decree.

As for the transportation power plant equipment, it will be carried out by splitting it into several parts so that the conveyance can be adjusted to the bend conditions on the road to be passed.

The mobilization of work material in the form of: sand, concrete mix, iron frame and others between 2-3 rays / hour. ± 50 rit mobilization of equipment that will be carried out 3-4 vehicles per mobilization.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	With an average daily volume of 3,384 vehicles assuming 2 passengers, there are 282 road users	Significant
Impact spread area	Impact spread area, especially on Lubuklinggau-Curup or Sp. Nakau-Curup.	Significant
The intensity and duration of the impact	Time delay between 1-2 hours of travel	Significant
The number of other environmental components affected	Other environmental components affected are traffic safety.	Significant
Cumulative nature of impact	Impacts are not cumulative and occur temporarily	Not Significant
Reversibility or irreversibility of the impact	Not turned around	Not Significant
Other criteria in accordance with the	-	-

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
development of science and technology		
Conclusion	Significant with consideration of possible traffic accidents (traffic safety disturbances)	

3.2.11.2. Mobilization of equipments and materials

Impact Magnitude

The mobilization of equipment is carried out with many wheeled vehicles, while the mobilization of materials in the form of sand, concrete mix, iron frame and others uses 8.3 tons of truck vehicles. Associated with the impact of traffic jams is the trucks carrying power plant equipment.

Impact Magnitude Forecast of road damage due to material mobilization activities with 8.3 tons of truck capacity is calculated based on the operation of a fleet of material transport trucks with carrying capacity as follows:

- Environmental road carrying capacity = 6 tons.
- Vehicle Weight = 2.3 tons
- Weight of building material load = 6 tons
- Total weight = 8.3 tons

Table 3-13 Load distribution on the axle of the vehicle is used Tronton Truck (3 Axis):

Configuration Axes and Types	Empty Weight (Tons)	Maximum Load (Tons)	Total Weight Maximum (Tons)	UE18 Ksal Blank	UE 18 Ksal Maximum	<input type="radio"/> RODA TUNGGAL PADA UJUNG SUMBU <input checked="" type="radio"/> RODA GANDA PADA UJUNG SUMBU
1,2L TRUCK	2,3	6	8,3	0,0013	0,2174	34% 66%

The load carried by the front axle : $0,25 \times 8,3 \text{ ton}$
: 2,075Ton <6ton

The load carried by the rear axle : $0,375 \times 8,3 \text{ ton}$
: 3,1125 Ton <6 ton

Conclusion: truck + cargo with a total weight of 8.3 tons, has MST (Heaviest Axis Load) of = 3.1125 tons, meaning that it does not exceed the carrying capacity of the road (6 tons).

Vehicle damage factor (VDF):

- Front axle load : $0,086 \times (2,075 / 8,160)^4 = 0,00036$
 - Rear axle load : $0,086 \times (3,1125 / 8,160)^4 = 0,00182$
- Total = 0,00218

(Source: 1982 DGH DGH Regulation)

This means that the damage caused by 1 truck unit and its cargo with a total weight of 8.3 tons on the road it passes is: $0.00218 / 0.2174 = 0.01$ times. At the time of heavy equipment mobilization activities it is estimated that 4 vehicles will be operated and there will be no vehicle convoy, so the estimated level of damage that will be caused = $1 \times 0.01 = 0.01$ damage.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	-	-
Impact spread area	-	-
The intensity and duration of the impact	The level of damage that will be caused = $1 \times 0.01 = 0.01$ times damage	Not Significant
The number of other environmental components affected	Other affected environmental components are nonexistent	Not Significant
Cumulative nature of impact	Impacts are not cumulative and occur temporarily	Not Significant
Reversibility or irreversibility of the impact	Not turn around	Not Significant
Other criteria in accordance with the development of science and technology	-	-
Conclusion	Not Significant with consideration of small damage level and with rite between 2 – 3 rite/ hour. But management and monitoring are needed.	

3.2.12. Increased Morbidity Rate

3.2.12.1. Mobilization of equipments and materials

Impact Magnitude

The emergence of an increase in Morbidity Rate due to the Mobilization of equipments and materials can occur due to a decrease in air quality that occurs from the vehicle races that carry tools and materials to the project site.

Estimates of public health impacts were also carried out with the method of environmental health impact analysis (ADKL) referring to Kep Bappedal No. 124 of 1997 concerning the forecast of Health impacts. The ADKL study as an approach to studying public health aspects includes:

This has been done with assessment / analysis on :

- ❖ Source of impact or source of emissions (node 1).

The construction of the Hululais GPP during the construction stage is the Mobilization of equipments and materials that produce emissions from vehicles that carry tools and materials from the outside to the project site. The source of the impact on public health is the source of emissions of motorized vehicles that carry tools and materials to the project site.

- ❖ Environmental media before contact with humans (node 2)

Environmental media before contact with humans is in the form of air. Environmental parameters predicted to be affected by public health include air quality. From the results of the measurement of the initial condition of ambient air quality at the location of the activity shows that the air quality parameters are still below the quality standard.

- ❖ Exposed population. (node 3)

Exposed residents are predicted to be construction workers and people who live along the road that is passed by vehicles (mobilization) of building materials. The specific conditions of the population are at risk of being estimated to be children of vulnerable age <5 years and the elderly aged > 65 years.

- ❖ Potential Health Impact (node 4)

Impacts on public health are eye irritation and upper respiratory tract infections (ARI), such as watery noses, inflammation of the windpipe, and bronchitis. Small particles can enter the lungs and then spread through the circulatory system throughout the body. Gas CO, if mixed with

hemoglobin, will interfere with oxygen transport. Lead particles will interfere with the formation of red blood cells so that it has an impact on health.

Based on data from the Public Health Centre in Lebong Selatan Subdistrict in 2017 that the type of disease based on air media that often occurs in the community is ARI, and Tonsillitis. The number of ARI cases was 280 cases (9.30%), and Tonsillitis 82 cases (2.72%). While the number of cases of ARI in Lebong Selatan Subdistrict were 60 cases (10.53%) and Pneumonia as many as 70 cases (12.8%).

The commencement of Mobilization of equipments and materials during the construction stage is predicted to have a small impact which will lead to an increase in Morbidity Rate of environmental-based illnesses, namely the incidence of cases of ARI, tonsillitis and pneumonia. By using the RATE (Epidemiology) formula, it is estimated that 0.01 percent of the population in the study area is at risk of getting ARD class disease.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	it is estimated that 0.01 percent of the population in the study area is at risk of getting ARD-class diseases.	Significant
Impact spread area	The area of impact distribution includes the Sub-districts of Lebong Selatan and Lebong Tengah.	Significant
The intensity and duration of the impact	The impact can last for a moment not continuously	Not Significant
The number of other environmental components affected	There are other environmental components that are affected namely public health.	Significant
Cumulative nature of impact	Impacts accumulate with surrounding activities (traffic)	Significant
Reversibility or irreversibility of the impact	Impacts that have occurred can be reversed or restored	Not Significant
Other criteria in accordance with the development of science and technology	There are no other criteria in accordance with the development of science and technology.	Not Significant
Conclusion		Significant

3.3. OPERATION STAGE

3.3.1. Decreasing Air Quality

3.3.1.1. Operation of GPP

Impact Magnitude

The decrease in air quality by GPP operation activities is possible to come from non-condensed gases. To maintain a vacuum condenser, uncondensed gas is released continuously by a gas extraction system. These gases contain: CO₂ 85-90% wt; H₂S 3.5% wt; the rest is N₂ and other gases. The direction of the dominant wind from the west and south direction. The closest settlement is ± 300 meters to the east.

Forecasts for air quality reduction using reference results: Analysis of H₂S and NH₃ Dispersions from Emissions from Geothermal Power Plants and Their Impacts on Surrounding Air Quality (Case Study: PT Pertamina Geothermal Energy Area Kamojang by: Angga Dwi Putranto, 2017. Concentration at the biggest point an average of 8 hours for H₂S and NH₃ was 228.79 µg / m³ and 6.23 µg / m³, while for concentrations at the largest value points for 24 hours H₂S and NH₃ were 76.26 µg / m³ and 2, 07 µg / m³. All concentrations are below the standard 8 hours and 24 hours.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	H ₂ S and NH ₃ pollutants as gases that are harmful to health	Significant
Impact spread area	The concentration at the largest point on average 8 hours for H ₂ S and NH ₃ was 228.79 µg / m ³ and 6.23 µg / m ³ . While for the concentration at the biggest value point for 24 hours for H ₂ S and NH ₃ is equal to 76.26 µg / m ³ and 2.07 µg / m ³ . All concentrations are below the 8 hour and 24 hour quality standard.	Not Significant
The intensity and duration of the impact	The concentration at the largest point on average 8 hours for H ₂ S and NH ₃ was 228.79 µg / m ³ and 6.23 µg / m ³ . While for the concentration at the biggest value point for 24 hours for H ₂ S and NH ₃ is equal to 76.26 µg / m ³ and 2.07	Not Significant

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
	$\mu\text{g} / \text{m}^3$. All concentrations are below the 8 hour and 24 hour quality standard.	
The number of other environmental components affected	Health	Significant
Cumulative nature of impact	Impacts are not cumulative	Not Significant
Reversibility or irreversibility of the impact	The impact is not reversed	Not Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Significant

3.3.2. Noise Increase

3.3.2.1. Operation of GPP

Impact Magnitude

The impact of noise is made possible by the operation of GPP. Noise can reach ± 85 dBA at a distance of 15 meters.

Noise forecast is using point source model: $L_2 = L_1 - 20 \log (R_2/R_1)$

Where :

- L_2 = Noise level at distance R_2 (dBA)
- L_1 = Noise level at distance R_1 (dBA)
- R_2 = Distance of listeners from noisy sources (meters)
- R_1 = Noise distance from the source (meter)

Total noise forecast from several sources with different noise levels:

$$L_{\text{tot}} = 10 \log \left(\sum_{i=1}^n 10^{L_i/10} \right) \text{ dBA}$$

The noise forecast is presented in the table below

Table3-14 Noise Increase

ESTIMATION OF SIGNIFICANT IMPACT

Location	Baseline (dBA)	Noise Commissioning: ... dBA at a distance ... meter			Noise ... dBA at a distance ... meters from commissioning			Quality standards
		15	65	70	15	65	70	
Site location	62	85	72	72	85	73	72	70+3
Access road	59	85	72	72	85	72	72	60+3
Settlement	70	85	72	72	85	74	74	55+3

* Minister of Environment Decree no.48 of 1996

Based on the table above, the impact of noise is up to a distance of 65 meters from the source beyond the standard noise level. Whereas at the location site at a distance of 70 meters it meets the standard noise level.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	The population of workers who are at a distance of 65 meters from the GPP location can be more than 50 people.	Significant
Impact spread area	at a distance of 65 meters from the GPP location	Significant
The intensity and duration of the impact	noise up to a distance of 65 meters from the source beyond the standard noise level	Significant
The number of other environmental components affected	Other affected environmental components do not exist.	Not Significant
Cumulative nature of impact	Impacts are not cumulative.	Not Significant
Reversibility or irreversibility of the impact	Impact is reversed.	Not Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Significant

3.3.3. Increasing Job Opportunities

3.3.3.1. Labor Reception Operations

Impact Magnitude

The results of interviews with the community, most of whom hoped that GPP activities could absorb workers from the local area, especially in the study area. Plans for the recruitment of 80 people for operating stages.

The highest unemployment rate is in Mubai Village which is 21.80% and the lowest in Danau Liang Village which is 3.69%, while in Taba Anyar Village Open unemployment rate is 5.69%, in Tes Village 13.36% and Village Turan Lalang 15, 54%. The unemployment rate in Mubai Village, Tes Village and Turan Lalang Village is higher than the average unemployment rate in Lebong District, based on data from Lebong Dalam Angka 2017 the open unemployment rate in the District is around 6.81%.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	The number of affected people according to the number of plans for the recruitment of 80 people in operating stage.	Significant
Impact spread area	Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village, Danau Liang Village	Significant
The intensity and duration of the impact	Local staff recruitment is expected by the community	Significant
The number of other environmental components affected	Income	Significant
Cumulative nature of impact	Impacts are not cumulative	Significant
Reversibility or irreversibility of the impact	Impact is reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Significant

3.3.4. Increased Business Opportunities

3.3.4.1. Labor Recruitment for Operations

Impact Magnitude

Increasing business is a further impact of increasing employment opportunities. The existence of a labor will create business opportunities for the community such as stall businesses providing food and beverage needs for workers.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	The number of affected people is according to the number of residents who have business opportunities.	Significant
Impact spread area	Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village, Danau Liang Village	Significant
The intensity and duration of the impact	The involvement of local economic businesses is expected by the community	Significant
The number of other environmental components affected	Income	Significant
Cumulative nature of impact	Impacts are not cumulative	Significant
Reversibility or irreversibility of the impact	Impact is reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Significant

3.3.5. Increased Community Income

3.3.5.1. Labor Reception Operations

Impact Magnitude

The increase in income is a further impact of increasing work opportunity. Impact Magnitude in accordance with the magnitude of the regional minimum wage (UMR) of Lebong District.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	The number of affected people according to the number of plans for the recruitment of 80 people operating stage.	Significant
Impact spread area	Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village, Danau Liang Village	Significant
The intensity and duration of the impact	Local staff recruitment is expected by the community	Significant
The number of other environmental components affected	Positive perception	Significant
Cumulative nature of impact	Impacts are not cumulative	Significant
Reversibility or irreversibility of the impact	Impact is reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Significant

3.3.6. Changes in Community Perception**3.3.6.1. Labor Recruitment for Operations****Impact Magnitude**

Community perception is a further impact of increasing employment opportunities.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	The number of affected people according to the number of plans for the recruitment of 80 people for operating stage.	Significant
Impact spread area	Mubai Village, Taba Anyar Village, Tes Village, Turan Lalang Village,	Significant

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
	Danau Liang Village	
The intensity and duration of the impact	Local staff recruitment is expected by the community	Significant
The number of other environmental components affected	Positive public perception	Significant
Cumulative nature of impact	Impacts are not cumulative	Significant
Reversibility or irreversibility of the impact	Impact is reversed	Significant
Other criteria in accordance with the development of science and technology		
Conclusion		Significant

3.3.7. Increased Morbidity Rate

3.3.7.1. Labor Recruitment for Operations

Impact Magnitude

The increase in Morbidity Rate rates due to the operation of the Hululais GPP can occur due to a decrease in air quality that occurs from the power plant activities.

Estimates of public health impacts were also carried out with the method of environmental health impact analysis (ADKL) referring to Kep Bappedal No. 124 of 1997 concerning the forecast of Health impacts. The ADKL study as an approach to studying public health aspects includes:

This review is carried out with assessment / analysis on :

- ❖ Source of impact or source of emissions (node 1).

The construction of the Hululais GPP during the operation stage is the operation of the Hululais GPP which produces electrical energy from geothermal energy. The source of the impact on public health is the process of generating electricity that has the potential to cause changes in air quality.

- ❖ Environmental media before contact with humans (node 2)

Environmental media before contact with humans is in the form of air. Environmental parameters predicted to be affected by public health include air quality. From the results of the measurement of the initial condition of ambient air quality at the location of the activity shows that the air quality parameters are still below the quality standard.

❖ Exposed population. (node 3)

Exposed residents are estimated to be workers and people who live around the site of the Hululais GPP project. The specific conditions of the population are at risk of being estimated to be children of vulnerable age <5 years and the elderly aged > 65 years.

❖ Potential Health Impact (node 4)

Impacts on public health are eye irritation and upper respiratory tract infections (ARI), such as watery noses, inflammation of the windpipe, and bronchitis. Small particles can enter the lungs and then spread through the circulatory system throughout the body. Gas CO, if mixed with hemoglobin, will interfere with oxygen transport. Lead particles will interfere with the formation of red blood cells so that it has an impact on health.

Based on data from the Community Health Center in Lebong Selatan Subdistrict in 2017 that the type of disease based on air media that often occurs in the community is ARI, and Tonsillitis. The number of ARI cases was 280 cases (9.30%), and Tonsillitis 82 cases (2.72%). While the number of cases of ARI in Lebong Selatan Subdistrict were 60 cases (10.53%) and Pneumonia as many as 70 cases (12.8%).

With the operation of the Hululais GPP at the operational stage of the power plant, it is predicted that a small impact will lead to an increase in environmental-based illness Morbidity Rate, namely the incidence of cases of ARI, tonsillitis and pneumonia. By using the RATE (Epidemiology) formula, it is estimated that 0.01 percent of the population in the study area is at risk of getting ARD class disease.

Significat Nature of Impact

Criteria for Significant impact (PP 27/2012)	Description	Significat Nature of Impact
The number of people who will be affected	It is estimated that as many as 0.01 percent of the population in the study area are at risk of getting ARI.	Significant

Criteria for Significant impact (PP 27/2012)	Description	Significant Nature of Impact
Impact spread area	The area of impact distribution includes the Sub-districts of Lebong Selatan and Lebong Tengah.	Significant
The intensity and duration of the impact	The impact can last for a moment not continuously	Not Significant
The number of other environmental components affected	There are other environmental components that are affected namely public health.	Significant
Cumulative nature of impact	Impacts accumulate with surrounding activities (traffic)	Significant
Reversibility or irreversibility of the impact	Impacts that have occurred can be reversed or restored	Not Significant
Other criteria in accordance with the development of science and technology	There are no other criteria in accordance with the development of science and technology.	Not Significant
Conclusion		Significant

CHAPTER 4

HOLISTIC EVALUATION OF ENVIRONMENTAL IMPACTS

CHAPTER 4. HOLISTIC EVALUATION OF ENVIRONMENTAL IMPACTS

4.1. RELATIONSHIP AND INTERACTION OF ALL HYPOTHETICAL SIGNIFICANT IMPACTS ASSESSMENT

Each environmental component basically does not stand alone. Changes experienced by an environmental component due to activities (primary impact) can bring further consequences to changes in other environmental components (secondary impacts). Secondary impacts on these environmental components can generate changes in other environmental components (tertiary impacts). And so on, until various components of the significant environmental impacts are established causal relationships. In connection with that, the evaluation of the significant environmental impacts is carried out holistically, presenting a causal relationship between the components of the activity plan and the environmental components affected by the primary, secondary, tertiary, and the linkages between impacts.

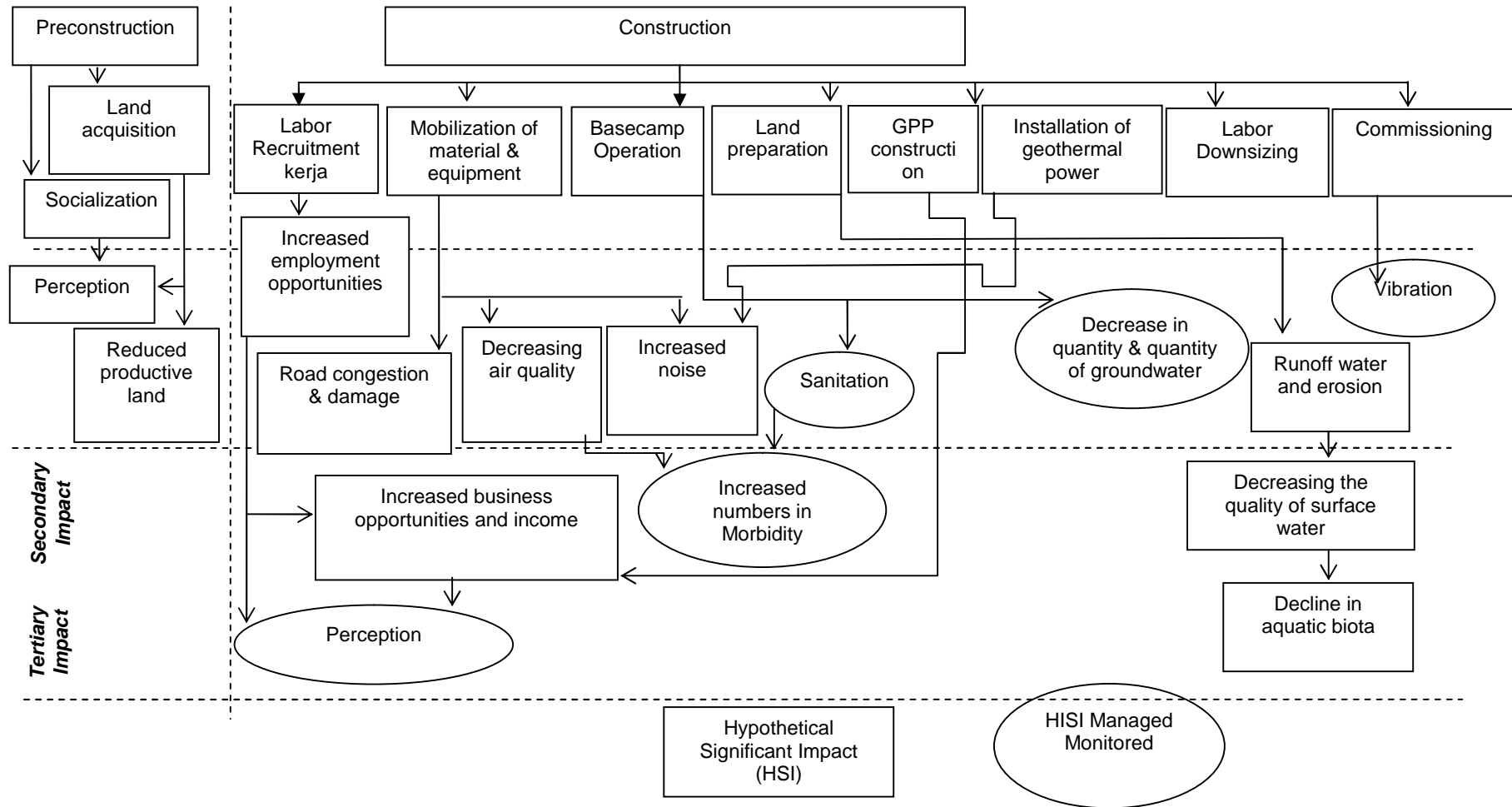
Evaluating the impact of significant is holistically using the impact evaluation matrix and impact evaluation flow chart. The Impact Evaluation Matrix and Flow Chart for the Evaluation of Significant Environmental Impacts are listed in Table 4-1 and Picture 4.1 and Picture 4.2.

Table 4-1 Summary of Potential Impact Evaluation of Activity Plans

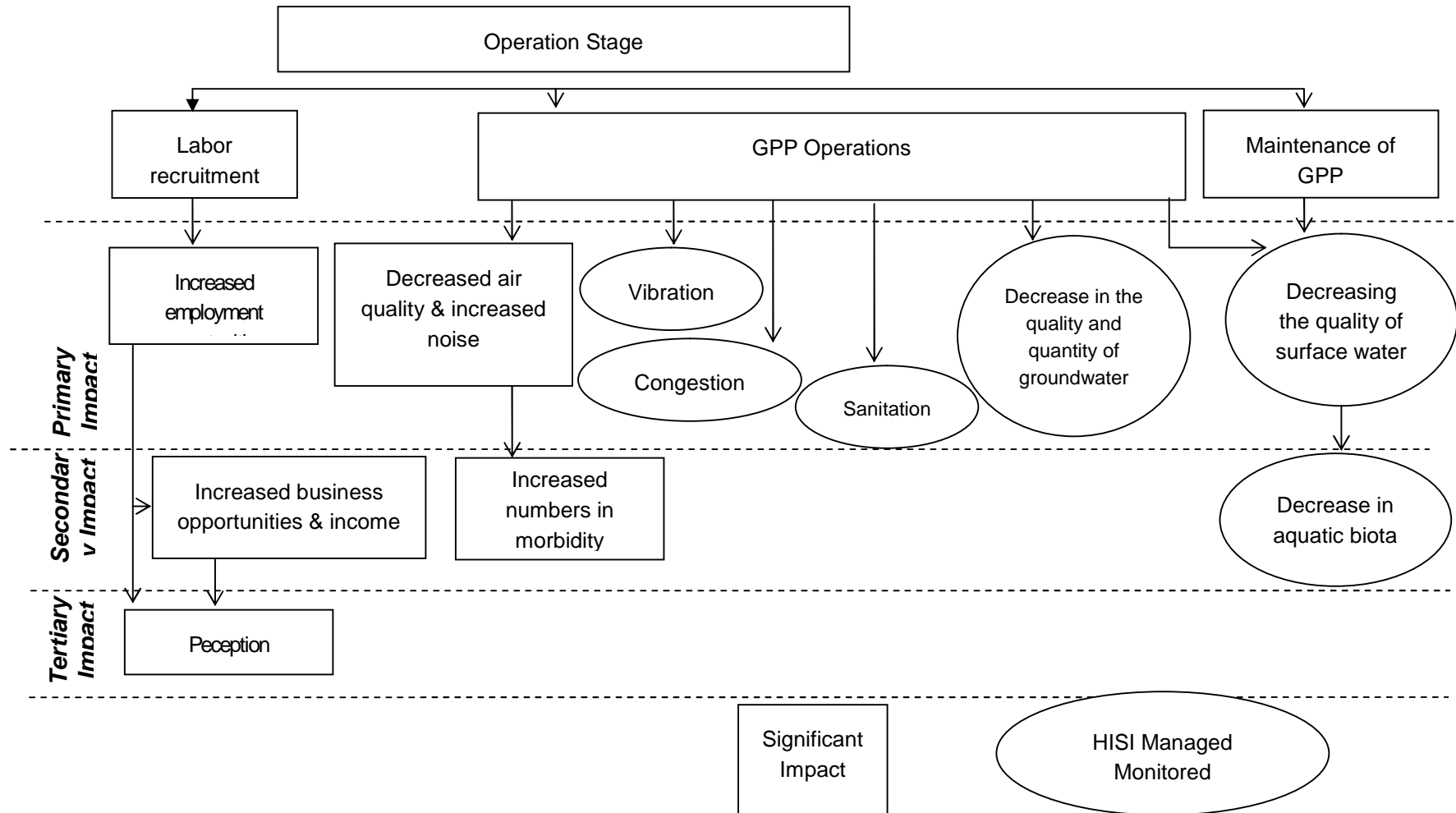
No	Environmental Components	Preconstruction		Construction activities								Operation		
		1	2	1	2	3	4	5	6	7	8	1	2	3
		Socialization	Land acquisition	Labor recruitment	Mobilization of equipments and materials	Base camp operation	Land preparation	GPP construction	Installation of geothermal power equipment	Labor Downsizing	Commissioning (Testing)	Labor recruitment	Operation of GPP	Maintenance of GPP
A	Chemical Geophysics													
1	Air quality				1		3	3	3		1		1	
2	Noise				1		3	3	1		1		1	
3	Vibration										2		2	
4	Surface water quality					2	1							2

HOLISTIC EVALUATION OF ENVIRONMENTAL IMPACTS

No	Environmental Components	Preconstruction		Construction activities								Operation		
		1	2	1	2	3	4	5	6	7	8	1	2	3
		Socialization	Land acquisition	Labor recruitment	Mobilization of equipments and materials	Base camp operation	Land preparation	GPP construction	Installation of geothermal power equipment	Labor Downsizing	Commissioning (Testing)	Labor recruitment	Operation of GPP	Maintenance of GPP
5	Groundwater quality					2							2	
6	Quantity of ground water					2							2	
7	Traffic				1								2	
8	Road damage				1									
9	Runoff & flood water speed						1							
10	Erosion						1							
11	Reduced productive land		1											
B	Biology													
1	Flora						3							
2	Fauna						3							
3	Aquatic Biota					2	1						2	2
C	Socio-Economic Culture													
1	Employment Opportunity			1						3		1		
2	Business opportunities			1				1				1		
3	Community income			1				1				1		
4	Public perception	1	1	1				1				1		
D	Public health													
1	Environment sanitation					2							2	
2	Morbidity Rate				1	2	3	3	3		1		1	



Picture 4-1 Flow Chart of HSI and HISI Managed Monitored (Pre-construction and Construction Stage)



Picture 4-2 Chart of Flow of HSI and DTPH Managed to Monitor (Operation Stage)

Table4-2 Summary of Impact Analysis

No	HSI	Source of Impact	Early Environmental Condition	Impact Forecasting Results	Impact Evaluation Results
Pre-construction Stage					
1.	Reduction of Productive Land (HSI 1)	Land acquisition	Dry Land / moor / fields in Mubai Village 78 ha, in the 6 Ha Test Village, in Turan Lalang Village 120 ha.	Impact Magnitude: Impact Magnitude of reduced productive land is ± 15 ha according to productive land of community plantations that will be used for the Hululais GPP. Significat Nature of Impact: significant	HSI 1 as a primary impact
2.	Changes in Community Perception	Activity Socialization	74 respondents agreed; 4 respondents less agree; 2 respondents did not agree; 20 respondents did not answer.	Impact: 74 respondents agreed; 4 respondents disagree; 2 respondents did not agree; 20 respondents did not answer. Significat Nature of Impact: significant.	HSI 2 as a primary impact
3.	Changes in Community Perception	Land acquisition	The results of public consultation is the public expecting that land acquisition can provide adequate compensation to the community	The results of public consultation is that the public expect that land acquisition can provide adequate compensation to the community Significat Nature of Impact: significant.	HSI 3 as a primary impact
Construction Stage					
4.	Decreasing air quality (HSI 4)	Mobilization of equipments and materials	CO = 114 µg/M ³ . NO ₂ = 17 µg/M ³ . HC = 1,6 µg/M ³ .	Impact: the effect of emissions on air NO2 parameters at a distance of 5 meters from the source = 516 µg / M ³ exceeded the quality standard, and at a distance of	HSI 4 as a primary impact. secondary effects of increased Morbidity Rate (HSI 20).

No	HSI	Source of Impact	Early Environmental Condition	Impact Forecasting Results	Impact Evaluation Results
				6 meters from the source = 158 µg / M ³ met the quality standard. Ambient air quality standard: CO = 30000 µg / M ³ . NO ₂ = 400 µg / M ³ . HC = 160 µg / M ³ . Significant Nature of Impact: significant	
5.	Increased noise (HSI 5)	Mobilization of equipments and materials	Site location 62 dBA; 59 dBA access road; 70 dBA settlement.	Impact: the noise impact up to a distance of 25 meters from the source exceeds the standard noise level for access roads = 71.3 dBA and settlements = 73.6 dBA. Whereas at the location site at a distance of 25 meters = 71.5 dBA it meets the noise level standard. Noise standard: Site location 70 + 3 dBA; Access road 60 + 3 dBA; Settlement 55 + 3 dBA. Significant Nature of Impact: significant	HSI 5 as a primary impact.
6.	Increased noise (HSI 6)	Commissioning	Site location 62 dBA; 59 dBA access road; 70 dBA settlement.	Impact: the impact of noise is up to a distance of 65 meters from the source beyond the standard noise level. Whereas at the location site at a distance of 70 meters it meets the standard noise level Significant Nature of Impact:	HSI 6 as a primary impact.
7.	Decrease in surface water quality (HSI 7)	Land preparation	TSS 180 mg/l.	Impact Magnitude: TSS 189 mg / l.	HSI 7 as a primary impact reduces the secondary impact of decreasing

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No	HSI	Source of Impact	Early Environmental Condition	Impact Forecasting Results	Impact Evaluation Results
				TSS quality standard 400 mg / l Nature of impact; Not Significant.	aquatic biota (HSI 10).
8.	Increased runoff water and flood speed (HSI 8)	Land preparation	run off water discharge: $Q = (C.I.A)/3,6 = (0,2 \times 13 \times 0,15)/3,6 = 0,2 \text{ m}^3/\text{second} = 100 \text{ liter/second}.$	Impact Magnitude: Water discharge run off: $Q = (C.I.A) / 3.6 = (0.4 \times 13 \times 0.15) / 3.6 = 0.2 \text{ m}^3 / \text{second} = 200 \text{ liters} / \text{second}.$ Nature of impact: Not Significant.	HSI 8 as a primary impact causes secondary effects of increased erosion (HSI 9)
9.	Erosion (HSI 9)	Land preparation	Maximum soil erosion rate = 154 tons / ha / year including moderate erosion level classification	Impact Magnitude: Maximum soil erosion rate = 768 tons / ha / year including very heavy erosion classification. Significant Nature of Impact: Not Significant	HSI 9 as a secondary impact of the primary impact of increasing running water rates (HSI 8).
10.	Decreasing aquatic biota (HSI 10)	Land preparation	The diversity index at the Air Kotok River upstream point is 2,301.	Impact Magnitude: The diversity index at the River Air Kotok upstream point can be more than 2,301. Significant Nature of Impact: Not Significant	HSI 10 as a secondary impact of decreasing the quality of surface water (HSI 7)
11.	Increased employment opportunities (HSI 11)	Labor recruitment	The unemployment rate in Mubai Village is 21.80% and in Danau Liang Village is 3.69%, while in Taba Anyar Village the open unemployment rate is 5.69%, in the Tes	Impact Magnitude: Plans for recruiting 193 construction workers. Significant Nature of Impact: Significant	HSI 11 as a primary impact reduces the secondary impact of business opportunities (HSI 12) and increases income (HSI 13); and tertiary effects of positive perceptions of society (HSI 14).

No	HSI	Source of Impact	Early Environmental Condition	Impact Forecasting Results	Impact Evaluation Results
			Village it is 13.36% and Turan Lalang Village is 15.54%. The unemployment rate in Mubai Village, Tes Village and Turan Lalang Village is higher than the average unemployment rate in Lebong District (6.81%).		
12.	Increased business opportunities (HSI 12)	Labor recruitment	There are shops, kiosks and restaurants or food stalls in the Tes Village, Taba Anyar, Mubai and Turan Lalang	Impact Magnitude: Local contractors are involved so that the local economy will join in with new activities Significat Nature of Impact: significant	HSI 12 as a secondary impact of the primary impact of increasing employment opportunities (HSI 11).
13.	Increased business opportunities (HSI 13)	GPP construction	There are shops, kiosks and restaurants or food stalls in the Tes Village, Taba Anyar, Mubai and Turan Lalang	Impact Magnitude: Local contractors are involved so that the local economy will join in with new activities Significat Nature of Impact: significant	HSI 13 as a secondary impact of the primary impact of increasing employment opportunities (HSI 11).
14.	Increased community income (HSI 14)	Labor recruitment	Monthly family income ranges from Rp. 1.5 million to Rp. 3 million.	Impact Magnitude: Impact Magnitude in accordance with the magnitude of the regional minimum wage (UMR) of Lebong District Significat Nature of Impact: Significant	HSI 14 as a secondary impact of the primary impact of increasing employment opportunities (HSI 11).

No	HSI	Source of Impact	Early Environmental Condition	Impact Forecasting Results	Impact Evaluation Results
15.	Increased community income (HSI 15)	GPP construction	Monthly family income ranges from Rp. 1.5 million to Rp. 3 million.	Impact Magnitude; Increased income is a further impact of increasing business opportunities. Significat Nature of Impact; significant	HSI 15 as a secondary impact of the primary impact of increasing employment opportunities (HSI 11).
16.	Changes in public perception (HSI 16)	Labor recruitment	74 respondents agreed; 4 respondents less agree; 2 respondents did not agree; 20 respondents did not answer.	Impact Magnitude: Community perception is a further impact of increasing employment opportunities Significat Nature of Impact: dizzy	HSI 16 is a tertiary impact of the primary impact of increasing employment opportunities (HSI 11).
17.	Changes in public perception (HSI 17)	GPP construction	74 respondents agreed; 4 respondents less agree; 2 respondents did not agree; 20 respondents did not answer.	Impact Magnitude: Community perception is a further impact of increasing employment opportunities Significat Nature of Impact: dizzy	HSI 16 is a tertiary impact of the primary impact of increasing employment opportunities (HSI 11).
18.	Traffic congestion (HSI 18)	Mobilization of equipments and materials	traffic volume on section Sp. Nakau-Bts. Prov. South Sumatra is quite crowded because it is a national (cross-provincial) road.	Impact Magnitude: The mobilization of work material in the form of: sand, concrete mix, iron frame and others between 2-3 rays / hour. ± 50 rit mobilization of equipment that will be carried out 3-4 vehicles per mobilization Significat Nature of Impact: significant	HSI 18 is the primary impact
19.	Road damage (HSI 19)	Mobilization of equipments and	Lubuk Linggau-Curup Road or Baai	Impact Magnitude: the factor of damage caused by 1 truck	HSI 19 is the primary impact

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Development Plan of 2 x 55 MW Hululais Geothermal Power Plant (GPP) in Lebong Selatan and Lebong Tengah Sub-districts, Lebong District, Bengkulu Province

No	HSI	Source of Impact	Early Environmental Condition	Impact Forecasting Results	Impact Evaluation Results
		materials	Bengkulu Island Port - Kepahiang - Curup good condition means that it is well maintained, while the road from Curup to Donok City via district roads with general conditions is good, but there are some segments that are not good means that they have experienced even a little damage	unit and its cargo with a total weight of 8.3 tons on the road it passes is: $0.00218 / 0.2174 = 0.01$ times. At the time of heavy equipment mobilization activities it is estimated that 4 vehicles will be operated and there will be no vehicle convoy, so that the estimated level of damage that will be caused = $1 \times 0.01 = 0.01$ damage. Significat Nature of Impact: significant	
20.	Increased Morbidity Rate (HSI 20)	Mobilization of equipments and materials	Based on data from the Puskesmas in Lebong Selatan Subdistrict in 2017 the type of disease based on air media that often occurs in the community is ARI, and Tonsillitis. The number of ARI cases was 280 cases (9.30%), and Tonsillitis 82 cases (2.72%). While the number of cases of ARI in Lebong Selatan Sub-district were 60 cases	It is estimated that as many as 0.01 percent of the population in the study area are at risk of getting ARI.	HSI 20 is a secondary impact of decreasing air quality (HSI 4)

No	HSI	Source of Impact	Early Environmental Condition	Impact Forecasting Results	Impact Evaluation Results
			(10.53%) and Pneumonia were 70 cases (12.8%).		
Operation Stage					
21.	Decreasing Air Quality (HSI 21)	Operation of GPP	Results of laboratory analysis of air quality at 3 points meet quality standards	Impact: Forecasts for air quality reduction using reference results: Analysis of H ₂ S and NH ₃ Dispersions from Emissions from Geothermal Power Plants and Their Impacts on Surrounding Air Quality (Case Study: PT Pertamina Geothermal Energy Area Kamojang by: Angga Dwi Putranto, 2017. Concentration at the biggest point an average of 8 hours for H ₂ S and NH ₃ was 228.79 µg / m ³ and 6.23 µg / m ³ , while for concentrations at the largest value points for 24 hours H ₂ S and NH ₃ were 76.26 µg / m ³ and 2, 07 µg / m ³ . All concentrations are below the standard 8 hours and 24 hours. Significat Nature of Impact: significant	HSI 21 is the primary impact of reducing secondary impacts of increased Morbidity Rate (HSI 27).
22.	Noise Enhancement (HSI 22)	Operation of GPP	the results of noise measurements on the project site plan meet the noise level standards. Whereas in settlements exceeding quality standards.	Impact: the impact of noise is up to a distance of 65 meters from the source beyond the standard noise level. Whereas at the location site at a distance of 70 meters it meets the standard noise level Significat Nature of Impact: significant.	HSI 22 is a primary impact.
23.	Increasing Job	Labor Reception	The unemployment	Impact Magnitude;	HSI 23 is a primary impact.

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Development Plan of 2 x 55 MW Hululais Geothermal Power Plant (GPP) in Lebong Selatan and Lebong Tengah Sub-districts, Lebong District, Bengkulu Province

No	HSI	Source of Impact	Early Environmental Condition	Impact Forecasting Results	Impact Evaluation Results
	Opportunities (HSI 23)	Operations	rate in Mubai Village is 21.80% and in Danau Liang Village is 3.69%, while in Taba Anyar Village the open unemployment rate is 5.69%, in the Tes Village it is 13.36% and Turan Lalang Village is 15.54%. The unemployment rate in Mubai Village, Tes Village and Turan Lalang Village is higher than the average unemployment rate in Lebong District (6.81%).	the planned number recruitment stage of 80 people. Significat Nature of Impact: significant.	
24.	Increased Business Opportunities (HSI 24)	Labor Reception Operations	There are shops, kiosks and restaurants or food stalls in the Tes Village, Taba Anyar, Mubai and Turan Lalang	Impact Magnitude: The existence of a labor will create business opportunities for the community such as stall businesses providing food and beverage needs for workers Significat Nature of Impact: significant	HSI 24 is a secondary impact of increasing employment opportunities (HSI 23).
25.	Increased Community Income (HSI 25)	Labor Reception Operations	Monthly family income ranges from Rp. 1.5 million to Rp. 3 million.	Impact Magnitude: The increase in income is a further impact of increasing work efficiency. Impact Magnitude in accordance with the magnitude of the regional minimum	HSI 25 is a secondary impact of the impact of increasing employment opportunities (HSI 23).

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No	HSI	Source of Impact	Early Environmental Condition	Impact Forecasting Results	Impact Evaluation Results
				wage (UMR) of Lebong District Significat Nature of Impact: significant	
26.	Changes in public perception (HSI 26)	Labor Reception Operations	74 respondents agreed; 4 respondents disagree; 2 respondents did not agree; 20 respondents did not answer.	Impact Magnitude; Community perception is a further impact of increasing employment opportunities Significat Nature of Impact: significant.	HSI 26 is a tertiary impact of increasing employment opportunities (HSI 23).
27.	Increased Morbidity Rates (HSI 27)	Operation of GPP	Based on data from the Puskesmas in Lebong Selatan Subdistrict in 2017 the type of disease based on air media that often occurs in the community is ARI, and Tonsillitis. The number of ARI cases was 280 cases (9.30%), and Tonsilitis 82 cases (2.72%). While the number of cases of ARI in Lebong Selatan Sub-district were 60 cases (10.53%) and Pneumonia were 70 cases (12.8%).	Impact Magnitude: it is estimated that 0.01 percent of the population in the study area is at risk of getting ARD-class diseases. Significat Nature of Impact: significant	HSI 27 as a secondary impact of decreasing air quality (HSI 21).

4.2. BEST ALTERNATIVE SELECTION

The planned construction of the Hululais GPP has determined the location, capacity, technology used, layout of the building, no other alternatives planned.

4.3. DIRECTION OF MANAGEMENT AND MONITORING OF ENVIRONMENT

Table 4-3 Referral Matrix for Environmental Management and Monitoring

No.	Managed and Monitored Environmental Impact	Components of the Impact Causing Activity	Environmental Management Direction	Environmental Monitoring Direction
Pre-construction Stage				
1.	Reduced productive land	Land acquisition	Communicate with the farming community to formulate CSR programs in agriculture and plantations	interviews of community respondents regarding the productivity of plantation businesses
2.	Changes in people's perceptions	<ul style="list-style-type: none"> ▪ Socialization ▪ Land acquisition 	Communicate with the community through various activities, both formal and informal	Respondent interviews regarding perceptions of planned activities
Construction Stage				
1.	Decreasing air quality	Mobilization of equipments and materials	Watering dusty roads during the dry season, especially those through settlements.	Ambient air sampling and laboratory analysis accredited by KAN
2.	Increased noise	<ul style="list-style-type: none"> ▪ Mobilization of equipments and materials ▪ Commissioning 	Carrying out daytime transportation activities between 05-20 hours so as not to disturb the rest of the population even days: Running an Induction Safety (HSE) program for drivers to understand environmental protection	Noise measurement with a sound level meter
3.	Decreasing the quality of	Land preparation	Emergency rain drains are created	Sampling of river water quality (TSS)

No.	Managed and Monitored Environmental Impact	Components of the Impact Causing Activity	Environmental Management Direction	Environmental Monitoring Direction
	surface water		around the location of the Land preparation, which at the end of the channel is made a settling hole (tub) to accommodate the mud carried by rain water so as not to enter the waters	and turbidity) and laboratory analysis accredited by KAN.
4.	Increased runoff and flood water speed	Land preparation	Emergency rain drains are created around the location of the Land preparation, which at the end of the channel is made a settling hole (tub) to allow rainwater to penetrate the ground.	Observation of the availability of emergency rain drains around the location of the Land preparation, which at the end of the channel is made a sedimentary pit (tub) which serves to give the opportunity for rainwater to seep into the ground.
5.	Erosion	Land preparation	Emergency rain drains are created around the location of the Land preparation, which at the end of the channel is made a settling hole (tub) to allow rainwater to penetrate the ground.	Whether or not there is available observation on the moving part of the soil retaining wall (DPT) disposal site or retaining wall or wire gabion to prevent erosion during the rainy season.
6.	Decline in aquatic biota	Land preparation	Emergency rain drains are created around the location of the Land preparation, which at the end of the channel is made a settling hole (tub) to accommodate the mud carried by rain water so as not to enter the waters	Sampling of aquatic biota (plankton & benthos) for laboratory analysis Diversity index value calculation: H'
7.	Increased employment opportunities	Recruitment of construction workers	Local labor recruitment priority.	Data collection on the number of workers from the local community
8.	Increased business opportunities	Recruitment of construction workers	Local labor recruitment priority.	Data collection on the number of local people who obtain business opportunities

No.	Managed and Monitored Environmental Impact	Components of the Impact Causing Activity	Environmental Management Direction	Environmental Monitoring Direction
9.	Increased community income	<ul style="list-style-type: none"> ▪ Recruitment of construction workers ▪ GPP construction 	Local labor recruitment priority.	Interview respondents regarding whether there is an increase in income by GPP construction activities.
10.	Changes in people's perceptions	<ul style="list-style-type: none"> ▪ Recruitment of construction workers ▪ GPP construction 	Local labor recruitment priority.	Interview respondents regarding perceptions of GPP construction activities
11.	Traffic congestion	Mobilization of equipments and materials	Coordination with the Bengkulu Province Transportation Office and the Lebong District Transportation Service	check the list of agenda items for equipment and material mobilization activities.
12.	Road damage	Mobilization of equipments and materials	Using an 8.3 ton truck or recommended by the Lebong District Transportation Service;	observation and inventory of road conditions
13.	Increased numbers in pain	Mobilization of equipments and materials	Management of primary impacts to prevent impacts on air quality	interviews of community respondents regarding the presence or absence of health impacts from GPP construction
Operation Stage				
1.	Decreasing air quality	Operation of GPP	Piping of non condensable gas (NCG) which is flowed into the cooling tower so that the gas is dissolved in condensate water which is then injected into the injection well.	Air emissions and ambient air sampling and laboratory analysis accredited by KAN.
2.	Increased noise	Operation of GPP	Regularly maintain the generator engine so that the noise generated is according to the standard	Noise measurement with a sound level meter.
3.	Increased employment opportunities	Operation labor recruitment	Give priority to recruitment from the local community.	Data collection on the number of workers from the local community

No.	Managed and Monitored Environmental Impact	Components of the Impact Causing Activity	Environmental Management Direction	Environmental Monitoring Direction
4.	Increased business opportunities	Operation labor recruitment	Give priority to recruitment from the local community.	Data collection on the number of local people who obtain business opportunities
5.	Increased community income	Operation labor recruitment	Give priority to recruitment from the local community.	Interview respondents regarding the presence or absence of increased income by GPP operational activities.
6.	Changes in people's perceptions	Operation labor recruitment	Give priority to recruitment from the local community.	Interview respondents regarding perceptions of GPP operational activities
7.	Increased numbers in pain	Operation labor recruitment	Management of primary impacts of decreased air quality.	interviews with community respondents regarding the presence or absence of health impacts from GPP operations

4.4. STATEMENT OF ENVIRONMENTAL FEASIBILITY

Consideration of environmental feasibility criteria:

Table4-4 Consideration of Environmental Feasibility

No	Environmental Feasibility Criteria	Consideration of Environmental Feasibility	Information
1	Conformity with the Regional Spatial Plan (RTRW)	Location suitability of the planned development of 2x55 MW Hululais GPP based on Lebong District Regulation No. 14 of 2012 concerning the 2012-2020 Lebong District Spatial Planning (RTRW), contained in the Lebong District Regional Secretariat Letter, Number 530.3 / 1884 / BAPPEDA / 2017 date 30 OCTober 2017 (Appendix 3). The overlay map of the planned location of activities with the Spatial Planning Spatial Pattern of Lebong District is presented in Appendix 4. Bengkulu Province Regional Regulation Number 02 of 2012 concerning the Regional Spatial Planning (RTRW) of Bengkulu Province in 2012-2032; Article 23 Paragraph (1) point (c) states: The Bengkulu Province energy network system consists of the development of a new Hululais Geothermal Power Plant (GPP).	Worthy
2	Policies in the field of protection and management of the environment and natural resources as regulated in legislation	Activity plans for following the policy in the field of protection and management of the environment and natural resources as stipulated in the laws and regulations.	Worthy
3	The former defense defense security	The activities plan does not conflict with the interests and defense of security.	Worthy
4	Careful forecast of quantities and Significant Nature of Impact	The results of careful forecasting of the magnitude and Significant Nature of Impact are listed in this ANDAL chapter III.	Worthy
5	Holistic evaluation results	The results of the holistic evaluation are listed in this ANDAL document chapter IV.	Worthy
6	The capacity of the initiator in overcoming the impact of significant negatives	The proponent has the ability to cope with significant negative impacts through technological, social and institutional approaches as stated in the RKL-RPL document.	Worthy
7	The plan of activities does not interfere with social values and community views	Initiators respect social values and the views of the community.	Worthy

HOLISTIC EVALUATION OF ENVIRONMENTAL IMPACTS

No	Environmental Feasibility Criteria	Consideration of Environmental Feasibility	Information
8	Plans for activities do not disturb ecological entities	The activity plan to not disturb ecological entities. Organizing activities to maintain the quality of ecological entities.	Worthy
9	The plan of activities does not cause interference with planned activities that already exist in the vicinity	The activity plan to not cause interference with planned activities that already exist in the vicinity. Environmental management will be carried out to protect the activities of surrounding communities from disturbing.	Worthy
10	Not beyond the carrying capacity and capacity of the environment	The activity plan to not beyond the carrying capacity and capacity of the environment. Environmental management will be carried out to maintain the carrying capacity and capacity of the environment.	Worthy

On the basis of the foregoing, the activity plan meets environmental feasibility.

BIBLIOGRAPHY

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APPENDIXES

APPENDIX 1.
TERM OF REFERENCE APPROVAL



**PEMERINTAH KABUPATEN LEBONG
DINAS LINGKUNGAN HIDUP**

Jln Raya Komplek Perkantoran Dua Jalur Telp. (0738) 21617
Email : blhkp_lebong@yahoo.com
TUBEI

Kode Pos 39164

**KEPUTUSAN KEPALA DINAS LINGKUNGAN HIDUP
KABUPATEN LEBONG PROVINSI BENGKULU**

SELAKU

**KETUA KOMISI PENILAI
ANALISIS MENGENAI DAMPAK LINGKUNGAN HIDUP
KABUPATEN LEBONG**

NOMOR : 660.1/ 09 /DLH / 2018

TENTANG

**PERSETUJUAN KERANGKA ACUAN ANALISIS DAMPAK LINGKUNGAN HIDUP
(KA-ANDAL) RENCANA KEGIATAN PEMBANGUNAN PEMBANGKIT LISTRIK TENAGA
PANAS BUMI (PLTP) HULULAIS (2 X 55 MW)
DI KECAMATAN LEBONG SELATAN DAN KECAMATAN LEBONG TENGAH
KABUPATEN LEBONG PROVINSI BENGKULU**

**KETUA KOMISI PENILAI ANALISIS MENGENAI DAMPAK LINGKUNGAN HIDUP
KABUPATEN LEBONG**

- Menimbang :
- a. bahwa usaha dan/atau rencana kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 X 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu merupakan usaha dan/atau kegiatan yang wajib dilengkapi dengan studi Analisis Mengenai Dampak Lingkungan Hidup;
 - b. bahwa Kerangka Acuan Analisis Dampak Lingkungan Hidup (KA-ANDAL) Rencana Kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 X 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu sebagai salah satu bagian dari studi Analisis Mengenai Dampak Lingkungan Hidup wajib mendapatkan Keputusan Kesepakatan berdasarkan hasil penilaian Komisi Penilai AMDAL kabupaten Lebong;
 - c. bahwa mengingat hal seperti pada huruf a dan b di atas, perlu ditetapkan Keputusan Kepala Dinas Lingkungan Hidup Kabupaten Lebong tentang Persetujuan Kerangka Acuan Analisis Dampak

Lingkungan Hidup (KA-ANDAL) Rencana Kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 X 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu oleh Tim Teknis Komisi Penilai AMDAL Kabupaten Lebong;

- Mengingat :
1. Undang-Undang Nomor 9 Tahun 1967 tentang Pembentukan Provinsi Bengkulu (Lembaran Negara Republik Indonesia Tahun 1967 Nomor 19, Tambahan Lembaran Negara Republik Indonesia Nomor 2828);
 2. Undang-Undang Republik Indonesia Nomor 5 Tahun 1990 tentang Konservasi Sumber Daya Alam Hayati Dan Ekosistemnya (Lembaran Negara Republik Indonesia Tahun 1990 Nomor 49, Tambahan Lembaran Negara Republik Indonesia Nomor 3419);
 3. Undang-Undang Nomor 39 Tahun 2003 tentang Pembentukan Kabupaten Lebong dan Kabupaten Kepahiang di Provinsi Bengkulu (Lembaran Negara Republik Indonesia Tahun 2003 Nomor 154, Tambahan Lembaran Negara Republik Indonesia Nomor 4349);
 4. Undang-Undang Republik Indonesia Nomor 26 Tahun 2007 tentang Penataan Ruang (Lembaran Negara Republik Indonesia Tahun 2007 Nomor 68, Tambahan Lembaran Negara Republik Indonesia Nomor 4725);
 5. Undang - Undang Republik Indonesia Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup (Lembaran Negara Republik Indonesia Tahun 2009 Nomor 140, Tambahan Lembaran Negara Republik Indonesia Nomor 5059);
 6. Undang - Undang Republik Indonesia Nomor 23 Tahun 2014 tentang Pemerintahan Daerah (Lembaran Negara Republik Indonesia Tahun 2014 Nomor 244, Tambahan Lembaran Negara Republik Indonesia Nomor 5587) sebagaimana telah diubah dengan Undang - Undang Republik Indonesia Nomor 2 Tahun 2015 tentang Penetapan Peraturan Pemerintah Pengganti Undang - Undang Nomor 2 Tahun 2014 Tentang Perubahan Atas Undang - Undang Nomor 23 Tahun 2014 Tentang Pemerintahan Daerah Menjadi Undang - Undang (Lembaran Negara Republik Indonesia Tahun 2015 Nomor 24, Tambahan Lembaran Negara Republik Indonesia Nomor 5657);
 7. Peraturan Pemerintah Republik Indonesia Nomor 27 Tahun 1999 tentang Analisis Mengenai Dampak

Lingkungan (Lembaran Negara Republik Indonesia Tahun 1999 Nomor 59; Tambahan Lembaran Negara Republik Indonesia Nomor 3838);

8. Peraturan Pemerintah Republik Indonesia Nomor 38 Tahun 2007 tentang Pembagian Urusan Pemerintahan Antara Pemerintah, Pemerintahan Daerah Provinsi, Dan Pemerintahan Daerah Kabupaten/Kota (Lembaran Negara Tahun 2007 Nomor 82, Tambahan Lembaran Negara Republik Indonesia Nomor 4738);
9. Peraturan Pemerintah Republik Indonesia Nomor 27 Tahun 2012 tentang Izin Lingkungan (Lembaran Negara Republik Indonesia Tahun 2012 Nomor 48, Tambahan Lembaran Negara Republik Indonesia Nomor 5285);
10. Peraturan Menteri Negara Lingkungan Hidup Nomor 05 Tahun 2012 tentang Jenis Rencana Usaha Dan/Atau Kegiatan Yang Wajib Memiliki Analisis Mengenai Dampak Lingkungan Hidup;
11. Peraturan Menteri Negara Lingkungan Hidup Nomor 16 Tahun 2012 tentang Pedoman Penyusunan Dokumen Lingkungan Hidup;
12. Peraturan Menteri Negara Lingkungan Hidup Nomor 17 Tahun 2012 tentang Pedoman Keterlibatan Masyarakat Dalam Proses Analisis Dampak Lingkungan Hidup dan Izin Lingkungan;
13. Peraturan Menteri Negara Lingkungan Hidup Nomor 08 Tahun 2013 tentang Tata Laksana Penilaian Dan Pemeriksaan Dokumen Lingkungan Hidup Serta Penerbitan Izin Lingkungan;
14. Peraturan Daerah Nomor 20 Tahun 2016 tentang Pembentukan dan Susunan Perangkat Daerah Kabupaten Lebong;

Memperhatikan :

Hasil Rapat Tim Teknis Komisi Penilai AMDAL Kabupaten Lebong di Ruang Pertemuan Hotel Pangeran Kabupaten Lebong pada tanggal 03 Maret 2018 Mengenai Penilaian Kerangka Acuan (KA-Andal) Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 X 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah, Kabupaten Lebong, Provinsi Bengkulu oleh PT. PLN (PERSERO) UIP Pembangkit Sumatera;

MEMUTUSKAN

Menetapkan :

KESATU : Menyetujui Kerangka Acuan Rencana Kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 X 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu.

KEDUA : Kerangka Acuan (KA) sebagaimana dimaksud dalam diktum KESATU menjadi dasar penyusunan Analisis Dampak Lingkungan Hidup (ANDAL) dan Rencana Pengelolaan Lingkungan Hidup - Rencana Pemantauan Lingkungan Hidup (RKL - RPL) Rencana Kegiatan Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 X 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu.

KETIGA Keputusan ini mulai berlaku pada tanggal ditetapkan

Ditetapkan di : Tubei
Pada tanggal : 19 Maret 2018

KEPALA DINAS LINGKUNGAN HIDUP
KABUPATEN LEBONG

selaku

Ketua Komisi Penilai

Analisis Mengenai Dampak Lingkungan Hidup
Kabupaten Lebong



ZAMHAR, SH, MH
Pembina TK. I

NIP. 19720808 199803 1 006

SALINAN : Keputusan ini disampaikan kepada Yth,

1. Bupati Lebong (sebagai laporan);
2. PT. PLN (PERSERO) UIP Pembangkit Sumatera
3. Arsip.

APPENDIX 2.
SPATIAL COMPLIANCE CERTIFICATE



PEMERINTAH KABUPATEN LEBONG
SEKRETARIAT DAERAH

Jalan Raya Tubei, No. 1 Lebong

Tubei, 30 Oktober 2017

Nomor : 530.3/1889/Bappeda/2017
Sifat : Penting
Lamp : 1 (satu) berkas
Perihal : Surat Keterangan Kesesuaian Tata Ruang

Kepada
Yth. General Manager PT. PLN
(Persero) UIP Pembangunan
Pembangkit Sumatera

di -
Tempat

Menanggapi Surat dari PT. PLN (Persero) Nomor 0832/KON.01.03/UIP KITSUM/2017 tanggal 12 September 2017 perihal Permohonan Rekomendasi Kesesuaian RTRW PLTP Hululais 2 x 55 MW dan Surat Nomor: 050/362/BAPPEDA/2015 tanggal 28 September 2015 perihal Surat Keterangan Kesesuaian Tata Ruang, dengan maksud melakukan pemindahan lokasi rencana pembangunan listrik PLTP Hululais 2 x 55 MW. Sehubungan dengan hal tersebut dapat kami jelaskan sebagai berikut:

1. Lokasi pemindahan berada di titik koordinat 3°14'01.45"S dan 102°16'44.24"E (peta terlampir)
2. Luas Lahan ± 15 Ha berada di Desa Mubai Kecamatan Lebong Selatan

Berdasarkan rencana pola ruang RTRW Kabupaten Lebong tidak masuk dalam kawasan lindung, melalui Badan Koordinasi Penataan Ruang Daerah (BKPRD) menerangkan bahwa Rencana Pembangunan PLTP Hululais 2 x 55 MW **tidak bertentangan** dengan Peraturan Daerah Kabupaten Lebong Nomor 14 Tahun 2012 tentang Rencana Tata Ruang Wilayah (RTRW) Kabupaten Lebong Tahun 2012-2032.

Demikian kami sampaikan untuk dipergunakan sebagaimana mestinya.

Sekretaris Daerah
selaku
Ketua BKPRD Kabupaten Lebong

H. MIRWAN EFFENDI, SE., M.Si

Pembina Utama Madya IV/d NIP. 19580930.198103.1.004

Tembusan, disampaikan kepada yth :

Bapak Bupati Lebong (sebagai laporan)

100' 10' 00"

100' 10' 00"



S.01.E

S.01.E

PETA
RENCANA JARINGAN ENERGI

0 0,04 0,08 0,16 0,24 Km



1:1,500

LEGENDA

Pembangunan PLP 1500/2x55 2x55 MW

DIBAWAH
 ANGGOTA SEKRETARIAT BKPRD

SALVATORIO WARSINI, ST
 STAF INFRASTRUKTUR

KETUA POKOK PENGANTARAAN BKPRD

RENGNI ANGGARA, SE
 KABID INFRASTRUKTUR

MENOR
 KETUA BKPRD

MIRWAN EFFENDI, SE, M.Si
 SEKRETARIS DAERAH

Sumber : Pengajuan P1 PLN
 Survei BKPRD tgl 20-06-2017

**PERUBAHAN RENCANA LOKASI PEMBANGUNAN
 PLTP HULULAIS KAPASITAS 2x55 MW**

PT. PLN (PERSERO) UNIT INDUK PEMBANGUNAN PEMBANGKIT SUMATERA



APPENDIX 3.
CERTIFICATE OF LOCATION SUITABILITY
WITH PIPPIB



PEMERINTAH PROVINSI BENGKULU
DINAS LINGKUNGAN HIDUP DAN KEHUTANAN

Jl. Pembangunan Padang Harapan Telp (0736) 20091-22856 Fax (0736) 22856
BENGKULU

Bengkulu, 26 September 2017

Nomor : 522 / 1609 / W-1
Lampiran : 1 (satu) lembar Peta
Hal : Surat Keterangan Kesesuaian Lokasi
dengan Peta Indikatif Penundaan
Pemberian Izin Baru (PIPPIB)

Kepada
Yth. General Manager Unit Induk
Pembangkit Sumatera
di-
Medan

Sehubungan dengan surat Saudara Nomor : 0831/KON.01.06/UIP KITSUM/2017 tanggal 12 September 2017, Perihal PLTP Hululais 2 x 55 MW Permohonan Surat Kesesuaian Lokasi dengan PIPPIB, dengan ini kami sampaikan kepada Saudara hal-hal sebagai berikut:

1. Dasar penundaan pemberian izin baru sesuai Instruksi Presiden Nomor 6 Tahun 2017 tanggal 17 Juli 2017 tentang Penunudaan dan Penyempurnaan Tata Kelola Pemberian Izin Baru Hutan Alam Primer dan Lahan Gambut sebagai kelanjutan dari Instruksi Presiden Nomor 8 Tahun 2015 tanggal 13 Mei 2015, ditindaklanjuti oleh Menteri Lingkungan Hidup dan Kehutanan dengan menetapkan Peta Indikatif Penundaan Pemberian Izin Baru setiap 6 (enam) bulan sekali.
2. Peta Indikatif Penundaan Pemberian Izin Baru tersebut ditetapkan dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan RI Nomor : SK.351/MenLHK/SETJEN/PLA.1/7/2017 Tanggal 31 Juli 2017 tentang Penetapan Peta Indikatif Penundaan Pemberian Izin Baru Pemanfaatan Hutan, Penggunaan Kawasan Hutan dan Perubahan Peruntukan Kawasan Hutan dan Areal Penggunaan Lain (Revisi XII).
3. Hasil Ploting Koordinat Lokasi Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais PT. PLN (Persero) Unit Induk Pembangunan I Kabupaten Lebong dengan Peta Indikatif Penundaan Pemberian Izin Baru Pemanfaatan Hutan, Penggunaan Kawasan Hutan dan Perubahan Peruntukan Kawasan Hutan dan Areal Penggunaan Lain (Revisi XII) lembar 0912 berdasarkan Keputusan Menteri Lingkungan Hidup dan Kehutanan RI Nomor : SK.351/MenLHK/SETJEN/PLA.1/7/2017 Tanggal 31 Juli 2017, **Di Luar Peta Indikatif Penundaan Pemberian Izin Baru.**
4. Terlampir Peta Ploting Koordinat Lokasi Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) An. PT. PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera dengan Peta Indikatif Penundaan Pemberian Izin Baru Revisi XII di Kabupaten Lebong Provinsi Bengkulu dan merupakan bagian yang tidak terpisahkan dengan surat ini.
5. Surat keterangan ini hanya sebatas penjelasan atas Lokasi Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais PT. PLN (Persero) Unit Induk Pembangunan I Kabupaten Lebong berkaitan dengan Peta Indikatif Penundaan Pemberian Izin Baru Revisi XII di Provinsi Bengkulu, bukan merupakan izin untuk kegiatan lainnya.

Demikian disampaikan, atas perhatiannya diucapkan terimakasih.



KEPALA DINAS,

Ir. AGUS PRIAMBUDI, M.Sc

NIP. 19610829 198703 1 001

Tembusan disampaikan kepada yth. :
Gubernur Bengkulu (sebagai laporan).

PETA PLOTTING KOORDINAT
LOKASI PEMBANGUNAN PEMBANGKIT LISTRIK TENAGA PANAS BUMI (PLTP) HULULAIS AN. PT. PLN (PERSERO) UNIT INDUK PEMBANGUNAN PEMBANGKIT SUMATERA DENGAN PETA INDIKATIF PENUNDAAN PEMBERIAN IZIN BARU REVISI XII DI KABUPATEN LEBONG PROVINSI BENGKULU

Skala 1 : 50.000



Lampiran Surat Kepala Dinas LH dan Kehutanan Provinsi Bengkulu
 Nomor : 522 / 1609 / N.1
 Tanggal : 26 September 2017

Kawasan Hutan dan PIPPIB XII :

- Kawasan Suaka Alam / Kawasan Pelestarian Alam (KSA/KPA)
- Kawasan Hutan Lindung (HL)
- Lokasi Pembangunan PLTP
- Areal Peruntukan Lain
- Desa

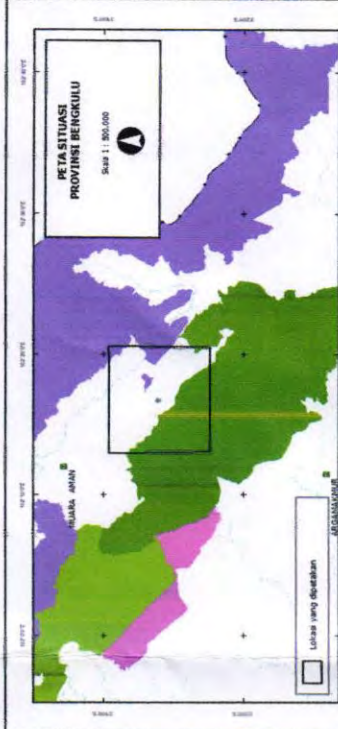
Legenda :

- Indikator Penundaan Pemberian Izin Baru
- Jalan / Jalan Lain
- Sungai

Coordinate System: GCS WGS 1984
 Datum: WGS 1984
 Units: Degree

Dasar :
 1. Keputusan Menteri Lingkungan Hidup dan Kehutanan No. SK.351/MenLH/SETJEN/PLA.1/72017 tanggal 31 Juli 2017.
 2. Surat General Manager PT. PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera Nomor : 0831/KON.01.06/UP KITSUM/2017 tanggal 12 September 2017.

Sumber Peta :
 1. Peta Rupa Bumi Indonesia Skala 1 : 50.000 Lembar 0912-41, 0912-42, 0912-43 dan 0912-44.
 2. Peta Kawasan Hutan dan Wilayah Tertentu yang Dibentuk sebagai Kawasan Hutan di Provinsi Bengkulu Skala 1 : 250.000 Lembar 0912 (Lampiran Kepmenhut No. SK.784/Menhut-1/2012 tgl. 27-12-2012)
 3. Peta Indikator Penundaan Pemberian Izin Baru Pemukiman Hutan, Penggunaan Kawasan Hutan dan Perubahan Peruntukan Kawasan Hutan dan Areal Penggunaan Lain (Revisi XII) Lembar 0912 (Keputusan Menteri Lingkungan Hidup dan Kehutanan No. SK.351/MenLH/SETJEN/PLA.1/72017 tanggal 31 Juli 2017)
 4. Tindakan pencegahan PLTP (Lampiran Surat General Manager 0831/KON.01.06/UP KITSUM/2017 tanggal 12 September 2017)



Dipetakan oleh : ASEP YUHANA, SP

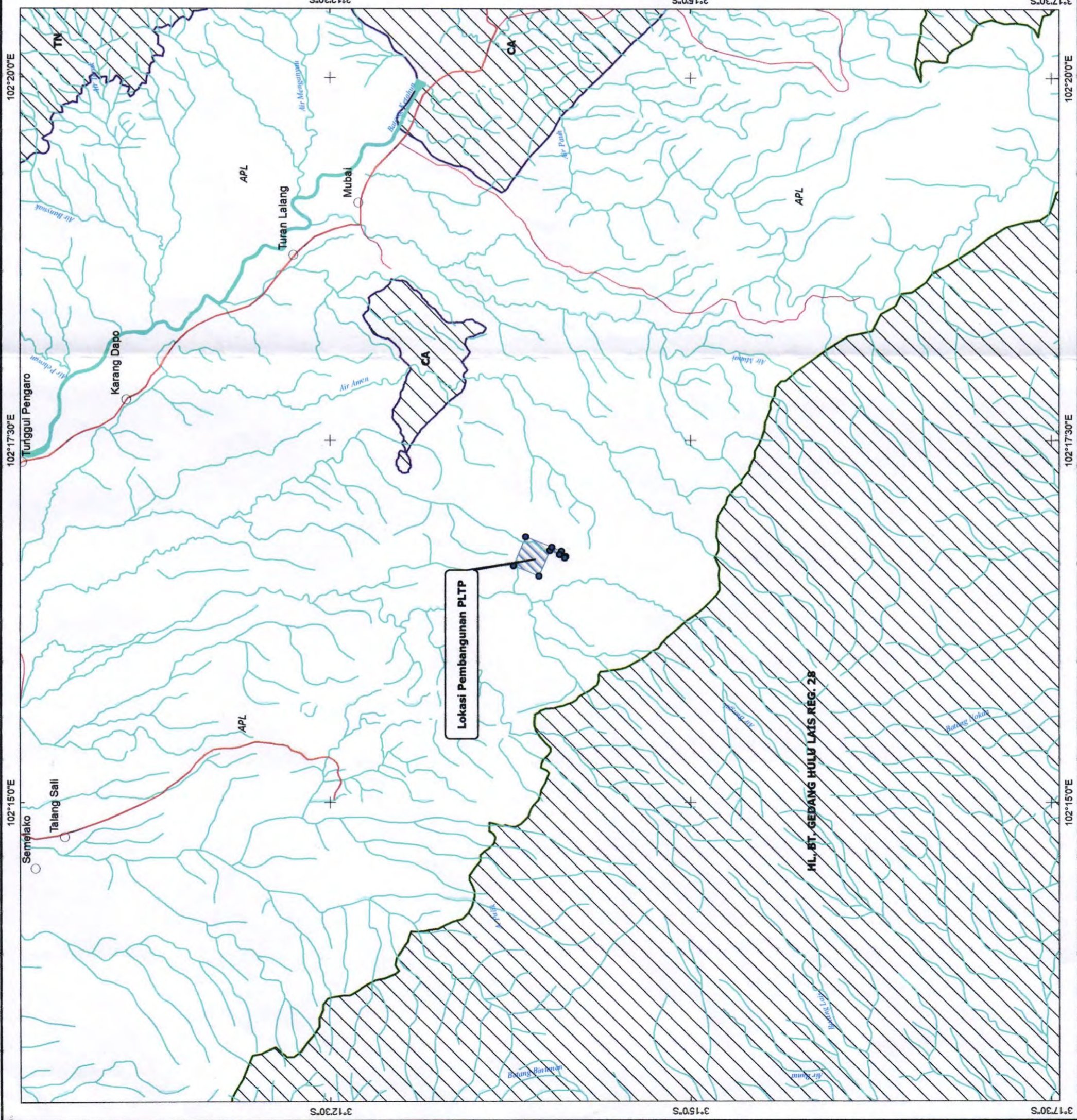
Diperiksa secara kartografis oleh :
 KEPALA SEKSI PERENCANAAN DAN TATA HUTAN

(Signature)

RISTO, SE
 NIP-19630527 198802 1 001

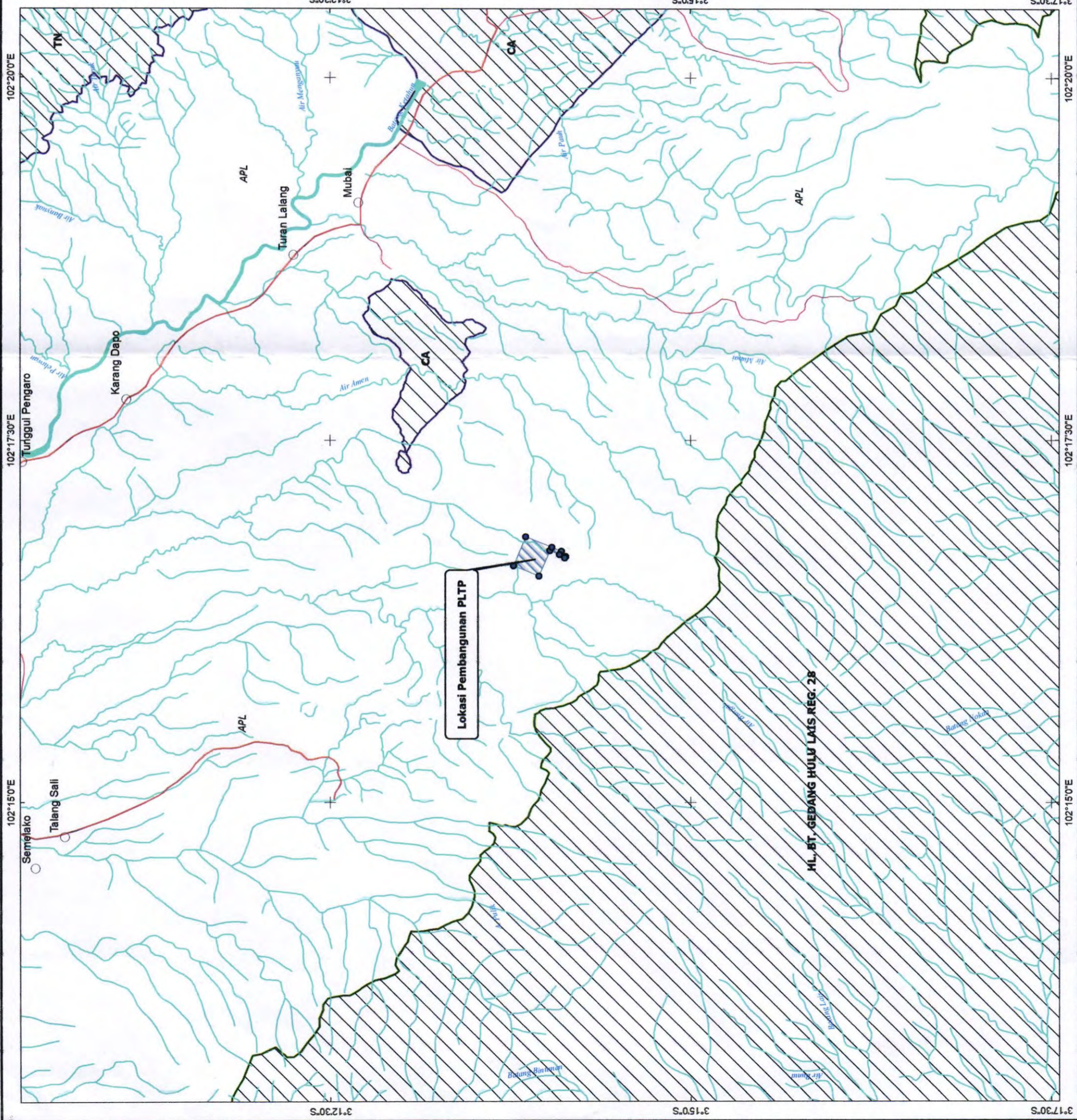
Mengetahui :
 KEPALA DINAS LH DAN KEHUTANAN
 PROVINSI BENGKULU,

(Signature)
 DAAS LINGKUNGAN HIDUP
 DAN TRAGUS PRATAM BUDI, M.Sc
 NIP-19610828 198703 1 001



Lokasi Pembangunan PLTP

HL, BT, GEDANG HULU LAMIS REG. 28



APPENDIX 4.
DEED OF ESTABLISHMENT OF THE
COMPANY



LENNY JANIS ISHAK, SH

NOTARIS KOTA ADMINISTRASI JAKARTA SELATAN

SK MENTERI KEHAKIMAN DAN HAK ASASI MANUSIA
REPUBLIK INDONESIA

Tgl. 23 November 2001 No. C-527. HT.03.02-Th.2001

Jl. Hang Lekir IX No. 1, Jakarta 12120
Telp. : (62-21) 722 1077, 723 0749, Fax. : (62-21) 723 3855

S A L I N A N

.....
PERNYATAAN KEPUTUSAN MENTERI BADAN USAHA MILIK
Akta : NEGARA SELAKU RAPAT UMUM PEMEGANG SAHAM PERUSAHAAN
.....
.....
.....
Tanggal : 22 FEBRUARI 2016
.....
Nomor : 12
.....

PERNYATAAN KEPUTUSAN MENTERI
BADAN USAHA MILIK NEGARA
SELAKU RAPAT UMUM PEMEGANG SAHAM
PERUSAHAAN PERSEROAN (PERSERO)
PT PERUSAHAAN LISTRIK NEGARA

Nomor : 12

-Pada hari ini, Senin, tanggal 22-02-2016 (duapuluh-
dua Februari duaribu enambelas), pukul 11.00-----
(sebelas) Waktu Indonesia Barat.-----

-Hadir di hadapan saya, LENNY JANIS ISHAK, Sarjana--
Hukum, Notaris berkedudukan di Kota Administrasi----
Jakarta Selatan, dengan wilayah jabatan seluruh----
Propinsi Daerah Khusus Ibukota Jakarta, dengan-----
dihadiri oleh saksi-saksi yang saya, Notaris, kenal-
dan akan disebutkan dalam akhir akta ini :-----

-Tuan SOFYAN BASIR, Direktur Utama PT PLN (Persero),
lahir di Bogor, pada tanggal 02-05-1958 (dua Mei---
seribu sembilanratus limapuluh delapan), bertempat-
tinggal di Jakarta, Jalan Taman Bendungan Jati-----
Luhur nomor 3, Rukun Tetangga 010, Rukun Warga 002,
Kelurahan Bendungan Hilir, Kecamatan Tanah Abang,--
Jakarta Pusat, pemegang Kartu Tanda Penduduk dengan
Nomor Induk Kependudukan 3173050205580008, Warga---
Negara Indonesia;-----

-menurut keterangannya dalam hal ini bertindak-----
dalam jabatannya tersebut, karenanya sah mewakili-
Direksi atas kekuatan kuasa yang diperoleh dari---
Menteri Badan Usaha Milik Negara selaku Rapat Umum
Pemegang Saham Perusahaan Perseroan (Persero)-----
PT Perusahaan Listrik Negara disingkat PT PLN-----



(Persero) sebagaimana akan disebut di bawah ini.---

-Penghadap telah saya, Notaris, kenal.-----

-Penghadap menerangkan terlebih dahulu sebagai-----

berikut :-----

-bahwa Menteri Badan Usaha Milik Negara selaku Rapat

Umum Pemegang Saham Perusahaan Perseroan (Persero)-

PT Perusahaan Listrik Negara telah mengambil-----

keputusan sebagaimana ternyata dari Surat Menteri---

Badan Usaha Milik Negara selaku Rapat Umum Pemegang

Saham Perusahaan Perseroan (Persero) PT Perusahaan-

Listrik Negara tertanggal 25-01-2016 (duapuluh lima

Januari duaribu enambelas) nomor S-82/MBU/01/2016---

perihal Penambahan Modal Dasar dan Modal Disetor---

serta Perubahan Anggaran Dasar Perusahaan Perseroan

(Persero) PT Perusahaan Listrik Negara, yang-----

aslinya diperlihatkan kepada saya, Notaris, dan---

copie collationeennya dilekatkan pada minuta akta---

ini (untuk selanjutnya disebut "Keputusan");-----

-bahwa Anggaran Dasar Perseroan dan perubahan-----

perubahannya telah diumumkan berturut-turut dalam---

Berita Negara Republik Indonesia :-----

-tertanggal 13-09-1994 (tigabelas September seribu

sembilanratus sembilanpuluh empat) nomor 73,-----

Tambahan nomor 6731;-----

-tertanggal 12-05-1998 (duabelas Mei seribu-----

sembilanratus sembilanpuluh delapan) nomor 38,---

Tambahan nomor 2545;-----

-tertanggal 23-04-2002 (duapuluh tiga April duarib

dua) nomor 33, Tambahan nomor 289;-----

-tertanggal 18-05-2007 (delapanbelas Mei duaribu--

(tujuh) nomor 40, Tambahan nomor 4866;-----
-tertanggal 14-11-2008 (empatbelas November duaribu
delapan) nomor 92, Tambahan nomor 23523;-----
-tertanggal 14-08-2009 (empatbelas Agustus duaribu-
sembilan) nomor 65, Tambahan nomor 664;-----
-tertanggal 17-09-2013 (tujuhbelas September-----
duaribu tigabelas) nomor 75, Tambahan nomor 1966/L;
Anggaran Dasar tersebut kemudian diubah dengan :---
-akta tertanggal 20-01-2015 (duapuluh Januari-----
duaribu limabelas) nomor 09, dibuat di hadapan----
saya, Notaris, yang pemberitahuannya telah-----
diterima dan dicatat dalam database Sistem-----
Administrasi Badan Hukum Kementerian Hukum Dan----
Hak Asasi Manusia Republik Indonesia' sesuai-----
surat tertanggal 23-01-2015 (duapuluh tiga-----
Januari duaribu limabelas) nomor-----
AHU-0004386.AH.01.03.Tahun 2015;-----
-sedangkan mengenai susunan Direksi Perseroan-----
terakhir sebagaimana dimuat dalam akta-----
tertanggal 24-11-2015 (duapuluh empat November---
duaribu limabelas) nomor 44, dibuat di hadapan---
saya, Notaris, yang pemberitahuannya telah-----
diterima dan dicatat dalam database Sistem-----
Administrasi Badan Hukum Kementerian Hukum Dan---
Hak Asasi Manusia Republik Indonesia sesuai surat
tertanggal 25-11-2015 (duapuluh lima November----
duaribu limabelas) nomor AHU-AH.01.03-0982787----
dan susunan Dewan Komisaris Perseroan terakhir---
sebagaimana dimuat dalam akta tertanggal-----
07-12-2015 (tujuh Desember duaribu limabelas)----

nomor 07, dibuat di hadapan saya, Notaris, yang pemberitahuannya telah diterima dan dicatat dalam database Sistem Administrasi Badan Hukum Kementerian Hukum Dan Hak Asasi Manusia Republik Indonesia sesuai surat tertanggal 21-12-2015 (duapuluh satu Desember duaribu limabelas) nomor AHU-AH.01.03-0989691;

-bahwa dalam Keputusan tersebut diwakili oleh 46.197.380 (empatpuluh enam juta seratus sembilanpuluh tujuh ribu tigaratus delapanpuluh) saham yang merupakan seluruh saham yang telah dikeluarkan oleh Perseroan sampai dengan hari pengambilan Keputusan tersebut;

-bahwa dengan demikian berdasarkan pasal 25 ayat 9 Anggaran Dasar Perseroan, Keputusan tersebut mempunyai kekuatan yang sama dengan keputusan yang diambil secara sah dalam Rapat Umum Pemegang Saham yaitu sah dan mengikat mengenai segala hal yang diputuskan;

-bahwa dalam Keputusan tersebut, Direksi Perseroan telah diberikan kuasa dengan hak substitusi untuk menyatakan segala sesuatu yang diputuskan dalam Keputusan tersebut dalam bentuk otentik di hadapan Notaris atau pejabat yang berwenang dan melakukan penyesuaian atau perbaikan-perbaikan yang diperlukan apabila dipersyaratkan oleh pihak yang berwenang untuk memperoleh pengesahan atas perubahan Anggaran Dasar Perseroan;

-Berdasarkan keterangan tersebut di atas, penghadap dalam kedudukannya sebagaimana tersebut, menyatakan

dalam akta ini Keputusan yang telah diambil adalah--
sebagai berikut :-----

1. Menyetujui peningkatan Modal Dasar Perseroan yang semula sebesar Rp. 63.000.000.000.000,00-----
(enampuluh tiga triliun rupiah), menjadi sebesar Rp. 204.000.000.000.000,00 (duaratus empat-----
triliun rupiah).-----
2. Menyetujui pengeluaran/penempatan saham yang-----
masih dalam simpanan (portepel) sebanyak-----
9.468.627 (sembilan juta empatratus enampuluh----
delapan ribu enamratus duapuluh tujuh) saham,----
masing-masing saham dengan nilai nominal sebesar Rp. 1.000.000,00 (satu juta rupiah) sehingga-----
seluruhnya seharga Rp. 9.468.627.000.000,00-----
(sembilan triliun empatratus enampuluh delapan---
miliar enamratus duapuluh tujuh juta rupiah) yang
seluruhnya diambil bagian oleh Negara Republik---
Indonesia.-----
3. Untuk memenuhi pengeluaran/penempatan saham yang-----
diambil bagian tersebut butir 2, menyetujui-----
penambahan modal Negara Republik Indonesia ke----
dalam saham Perseroan sebesar-----
Rp. 4.468.626.687.910,00 (empat triliun-----
empatratus enampuluh delapan miliar enamratus----
duapuluh enam juta enamratus delapanpuluh tujuh--
ribu sembilanratus sepuluh rupiah) berdasarkan---
Peraturan Pemerintah Nomor 42 Tahun 2015 tanggal-
23-06-2015 (duapuluh tiga Juni duaribu limabelas)
sebesar Rp. 5.000.000.000.000,00 (lima triliun---
rupiah) berdasarkan Peraturan Pemerintah Nomor---

125 Tahun 2015 tanggal 28-12-2015 (duapuluh-----
delapan Desember duaribu limabelas), dan sebesar-
Rp. 312.090,00 (tigaratus duabelas ribu-----
sembilanpuluh rupiah) yang berasal dari-----
kapitalisasi sebagian cadangan Perseroan-----
sebagaimana tercatat dalam Laporan Keuangan tahun
buku 2014 (duaribu empatbelas) yang telah diaudit
oleh Kantor Akuntan Publik (KAP) Tanudiredja,----
Wibisana & Rekan sebagaimana suratnya tertanggal-
27-02-2015 (duapuluh tujuh Februari duaribu-----
limabelas) nomor A150227014/DC2/HSB/I/2015.-----

4. Dengan adanya penambahan modal disetor tersebut,-
maka modal ditempatkan/disetor PT Perusahaan-----
Listrik Negara (Persero) yang semula sebesar-----
Rp. 46.197.380.000.000,00 (empatpuluh enam-----
triliun seratus sembilanpuluh tujuh miliar-----
tigaratus delapanpuluh juta rupiah) menjadi-----
sebesar Rp. 55.666.007.000.000,00 (limapuluh lima
triliun enamratus enampuluh enam miliar tujuh---
juta rupiah).-----

5. Menyetujui perubahan Pasal 4 ayat 1, ayat 2 dan--
ayat 3 Anggaran Dasar PT Perusahaan Listrik-----
Negara (Persero) untuk disesuaikan dengan-----
pengeluaran/penempatan saham yang masih dalam----
simpanan (portepel) dan penambahan modal disetor-
sebagaimana dimaksud pada angka 2, angka 3 dan---
angka 4, sehingga Pasal 4 ayat 1, ayat 2 dan----
ayat 3 menjadi berbunyi sebagai berikut :-----

-----M O D A L-----

-----Pasal 4-----

1. Modal dasar Perseroan ini ditetapkan sebesar--
Rp. 204.000.000.000.000,00 (duaratus empat---
triliun rupiah) terbagi atas 204.000.000-----
(duaratus empat juta) saham, masing-masing----
saham dengan nilai nominal Rp. 1.000.000,00---
(satu juta rupiah).-----
2. Dari modal dasar tersebut telah ditempatkan---
dan diambil bagian oleh Negara Republik-----
Indonesia sebanyak 55.666.007 (limapuluh lima-
juta enamratus enampuluh enam ribu tujuh)-----
saham atau seluruhnya sebesar-----
Rp. 55.666.007.000.000,00 (limapuluh lima-----
triliun enamratus enampuluh enam milyar tujuh-
juta rupiah).-----
3. 100% (seratus) persen dari nilai nominal-----
setiap saham yang ditempatkan tersebut di-----
atas, atau seluruhnya berjumlah sebesar-----
Rp. 55.666.007.000.000,00 (limapuluh lima-----
triliun enamratus enampuluh enam miliar tujuh-
juta rupiah) telah disetor penuh oleh Negara--
Republik Indonesia (Pemegang Saham) dengan----
cara sebagai berikut :-----
 - a. sebesar Rp. 46.197.380.000.000,00-----
(empatpuluh enam triliun seratus-----
sembilanpuluh tujuh miliar tigaratus-----
delapanpuluh juta rupiah) merupakan setoran
modal lama sesuai dengan akta tertanggal---
05-08-2011 (lima Agustus duaribu sebelas)--
nomor 05, dibuat di hadapan saya, Notaris--
dan telah memperoleh persetujuan dari-----

Menteri Hukum Dan Hak Asasi Manusia-----
Republik Indonesia tertanggal 19-08-2011---
(sembilanbelas Agustus duaribu sebelas)---
nomor AHU-AH.01.10-26937;-----

b. sebesar Rp. 4.468.626.687.910,00 (empat---
triliun empatratus enampuluh delapan miliar
enamratus duapuluh enam juta enamratus---
delapanpuluh tujuh ribu sembilanratus---
sepuluh rupiah) yang berasal dari-----
penambahan modal Negara Republik Indonesia-
ke dalam saham Perseroan berdasarkan-----
Peraturan Pemerintah Nomor 42 Tahun 2015---
tanggal 23-06-2015 (duapuluh tiga Juni-----
duaribu limabelas).-----

c. sebesar Rp. 5.000.000.000.000,00 (lima---
triliun rupiah) yang berasal dari-----
penambahan modal Negara Republik Indonesia-
ke dalam saham Perseroan berdasarkan-----
Peraturan Pemerintah Nomor 125 Tahun 2015--
tanggal 28-12-2015 (duapuluh delapan-----
Desember duaribu limabelas).-----

d. sebesar Rp. 312.090,00 (tigaratus duabelas-
ribu sembilanpuluh rupiah) yang berasal---
dari kapitalisasi sebagian cadangan-----
Perseroan sebagaimana tercatat dalam-----
Laporan Keuangan tahun buku 2014 (duaribu--
empatbelas) yang telah diaudit oleh Kantor-
Akuntan Publik (KAP) Tanudiredja,-----
Wibisana & Rekan sebagaimana suratnya---
tertanggal 27-02-2015 (duapuluh tujuh-----

Februari duaribu limabelas) nomor-----
A150227014/DC2/HSH/I/2015.-----

6. Memberi kuasa dengan hak substitusi kepada-----

Direksi PT Perusahaan Listrik Negara (Persero)---
untuk menyatakan segala sesuatu yang diputuskan--
dalam keputusan ini dalam bentuk otentik di-----
hadapan Notaris atau pejabat yang berwenang dan--
melakukan penyesuaian atau perbaikan-perbaikan---"
yang diperlukan apabila dipersyaratkan oleh pihak
yang berwenang untuk memperoleh pengesahan atas--
perubahan anggaran dasar Perseroan dimaksud.-----

7. Direksi PT Perusahaan Listrik Negara (Persero)---

wajib melaporkan secara tertulis hasil-----
pelaksanaan keputusan tersebut kepada Pemegang---
Saham Perseroan.-----

-Selanjutnya penghadap dalam kedudukannya-----
sebagaimana tersebut dengan ini menerangkan dan-----
menyatakan bahwa sehubungan dengan Keputusan-----
tersebut, maka Pasal 4 Anggaran Dasar Perseroan-----
disusun kembali sehingga untuk selanjutnya ketentuan
Pasal 4 Anggaran Dasar Perseroan diubah menjadi-----
berbunyi sebagai berikut :-----

-----M O D A L-----

-----Pasal 4-----

1. Modal dasar Perseroan ini ditetapkan sebesar-----

Rp. 204.000.000.000.000,00 (duaratus empat triliun
rupiah) terbagi atas 204.000.000 (duaratus empat-
juta) saham, masing-masing saham dengan nilai----
nominal Rp. 1.000.000,00 (satu juta rupiah).-----

2. Dari modal dasar tersebut telah ditempatkan dan--

diambil bagian oleh Negara Republik Indonesia-----
sebanyak 55.666.007 (limapuluh lima juta-----
enamratus enampuluh enam ribu tujuh) saham atau--
seluruhnya sebesar Rp. 55.666.007.000.000,00-----
(limapuluh lima triliun enamratus enampuluh enam--
milyar tujuh juta rupiah) dengan rincian serta---
nilai nominal saham yang disebutkan pada bagian--
akhir sebelum penutup akta.-----

3. Saham-saham yang masih dalam simpanan akan-----
dikeluarkan menurut keperluan Perseroan dengan---
persetujuan Rapat Umum Pemegang Saham dengan-----
syarat dan harga sebagaimana akan ditetapkan-----
oleh Direksi dan Dewan Komisaris, dengan-----
ketentuan harga tersebut tidak di bawah pari.-----

4. Seluruh saham yang dikeluarkan untuk penambahan--
modal harus terlebih dahulu ditawarkan kepada----
setiap Pemegang Saham seimbang dengan pemilikan--
saham.-----

5. Penawaran sebagaimana dimaksud pada ayat 4 Pasal-
ini tidak berlaku dalam hal pengeluaran saham :--
a. ditujukan kepada karyawan Perseroan;-----
b. ditujukan kepada pemegang obligasi atau-----
efek lain yang dapat dikonversikan menjadi----
saham, yang telah dikeluarkan dengan-----
persetujuan Rapat Umum Pemegang Saham; atau---
c. dilakukan dalam rangka reorganisasi dan/atau--
restrukturisasi yang telah disetujui Rapat----
Umum Pemegang Saham.-----

6. Dalam hal Pemegang Saham lain sebagaimana-----
dimaksud pada ayat 4 Pasal ini tidak menggunakan--

hak untuk membeli dan membayar lunas saham yang--
dibeli dalam jangka waktu 14 (empat belas) hari--
terhitung sejak tanggal penawaran, Perseroan----
dapat menawarkan sisa saham yang tidak diambil---
bagian tersebut kepada pihak ketiga.-----

-Akhirnya penghadap bertindak dalam kedudukannya----
sebagaimana tersebut di atas menerangkan bahwa :----

-Modal ditempatkan sebagaimana dimaksud dalam Pasal-
4 ayat 2 telah diambil bagian dan disetor penuh----
oleh :-----

-Negara Republik Indonesia sebanyak 55.666.007-----

(limapuluh lima juta enamratus enampuluh enam ribu
tujuh) saham atau seluruhnya dengan nilai nominal-
sebesar Rp. 55.666.007.000.000,00 (limapuluh lima-
triliun enamratus enampuluh enam miliar tujuh juta
rupiah) dengan cara sebagai berikut :-----

a. sebesar Rp. 46.197.380.000.000,00 (empatpuluh--
enam triliun seratus sembilanpuluh tujuh miliar
tigaratus delapanpuluh juta rupiah) merupakan--
setoran modal lama sesuai dengan akta-----
tertanggal 05-08-2011 (lima Agustus duaribu----
sebelas) nomor 04, dibuat di hadapan saya,-----
Notaris dan telah memperoleh persetujuan dari--
Menteri Hukum Dan Hak Asasi Manusia Republik---
Indonesia tertanggal 19-08-2011 (sembilanbelas-
Agustus duaribu sebelas) nomor-----
AHU-AH.01.10-26937;-----

b. sebesar Rp. 4.468.626.687.910,00 (empat triliun
empatatus enampuluh delapan miliar enamratus--
duapuluh enam juta enamratus delapanpuluh tujuh

ribu sembilanratus sepuluh rupiah) yang berasal dari penambahan modal Negara Republik Indonesia ke dalam saham Perseroan berdasarkan Peraturan Pemerintah Nomor 42 Tahun 2015 tanggal-----
23-06-2015 (duapuluh tiga Juni duaribu-----
limabelas).-----

c. sebesar Rp. 5.000.000.000.000,00 (lima triliun rupiah) yang berasal dari penambahan modal-----
Negara Republik Indonesia ke dalam saham-----
Perseroan berdasarkan Peraturan Pemerintah-----
Nomor 125 Tahun 2015 tanggal 28-12-2015-----
(duapuluh delapan Desember duaribu limabelas).-

d. sebesar Rp. 312.090,00 (tigaratus duabelas ribu sembilanpuluh rupiah) yang berasal dari-----
kapitalisasi sebagian cadangan Perseroan-----
sebagaimana tercatat dalam Laporan Keuangan-----
tahun buku 2014 (duaribu empatbelas) yang telah
diaudit oleh Kantor Akuntan Publik (KAP)-----
Tanudiredja, Wibisana & Rekan sebagaimana-----
suratnya tertanggal 27-02-2015 (duapuluh tujuh-
Februari duaribu limabelas) nomor-----
A150227014/DC2/HSH/I/2015.-----

-----DEMIKIANLAH AKTA INI-----

-Dibuat sebagai minuta dan dilangsungkan di-----
Jakarta, pada hari dan tanggal tersebut di atas,-----
dengan dihadiri oleh :-----

1. Nona OEY REBECCA GABRIELLA WIJAYA, Sarjana Hukum,
Magister Kenotariatan, lahir di Balikpapan, pada-
tanggal 17-08-1991 (tujuhbelas Agustus seribu----
sembilanratus sembilanpuluh satu), bertempat-----

tinggal di Jakarta, Apartemen Puri Garden #2706,-
Jalan Kembangan Raya, Rukun Tetangga 001,-----
Rukun Warga 002, Kelurahan Kembangan Selatan,----
Kecamatan Kembangan, Jakarta Barat, pemegang-----
Kartu Tanda Penduduk dengan Nomor Induk-----
Kependudukan 6471055708910006, Warga Negara-----
Indonesia;-----

2. Nona ASRIMETIA, Sarjana Hukum, lahir di Jakarta,-
pada tanggal 01-09-1982 (satu September seribu---
sembilanratus delapanpuluh dua), bertempat-----
tinggal di Jakarta, Komplek Keuangan, Rukun-----
Tetangga 002, Rukun Warga 003, Kelurahan Joglo,--
Kecamatan Kembangan, Jakarta Barat, pemegang-----
Kartu Tanda Penduduk dengan Nomor Induk-----
Kependudukan 3173084109820002, Warga Negara-----
Indonesia;-----

keduanya pegawai kantor saya, Notaris, sebagai-----
saksi-saksi.-----

-Segera setelah akta ini saya, Notaris bacakan-----
kepada penghadap dan saksi-saksi, maka akta ini-----
ditandatangani oleh penghadap, saksi-saksi dan-----
saya, Notaris.-----

-Dilangsungkan tanpa perubahan.-----

-Asli akta ini telah ditandatangani dengan sempurna.

-Diberikan untuk salinan yang sama bunyinya.-----

Notaris Kota Administrasi Jakarta Selatan



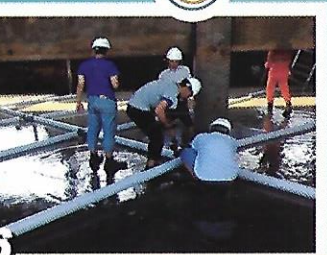
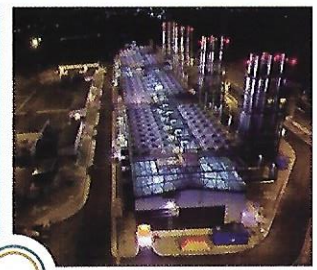
LENNY JANIS ISHAK, SH

APPENDIX 5.

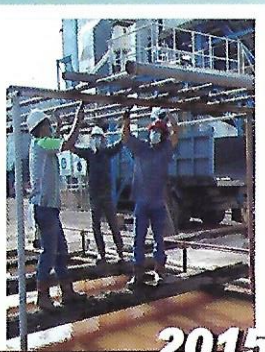
COMPANY PROFILE



PROYEK
UIP
KITSUM



ERBIT (Sistem Pemipaan Drain Turbidity & Conductivity)



KARYA
NOVASI

2015
SI-CUMI (Sistem Cooling Tower Mini)

BUDE NOVA – Budaya Ide Inovasi

Tema : “Berkarya untuk membangun dan menerangi Sumatera”

TUJUAN...

Tujuan dari program BUDE NOVA – Budaya Ide Inovasi merupakan salah satu upaya untuk memotivasi dan mendorong pegawai PT PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera untuk dapat berkarya dengan bentuk ide-ide terobosan dalam wadah inovasi. Dengan munculnya karya atau ide-ide, maka akan optimal dalam penyelesaian pekerjaan proyek dan dapat meningkatkan nilai kinerja Unit

PT PLN (PERSERO)
UIP PEMBANGKIT SUMATERA

Jalan R. A. Kartini No. 23, Medan—20152
Phone: (061) 4568628 - 4568629 - 4568504
Fax: (061) 4568532

**PT PLN (PERSERO)
UNIT INDUK PEMBANGUNAN
PEMBANGKIT SUMATERA**

**35.000 MW
UNTUK
INDONESIA**



Sesuai dengan Peraturan Direksi No.0043.P/DIR/2016 tanggal 19 Februari 2016 tentang Organisasi Unit Induk Pembangunan Pembangkit Sumatera, PT PLN (Persero) Unit Induk Pembangunan 1 telah berubah nama menjadi PT PLN (Persero) Unit Induk Pembangunan Pembangkit yang berlokasi di Kota Medan, Sumatera Utara.



Tugas dan tanggung jawab PT PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera adalah untuk melaksanakan kegiatan usaha dalam bidang pembangunan pembangkit di Sumatera. Produk utama yang dihasilkan adalah pembangkit di wilayah Sumatera.

PT PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera mempunyai 9 Unit Pelaksana Proyek (UPP) yang tersebar di Sumatera. Setiap UPP mengelola pelaksanaan pembangunan sesuai kontrak dengan pihak kontraktor, supervisi konstruksi, supervisi desain dan pihak lainnya sebagai bagian pencapaian target kinerja pembangunan yang ditetapkan perusahaan.

VISI DAN MISI PT PLN (PERSERO)

Visi

Diakui sebagai perusahaan kelas Dunia yang Bertumbuh-kembang, Unggul, dan Terpercaya dengan bertumpu pada potensi Insani.

Misi

Menjalankan bisnis kelistrikan dan bidang lain yang terkait, berorientasi pada kepuasan pelanggan, anggota perusahaan, dan pemegang saham.

Menjadikan tenaga listrik sebagai media untuk meningkatkan kualitas kehidupan masyarakat.

Mengupayakan agar tenaga listrik menjadi pendorong kegiatan ekonomi.

Menjalankan kegiatan usaha yang berwawasan lingkungan.

VISI DAN MISI PT PLN (PERSERO)

UIP PEMBANGKIT SUMATERA

Visi

Diakui sebagai unit pembangunan pembangkit berstandar internasional yang unggul dan terpercaya dengan bertumpu pada potensi insani.

Misi

Menjalankan manajemen konstruksi pembangunan pembangkit yang berkualitas.

Mengembangkan potensi insani dan melaksanakan pembangunan pembangkit yang ramah lingkungan dan siap beroperasi.



APPENDIX 6.
COMPANY ORGANIZATIONAL
STRUCTURE



PT PLN (PERSERO)

PERATURAN DIREKSI PT PLN (PERSERO)

NOMOR : 0043.P/DIR/2016

TENTANG

ORGANISASI
PT PLN (PERSERO) UNIT INDUK PEMBANGUNAN
PEMBANGKIT SUMATERA

DIREKSI PT PLN (PERSERO)

- Menimbang :
- a. bahwa pelaksanaan pembangunan pembangkit di Sumatera pada saat ini dilaksanakan oleh Unit Induk Pembangunan I untuk pembangunan pembangkit;
 - b. bahwa dalam rangka meningkatkan efektifitas pembangunan pembangkit di Sumatera, maka dipandang perlu dilakukan penataan ulang pelaksanaan pembangunan sebagaimana dimaksud pada butir a, sehingga terjadi keselarasan dan integrasi pekerjaan yang baik antara pembangunan pembangkit di Sumatera;
 - c. bahwa berdasarkan pertimbangan sebagaimana dimaksud dalam huruf a dan b, maka dipandang perlu merubah Unit Induk Pembangunan di Sumatera yaitu dari Unit Induk Pembangunan I menjadi Unit Induk Pembangunan Pembangkit Sumatera yang melaksanakan pembangunan pembangkit di Sumatera;
 - d. bahwa berdasarkan pertimbangan sebagaimana dimaksud dalam huruf a, b dan c di atas, perlu ditetapkan Peraturan Direksi PT PLN (Persero) tentang Organisasi PT PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera.
- Mengingat :
1. Undang-Undang Republik Indonesia Nomor 19 Tahun 2003 tentang Badan Usaha Milik Negara;
 2. Undang-Undang Republik Indonesia Nomor 40 Tahun 2007 tentang Perseroan Terbatas;
 3. Undang-Undang Republik Indonesia Nomor 30 Tahun 2009 tentang Ketenagalistrikan;
 4. Peraturan Pemerintah Republik Indonesia Nomor 23 Tahun 1994 tentang Pengalihan Bentuk Perusahaan Umum (Perum) Listrik Negara menjadi Perusahaan Perseroan (Persero);
 5. Anggaran Dasar PT PLN (Persero) dan perubahannya;
 6. Keputusan Direksi PT PLN (Persero) Nomor 304.K/DIR/2009 tentang Batasan Kewenangan Pengambilan Keputusan di Lingkungan PT PLN (Persero) sebagaimana telah diubah 4 (empat) kali, terakhir dengan Keputusan Direksi PT PLN (Persero) Nomor 0313.K/DIR/2014;
 7. Keputusan Direksi PT PLN (Persero) Nomor 299.K/DIR/2010 tentang Kewenangan Penetapan Bidang Organisasi PT PLN (Persero);
 8. Peraturan Direksi PT PLN (Persero) Nomor 0015.P/DIR/2015 tentang Organisasi dan Tata Kerja PT PLN (Persero);

9. Keputusan ...



9. Keputusan Direksi PT PLN (Persero) Nomor 165.K/DIR/2013 tentang Organisasi PT PLN (Persero) Unit Induk Pembangunan I sebagaimana telah diubah 2 (dua) kali, terakhir dengan Keputusan Direksi PT PLN (Persero) Nomor 207.K/DIR/2014.

MEMUTUSKAN

Memperhatikan : Keputusan Direksi Di Luar Rapat (Sirkuler) Nomor 174/DIR/2015 Tentang Penguatan Unit Induk Pembangunan Untuk Mendukung Program Pembangunan Pembangkit Dan Transmisi.

Menetapkan : PERATURAN DIREKSI PT PLN (PERSERO) TENTANG ORGANISASI PT PLN (PERSERO) UNIT INDUK PEMBANGUNAN PEMBANGKIT SUMATERA

Pasal 1 Ketentuan Umum

Dalam Keputusan ini yang dimaksudkan dengan :

- a. Perusahaan adalah Perusahaan perseroan PT (Persero) Perusahaan Listrik Negara yang didirikan dengan Akte Notaris Sutjipto, SH No. 169 tanggal 30 Juli 1994, beserta perubahannya;
- b. Direksi adalah organ Perusahaan yang bertanggung jawab atas pengelolaan Perusahaan sesuai dengan maksud dan tujuan Perusahaan yang terdiri dari seorang Direktur Utama sebagai koordinator dengan beberapa Direktur sebagai anggota;
- c. General Manager adalah General Manager PT PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera;
- d. Unit Induk adalah PT PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera;
- e. Unit Pelaksana Proyek adalah Unit Pelaksana pada PT PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera;
- f. Jabatan adalah suatu kumpulan kewajiban dan tanggung jawab secara keseluruhan yang dibebankan kepada Pegawai untuk memproduksi hasil kerja tertentu;
- g. Formasi Jabatan adalah susunan jabatan yang diperlukan untuk Unit Organisasi;
- h. Fungsi adalah sekelompok kegiatan utama dari satuan organisasi yang menggambarkan adanya hubungan yang sangat erat serta ditujukan untuk pencapaian sasaran;
- i. Tugas pokok adalah rangkaian tugas yang dibebankan kepada organisasi untuk mencapai misi organisasi.

Pasal 2 Misi

Misi Unit Induk adalah melakukan perencanaan, pengorganisasian, pengelolaan dan pengawasan kegiatan Pembangunan Pembangkit serta melaksanakan administrasi konstruksi dengan bertindak sebagai wakil pemilik (*owner*) untuk menghasilkan Pembangkit yang berkualitas dan siap dioperasikan melalui proses pelaksanaan pembangunan yang efektif, efisien, tepat waktu dan mutu, untuk mencapai sasaran kinerja sesuai Ketetapan Direksi.

Pasal 3 ...



Pasal 3 Susunan Organisasi

- (1) Susunan Organisasi Unit Induk Pembangunan Pembangkit Sumatera adalah sebagai berikut:
 - a. Unit Induk:
 1. General Manager
 2. Bidang-bidang :
 - a) Perencanaan;
 - b) Operasi Konstruksi I;
 - c) Operasi Konstruksi II;
 - d) Keuangan dan Sumber Daya Manusia;
 - e) Hukum, Komunikasi dan Pertanahan.
 3. Pejabat Pengadaan :
 - a) Pejabat Perencana Pengadaan;
 - b) Pejabat Pelaksana Pengadaan.
 - b. Unit Pelaksana;
 1. Unit Pelaksana Proyek
- (2) Bagan Susunan Organisasi Unit Induk Pembangunan Pembangkit Sumatera adalah sebagaimana dimaksud dalam Lampiran 1 Peraturan ini;
- (3) Wilayah Kerja Unit Induk Pembangunan Pembangkit Sumatera meliputi wilayah Sumatera serta berkedudukan di Medan;
- (4) Kedudukan Bidang Operasi Konstruksi I dan Bidang Operasi Konstruksi II ditetapkan oleh Direktur Bisnis Regional Sumatera.

Pasal 4 Fungsi dan Tugas Pokok

Uraian fungsi dan tugas pokok General Manager, Manajer Bidang dan Manajer Unit Pelaksana Proyek adalah sebagaimana pada Lampiran 2 Peraturan ini. Selanjutnya rincian tugas pokok akan diatur lebih lanjut dan ditetapkan oleh General Manager.

Pasal 5 Formasi Jabatan

- (1) Unit Induk Pembangunan Pembangkit Sumatera dipimpin oleh General Manager, Bidang dipimpin oleh Manajer, dan Unit Pelaksana Proyek dipimpin oleh Manajer Unit Pelaksana Proyek.
- (2) General Manager, Manajer dan Manajer Unit Pelaksana Proyek dapat dibantu oleh pegawai struktural/ fungsional sesuai dengan Formasi Jabatan yang ditetapkan;
- (3) Formasi Jabatan pada Unit Induk dan Unit Pelaksana Proyek ditetapkan oleh Pejabat yang berwenang sesuai dengan ketentuan Kewenangan Penetapan Bidang Organisasi.

Pasal 6 Ketentuan Peralihan

- (1) Anggaran, aset, dan Sumber Daya Manusia Unit Induk Pembangunan Pembangkit Sumatera berasal dari penataan Unit Induk Pembangunan I;
- (2) General Manager Unit Induk Pembangunan I masih menjalankan fungsi dan tugas pokoknya selama proses peralihan pengelolaan anggaran, aset, Sumber Daya Manusia dan manajemen yang akan dikelola oleh Unit Induk Pembangunan Pembangkit Sumatera;
- (3) Proses peralihan sebagaimana dimaksud pada butir (1) dilaksanakan selambat-lambatnya 10 (sepuluh) bulan terhitung mulai tanggal ditetapkannya Peraturan ini.



**Pasal 7
Penutup**

- (1) Pada saat Peraturan ini mulai berlaku, maka Keputusan Direksi PT PLN (Persero) Nomor 165.K/DIR/2013 tentang Organisasi PT PLN (Persero) Unit Induk Pembangunan I, sebagaimana telah diubah 2 (dua) kali, terakhir dengan Keputusan Direksi PT PLN (Persero) Nomor 207.K/DIR/2014 dan Ketentuan-Ketentuan lain yang bertentangan dengan Peraturan ini dinyatakan dicabut dan tidak berlaku lagi;
- (2) Hal hal yang belum diatur dalam Peraturan ini akan ditetapkan lebih lanjut oleh General Manajer Unit Induk Pembangunan Pembangkit Sumatera sesuai dengan kewenangannya.

Peraturan ini mulai berlaku efektif terhitung sejak selesainya proses peralihan sebagaimana ketentuan pasal 6 pada Peraturan ini.

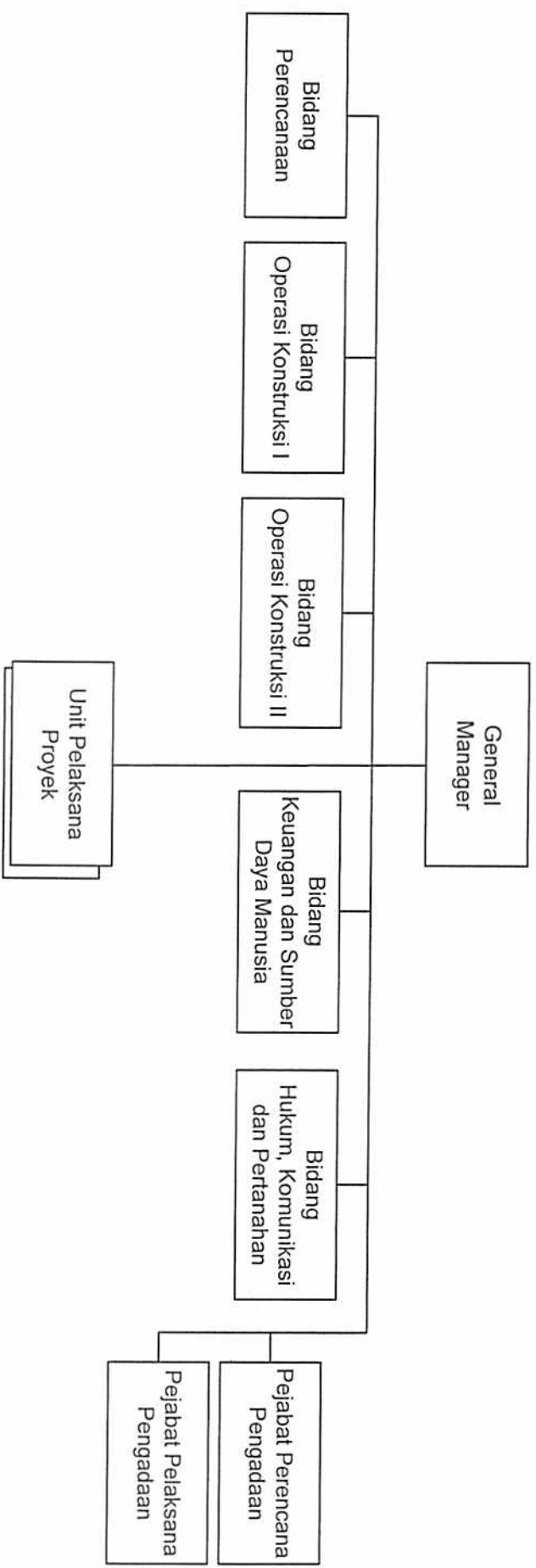
Ditetapkan di Jakarta
Pada tanggal

**DIREKTUR
HUMAN CAPITAL MANAGEMENT,**

MUHAMAD ALI



BAGAN SUSUNAN ORGANISASI
PT PLN (PERSERO) UNIT INDUK PEMBANGUNAN PEMBANGKIT SUMATERA



DIREKTUR
HUMAN CAPITAL MANAGEMENT,
MUHAMMAD ALI
MUHAMMAD ALI



URAIAN FUNGSI DAN TUGAS POKOK PADA PT PLN (PERSERO) UNIT INDUK PEMBANGUNAN PEMBANGKIT SUMATERA

1. General Manager

Bertanggung jawab memimpin terselenggaranya perencanaan, pengorganisasian, pengelolaan dan pengawasan kegiatan pembangunan Pembangkit tenaga listrik, memastikan pengendalian terhadap biaya, jadwal, dan mutu sesuai target kinerja yang ditetapkan Direksi dengan mengoptimalkan sumber daya yang tersedia, dan memastikan tersedianya analisa dan mitigasi risiko, serta proses bisnis, dengan tugas pokok meliputi:

- a. Memastikan penyusunan, pelaksanaan dan evaluasi strategi dan kebijakan pembangunan dan menetapkannya dalam Rencana Kerja Anggaran Perusahaan (RKAP) Unit Induk Pembangunan;
- b. Memastikan penyusunan, evaluasi dan kelancaran koordinasi pekerjaan supervisi dan menetapkan *Service Level Agreement* (SLA) dengan pihak supervisi konstruksi dan supervisi desain;
- c. Memastikan pengelolaan, pengendalian, dan evaluasi kegiatan perijinan, pembebasan tanah, pembangunan, serta bertindak sebagai wakil pemilik (*owner*);
- d. Memastikan penyusunan, menetapkan, dan evaluasi Sistem Manajemen Kinerja dan Sistem Manajemen Mutu, serta penyusunan Lamporan Manajemen Unit Induk Pembangunan;
- e. Memastikan pengendalian dan pelaksanaan pembangunan, pengembangan dan evaluasi hubungan dengan pihak lain untuk integrasi pembangunan, kelancaran dan keberhasilan penyelesaian pembangunan, sesuai dengan biaya, jadwal dan mutu yang ditetapkan;
- f. Memastikan penyusunan dan pelaksanaan mitigasi risiko serta memberikan *early warning system* terhadap pelaksanaan konstruksi, infrastruktur ketenagalistrikan, serta pengembangan, pemeliharaan dan evaluasi kompetensi organisasi dan kompetensi anggota organisasi Unit Induk Pembangunan.

2. Bidang Perencanaan

Bertanggung jawab dan menjamin tersedianya perencanaan umum, perencanaan lingkungan hidup, perencanaan konstruksi pembangunan, menyusun kebijakan manajemen strategis dalam rangka pencapaian target kinerja Unit Induk Pembangunan, mengkoordinir perencanaan dan pelaksanaan pengadaan, dengan tugas pokok meliputi:

- a. Menyusun, melaksanakan dan mengevaluasi Rencana Kerja dan Anggaran (RKA) Unit Induk Pembangunan Tahunan;
- b. Menyusun, melaksanakan dan mengevaluasi kegiatan perencanaan, enjiniring, *survey* dan *soil investigation*, perencanaan kegiatan perijinan dan pembebasan tanah;
- c. Menyusun, melaksanakan dan mengevaluasi kegiatan analisa dampak lingkungan dan pengelolaan lingkungan hidup yang terkait dengan fasilitas proyek dan pertanahan;
- d. Menyusun, melaksanakan dan mengevaluasi perencanaan pembangunan yang terintegrasi dengan kegiatan supervisi konstruksi, supervisi desain dan pembangunan unit lain;
- e. Mengkoordinir persiapan, perencanaan dan pelaksanaan kegiatan pengadaan termasuk menyiapkan dokumen pelelangan;
- f. Menyusun, melaksanakan dan mengevaluasi sistem manajemen kinerja dan sistem manajemen mutu, mengelola implementasi Sistem Teknologi Informasi untuk mendukung operasional dan pengendalian kinerja konstruksi.



3. Bidang Operasi Konstruksi I dan II

Bertanggung jawab mengelola pelaksanaan pekerjaan konstruksi pembangunan, konsolidasi Unit Pelaksana Proyek sesuai dengan jadwal, biaya, dan kualitas pekerjaan melalui pemantauan hasil kerja, untuk pencapaian target kinerja Unit Induk Pembangunan, dengan tugas pokok meliputi :

- a. Menyusun, melaksanakan dan mengevaluasi secara keseluruhan pengendalian pembangunan agar pelaksanaan pembangunan dapat dilaksanakan secara tepat waktu, biaya dan mutu;
- b. Menyusun, melaksanakan dan mengevaluasi kegiatan pelaksanaan administrasi teknik, meliputi administrasi tenaga kerja asing, administrasi kontrak (penanganan klaim kontrak, amandemen kontrak, berita acara pembayaran) dan pengendalian TKDN;
- c. Menyusun, mengelola dan mengevaluasi persetujuan Master List dan kegiatan kepabeanan termasuk mengelola pengendalian logistik dan administrasi monitoring terkait dengan pekerjaan pembangunan;
- d. Menyusun, mengelola dan mengevaluasi program Keselamatan, Kesehatan Kerja, Keamanan dan Lingkungan;
- e. Menyusun, melaksanakan dan mengevaluasi *Basic Communication* internal dan eksternal dengan pihak ketiga terkait dengan kelancaran pelaksanaan pembangunan;
- f. Menyusun, mengelola dan mengevaluasi kegiatan Serah Terima Proyek dan Laporan Proyek Selesai di lingkungan Unit Induk Pembangunan.

4. Bidang Keuangan dan Sumber Daya Manusia

Bertanggung jawab mengelola keuangan, sumber daya manusia, dan administrasi untuk mendukung pelaksanaan pekerjaan kegiatan Unit Induk Pembangunan dalam mencapai target kinerja Unit Induk Pembangunan, dengan tugas pokok meliputi:

- a. Menyusun, melaksanakan dan mengevaluasi kegiatan pendanaan, penganggaran dan perencanaan pembayaran terkait dengan progres pembangunan;
- b. Menyusun, melaksanakan dan mengevaluasi proses pembayaran sesuai dengan alokasi penganggaran, kewajiban dan ketentuan kontrak;
- c. Menyusun, mengelola dan mengevaluasi pelaksanaan kegiatan akuntansi, perpajakan, dan asuransi;
- d. Menyusun, melaksanakan dan mengevaluasi pengembangan kompetensi dan karir pegawai;
- e. Menyusun, melaksanakan dan mengevaluasi kegiatan administrasi SDM di Unit Induk dan Unit Pelaksana;
- f. Menyusun, melaksanakan, dan mengevaluasi kegiatan administrasi kesekretariatan dan umum.

5. Bidang Hukum, Komunikasi, dan Pertanahan

Bertanggung jawab mengelola pelaksanaan proses hukum dan pertanahan dalam pelaksanaan proyek konstruksi, serta atas seluruh proses komunikasi dengan pihak eksternal proyek untuk menunjang keberhasilan proyek konstruksi, dengan tugas pokok:

- a. Menyusun, melaksanakan dan mengevaluasi pengelolaan fungsi hukum termasuk penyelesaian masalah hukum, konsultasi, dan penanganan kegiatan hukum;
- b. Menyusun, melaksanakan dan mengevaluasi kegiatan komunikasi dan kehumasan, terkait dengan proses pembangunan;
- c. Menyusun, melaksanakan dan mengevaluasi proses perijinan dan administrasi dokumen terkait dengan pembebasan tanah dan sertifikasi tanah;



- d. Menyusun, melaksanakan dan mengevaluasi kegiatan pembebasan tanah meliputi perencanaan, proses penyiapan dokumen, persiapan pelaksanaan, melakukan koordinasi dengan pihak terkait untuk pelaksanaan pembebasan tanah;
- e. Menyusun, melaksanakan dan mengevaluasi sosialisasi, dan inventarisasi kegiatan pembebasan tanah dan kompensasi ROW serta melaksanakan proses pengajuan permohonan pembayaran pembebasan tanah, dan kompensasi ROW;
- f. Menyusun, melaksanakan dan mengevaluasi kegiatan *Corporate Social Responsibility* (CSR).

6. Pejabat Pengadaan

5.1 Pejabat Perencana Pengadaan

Bertanggung jawab mengelola rencana strategi perencanaan pengadaan, menangani perencanaan portofolio pengadaan, terutama yang masuk dalam kategori *Strategis*, *Leverage*, dan *Critical/ Bottleneck*, riset pasar dengan proses penilaian kualifikasi, *Due Diligence* dan penyusunan Daftar Penyedia Terseleksi (DPT); termasuk mengelola pengadaan yang dikonsolidasikan & didesentralisasikan serta mempersiapkan dokumen pengadaan (Bid Doc / Rencana Kerja dan Syarat-syarat (RKS)), dengan tugas pokok sebagai berikut:

- a. Menghasilkan Rencana Pengadaan dan Strategi Pengadaan PLN yang berlaku setiap tahun;
- b. Melakukan kajian atas kebutuhan barang dan jasa, termasuk kebutuhan antisipasi jika terjadi keadaan darurat, sumber daya yang dibutuhkan, waktu pemanfaatan serta pendistribusian yang menyesuaikan kebutuhan operasional dan proyek;
- c. Menyusun dan mengelola Dokumen Rencana Pengadaan Barang/Jasa;
- d. Melaporkan hasil proses perencanaan pengadaan barang/jasa kepada Atasan Langsung untuk selanjutnya disampaikan kepada *Value for Money Committee* dan disahkan oleh Pengguna Barang/Jasa;
- e. Menyusun draft Dokumen Pelelangan Barang/Jasa atau Rencana Kerja dan Syarat-syarat (RKS);
- f. Menyusun dan mengelola Harga Perkiraan Engineering (HPE);
- g. Melakukan evaluasi dan mengukur kinerja Penyedia Barang/Jasa;
- h. Membantu Wakil Pengguna Barang / Jasa dalam pelaksanaan Manajemen Perjanjian / Kontrak.

5.2 Pejabat Pelaksana Pengadaan

Bertanggung jawab melaksanakan pengadaan, mulai dari pengumuman, penjelasan, evaluasi, memastikan *Value for Money* dan mempersiapkan kontrak, dengan tugas pokok sebagai berikut:


- a. Melakukan analisis yang mendalam terhadap lingkup pengadaan barang/jasa yang akan dilakukan;
- b. Menyusun jadwal pelaksanaan Pengadaan Barang/Jasa, melakukan finalisasi Dokumen Pelelangan dan Memahami metode penyusunan estimasi biaya sebagai dasar Harga Perkiraan Sendiri (HPS), konsep *Total Cost of Ownership* (TCOO), serta melakukan analisa penawaran harga dari penyedia untuk diusulkan penetapannya oleh Pengguna Barang / Jasa;
- c. Melakukan proses pengumuman / undangan kepada Calon Penyedia Barang / Jasa;
- d. Memastikan calon Penyedia Barang / Jasa yang akan diundang tidak termasuk dalam daftar hitam (black list) PLN, dan melakukan penilaian kualifikasi calon Penyedia Barang/Jasa dalam hal pengadaan melalui prakualifikasi atau pascakualifikasi yang tidak memiliki DPT;
- e. Memberikan penjelasan pengadaan (Aanwijzing), serta melakukan evaluasi terhadap Dokumen Penawaran;

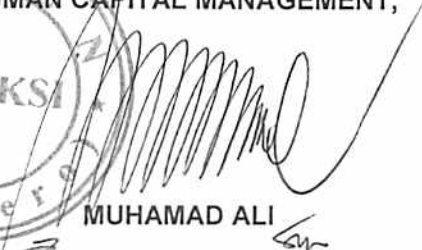
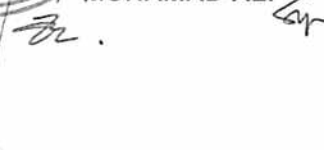
- f. Menentukan penilaian kewajaran harga yang ditawarkan oleh penyedia dengan berkoordinasi dengan Pejabat Perencana Pengadaan;
- g. Memahami metode penyusunan estimasi biaya sebagai dasar Harga Perkiraan Sendiri (HPS), konsep *Total Cost of Ownership* (TCOO), serta melakukan analisa penawaran harga dari penyedia;
- h. Melakukan negosiasi kompetitif dengan calon penyedia yang memberikan penawaran terbaik dan melampaui nilai minimum kualitas (*best and final offer* "BAFO"). BAFO merupakan tambahan langkah setelah keseluruhan evaluasi untuk meningkatkan kompetisi dan *value for money*;
- i. Memastikan bahwa spesifikasi dan deskripsi teknis yang ditulis tidak mengandung ambiguitas, jelas dan bersifat generik, serta mendorong kompetisi yang wajar antar Penyedia, tidak menyebut *brand names*, atau memberi restriksi (kecuali jika masih dalam masa pemeliharaan *Original Equipment Manufacture* (OEM)).

6. Unit Pelaksana Proyek

Bertanggung jawab mengelola pelaksanaan pembangunan sesuai kontrak dengan pihak kontraktor, supervisi konstruksi, supervisi desain dan pihak lainnya sebagai bagian pencapaian target kinerja pembangunan yang ditetapkan perusahaan, dengan tugas pokok meliputi:

- a. Mendukung dan melaksanakan proses perijinan, pelaksanaan dan pengawasan pembebasan tanah, mengendalikan dan mengawasi tanah yang telah dibebaskan;
- b. Mendukung dan melaksanakan kegiatan survey perencanaan proyek terkait dengan pelaksanaan analisa dampak lingkungan dan pengelolaan lingkungan hidup;
- c. Menyusun, melaksanakan dan mengevaluasi kegiatan pekerjaan konstruksi, pemantauan dan pengendalian kemajuan fisik, administrasi konstruksi melalui sinergi dengan pihak supervisi konstruksi dan supervisi desain serta menyusun laporan kemajuan pekerjaan pembangunan;
- d. Menyusun, melaksanakan dan mengevaluasi kegiatan logistik, tata usaha gudang serta administrasi dan umum;
- e. Melaksanakan dan mengevaluasi pelaksanaan test komisioning, penyelesaian *pending item*, dan penyiapan Serah Terima Proyek di lingkungan Unit Pelaksana Proyek dengan Pembangunan, atau Penyaluran dan Pusat Pengatur Beban Sumatera, atau Wilayah;
- f. Menyusun, mengelola dan mengevaluasi program Keselamatan, Kesehatan Kerja, Keamanan dan Lingkungan;
- g. Menyusun, melaksanakan dan mengevaluasi kegiatan CSR yang telah disetujui oleh Kantor Induk.



 DIREKTUR
 HUMAN CAPITAL MANAGEMENT,

 MUHAMAD ALI


**APPENDIX 7.
LOCATION PERMIT**



PEMERINTAH DAERAH KABUPATEN LEBONG
DINAS PENANAMAN MODAL DAN PELAYANAN TERPADU SATU PINTU

Jln. Raya Curup – Muara Aman 39164

KEPUTUSAN
KEPALA DINAS PENANAMAN MODAL DAN PELAYANAN TERPADU SATU PINTU
KABUPATEN LEBONG PROVINSI BENGKULU
NOMOR 02 TAHUN 2018

TENTANG

**PEMBERIAN IZIN LOKASI UNTUK KEPERLUAN PEMBANGUNAN PEMBANGKIT LISTRIK
TENAGA PANAS BUMI (PLTP) HULULAIS KAPASITAS 2 X 55 MW
ATAS NAMA PT. PLN (PERSERO) UNIT INDUK PEMBANGUNAN PEMBANGKIT SUMATERA
TERLETAK DI KELURAHAN MUBAI KECAMATAN LEBONG SELATAN
KABUPATEN LEBONG PROVINSI BENGKULU**

KEPALA,

- Menimbang** :
- a. bahwa rencana pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais Kapasitas 2 x 55 MW dari PT. PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera telah sesuai dengan Rencana Tata Ruang Wilayah Kabupaten Lebong Nomor 14 Tahun 2012 Tentang RT RW Kabupaten Lebong;
 - b. bahwa pemohon telah memperoleh surat persetujuan izin prinsip dari Kepala Badan Koordinasi Penanaman Modal Republik Indonesia Nomor : 57/1/PI/PMDN/2018 Tanggal 05 Februari 2018;
 - c. bahwa berdasarkan Pertimbangan Teknis Pertanahan Kabupaten Lebong Nomor : 03/400-07.10/II/2018 tanggal 12 Februari 2018;
 - d. bahwa berdasarkan Pertimbangan sebagaimana dimaksud pada huruf a, huruf b, dan huruf c diatas, maka perlu ditetapkan Izin Lokasi dengan Keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Kabupaten Lebong.

- Mengingat** :
1. Undang-Undang Nomor 5 Tahun 1960 tentang Peraturan Dasar Pokok-Pokok Agraria (Lembaran Negara Republik Indonesia Tahun 1960 Nomor 104, Tambahan Lembaran Negara Republik Indonesia Nomor 2013);
 2. Undang-Undang Nomor 39 Tahun 2003 tentang Pembentukan Kabupaten Lebong dan Kabupaten Kepahiang di Provinsi Bengkulu, (Lembaran Negara Republik Indonesia Tahun 2003 Nomor 154, Tambahan Lembaran Negara Republik Indonesia Nomor 4349);
 3. Undang-Undang Nomor 25 Tahun 2007 tentang Penanaman Modal (Lembaran Negara Republik Indonesia Tahun 2007 Nomor 67, Tambahan Lembaran Negara Republik Indonesia Nomor 4724);

4. Undang-Undang Nomor 26 Tahun 2007 tentang Penataan Ruang (Lembaran Negara Republik Indonesia Tahun 2007 Nomor 68, Tambahan Lembaran Negara Republik Indonesia Nomor 4725);
5. Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup (Lembaran Negara Republik Indonesia Tahun 2009 Nomor 140, Tambahan Lembaran Negara Republik Indonesia Nomor 5059);
6. Undang-Undang Nomor 12 Tahun 2011 tentang Pembentukan Peraturan Perundang-undangan (Lembaran Negara Republik Indonesia Tahun 2011 Nomor 82, Tambahan Lembaran Negara Republik Indonesia Nomor 5234);
7. Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah (Lembaran Negara Republik Indonesia Tahun 2007 Nomor 68, Tambahan Lembaran Negara Republik Indonesia Nomor 4725) sebagaimana telah diubah beberapa kali terakhir dengan Undang-Undang Nomor 9 Tahun 2015 tentang Perubahan Kedua Atas Undang-undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah (Lembaran Negara Republik Indonesia Tahun 2015 Nomor 58, Tambahan Lembaran Negara Republik Indonesia Nomor 5679);
8. Peraturan Pemerintah Nomor 25 Tahun 2000 tentang Kewenangan Pemerintah dan Kewenangan Provinsi sebagai Daerah Otonom (Lembaran Negara Republik Indonesia Tahun 2000 Nomor 54, Tambahan Lembaran Republik Indonesia Nomor 3952);
9. Peraturan Pemerintah Nomor 16 Tahun 2004 tentang Penatagunaan Tanah (Lembaran Negara Republik Indonesia Tahun 2004 Nomor 45, Tambahan Lembaran Negara Republik Indonesia Nomor 4385);
10. Peraturan Pemerintah Nomor 38 Tahun 2007 tentang Pembagian Urusan Pemerintah, Pemerintahan Daerah Provinsi dan Pemerintahan Daerah Kabupaten/kota (Lembaran Negara Republik Indonesia Tahun 2007 Nomor 82, Tambahan Lembaran Negara Republik Indonesia Nomor 4737);
11. Peraturan Pemerintah Nomor 13 Tahun 2010 tentang Jenis dan Tarif Atas Jenis Penerimaan Negara Bukan Pajak yang berlaku Pada Badan Pertanahan Nasional (Lembaran Negara Republik Indonesia Tahun 2010 Nomor 18, Tambahan Lembaran Negara Republik Indonesia Nomor 5100);
12. Peraturan Pemerintah Nomor 15 Tahun 2010 tentang Penyelenggaraan Penataan Ruang (Lembaran Negara Republik Indonesia Tahun 2010 Nomor 21, Tambahan Lembaran Negara Republik Indonesia Nomor 5103);
13. Peraturan Pemerintah Nomor 27 Tahun 2012 tentang Izin Lingkungan (Lembaran Negara Republik Indonesia Tahun 2012 Nomor 48, Tambahan Lembaran Negara Republik Indonesia Nomor 5285);
14. Peraturan Pemerintah Nomor 18 Tahun 2016 tentang Perangkat Daerah (Lembaran Negara Republik Indonesia Tahun 2016 Nomor 114, Tambahan Lembaran Negara Republik Indonesia Nomor 5887);

15. Keputusan Presiden Republik Indonesia Nomor 55 Tahun 1993 tentang Pengadaan Tanah Bagi Pelaksanaan Pembangunan Untuk Kepentingan Umum;
16. Keputusan Presiden Republik Indonesia Nomor 10 Tahun 2001 tentang Pelaksanaan Otonomi Daerah di Bidang Pertanahan;
17. Peraturan Menteri Agraria dan Tata Ruang/Kepala Badan Pertanahan Nasional Republik Indonesia Nomor 2 Tahun 2011 tentang Pedoman Pertimbangan Teknis Pertanahan dalam Pemberian Izin Lokasi, Penetapan Izin Lokasi dan Izin Perubahan Penggunaan Tanah;
18. Peraturan Menteri Agraria dan Tata Ruang/Kepala Badan Pertanahan Nasional Republik Indonesia Nomor 15 Tahun 2015 tentang Izin Lokasi;
19. Peraturan Menteri Dalam Negeri Republik Indonesia Nomor 20 Tahun 2008 tentang Pedoman Organisasi dan Tata Kerja Unit Pelayanan Perizinan Terpadu di Daerah;
20. Peraturan Menteri Dalam Negeri Nomor 80 tahun 2015 tentang Pembentukan Produk Hukum Daerah (Berita Acara Republik Indonesia Tahun 2015 Nomor 2036);
21. Peraturan Menteri Dalam Negeri Nomor 138 tahun 2017 tentang Penyelenggaraan Pelayanan Terpadu Satu Pintu Daerah;
22. Peraturan Daerah Kabupaten Lebong Nomor 14 Tahun 2012 tentang Rencana Tata Ruang Wilayah;
23. Peraturan Daerah Kabupaten Lebong Nomor 10 Tahun 2016 tentang Pembentukan dan Susunan Perangkat Daerah;
24. Peraturan Daerah Kabupaten Lebong Nomor 6 Tahun 2016 tentang Tanggung Jawab Sosial Perusahaan (Corporate Social Responsibility);
25. Peraturan Bupati Lebong Nomor 70 Tahun 2017 tentang Penjabaran Tugas Pokok dan Fungsi Dinas Penanaman Modal Dan Pelayanan Terpadu Satu Pintu Kabupaten Lebong;
26. Peraturan Bupati Lebong Nomor 60 Tahun 2017 tentang Pendelegasian Wewenang Penandatanganan Perizinan Dan Non Perizinan Pemerintah Kabupaten Lebong Kepada Kepala Dinas Penanaman Modal Dan Pelayanan Terpadu Satu Pintu Kabupaten Lebong.

MEMUTUSKAN :

Menetapkan : **KEPUTUSAN KEPALA DINAS PENANAMAN MODAL DAN PELAYANAN TERPADU SATU PINTU TENTANG PEMBERIAN IZIN LOKASI UNTUK KEPERLUAN PEMBANGUNAN PEMBANGKIT LISTRIK TENAGA PANAS BUMI (PLTP) HULULAIS KAPASITAS 2 X 55 MW ATAS NAMA PT. PLN (PERSERO) UNIT INDUK PEMBANGUNAN PEMBANGKIT SUMATERA TERLETAK DI KELURAHAN MUBAI KECAMATAN LEBONG SELATAN KABUPATEN LEBONG PROVINSI BENGKULU.**

KESATU

- : Memberikan Izin Lokasi Kepada PT. PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera, beralamat di Jl. R.A Kartini No. 23 Kecamatan Medan Polonia Kelurahan Madras Hulu Kota Medan 20152, Sumatera Utara untuk tanah seluas \pm 15 Ha (lebih kurang Lima belas hektar), Terletak di Kelurahan Mubai Kecamatan Lebong Selatan Kabupaten Lebong Provinsi Bengkulu, sebagaimana terlampir dalam peta pada lampiran surat keputusan ini.

KEDUA

- : Semua persyaratan dan ketentuan serta tahapan perizinan harus dipatuhi sesuai peraturan perundang-undangan yang berlaku.

KETIGA

- : Hak dan Kewajiban Pemegang Izin :
1. Pemegang Izin Lokasi diizinkan untuk memperoleh/membebasakan tanah dalam areal Izin Lokasi dari hak dan kepentingan pihak lain berdasarkan kesepakatan dengan pemegang hak atau pihak yang mempunyai kepentingan tersebut dengan cara pelepasan hak atau jual beli, pemberian ganti kerugian, relokasi/konsolidasi tanah, atau cara lain sesuai ketentuan yang berlaku.
 2. Setelah memperoleh Surat Keputusan Izin Lokasi, Pemegang Izin Lokasi wajib memberitahu dan menyelenggarakan sosialisasi, di lokasi yang dimohon.
 3. Sebelum tanah yang bersangkutan dibebaskan oleh pemegang Izin Lokasi, maka semua hak atau kepentingan pihak lain yang sudah ada diatas tanah yang bersangkutan tidak berkurang atau tetap diakui haknya, termasuk kewenangan yang menurut hukum dipunyai oleh pemegang hak atas tanah untuk memperoleh tanda bukti hak (sertipikat), dan kewenangan untuk menggunakan dan memanfaatkan tanahnya bagi keperluan pribadi atau usahanya sesuai rencana tata ruang yang berlaku, serta kewenangan untuk mengalihkannya kepada pihak lain.
 4. Pemegang Izin Lokasi wajib menghormati kepentingan pihak-pihak lain atas tanah yang belum dibebaskan, tidak menutup atau mengurangi aksesibilitas yang dimiliki masyarakat disekitar lokasi, dan menjaga serta melindungi kepentingan umum.
 5. Perolehan tanah harus diselesaikan dalam jangka waktu 3 (tiga) tahun sejak tanggal ditetapkan Surat Keputusan ini dan dapat diperpanjang paling lama 1 (satu) tahun dan Pemegang Izin Lokasi wajib untuk melaporkan secara berkala setiap 3 (tiga) bulan kepada Kepala Kantor Pertanahan Kabupaten Lebong.
 6. Pemegang Izin Lokasi hanya dapat memperoleh tanah sesuai dengan peta Izin Lokasi
 7. Pemegang Izin Lokasi yang memperoleh tanah diluar lokasi yang ditetapkan dalam Izin Lokasi, maka perolehan hak atas tanahnya tidak dapat diproses.
 8. Pemegang Izin Lokasi wajib menggunakan dan memanfaatkan tanah yang sudah diperoleh sesuai peruntukan.
 9. Pemegang Izin Lokasi wajib mendaftarkan tanah yang sudah diperoleh pada Kantor Pertanahan Kabupaten Lebong.

KEEMPAT

: Izin Lokasi ini bukan merupakan pemberian hak atas tanah dan diberikan untuk mengurus perizinan selanjutnya pada instansi yang berwenang.

KELIMA

: Apabila dikemudian hari ada penetapan/keputusan yang bersifat tetap dan mengikat terhadap penggunaan tanah lainnya yang berada di dalam areal Izin Lokasi PT. PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera, maka keputusan pemberian Izin Lokasi ini akan ditinjau kembali.

KEENAM

: Keputusan ini berlaku selama 3 (tiga) tahun sejak tanggal ditetapkan dengan ketentuan apabila dikemudian hari terdapat kekeliruan dalam penetapannya, akan diubah dan diperbaiki sebagaimana mestinya.

Ditetapkan di Lebong
Pada Tanggal 14 Maret 2018



KEPALA

BAMBANG ASB, S.Sos. M.Si

Pembina TK.I IV.b

NIP.19730910 199903 1 002

Tembusan Keputusan ini disampaikan kepada Yth :

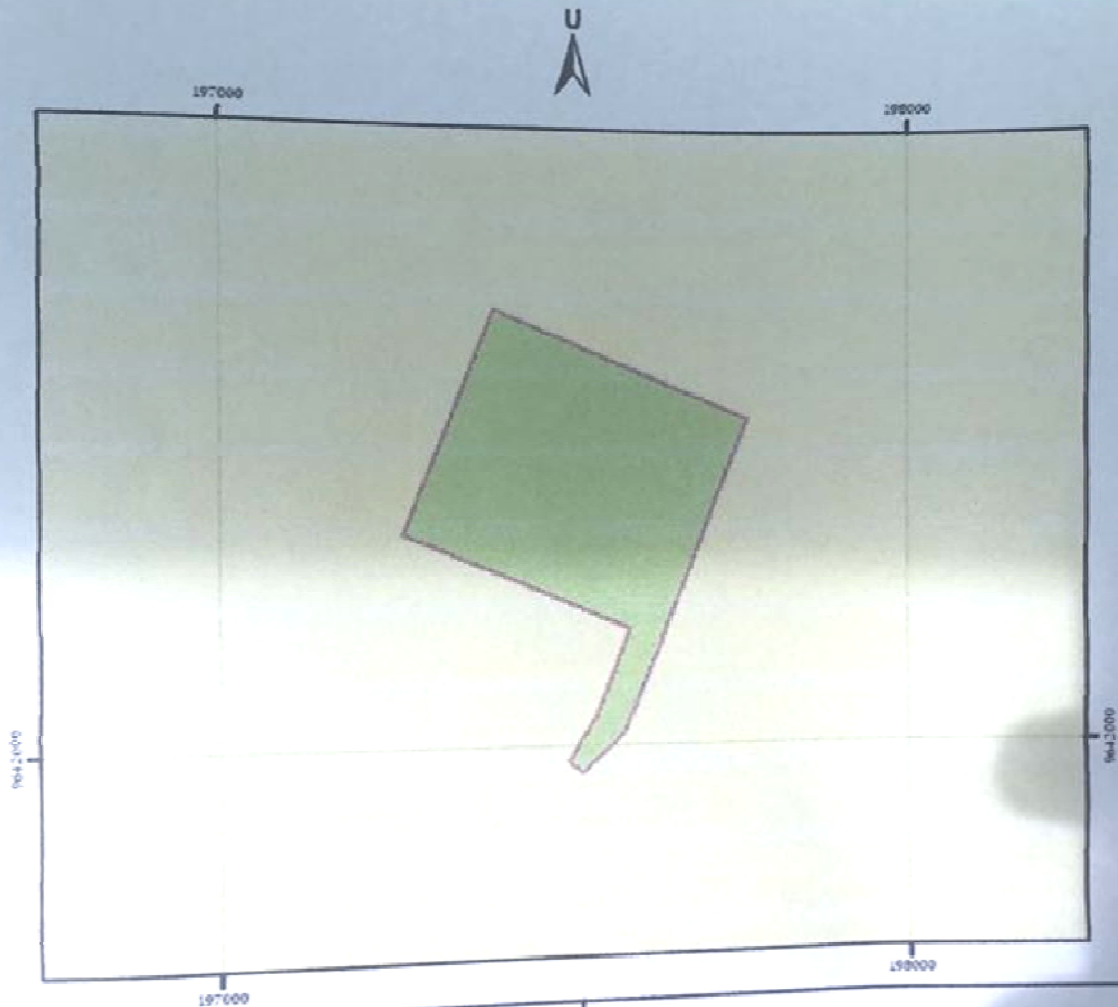
1. Menteri Agraria dan Tata Ruang/Kepala Badan Pertanahan Nasional di Jakarta.
2. Gubernur Bengkulu di Bengkulu.
3. Sekretaris Daerah Kabupaten Lebong di Tubei.
4. Kepala BAPPEDA Kabupaten Lebong di Tubei.
5. Kepala Dinas Lingkungan Hidup Kabupaten Lebong di Tubei.
6. Kepala Dinas Pertanian dan Perikanan Kabupaten Lebong di Tubei.
7. Kepala Kantor Pertanahan Kabupaten Lebong di Tubei.
8. Camat Rimbo Pengadang di Rimbo Pengadang
9. Direktur PT. PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera di Medan.

Nama Pemohon/Badan Usaha : PT. PLN (Persero) Unit Induk
Pembangunan Pembangkit Sumatera

Lokasi : Kelurahan Mubai, Kec. Lebong Selatan

Luas Tanah : ±15 Ha

**PETA PERTIMBANGAN TEKNIS PERTANAHAN
DALAM PENERBITAN IZIN LOKASI
Skala 1 : 10.000**



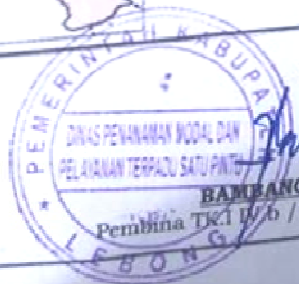
Pemunjuk Letak Lokasi
Skala 1 : 3.000.000



• Lokasi yang dimohon

Keterangan :

- Jalan
- Area yang dimohon (Luas 15 Ha)
- Dibebaskan bersyarat (Luas 15 Ha)
- Sungai



KEPALA

BAMBANG ASB, S.Sos. M.Si

Pembina TKI II/B / NIP.19730910 199903 1 002

APPENDIX 8.

THEORETICAL PLATFORM

Ringkasan Dasar Teori Dalam Prakiraan Besar Dampak

A. Prakiraan Besar Dampak Penurunan Kualitas Udara

1. Dasar Teori

Untuk menghitung estimasi/prakiraan terhadap penurunan kualitas udara dari aktifitas mobilisasi alat dan material adalah mobilitas kendaraan pengangkut alat dan material. Penurunan kualitas udara oleh kegiatan mobilisasi alat dan material dimungkinkan berasal dari emisi kendaraan. EF = Faktor Emisi = jumlah polutan yang diemisikan oleh tiap unit komponen kegiatan dari suatu sumber emisi, sebagaimana tabel di bawah:

Tabel 1 Faktor Emisi

Jenis Kegiatan/ peralatan	Faktor Emisi Parameter Kualitas Udara						Satuan
	SO ₂	CO	CO ₂	NO _x	HC	Partikulat	
Berbahan bakar bensin	-	462,63	2597,86	21,35	54,09	-	Gram/liter bensin
Berbahan bakar solar	-	35,57	2924,9	39,53	8,15	-	Gram/liter solar

Sumber: Deputi Bidang Tata Lingkungan, Kementerian Lingkungan Hidup, 2007

A = intensitas kegiatan per-satuan waktu
ER = Efisiensi pengurangan polutan dari system pengendali emisi yang digunakan (kemampuan knalpot sebagai pengendali emisi).

Formula yang digunakan dalam memprakiraan penyebaran emisi kendaraan menggunakan persamaan Gaussian (sumber garis), sebagai berikut:

$$\Delta C_{(x,z)} = \frac{2Q}{(2\pi)^{1/2} \sigma_z U} \exp \left[\frac{-z^2}{2\sigma_z^2} \right]$$

Keterangan:

- C = konsentrasi emisi (g/m³)
- Q = laju emisi dari sumbernya per unit panjang jalan(g/det.m) = polutan yang diemisikan per satuan waktu
- U = kecepatan angin dalam arah x atau tegak lurus sumbu jalan (m/det).
- = koefisien dispersi
- Z = tinggi lokasi terdampak yang ditinjau (meter).

Tabel 2 Koefisien Dispersi

Kategori Pasquill	Koefisien Dispersi Horisontal Oy (Meter)	Koefisien Dispersi Vertikal Oz (Meter)
Pedesaan		
A	0,22x (1+0,0001x) ^{0,5}	0,20x
B	0,16x (1+0,0001x) ^{0,5}	0,12x
C	0,11x (1+0,0001x) ^{0,5}	0,08x (1+0,0002x) ^{0,5}
D	0,08x (1+0,0001x) ^{0,5}	0,06x (1+0,0002x) ^{0,5}
E	0,06x (1+0,0001x) ^{0,5}	0,03x (1+0,0002x) ^{0,5}
F	0,04x (1+0,0001x) ^{0,5}	0,016x (1+0,0002x) ^{0,5}
Perkotaan		
A-B	0,32x (1+0,0001x) ^{0,5}	0,24x (1+0,0002x) ^{0,5}
C	0,22x (1+0,0001x) ^{0,5}	0,20x
D	0,16x (1+0,0001x) ^{0,5}	0,14x (1+0,0002x) ^{0,5}
E	0,11x (1+0,0001x) ^{0,5}	0,08x (1+0,0002x) ^{0,5}

Sumber: Boubel dkk, 1994 dan The Meteorological Resouce Centre, 2002 (dalam Diah Wijayanti, Surabaya)

Tabel 3 Klasifikasi Stabilitas Atmosfer

Klasifikasi Stabilitas Atmosfer					
Kecepatan Angin (m/detik)	Siang			Malam	
	Intensitas Sinar Matahari (Insolation)			Tutupan Awan	
	Kuat	Sedang	Lemah	4/8 berawan	3/8 cerah
< 2	A	A – B	B	F	F
2 – 3	A – B	B	C	E	F
3 – 5	B	B – C	C	D	E
5 – 6	C	C – D	D	D	D
2> 6	C	D	D	D	D
Keterangan:	A = Sangat tidak stabil B = Tidak stabil C = Sedikit tidak stabil		D = Netral E = Agak sedikit stabil F = Stabil		
q = EF x A x (1 – ER/100) EF = Faktor Emisi = jumlah polutan yang diemisikan oleh tiap unit komponen kegiatan dari suatu sumber emisi. A = Intensitas kegiatan per-satuan waktu ER = Efisiensi pengurangan polutan dari system pengendali emisi yang digunakan					

2. Asumsi

$$Q = EF \times A \times (1 - ER/100)$$

Penggunaan bahan bakar solar untuk 2 unit truk secara bersamaan pada waktu yang sama = 2 x 8 liter/jam = 16 liter/jam, dengan pertimbangan:

Kecepatan kendaraan 40 km/jam,

penggunaan bahan bakar solar per unit truk = 1 liter/5 km

Prakiraan emisi menggunakan rumus Gaussian sumber garis terbatas (100 meter) dengan intensitas bahan bakar solar pada lokasi jalan per 100 meter adalah A = (100 m/40 km) x 16 liter = 0,04 liter/jam untuk 2 unit truk secara bersamaan pada waktu yang sama.

3. Rona Lingkungan Awal

Hasil analisa laboratorium terhadap kualitas udara di 3 (tiga) titik pengukuran sebagaimana dicantumkan pada tabel di bawah.

Tabel 4 Kualitas Udara Rona Awal

No.	Parameter	Unit	Baku Mutu	Lokasi		
				Tapak Lokasi S: 03° 13' 51,6"; E: 102° 16' 47,2"	Jalan Akses S: 03° 14' 02,4"; E: 102° 16' 33,6"	Pemukiman S: 03° 12' 44,1"; E: 102° 18' 53,2"
1	Temperatur	°C	-	32,6	31,7	30,0
2	Kelembaban	%	-	59,2	61,8	62,8
3	Kecepatan Angin	m/s	-	1,0- 3,0	0,0 - 1,5	0,1 - 0,2
4	Arah Angin	-	-	Barat	Selatan	Selatan
5	Tekanan	mmHg	-	764	763	762,7
6	SO ₂	µg/Nm ³	900	<33	<33	<33
7	O ₃	µg/Nm ³	235	66	53	49
8	NO ₂	µg/Nm ³	400	<17	<17	<17
9	TSP	µg/Nm ³	230	18	16	24
10	Pb	µg/Nm ³	2	<0,01	<0,01	<0,01
11	CO	µg/Nm ³	30.000	<114	<114	<114
12	HC	µg/Nm ³	160	<1,6	<1,6	<1,6

Sumber: Hasil pengukuran dan analisa laboratorium. Maret 2018.

4. Hasil Perhitungan

– Laju emisi dari kendaraan pengangkut

Prakiraan emisi disajikan pada tabel-tabel di bawah. Tabel menyajikan simulasi matematis jarak batas antara kualitas udara melampaui baku mutu dan memenuhi baku sebagai dampak emisi kendaraan.

Tabel 5 Prakiraan Emisi dari Penggunaan Solar (pada jarak 5 m dari sumber)

No	Emisi	U (m/det)	A (liter solar/jam)	EF (gram/liter solar)	ER (%)	Q (gr/jam)	Q (gr/det)	x (m)	z (m)	σz (m)	C (gr/m ³)
1	CO	2	0,04	35,57	95	0,07114	0,000020	5	1,6	0,6	0,000449
2	NO _x	2	0,04	39,53	95	0,07906	0,000022	5	1,6	0,6	0,000499
3	HC	2	0,04	8,15	95	0,0163	0,000005	5	1,6	0,6	0,000103

Tabel 6 Prakiraan Emisi dari Penggunaan Solar (pada jarak 6 m dari sumber)

No	Emisi	U (m/det)	A (liter solar/jam)	EF (gram/liter solar)	ER (%)	Q (gr/jam)	Q (gr/det)	x (m)	z (m)	σz (m)	C (gr/m ³)
1	CO	2	0,04	35,57	95	0,07114	0,000020	6	1,6	0,7	0,000127
2	NO _x	2	0,04	39,53	95	0,07906	0,000022	6	1,6	0,7	0,000141
3	HC	2	0,04	8,15	95	0,0163	0,000005	6	1,6	0,7	0,000029

Tabel 7 Penurunan Kualitas Udara oleh Emisi Kendaraan

No	Parameter	Rona awal	Besarnya dampak, jarak .. m		Kualitas udara, jarak.. m		Baku mutu
			5	6	5	6	
1	CO (µg/M ³)	114	449	127	563	241	30000
2	NO ₂ (µg/M ³)	17	499	141	516	158	400
3	HC (µg/M ³)	1,6	103	29	105	31	160

Berdasarkan tabel di atas pengaruh emisi terhadap parameter NO₂ udara pada jarak 5 meter dari sumber melampaui baku mutu, dan pada jarak 6 meter dari sumber memenuhi baku mutu.

– Laju kandungan debu dari mobilitas kendaraan pengangkut

Prakiraan sebaran debu (dari potensi ceceran tanah), menggunakan persamaan empiris Faktor Emisi fugitive debu dari sumber kegiatan pada jalan, untuk setiap jarak tempuh kendaraan:

$$R_{TSP} = 5,9 \times (\text{Silt}/12) \times (\text{Speed}/30) \times (\text{Weight}/3)^{0,7} \times (\text{Wheels}/4)^{0,5}$$

(Sumber referensi: US EPA 1998).

Dimana :

- R = Faktor Emisi, grams/ mile
- Silt = Kandungan debu (dari potensi ceceran tanah) pada permukaan jalan beraspal (%)
- Speed = Rata-rata kecepatan kendaraan (mile/jam)
- Weight = Rata-rata berat kendaraan (tons/unit)
- Wheels = Rata-rata jumlah roda kendaraan (roda)

Prakiraan sebaran debu oleh kegiatan mobilitas kendaraan pengangkut peralatan dan material kerja disajikan pada tabel berikut:

Tabel 8 Prakiraan Sebaran Debu Pada Jarak 4 m dari Sumber

No	Debu	U (m/det)	A (meter/jam)	R	Q (gr/jam)	Q (gr/det)	x (m)	z (m)	σ_z (m)	C (gr/m ³)
1	Debu	2	32000	0,0000004	0,013	0,0000004	4	1,6	0,5	0,00075

Tabel 9 Prakiraan Sebaran Debu Pada Jarak 5 m dari Sumber

No	Debu	U (m/det)	A (meter/jam)	R	Q (gr/jam)	Q (gr/det)	x (m)	z (m)	σ_z (m)	C (gr/m ³)
1	Debu	2	32000	0,0000004	0,013	0,0000004	5	1,6	0,6	0,00008

Tabel 10 Prakiraan Peningkatan Debu Udara

No	Parameter	Rona awal	Besar dampak, jarak .. m		Kualitas udara, jarak.. m		Baku mutu
			4	5	4	5	
1	Debu ($\mu\text{g}/\text{M}^3$)	24	750	82	774	106	230

Pada tabel di atas pada jarak 4 m dari sumber kandungan debu udara melampaui baku mutu, dan pada jarak 5 m dari sumber parameter debu memenuhi baku mutu.

B. Prakiraan Besar Dampak Peningkatan Kebisingan

1. Dasar Teori

Kebisingan adalah suara gaduh/hiruk pikuk yang dapat menyakitkan telinga. Kebisingan akan berkurang dengan bertambahnya jarak antara sumber kebisingan dan penerima. Sesuai dengan ketentuan berdasarkan Keputusan Menteri Negara Lingkungan Hidup No. 48 Tahun 1996 Tentang : Baku Tingkat Kebisingan. Baku tingkat kebisingan disajikan pada tabel di bawah ini.

Tabel 11 Baku mutu tingkat kebisingan

No	Parameter	Waktu Pengukuran	Baku Mutu	Metoda Analisa	Peralatan
1.	Kebisingan	mewakili waktu siang dan malam hari	55 dBA (pemukiman) 70 dBA (kawasan industri)	Sound Pressure Metri	Sound Level Meter

Sumber: Keputusan Menteri Lingkungan Hidup Republik Indonesia Nomor Kep-48/MENLH/11/1996

Prakiraan kebisingan menggunakan model sumber garis menggunakan formula:

$$L_2 = L_1 - 10 \log (R_2/R_1)$$

Dimana :

- L₂ = Tingkat kebisingan pada jarak R₂ (dBA)
- L₁ = Tingkat kebisingan pada jarak R₁ (dBA)
- R₂ = Jarak pendengar dari sumber bising (meter)
- R₁ = Jarak bising dari sumbernya (meter)

Prakiraan kebisingan total dari beberapa sumber dengan tingkat bising berbeda dengan menggunakan formula:

$$L_{tot} = 10 \log \left(\sum_{i=1}^n 10^{L_i/10} \right) \text{ dBA}$$

2. Asumsi

Asumsi sumber kebisingan adalah mobilitas kendaraan pengangkut peralatan dan material kerja, yakni truk. Kendaraan *dump truck* menimbulkan kebisingan 85 dBA pada jarak 1 meter.

3. Rona Lingkungan Awal

Tingkat kebisingan diukur dengan menggunakan alat *Sound Level Meter* selama 10 menit untuk setiap pengukuran dimana pembacaan dilakukan setiap 5 (lima) detik. Setiap pengukuran mewakili selang waktu siang hari dan malam hari:

- L1 = pengukuran diambil jam 7.00, mewakili jam 06.00 – 09.00
- L2 = pengukuran diambil jam 10.00, mewakili jam 09.00 – 14.00
- L3 = pengukuran diambil jam 15.00, mewakili jam 14.00 – 17.00
- L4 = pengukuran diambil jam 20.00, mewakili jam 17.00 – 22.00
- L5 = pengukuran diambil jam 23.00, mewakili jam 22.00 – 24.00
- L6 = pengukuran diambil jam 24.00, mewakili jam 24.00 – 03.00
- L7 = pengukuran diambil jam 04.00, mewakili jam 03.00 – 06.00

Metode perhitungan tingkat kebisingan, mengikuti lampiran II Keputusan Menteri Negara Lingkungan Hidup No. 48/MENLH/11/1996, sebagai berikut:

$$L_{sm} = 10 \log 1/24 \{16 \cdot 10^{0,1L_s} + 8 \cdot 10^{(L_m + 5)}\} \text{ dB(A)}$$

Sumber: lampiran II Keputusan Menteri Negara Lingkungan Hidup No. 48/MENLH/11/1996

Dimana:

$$L_s = 10 \log 1/16 \{T_1 \cdot 10^{0,1L_1} + \dots + T_4 \cdot 10^{0,1L_4}\} \text{ dB(A)}$$

$$L_m = 10 \log 1/8 \{T_5 \cdot 10^{0,1L_5} + \dots + T_7 \cdot 10^{0,1L_7}\} \text{ dB(A)}$$

Leq = *Tingkat Kebisingan Sinambungan Setara*, yaitu nilai tingkat kebisingan yang berubah-ubah (fluktuatif) selama waktu tertentu, yang setara dengan tingkat kebisingan dari kebisingan yang ajeg (steady) pada selang waktu yang sama. Satuannya adalah dB(A).

L_{TM5} = Leq dengan waktu sampel tiap 5 detik.

L_s = Leq selama siang hari.

L_m = Leq selama malam hari.

L_{SM} = Leq selama siang dan malam hari.

Tabel 12 Tingkat Kebisingan Rona Awal

No.	Parameter	Unit	Baku Mutu	Lokasi		
				Tapak Lokasi S: 03° 13' 51,6"; E: 102° 16' 47,2"	Jalan Akses S: 03° 14' 02,4"; E: 102° 16' 33,6"	Pemukiman S: 03° 12' 44,1"; E: 102° 18' 53,2"
1	Kebisingan	dB(A)	-	62	59	70

Sumber: Hasil pengukuran dan analisa laboratorium. Maret 2018.

4. Hasil Perhitungan

Prakiraan tingkat kebisingan yang dihasilkan oleh penggunaan/operasional peralatan yang digunakan untuk melakukan pekerjaan konstruksi disajikan pada tabel di bawah.

Tabel 13 Prakiraan Tingkat Kebisingan oleh Aktivitas Peralatan

Kebisingan	Rona awal (dBA)	Besarnya dampak kebisingan kendaraan pada jarak ... meter dari sumber (dBA)			Kebisingan saat pelaksanaan proyek pada jarak ... meter dari sumber (dBA)			Baku mutu (dBA)*
		1	20	25	1	20	25	
Tapak lokasi	62	85	72	71	85,0	72,4	71,5	70+3
Jalan akses	59	85	72	71	85,0	72,2	71,3	60+3
Pemukiman	70	85	72	71	85,1	74,1	73,6	55+3

*Kepmen LH no.48 tahun 1996

Tabel 14 Prakiraan Tingkat Kebisingan oleh Aktivitas Power Plant

Lokasi	Rona awal (dBA)	Kebisingan Commissioning: ... dBA pada jarak ... meter			Kebisingan .. dBA pada jarak ... meter dari commissioning			Baku mutu (dBA)*
		15	65	70	15	65	70	
Tapak lokasi	62	85	72	72	85	73	72	70+3
Jalan akses	59	85	72	72	85	72	72	60+3
Pemukiman	70	85	72	72	85	74	74	55+3

*Kepmen LH No.48 tahun 1996

C. Prakiraan Besar Dampak Peningkatan TSS pada Sungai Airkotok

1. Dasar Teori

Penurunan kualitas air permukaan (sungai) dimungkinkan berasal dari butiran tanah yang berpotensi masuk ke sungai. Kegiatan penyiapan lahan yang akan dilakukan adalah pembersihan dari vegetasi, semak dan rumput. Dengan adanya pembersihan ini, tanah akan mudah tererosi, dan air run off dengan material erosi akan mengalir ke sungai, menyebabkan peningkatan TSS.

Penurunan kualitas air permukaan akibat masuknya butiran tanah, diperkirakan dengan rumus *mixing zone* sebagai berikut:

$$C3 = \frac{(Q1 \times C1) + (Q2 \times C2)}{(Q1 + Q2)}$$

- Q1 : debit air sungai (liter/detik) sebelum menerima air run off.
 C1 : konsentrasi TSS air sungai (mg/liter) sebelum menerima air run off.
 Q2 : debit masuknya air run off (liter/detik) ke sungai.
 C2 : Konsentrasi TSS air run off yang masuk ke sungai (mg/liter).
 C3 : konsentrasi TSS air sungai (mg/liter) setelah menerima masuknya air run off.

2. Asumsi

Asumsi debit timbulan air larian (*run off*) dengan menggunakan formula:

$$\text{Debit air run off: } Q = (C.I.A)/3,6$$

- C = Koefisien air larian permukaan tanah terbuka (0,4)
 I = Intensitas hujan (=591/23 mm/hari = 26 mm/hari = 13 mm/jam)
 A = Luas area pengaliran air (15 ha = 0,15 km²)
 Q = Laju air larian (m³/detik)

$$\text{Debit air run off: } Q = (C.I.A)/3,6 = (0,4 \times 13 \times 0,15)/3,6 = 0,2 \text{ m}^3/\text{detik} = 200 \text{ liter/detik.}$$

Prakiraan penurunan kualitas air permukaan menggunakan data:

- Kecepatan aliran sungai (saat hujan) ±10 cm/det.
- Lebar sungai 5 meter, kedalaman sungai 50 cm.

3. Debit air run off yang masuk ke sungai (liter/detik).
4. TSS dari air run off yang masuk ke sungai ± 200 mg/l.
5. TSS rona awal air sungai 180 mg/l.

3. Rona Lingkungan Awal

Hasil analisa laboratorium terhadap kualitas air sungai Airkotok di dua titik pengukuran sebagaimana dicantumkan pada tabel di bawah.

Tabel 15 Rona Awal Kualitas Air Permukaan Sungai Airkotok

No.	Parameter	Unit	Baku Mutu	Upstream Sungai Airkotok S: 03° 14' 09,3"; E: 102° 16' 30,4"	Downstream Sungai Airkotok S: 03° 10' 52,7"; E: 102° 16' 00,8"
Fisika					
1	Temperatur	°C	± 3	26,7	25,6
2	Zat Padat Terlarut (TDS)	mg/L	1.000	926	920
3	Zat Padat Tersuspensi (TSS)	mg/L	400	145	180
Kimia					
4	pH (Insitu)	-	6-9	2,76	2,92
5	Oksigen Terlarut (DO)	mg/L	3	6,6	7,3
6	Fluorida (F)	mg/L	1,5	0,4	0,2
7	Fenol	mg/L	0,001	<0,001	<0,001
8	Fosfat total (PO ₄)	mg/L	1	<0,03	<0,03
9	Khlorin bebas (Cl ₂)	mg/L	-	<0,01	<0,01
10	Minyak & Lemak	mg/L	1	<0,2	<0,2
11	Nitrat (NO ₃ .N)	mg/L	20	<0,1	0,2
12	Nitrit (NO ₂ .N)	mg/L	0,06	<0,002	<0,002
13	Sulfida (H ₂ S)	mg/L	0,002	<0,002	<0,002
14	Sianida (CN)	mg/L	0,02	<0,005	<0,005
15	Detergen (MBAS)	mg/L	0,2	<0,01	<0,01
16	BOD ₅	mg/L	6	5	5
17	COD	mg/L	50	14	17
18	Chromium Hexavalent	mg/L	0,05	<0,010	<0,010
19	Mercury	mg/L	0,002	<0,00005	<0,00005
21	Boron	mg/L	1	0,0985	0,305
22	Cobalt	mg/L	0,2	0,0450	0,0226
23	Copper	mg/L	0,02	0,0234	0,0121
24	Zinc	mg/L	0,05	0,248	0,120
25	Arsenic	mg/L	1	0,0020	<0,0010
26	Selenium	mg/L	0,05	<0,0050	<0,0050
27	Cadmium	mg/L	0,01	<0,0010	<0,0010
28	Lead	mg/L	0,03	<0,0050	<0,0050
Mikrobiologi					
29	Fecal Coliform	mg/L	2.000	<1,8	<1,8
30	Total Coliform	mg/L	10.000	<1,8	<1,8

Sumber: Hasil pengukuran dan analisa laboratorium. 2018.

4. Hasil Perhitungan

Prakiraan peningkatan TSS akibat dari pekerjaan konstruksi disajikan pada tabel di bawah

Tabel 16 Prakiraan peningkatan TSS air permukaan (Sungai Airkotok)

No	Parameter	Dampak		Rona awal		C3 (konsentrasi air sungai dengan proyek)	Baku mutu air sungai*
		Q2 (debit air larian) l/det	C2 (konsentrasi TSS air larian)	Q1 (debit badan air sungai) l/det	C2 (konsentrasi air sungai)		
1	TSS (mg/l)	200	200	250	180	189	400

*PP 82 Tahun 2001 (Kelas III)

D. Prakiraan Besar Dampak Peningkatan Kerusakanjalan

1. Dasar Teori

Mobilisasi peralatan dilakukan dengan kendaraan beroda banyak, sedangkan mobilisasi material berupa :pasir, *concrete mix*, rangka besi dan lain-lain menggunakan kendaraan truk kapasitas 8,3 ton. Terkait dengan dampak kemacetan (gangguan) lalu lintas adalah truk pengangkut peralatan *power plant*.

2. Asumsi

Prakiraan besaran dampak kerusakan jalan akibat kegiatan mobilisasi material dengan truk kapasitas 8,3 ton dihitung berdasarkan pengoperasian armada truk pengangkut material dengan kapasitas angkut sebagai berikut:

- Daya dukung jalan lingkungan = 6 Ton.
- Berat Kendaraan = 2,3 ton
- Berat beban material bangunan = 6 ton
- Total berat = 8,3 ton

3. Rona Lingkungan Awal

Akses jalan yang akan dilewati adalah kelas jalan kabupaten dengan daya dukung jalan 6 ton.

4. Hasil Perhitungan

Prakiraan kerusakan jalan akibat aktivitas mobilisasi material kerja dengan perhitungan sebagai berikut:

Tabel 17 Pembagian beban pada gardan/As roda kendaraan dipakai Truck Tronton (3 Sumbu):

Konfigurasi Sumbu & Tipe	Berat Kosong (Ton)	Beban Muatan Maksimum (Ton)	Berat Total Maksimum (Ton)	UE 18 Ksal Kosong	UE 18 Ksal Maksimum	<input type="radio"/> RODA TUNGGAL PADA UJUNG SUMBU <input checked="" type="radio"/> RODA GANDA PADA UJUNG SUMBU
1,2L TRUK	2,3	6	8,3	0,0013	0,2174	34% 66%

Beban yang dipikul As depan : 0,25 x 8,3 ton
: 2,075Ton <6ton

Beban yang dipikul As Belakang : 0,375 x 8,3ton
: 3,1125 Ton <6 ton

Kesimpulan :truk + muatan dengan berat total 8,3 ton, mempunyai MST (Muatan Sumbu Terberat) sebesar = 3,1125 ton, artinya tidak melebihi kapasitas daya dukung jalan (6 ton).

Faktor kerusakan kendaraan (VDF):

- Beban sumbu depan : $0,086 \times (2,075 / 8,160)^4 = 0,00036$
 - Beban sumbu belakang : $0,086 \times (3,1125 / 8,160)^4 = 0,00182$
- Total = 0,00218

(Sumber : Peraturan Dirjen Bina Marga Tahun 1982)

Artinya faktor kerusakan yang ditimbulkan 1 unit truk beserta muatannya dengan total berat 8,3 ton terhadap jalan yang dilaluinya adalah: $0,00218/0,2174 = 0,01$ kali. Pada saat kegiatan mobilisasi peralatan berat diperkirakan akan dioperasikan 4 kendaraan dan tidak ada konvoi kendaraan, sehingga diperkirakan tingkat kerusakan yang akan ditimbulkan = $1 \times 0,01 = 0,01$ kali kerusakan.

APPENDIX 9.

ACTIVITY DOCUMENTATION

DOKUMENTASI KEGIATAN



Gambar 1. Akses jalan Kabupaten ke PLTP Hululais di Kelurahan Tes



Gambar 2. Akses jalan Desa ke Lokasi PLTP Hululais



Gambar 3. Kondisi jalan menuju lokasi PLTP Hululais



Gambar 4. Cluster milik PT PGE yang berdekatan dengan lokasi PLTP Hululais



Gambar 5. Sungai yang berdekatan dengan lokasi PLTP Hululais



Gambar 6. Kondisi lokasi tapak proyek



Gambar 7. Permukiman yang berdekatan dengan lokasi kegiatan



Gambar 8. Pengukuran kualitas udara ambien dan tingkat kebisingan di lokasi tapak proyek.



Gambar 9. Pengukuran kualitas udara dan tingkat kebisingan di permukiman penduduk.



Gambar 10. Pengambilan sampel kualitas air di Sungai Air Kotok



Gambar 11. Survey sosial masyarakat di Desa Danau Liang



Gambar 12. Survey sosial masyarakat di Kelurahan Mubai

APPENDIX 10.
LABORATORY ANALYSIS RESULT

LABORATORY ANALYSIS REPORT

Report Number : OSL1803093
Number of Pages : 3 Including Cover
Sample(s) Description : Ambient Air & Noise
Customer Sample(s) Identity : UA-1 Tapak Lokasi, UA-2 Lokasi Jalan Akses, UA-3 Pemukiman
Sampled by : Laboratory Customer
Date of Sample(s) Reception : March 27, 2018
Date of Analysis Finished : April 06, 2018
Customer Name : PT Nusa Buana Cipta
Customer Category : Company Government Institution School/University
 Private Individual Others
Customer Address : Jl. Tebet Utara 1B, No.3 Jakarta,12820
Customer Contact Person : Mr. Budi Prasetyo
Report On : AMDAL PLTP HULULAIS (2 x 55 MW)
Attention : PT PLN UIP I

Authorized by,


Organo Science
Lab

Yadi Bachtiar, S.Si
Technical Manager
April 06, 2018

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• (1) is sign for subcontracted test parameter; • (2) is sign for non accredited test parameter or test parameter become unaccredited due to different sample matrix; • (3) is sign for air sample reporting result unit, ppm= (mg/Nm³ value)/(24,45/Molecular weight); • (4) is sign for parameter related to sample(s) taken by other party as described in point d; • (5) is sign for parameter related to sample(s) taken not in accordance with the stated method as described in point d; (6) is sign for in situ test parameter; • NA mean Not Available or Not Applicable

LABORATORY ANALYSIS REPORT

OSL1803093-1

Sample Origin and Sampling Data			
Customer Sample Identity	UA-1 Tapak Lokasi	Sampling Method	NA
Matrix	Ambient Air & Noise	Date of Sampling	22-03-2018
Regulation Limit Refer to	PPRI 41/1999	Time of Sampling	12:00 WITA

Temperature (°C)	32,6°C	Wind Direction	West to East
Humidity (%RH)	59,2 %	Atmospheric Pressure (mmHg)	764 mmHg
Windspeed (m/s)	1,0 – 3,0 m/s	Sampling Point Coordinate	S : 03°13'51,6" ; E : 102°16'47,2"

Laboratory Analysis Result				
Parameter(s) of Analysis	Method of Analysis	Unit	Reg. Limit	Result
Sulphur Dioxide (SO ₂)	SNI 19-7119.7 (2005)	µg/Nm ³	900	< 33
Ozone (O ₃)	SNI 19-7119.8 (2005)	µg/Nm ³	235	66
Nitrogen Dioxide (NO ₂)	SNI 19-7119.2 (2005)	µg/Nm ³	400	< 17
Total Suspended Particulates (TSP)	SNI 19-7119.3 (2005)	µg/Nm ³	230	18
Lead (Pb)	SNI 19-7119.4 (2005)	µg/Nm ³	2	< 0,01
Carbon Monoxide (CO)	SNI 7119.10 (2011)	µg/Nm ³	30000	< 114
Hydrocarbons (HC)	SNI 19-4843 (1998)	µg/Nm ³	160	< 1,6
Noise	Inhouse Method, OWI-AA11	dBA	NA	62

OSL1803093-2

Sample Origin and Sampling Data			
Customer Sample Identity	UA-2 Lokasi Jalan Akses	Sampling Method	NA
Matrix	Ambient Air & Noise	Date of Sampling	23-03-2018
Regulation Limit Refer to	PPRI 41/1999	Time of Sampling	13:00 WITA

Temperature (°C)	31,7°C	Wind Direction	South to North
Humidity (%RH)	61,8 %	Atmospheric Pressure (mmHg)	763 mmHg
Windspeed (m/s)	0,0 – 1,5 m/s	Sampling Point Coordinate	S : 03°14'2,4" ; E : 102°16'33,6"

Laboratory Analysis Result				
Parameter(s) of Analysis	Method of Analysis	Unit	Reg. Limit	Result
Sulphur Dioxide (SO ₂)	SNI 19-7119.7 (2005)	µg/Nm ³	900	< 33
Ozone (O ₃)	SNI 19-7119.8 (2005)	µg/Nm ³	235	53
Nitrogen Dioxide (NO ₂)	SNI 19-7119.2 (2005)	µg/Nm ³	400	< 17
Total Suspended Particulates (TSP)	SNI 19-7119.3 (2005)	µg/Nm ³	230	16
Lead (Pb)	SNI 19-7119.4 (2005)	µg/Nm ³	2	< 0,01
Carbon Monoxide (CO)	SNI 7119.10 (2011)	µg/Nm ³	30000	< 114
Hydrocarbons (HC)	SNI 19-4843 (1998)	µg/Nm ³	160	< 1,6
Noise	Inhouse Method, OWI-AA11	dBA	NA	59

LABORATORY ANALYSIS REPORT

OSL1803093-3

Sample Origin and Sampling Data			
Customer Sample Identity	UA-3 Pemukiman	Sampling Method	NA
Matrix	Ambient Air & Noise	Date of Sampling	24-03-2018
Regulation Limit Refer to	PPRI 41/1999	Time of Sampling	14:00 WITA
Temperature (°C)	30,0°C	Wind Direction	South to North
Humidity (%RH)	62,8 %	Atmospheric Pressure (mmHg)	762,7 mmHg
Windspeed (m/s)	0,1 – 0,2 m/s	Sampling Point Coordinate	S : 03°12'44,1" ; E : 102°18'53,2"

Laboratory Analysis Result				
Parameter(s) of Analysis	Method of Analysis	Unit	Reg. Limit	Result
Sulphur Dioxide (SO ₂)	SNI 19-7119.7 (2005)	µg/Nm ³	900	< 33
Ozone (O ₃)	SNI 19-7119.8 (2005)	µg/Nm ³	235	49
Nitrogen Dioxide (NO ₂)	SNI 19-7119.2 (2005)	µg/Nm ³	400	< 17
Total Suspended Particulates (TSP)	SNI 19-7119.3 (2005)	µg/Nm ³	230	24
Lead (Pb)	SNI 19-7119.4 (2005)	µg/Nm ³	2	< 0,01
Carbon Monoxide (CO)	SNI 7119.10 (2011)	µg/Nm ³	30000	< 114
Hydrocarbons (HC)	SNI 19-4843 (1998)	µg/Nm ³	160	< 1,6
Noise	Inhouse Method, OWI-AA11	dBA	NA	70

Reported Quality Control

We show only part of the whole quality control parameters that we have done.

All quality control parameters that we did already meet the requirements. Figures shown in blank sample column indicate Detection Limit (DL).

Parameter(s) of Analysis	Coefficient Correlation	Blank Sample (Below DL)	Verification Standard/CRM (% Recovery)	Standard Spike to Sample (% Recovery)	Replicate (% RPD)
Sulphur Dioxide (SO ₂)	0,9996	< 33 µg/Nm ³	93	NA	NA
Ozone (O ₃)	0,9996	< 34 µg/Nm ³	92	NA	NA
Nitrogen Dioxide (NO ₂)	0,9999	< 17 µg/Nm ³	87	NA	NA
Lead (Pb)	0,9999	< 0,01 µg/Nm ³	98	NA	NA
Hydrocarbons (HC)	0,9990	< 0,05 µg/Nm ³	108	114	0

**PT. UNILAB PERDANA**

Laboratorium Lingkungan Hidup dan Kalibrasi

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 Representative Office : Jl. Kutisari IV/2B, Kuntisari, Tenggilis Mejoyo, Surabaya, Jawa Timur Telp. (031) 8415839 Fax. (031) 8415839

LAPORAN HASIL PENGUJIAN

Nomor : LPUP02940

Nama pelanggan : **PT. NUSA BUANA CIPTA**
 Alamat : **Jl. Tebet Utara 1B No.3 Jakarta Selatan**
 No. identifikasi contoh : **02940-01**
 Uraian contoh : **Air Bersih**
 (GW-1 Tgl. 23/03/18 Jam 14:52 WITA)
 Koordinat : **S 03° 12' 30,3" E 102° 15' 17,8"**
 Asal lokasi : **AMDAL PLTP HULULAIS (2 x 55 MW)**
 Desa Danau Liang, Kec. Lebong Tengah, Kab. Lebong
 Tanggal diterima di Lab : **27 Maret 2018**
 Tanggal pengujian : **27 Maret 2018 sampai 09 April 2018**

Hasil Pengujian

NO	PARAMETER	SATUAN	BAKU MUTU *)	HASIL	METODE
A.	FISIKA				
1	Kekeruhan **)	NTU	25	1	UP.IK.21.01.27 (Turbidimetri)
2	Warna **)	Pt-Co	50	<1	UP.IK.21.01.11 (Spektrofotometri)
3	Zat padat terlarut (TDS) **)	mg/L	1.000	56	UP.IK.21.01.06 (Konduktometri)
4	Suhu (insitu)	°C	Udara ± 3 °C	26,4	Termometer
5	Rasa **)	-	Tdk. Berasa	Tdk berasa	SNI 06-6859-2002
6	Bau **)	-	Tdk. Berbau	Tdk berbau	SNI 06-6860-2002
B.	KIMIA				
1	pH (insitu)	-	6,5 – 8,5	5,38	pH meter
2	Flourida (F) **)	mg/L	1,5	<0,01	APHA Ed. 22nd 4500-F.D-2012
3	Kesadahan total (CaCO ₃) **)	mg/L	500	37	SNI 06-6989.12-2004
4	Nitrat (NO ₃ -N) **)	mg/L	10	1	APHA Ed.22nd 4500-NO ₃ -E-2012
5	Nitrit (NO ₂ -N) **)	mg/L	1	<0,002	SNI 06-6989.9-2004
6	Sianida (CN) **)	mg/L	0,1	<0,005	APHA Ed. 22nd 4500-CN.E-2012
7	Surfactan anion (MBAS) **)	mg/L	0,05	<0,01	SNI 06-6989.51-2005
8	Sulfat (SO ₄) **)	mg/L	400	15	SNI 06-6989.20-2009
9	Nilai permanganat (KMnO ₄) **)	mg/L	10	0,9	SNI 06-6989.22-2004

Keterangan : *) = PERMENKES No. 32 Tahun 2017 Lampiran I. Bab II.A

**) = Parameter terakreditasi oleh KAN No. LP-195-IDN

• Pengukuran parameter Suhu dan pH dilakukan oleh pihak pelanggan

< = Lebih kecil

Jakarta, 11 April 2018
 PT. UNILAB PERDANA



Riyanti P.
 Manajer Sampling

Halaman 1 dari 2

- Hasil yang ditampilkan hanya berhubungan dengan contoh yang diuji dan laporan hasil pengujian tidak boleh digandakan kecuali seluruhnya tanpa persetujuan tertulis dari laboratorium.
- Pengaduan terhadap laporan hasil pengujian tidak dilayani setelah 30 hari dari waktu penerbitan laporan hasil pengujian



PT. UNILAB PERDANA

Laboratorium Lingkungan Hidup dan Kalibrasi

No. Reg : 0001/LPJ/LABLING-1/LRK/KLH



Head Office : GEDUNG UNILAB Jl. Ciledug Raya No. 10, Cipulir, Kebayoran Lama, Jakarta 12230 Telp.(021) 7253322 (hunting) Fax : (021) 7253323 e-mail : unilabperdana.centrin.net.id
Representative Office : Jl. Kutisari IV/2B, Kuntisari, Tenggilis Mejoyo, Surabaya, Jawa Timur Telp. (031) 8415839 Fax. (031) 8415839

LAPORAN HASIL PENGUJIAN

Nomor : LPUP02940

Nama pelanggan : **PT. NUSA BUANA CIPTA**
 Alamat : **Jl. Tebet Utara 1B No.3 Jakarta Selatan**
 No. identifikasi contoh : **02940-02**
 Uraian contoh : **Air Bersih**
 (GW-2 Sumur Bapak Erlan Joni Tgl. 23/03/18 Jam 10:23 WITA)
 Koordinat : **S 03° 12' 42,2" E 102° 18' 52,9"**
 Asal lokasi : **AMDAL PLTP HULULAIS (2 x 55 MW)**
 Desa Mubai, Kec. Lebong Selatan, Kab. Lebong
 Tanggal diterima di Lab : **27 Maret 2018**
 Tanggal pengujian : **27 Maret 2018 sampai 09 April 2018**

Hasil Pengujian

NO	PARAMETER	SATUAN	BAKU MUTU *)	HASIL	METODE
A. FISIKA					
1	Kekeruhan **)	NTU	25	<1	UP.IK.21.01.27 (Turbidimetri)
2	Warna **)	Pt-Co	50	<1	UP.IK.21.01.11 (Spektrofotometri)
3	Zat padat terlarut (TDS) **)	mg/L	1.000	65	UP.IK.21.01.06 (Konduktometri)
4	Suhu (insitu)	°C	Udara ± 3 °C	25,6	Termometer
5	Rasa **)	-	Tdk. Berasa	Tdk berasa	SNI 06-6859-2002
6	Bau **)	-	Tdk. Berbau	Tdk berbau	SNI 06-6860-2002
B. KIMIA					
1	pH (insitu)	-	6,5 – 8,5	6,82	pH meter
2	Flourida (F) **)	mg/L	1,5	<0,01	APHA Ed. 22nd 4500-F.D-2012
3	Kesadahan total (CaCO ₃) **)	mg/L	500	47	SNI 06-6989.12-2004
4	Nitrat (NO ₃ -N) **)	mg/L	10	0,4	APHA Ed.22nd 4500-NO ₃ -E-2012
5	Nitrit (NO ₂ -N) **)	mg/L	1	<0,002	SNI 06-6989.9-2004
6	Sianida (CN) **)	mg/L	0,1	<0,005	APHA Ed. 22nd 4500-CN.E-2012
7	Surfactan anion (MBAS) **)	mg/L	0,05	<0,01	SNI 06-6989.51-2005
8	Sulfat (SO ₄) **)	mg/L	400	36	SNI 06-6989.20-2009
9	Nilai permanganat (KMnO ₄) **)	mg/L	10	1	SNI 06-6989.22-2004

Keterangan : *) = PERMENKES No. 32 Tahun 2017 Lampiran I. Bab II.A

***) = Parameter terakreditasi oleh KAN No. LP-195-IDN

• Pengukuran parameter Suhu dan pH dilakukan oleh pihak pelanggan

< = Lebih kecil

Jakarta, 11 April 2018

PT. UNILAB PERDANA


Rivanir P.
Manajer Sampling

Halaman 2 dari 2

- Hasil yang ditampilkan hanya berhubungan dengan contoh yang diuji dan laporan hasil pengujian tidak boleh digandakan kecuali seluruhnya tanpa persetujuan tertulis dari laboratorium.
- Pengaduan terhadap laporan hasil pengujian tidak dilayani setelah 30 hari dari waktu penerbitan laporan hasil pengujian



CERTIFICATE OF ANALYSIS with GUIDELINE COMPARISON

Table with 2 columns: Field Name and Value. Fields include Work Order, Amendment, Client, Contact, Address, E-mail, Telephone, Facsimile, Project, Order number, C-O-C number, Site, Sampled by, Page, Date Samples Received, Date Analysis Commenced, Issue Date, No. of samples received, No. of samples analysed, Quote number, and QC Level.

This Certificate of Analysis contains the following information:

- General Comments
• Analytical Results

Signatories



This laboratory is accredited under KOMITE AKREDITASI NASIONAL. The tests reported herein have been performed in accordance with laboratory's Terms of Accreditation. This document has been electronically signed by authorized signatories indicated below. Electronic signing has been carried out in compliance with procedure specified in 21 CFR Part 11.

Table with 2 columns: Signatories and Position. Row: Sisca Nurhafifa, Laboratory Manager



General Comments

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Key: LOR = Limit of reporting CFU = Colony Forming Unit MPN = Most Probable Number PN = Probable Number
ø = ALS is not accredited for these tests

Work Order Specific Comments

- Results for soil samples are reported on a dry weight basis.



Analytical Results

WATER

001 GW-1

S: 03°12'30.3" ; E: 102°15'17.8"

23-Mar-2018 14:52

PerMenKes No. 32 Year 2017, Table 3

Test description	Method	LOR	Unit	Result	Low	High	Unit
Metal and Major Cations							
Chromium - Hexavalent	APHA3500-Cr	0.010	mg/L	<0.010	----	0.05	mg/L
Metal and Major Cations-Dissolved							
Mercury	APHA 3112 B	0.00005	mg/L	<0.00005	----	0.001	mg/L
Manganese	APHA 3125 B	0.0050	mg/L	0.102	----	0.5	mg/L
Iron	APHA 3125 B	0.0050	mg/L	0.511	----	1	mg/L
Zinc	APHA 3125 B	0.0050	mg/L	0.0201	----	15	mg/L
Arsenic	APHA 3125 B	0.0010	mg/L	<0.0010	----	0.05	mg/L
Selenium	APHA 3125 B	0.0050	mg/L	<0.0050	----	0.01	mg/L
Cadmium	APHA 3125 B	0.0010	mg/L	<0.0010	----	0.005	mg/L
Lead	APHA 3125 B	0.0050	mg/L	<0.0050	----	0.05	mg/L

Issue Date : 04-Apr-2018 10:58
Page : 4 of 6
Work Order : JW1801360
Client : NUSA BUANA CIPTA



WATER 001 GW-1 S: 03°12'30.3" ; E: 102°15'17.8" 23-Mar-2018 14:52					PerMenKes No. 32 Year 2017, Table 2		
<i>Test description</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Low</i>	<i>High</i>	<i>Unit</i>
Microbiological Testing							
Total Coliform Count	APHA9222B	1	CFU/100mL	<1.8	----	50	CFU/100mL

Issue Date : 04-Apr-2018 10:58
 Page : 5 of 6
 Work Order : JW1801360
 Client : NUSA BUANA CIPTA



WATER					PerMenKes No. 32 Year 2017, Table 3		
002 GW-2 SUMUR BAPAK ERLAN JONI							
S: 03°12'44.2" ; E: 102°18'52.9"							
23-Mar-2018 10:23							
Test description	Method	LOR	Unit	Result	Low	High	Unit
Metal and Major Cations							
Chromium - Hexavalent	APHA3500-Cr	0.010	mg/L	<0.010	----	0.05	mg/L
Metal and Major Cations-Dissolved							
Mercury	APHA 3112 B	0.00005	mg/L	<0.00005	----	0.001	mg/L
Manganese	APHA 3125 B	0.0050	mg/L	0.0311	----	0.5	mg/L
Iron	APHA 3125 B	0.0050	mg/L	0.0245	----	1	mg/L
Zinc	APHA 3125 B	0.0050	mg/L	0.0060	----	15	mg/L
Arsenic	APHA 3125 B	0.0010	mg/L	<0.0010	----	0.05	mg/L
Selenium	APHA 3125 B	0.0050	mg/L	<0.0050	----	0.01	mg/L
Cadmium	APHA 3125 B	0.0010	mg/L	<0.0010	----	0.005	mg/L
Lead	APHA 3125 B	0.0050	mg/L	<0.0050	----	0.05	mg/L

Issue Date : 04-Apr-2018 10:58
Page : 6 of 6
Work Order : JW1801360
Client : NUSA BUANA CIPTA



WATER 002 GW-2 SUMUR BAPAK ERLAN JONI S: 03°12'44.2" ; E: 102°18'52.9" 23-Mar-2018 10:23					PerMenKes No. 32 Year 2017, Table 2		
<i>Test description</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Low</i>	<i>High</i>	<i>Unit</i>
Microbiological Testing							
Total Coliform Count	APHA9222B	1	CFU/100mL	<1.8	----	50	CFU/100mL

QUALITY CONTROL REPORT

Work Order	: JW1801360	Page	: 1 of 4
Client	: NUSA BUANA CIPTA	Laboratory	: PT ALS INDONESIA
Contact	: MS RORO SORAYA	Contact	: Tamara Dayu
Address	: JL. TEBET UTARA 1B NO. 3 JAKARTA 12820	Address	: SENTUL INDUSTRIAL AREA CAHAYA RAYA ROAD BLOK K BOGOR WEST JAVA INDONESIA 16810
E-mail	: lab@nusabuanacipta.com	E-mail	: Tamara.Dayu@alsglobal.com
Telephone	: 0218303718	Telephone	: +62 21 29415151
Facsimile	: ----	Facsimile	: +62 21 29415152
Project	: AMDAL PLTP HULULAIS (2 X 55 MW)	QC Level	: ALS Indonesia Quality Control Schedule (Standard)
Order number	: ----	Date Samples Received	: 26-Mar-2018
C-O-C number	: ----	Date Analysis Commenced	: 26-Mar-2018
Sampler	: CLIENT	Issue Date	: 04-Apr-2018
Site	: ----	No. of samples received	: 2
Quote number	: WATER - Metals + T.Coliform (CFU)	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



Signatories

This laboratory is accredited under KOMITE AKREDITASI NASIONAL. The tests reported herein have been performed in accordance with laboratory's Terms of Accreditation. This document has been electronically signed by authorized signatories indicated below. Electronic signing has been carried out in compliance with procedure specified in 21 CFR Part 11.

Signatories

Position

Sisca Nurhafifa

Laboratory Manager



General Comments

The analytical procedures used by the PT ALS Indonesia have been developed from established internationally recognized procedures. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :

- Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
- CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
- LOR = Limit of reporting
- RPD = Relative Percentage Difference
- # = Indicates failed QC
- CFU = Colony Forming Unit
- MPN = Most Probable Number
- PN = Probable Number
- Result <LOR = Not Detected (ND)



Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method SOP-QD-23 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
Metal and Major Cations : APHA3500-Cr / Chromium (VI) by UV-Vis Spectrophotometer									
JW1801316-001	Anonymous	Chromium - Hexavalent	----	0.01	mg/L	<0.010	<0.010	0.00	No Limit
Metal and Major Cations-Dissolved : APHA / Total Mercury (Dissolved) by FIMS									
JW1801315-001	Anonymous	Mercury	7439-97-6	0.00005	mg/L	<0.00005	<0.00005	0.00	No Limit
Metal and Major Cations-Dissolved : APHA / Total Metals (Dissolved) by ICP-MS									
JW1801315-001	Anonymous	Manganese	7439-96-5	0.005	mg/L	<0.0050	<0.0050	0.00	No Limit
		Iron	7439-89-6	0.005	mg/L	0.252	0.249	1.26	0% - 20%
		Zinc	7440-66-6	0.005	mg/L	0.0095	0.0092	3.18	No Limit
		Arsenic	7440-38-2	0.001	mg/L	0.0014	<0.0010	33.4	No Limit
		Selenium	7782-49-2	0.005	mg/L	<0.0050	<0.0050	0.00	No Limit
		Cadmium	7440-43-9	0.001	mg/L	<0.0010	<0.0010	0.00	No Limit
		Lead	7439-92-1	0.005	mg/L	<0.0050	<0.0050	0.00	No Limit



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
Metal and Major Cations : APHA3500-Cr/Chromium (VI) by UV-Vis Spectrophotometer									
Chromium - Hexavalent	----	0.01	mg/L	<0.010	0.1 mg/L	112	80	120	
Metal and Major Cations-Dissolved : APHA/Total Mercury (Dissolved) by FIMS									
Mercury	7439-97-6	0.00005	mg/L	<0.00005	0.004 mg/L	109	80	120	
Metal and Major Cations-Dissolved : APHA/Total Metals (Dissolved) by ICP-MS									
Manganese	7439-96-5	0.005	mg/L	<0.0050	0.02 mg/L	104	80	120	
Iron	7439-89-6	0.005	mg/L	<0.0050	0.05 mg/L	91.3	80	120	
Zinc	7440-66-6	0.005	mg/L	<0.0050	0.02 mg/L	103	80	120	
Arsenic	7440-38-2	0.001	mg/L	<0.0010	0.02 mg/L	103	80	120	
Selenium	7782-49-2	0.005	mg/L	<0.0050	0.02 mg/L	98.6	80	120	
Cadmium	7440-43-9	0.001	mg/L	<0.0010	0.02 mg/L	107	80	120	
Lead	7439-92-1	0.005	mg/L	<0.0050	0.02 mg/L	104	80	120	

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
Metal and Major Cations : APHA3500-Cr/Chromium (VI) by UV-Vis Spectrophotometer							
JW1801316-002	Anonymous	Chromium - Hexavalent	----	0.1 mg/L	113	80	120
Metal and Major Cations-Dissolved : APHA/Total Mercury (Dissolved) by FIMS							
JW1801315-002	Anonymous	Mercury	7439-97-6	0.004 mg/L	92.3	80	120
Metal and Major Cations-Dissolved : APHA/Total Metals (Dissolved) by ICP-MS							
JW1801315-002	Anonymous	Arsenic	7440-38-2	0.02 mg/L	88.4	80	120
		Cadmium	7440-43-9	0.02 mg/L	91.0	80	120
		Lead	7439-92-1	0.02 mg/L	93.4	80	120
		Manganese	7439-96-5	0.02 mg/L	88.9	80	120
		Selenium	7782-49-2	0.02 mg/L	93.6	80	120
		Zinc	7440-66-6	0.02 mg/L	84.2	80	120



CERTIFICATE OF ANALYSIS with GUIDELINE COMPARISON

Table with 2 columns: Field Name and Value. Fields include Work Order, Amendment, Client, Contact, Address, E-mail, Telephone, Facsimile, Project, Order number, C-O-C number, Site, Sampled by, Page, Date Samples Received, Date Analysis Commenced, Issue Date, No. of samples received, No. of samples analysed, Quote number, and QC Level.

This Certificate of Analysis contains the following information:

- General Comments
• Analytical Results

Signatories



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Table with 2 columns: Signatories and Position. Row: Sisca Nurhafifa, Laboratory Manager



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Key: LOR = Limit of reporting CFU = Colony Forming Unit MPN = Most Probable Number PN = Probable Number
ø = ALS is not accredited for these tests

Work Order Specific Comments

- Results for soil samples are reported on a dry weight basis.



Analytical Results

WATER

001 SW-1 UPSTREAM SUNGAI AIR KOTOK

S: 03°14'09.3" ; E: 102°16'30.4"

23-Mar-2018 13:50

PP No 82 Year 2001, Class III

Test description	Method	LOR	Unit	Result	Low	High	Unit
Metal and Major Cations							
Chromium - Hexavalent	APHA3500-Cr	0.010	mg/L	<0.010	----	0.05	mg/L
Metal and Major Cations-Dissolved							
Mercury	APHA 3112 B	0.00005	mg/L	<0.00005	----	0.002	mg/L
Boron	APHA 3125 B	0.0050	mg/L	0.0985	----	1	mg/L
Cobalt	APHA 3125 B	0.0010	mg/L	0.0450	----	0.2	mg/L
Copper	APHA 3125 B	0.0050	mg/L	0.0234	----	0.02	mg/L
Zinc	APHA 3125 B	0.0050	mg/L	0.248	----	0.05	mg/L
Arsenic	APHA 3125 B	0.0010	mg/L	0.0020	----	1	mg/L
Selenium	APHA 3125 B	0.0050	mg/L	<0.0050	----	0.05	mg/L
Cadmium	APHA 3125 B	0.0010	mg/L	<0.0010	----	0.01	mg/L
Lead	APHA 3125 B	0.0050	mg/L	<0.0050	----	0.03	mg/L
Microbiological Testing							
Total Fecal Coliform Count	APHA9221E	1.8	MPN/100 mL	<1.8	----	2000	MPN/100 mL
Total Coliform Count	APHA9221B	1.8	MPN/100 mL	<1.8	----	10000	MPN/100 mL

QUALITY CONTROL REPORT

Work Order	: JW1801359	Page	: 1 of 4
Client	: NUSA BUANA CIPTA	Laboratory	: PT ALS INDONESIA
Contact	: MS RORO SORAYA	Contact	: Tamara Dayu
Address	: JL. TEBET UTARA 1B NO. 3 JAKARTA 12820	Address	: SENTUL INDUSTRIAL AREA CAHAYA RAYA ROAD BLOK K BOGOR WEST JAVA INDONESIA 16810
E-mail	: lab@nusabuanacipta.com	E-mail	: Tamara.Dayu@alsglobal.com
Telephone	: 0218303718	Telephone	: +62 21 29415151
Facsimile	: ----	Facsimile	: +62 21 29415152
Project	: AMDAL PLTP HULULAIS (2 X 55 MW)	QC Level	: ALS Indonesia Quality Control Schedule (Standard)
Order number	:	Date Samples Received	: 26-Mar-2018
C-O-C number	: ----	Date Analysis Commenced	: 26-Mar-2018
Sampler	: CLIENT	Issue Date	: 05-Apr-2018
Site	: ----	No. of samples received	: 1
Quote number	: WATER - Diss. Metals + Fecal & Total Coliform (MPN)	No. of samples analysed	: 1

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- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



Signatories

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Signatories

Position

Sisca Nurhafifa

Laboratory Manager



General Comments

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- MPN = Most Probable Number
- PN = Probable Number
- Result <LOR = Not Detected (ND)



Laboratory Duplicate (DUP) Report

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Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
Metal and Major Cations : APHA3500-Cr / Chromium (VI) by UV-Vis Spectrophotometer									
JW1801316-001	Anonymous	Chromium - Hexavalent	----	0.01	mg/L	<0.010	<0.010	0.00	No Limit
Metal and Major Cations-Dissolved : APHA / Total Mercury (Dissolved) by FIMS									
JW1801315-001	Anonymous	Mercury	7439-97-6	0.00005	mg/L	<0.00005	<0.00005	0.00	No Limit
Metal and Major Cations-Dissolved : APHA / Total Metals (Dissolved) by ICP-MS									
JW1801315-001	Anonymous	Boron	7440-42-8	0.005	mg/L	0.0299	0.0282	6.08	No Limit
		Cobalt	7440-48-4	0.001	mg/L	<0.0010	<0.0010	0.00	No Limit
		Copper	7440-50-8	0.005	mg/L	<0.0050	<0.0050	0.00	No Limit
		Zinc	7440-66-6	0.005	mg/L	0.0095	0.0092	3.18	No Limit
		Arsenic	7440-38-2	0.001	mg/L	0.0014	<0.0010	33.4	No Limit
		Selenium	7782-49-2	0.005	mg/L	<0.0050	<0.0050	0.00	No Limit
		Cadmium	7440-43-9	0.001	mg/L	<0.0010	<0.0010	0.00	No Limit
		Lead	7439-92-1	0.005	mg/L	<0.0050	<0.0050	0.00	No Limit



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
Metal and Major Cations : APHA3500-Cr/Chromium (VI) by UV-Vis Spectrophotometer								
Chromium - Hexavalent	----	0.01	mg/L	<0.010	0.1 mg/L	112	80	120
Metal and Major Cations-Dissolved : APHA/Total Mercury (Dissolved) by FIMS								
Mercury	7439-97-6	0.00005	mg/L	<0.00005	0.004 mg/L	109	80	120
Metal and Major Cations-Dissolved : APHA/Total Metals (Dissolved) by ICP-MS								
Boron	7440-42-8	0.005	mg/L	<0.0050	0.05 mg/L	102	80	120
Cobalt	7440-48-4	0.001	mg/L	<0.0010	0.02 mg/L	98.1	80	120
Copper	7440-50-8	0.005	mg/L	<0.0050	0.02 mg/L	96.6	80	120
Zinc	7440-66-6	0.005	mg/L	<0.0050	0.02 mg/L	103	80	120
Arsenic	7440-38-2	0.001	mg/L	<0.0010	0.02 mg/L	103	80	120
Selenium	7782-49-2	0.005	mg/L	<0.0050	0.02 mg/L	98.6	80	120
Cadmium	7440-43-9	0.001	mg/L	<0.0010	0.02 mg/L	107	80	120
Lead	7439-92-1	0.005	mg/L	<0.0050	0.02 mg/L	104	80	120

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
				MS	Low	High	
Metal and Major Cations : APHA3500-Cr/Chromium (VI) by UV-Vis Spectrophotometer							
JW1801316-002	Anonymous	Chromium - Hexavalent	----	0.1 mg/L	113	80	120
Metal and Major Cations-Dissolved : APHA/Total Mercury (Dissolved) by FIMS							
JW1801315-002	Anonymous	Mercury	7439-97-6	0.004 mg/L	92.3	80	120
Metal and Major Cations-Dissolved : APHA/Total Metals (Dissolved) by ICP-MS							
JW1801315-002	Anonymous	Arsenic	7440-38-2	0.02 mg/L	88.4	80	120
		Cadmium	7440-43-9	0.02 mg/L	91.0	80	120
		Cobalt	7440-48-4	0.02 mg/L	84.1	80	120
		Copper	7440-50-8	0.02 mg/L	82.6	80	120
		Lead	7439-92-1	0.02 mg/L	93.4	80	120
		Selenium	7782-49-2	0.02 mg/L	93.6	80	120
		Zinc	7440-66-6	0.02 mg/L	84.2	80	120



CERTIFICATE OF ANALYSIS with GUIDELINE COMPARISON

Table with 2 columns: Field Name and Value. Fields include Work Order, Amendment, Client, Contact, Address, E-mail, Telephone, Facsimile, Project, Order number, C-O-C number, Site, Sampled by, Page, Date Samples Received, Date Analysis Commenced, Issue Date, No. of samples received, No. of samples analysed, Quote number, and QC Level.

This Certificate of Analysis contains the following information:

- General Comments
• Analytical Results

Signatories



This laboratory is accredited under KOMITE AKREDITASI NASIONAL. The tests reported herein have been performed in accordance with laboratory's Terms of Accreditation. This document has been electronically signed by authorized signatories indicated below. Electronic signing has been carried out in compliance with procedure specified in 21 CFR Part 11.

Table with 2 columns: Signatories and Position. Row: Sisca Nurhafifa, Laboratory Manager



General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

The analytical procedures used by the PT ALS Indonesia have been developed from established internationally recognized procedures. In house developed procedures are employed in the absence of documented standards or by client request.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to insufficient sample (reduced weight employed) or matrix interference.

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

Key: LOR = Limit of reporting CFU = Colony Forming Unit MPN = Most Probable Number PN = Probable Number
ø = ALS is not accredited for these tests

Work Order Specific Comments

- Results for soil samples are reported on a dry weight basis.



Analytical Results

WATER

PP No 62 Year 2001, Class III

001 SW-2 DOWNSTREAM SUNGAI AIR KOTOK

S = 03°10'52.7" E = 102°16'00.8"

24-Mar-2018 14:45

Test description	Method	LOR	Unit	Result	Low	High	Unit
Metal and Major Cations							
Chromium Hexavalent	APHA-A3500-Cr	0.010	mg/L	<0.010	---	0.05	mg/L
Metal and Major Cations-Dissolved							
Mercury	APHA 3112 B	0.00005	mg/L	<0.00005	---	0.002	mg/L
Boron	APHA 3125 B	0.0050	mg/L	3.305	---	1	mg/L
Cobalt	APHA 3125 B	0.0010	mg/L	0.0226	---	0.2	mg/L
Copper	APHA 3125 B	0.0050	mg/L	0.0121	---	0.02	mg/L
Zinc	APHA 3125 B	0.0050	mg/L	0.120	---	0.05	mg/L
Arsenic	APHA 3125 B	0.0010	mg/L	<0.0010	---	1	mg/L
Selenium	APHA 3125 B	0.0050	mg/L	<0.0050	---	0.05	mg/L
Cadmium	APHA 3125 B	0.0010	mg/L	<0.0010	---	0.01	mg/L
Lead	APHA 3125 B	0.0050	mg/L	<0.0050	---	0.03	mg/L
Microbiological Testing							
Total Fecal Coliform Count	APHA-A9221E	1.8	MPN/100 m _L	<1.8	---	2000	MPN/100 m _L
Total Coliform Count	APHA-A9221B	1.8	MPN/100 m _L	<1.8	---	10000	MPN/100 m _L

QUALITY CONTROL REPORT

Work Order	: JW1801397	Page	: 1 of 4
Client	: NUSA BUANA CIPTA	Laboratory	: PT ALS INDONESIA
Contact	: MS RORO SORAYA	Contact	: Tamara Dayu
Address	: JL. TEBET UTARA 1B NO. 3 JAKARTA 12820	Address	: SENTUL INDUSTRIAL AREA CAHAYA RAYA ROAD BLOK K BOGOR WEST JAVA INDONESIA 16810
E-mail	: lab@nusabuanacipta.com	E-mail	: Tamara.Dayu@alsglobal.com
Telephone	: 0218303718	Telephone	: +62 21 29415151
Facsimile	: ----	Facsimile	: +62 21 29415152
Project	: AMDAL PLTP HULULAIS (2 X 55 MW)	QC Level	: ALS Indonesia Quality Control Schedule (Standard)
Order number	: ----	Date Samples Received	: 27-Mar-2018
C-O-C number	: ----	Date Analysis Commenced	: 28-Mar-2018
Sampler	: CLIENT	Issue Date	: 09-Apr-2018
Site	: ----	No. of samples received	: 1
Quote number	: WATER - Diss. Metals + Fecal & Total Coliform (MPN)	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



Signatories

This laboratory is accredited under KOMITE AKREDITASI NASIONAL. The tests reported herein have been performed in accordance with laboratory's Terms of Accreditation. This document has been electronically signed by authorized signatories indicated below. Electronic signing has been carried out in compliance with procedure specified in 21 CFR Part 11.

Signatories

Position

Sisca Nurhafifa

Laboratory Manager



General Comments

The analytical procedures used by the PT ALS Indonesia have been developed from established internationally recognized procedures. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :

- Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
- CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
- LOR = Limit of reporting
- RPD = Relative Percentage Difference
- # = Indicates failed QC
- CFU = Colony Forming Unit
- MPN = Most Probable Number
- PN = Probable Number
- Result <LOR = Not Detected (ND)



Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method SOP-QD-23 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
Metal and Major Cations : APHA3500-Cr / Chromium (VI) by UV-Vis Spectrophotometer									
JW1801383-001	Anonymous	Chromium - Hexavalent	----	0.01	mg/L	<0.050	<0.050	0.00	No Limit
Metal and Major Cations-Dissolved : APHA / Total Mercury (Dissolved) by FIMS									
JW1801321-001	Anonymous	Mercury	7439-97-6	0.00005	mg/L	<0.00005	<0.00005	0.00	No Limit
Metal and Major Cations-Dissolved : APHA / Total Metals (Dissolved) by ICP-MS									
JW1801397-001	SW-2 DOWNSTREAM SUNGAI CIKOTOK S = 03□10'52.7" E = 102□16'00.8"	Boron	7440-42-8	0.005	mg/L	0.305	0.319	4.55	0% - 20%
		Cobalt	7440-48-4	0.001	mg/L	0.0226	0.0227	0.678	0% - 20%
		Copper	7440-50-8	0.005	mg/L	0.0121	0.0123	1.63	No Limit
		Zinc	7440-66-6	0.005	mg/L	0.120	0.121	0.859	0% - 20%
		Arsenic	7440-38-2	0.001	mg/L	<0.0010	<0.0010	0.00	No Limit
		Selenium	7782-49-2	0.005	mg/L	<0.0050	<0.0050	0.00	No Limit
		Cadmium	7440-43-9	0.001	mg/L	<0.0010	<0.0010	0.00	No Limit
		Lead	7439-92-1	0.005	mg/L	<0.0050	<0.0050	0.00	No Limit



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
Metal and Major Cations : APHA3500-Cr/Chromium (VI) by UV-Vis Spectrophotometer									
Chromium - Hexavalent	----	0.01	mg/L	<0.010	0.1 mg/L	110	80	120	
Metal and Major Cations-Dissolved : APHA/Total Mercury (Dissolved) by FIMS									
Mercury	7439-97-6	0.00005	mg/L	<0.00005	0.004 mg/L	99.2	80	120	
Metal and Major Cations-Dissolved : APHA/Total Metals (Dissolved) by ICP-MS									
Boron	7440-42-8	0.005	mg/L	<0.0050	0.02 mg/L	96.4	80	120	
Cobalt	7440-48-4	0.001	mg/L	<0.0010	0.02 mg/L	98.3	80	120	
Copper	7440-50-8	0.005	mg/L	<0.0050	0.02 mg/L	98.5	80	120	
Zinc	7440-66-6	0.005	mg/L	<0.0050	0.02 mg/L	98.7	80	120	
Arsenic	7440-38-2	0.001	mg/L	<0.0010	0.02 mg/L	95.0	80	120	
Selenium	7782-49-2	0.005	mg/L	<0.0050	0.05 mg/L	108	80	120	
Cadmium	7440-43-9	0.001	mg/L	<0.0010	0.02 mg/L	95.9	80	120	
Lead	7439-92-1	0.005	mg/L	<0.0050	0.02 mg/L	93.8	80	120	

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
Metal and Major Cations : APHA3500-Cr/Chromium (VI) by UV-Vis Spectrophotometer							
JW1801383-002	Anonymous	Chromium - Hexavalent	----	0.1 mg/L	107	80	120
Metal and Major Cations-Dissolved : APHA/Total Mercury (Dissolved) by FIMS							
JW1801321-002	Anonymous	Mercury	7439-97-6	0.004 mg/L	113	80	120



PT. UNILAB PERDANA

Laboratorium Lingkungan Hidup dan Kalibrasi

No. Reg : 0001/LPJ/LABLING-1/LRK/KLIH



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Representative Office : Jl. Kutisari IV/2B, Kuntisari, Tenggilis Mejoyo, Surabaya, Jawa Timur Telp. (031) 8415839 Fax. (031) 8415839

LAPORAN HASIL PENGUJIAN

Nomor : LPUP02987

Nama pelanggan : **PT. NUSA BUANA CIPTA**
 Alamat : **Jl. Tebet Utara 1B No.3 Jakarta Selatan**
 No. identifikasi contoh : **02987**
 Uraian contoh : **Air Permukaan**
(SW-2 Downstream Sungai Air Kotok, Tgl. 24/03/18 jam 14:45 WITA)
 Koordinat : **S 03° 10' 52,7" E 102° 16' 00,8"**
 Asal lokasi : **AMDAL PLTP HULULAIS (2 X 55 MW)**
Desa Danau Liang, Kec. Lebong Selatan, Kab. Lebong
 Tanggal diterima di Lab : **27 Maret 2018**
 Tanggal pengujian : **27 Maret 2018 sampai 06 April 2018**

Hasil Pengujian

NO	PARAMETER	SATUAN	BAKU *) MUTU	HASIL	METODE
A.	FISIKA				
1	Temperatur (insitu)	°C	Udara ± 3 °C	25,6	Termometer
2	Zat padat terlarut (TDS **)	mg/L	1.000	920	UP.IK.21.01.06 (Konduktometri)
3	Zat padat tersuspensi (TSS **)	mg/L	400	180	UP.IK.21.01.07 (Spektrofotometri)
B.	KIMIA				
1	pH (Insitu)	-	6 - 9	2,92	pH meter
2	Oksigen Terlarut (DO) insitu	mg/L	3	7,3	DO meter
3	Fluorida (F **)	mg/L	1,5	0,2	APHA Ed. 22nd 4500-F-D-2012
4	Fenol **)	µg/L	1	<1	APHA Ed. 22nd 5530-Phenol B-D-2012
5	Fosfat total (PO ₄ **)	mg/L	1	<0,03	APHA Ed. 22nd 4500-P, B&E-2012
6	Klorin bebas (Cl ₂ **)	mg/L	-	<0,01	UP.IK.21.01.34 (Spektrofotometri)
7	Minyak & Lemak	µg/L	1.000	<200	Ekstraksi - Spektrofotometri
8	Nitrat (NO ₃ -N **)	mg/L	20	0,2	APHA Ed.22nd 4500-NO ₃ -E-2012
9	Nitrit (NO ₂ -N **)	mg/L	0,06	<0,002	SNI 06-6989.9-2004
10	Sulfida (H ₂ S **)	mg/L	0,002	<0,002	APHA Ed. 22nd 4500-S ₂ -D-2012
11	Sianida (CN **)	mg/L	0,02	<0,005	APHA Ed. 22nd 4500-CN-E-2012
12	Detergen (MBAS **)	µg/L	200	<10	SNI 06-6989.51-2005
13	BOD ₅ **)	mg/L	6	5	SNI 6989.72-2009
14	COD **)	mg/L	50	17	SNI 6989.2-2009

Keterangan : *) = PP No. 82 Tahun 2001, Kelas III

**) = Parameter terakreditasi oleh KAN No. LP-195-IDN

• Pengukuran parameter Suhu, pH dan DO dilakukan oleh pihak pelanggan

< = Lebih kecil

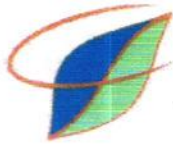
10 April 2018

PT. UNILAB PERDANA



Diab. Andaningsari P.

Ket. Pengembangan Usaha



LAPORAN HASIL ANALISIS

Tanggal Penerimaan Sampel : 26 Maret 2018
Jenis Sampel : Biota Air: Plankton
Metode Sampling Plankton : SNI 13-4717-1998
Metode analisis Plankton : SNI 06-3963-1995
Metode Sampling Benthos : SNI 13-4718-1998
Metode analisis Benthos : SNI 03-3401-1994
Tanggal Analisis : 27 Maret 2018
No. Work Order : WO#886
Nama pelanggan : PT. PLN UIP I
Asal sampel : AMDAL PLTP HULULAIS (2 x 55 MW)
Personil penghubung : Dio Arista
Jumlah Sampel : 1 (Satu) Sampel Plankton
Pelaksana analisis : Drs. Guritno Dj.

Jakarta 29 Maret 2018

Penyelia Laboratorium

Drs. Yadi Priyadi, Msi.



HASIL ANALISIS PLANKTON
W.O.#886. Date of Issue: 29 Maret 2018

No.	Organisme Plankter	PB-1
		Upstream Sungai Cikotok S: 03°14'09.3"; E: 102°16'30.4"
I	Fitoplankton	
A	Cyanophyceae	
1	<i>Oscillatoria</i>	60
B	Chlorophyceae	
2	<i>Scenedesmus</i>	75
C	Bacillariophyceae	
3	<i>Cymbella</i>	30
4	<i>Fragilaria</i>	45
5	<i>Coscinodiscus</i>	45
6	<i>Navicula</i>	75
7	<i>Nitzschia</i>	30
II	Zooplankton	
D	Monogononta	
8	<i>Lepadella</i>	20
9	<i>Monostyla</i>	20
10	<i>Notholca</i>	30
E	Crustaceae	
11	<i>Nauplius</i>	30
F	Rotatoria	
12	Philodina	45
	Kelimpahan plankter/liter	445
	Jumlah taksa	12
	Indeks Diversitas Shanon-Wiener (H')	2,301
	H'maksimum	2,485
	Indeks Equitabilitas	0,926



LAPORAN HASIL ANALISIS

Tanggal Penerimaan Sampel : 26 Maret 2018
Jenis Sampel : Biota Air: Plankton
Metode Sampling Plankton : SNI 13-4717-1998
Metode analisis Plankton : SNI 06-3963-1995
Metode Sampling Benthos : SNI 13-4718-1998
Metode analisis Benthos : SNI 03-3401-1994
Tanggal Analisis : 27 Maret 2018
No. Work Order : WO#914
Nama pelanggan : PT. PLN UIP I
Asal sampel : AMDAL PLTP HULULAIS (2 x 55 MW)
Personil penghubung : Dio Arista
Jumlah Sampel : 1 (Satu) Sampel Plankton-Benthos
Pelaksana analisis : Drs. Guritno Dj.

Jakarta 29 Maret 2018

Penyelia Laboratorium

Drs. Yadi Priyadi, Msi.



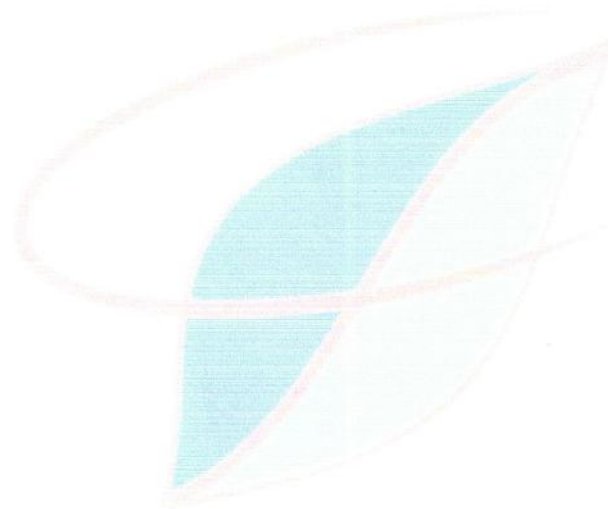
HASIL ANALISIS PLANKTON
W.O.#886. Date of Issue: 29 Maret 2018

No.	Organisme Plankter	PB-1
		Downstream Sungai Cikotok S: 03°10'52.7"; E: 102°16'00.8"
I	Fitoplankton	
A	Cyanophyceae	
1	<i>Oscillatoria</i>	30
B	Bacillariophyceae	
2	<i>Cymbella</i>	30
3	<i>Coscinodiscus</i>	45
4	<i>Navicula</i>	30
5	<i>Nitzschia</i>	30
II	Zooplankton	
C	Monogononta	
6	<i>Monostyla</i>	30
7	<i>Notholca</i>	30
D	Decapoda	
8	Larva decapoda	15
E	Rotatoria	
9	<i>Philodina</i>	30
Kelimpahan plankter/liter		270
Jumlah taksa		9
Indeks Diversitas Shanon-Wiener (H')		2,168
H'maksimum		2,197
Indeks Equitabilitas		0,987



HASIL ANALISIS BENTHOS
W.O.#886. Date of Issue: 29 Maret 2018

No	Makrobentik-Fauna	PB-1
		Downstream Sungai Cikotok
		S: 03°10'52.7"; E: 102°16'00.8"
I	INSECTA	
A	Hemiptera	
1	<i>Velia</i> sp.	100
	Kelimpahan benthos/m ²	100
	Jumlah taksa	1
	Indeks Diversitas Shanon-Wiener (H')	0
	H'maksimum	0
	Indeks Equitabilitas	0



APPENDIX 11.
MINUTES OF MEETING ON TECHNICAL
MEETINGS AND EIA ASSESSMENTS
COMMISSIONS MEETINGS



PEMERINTAH KABUPATEN LEBONG
DINAS LINGKUNGAN HIDUP

Jalan Dua Jalur Komplek Perkantoran email: blhkp_lebong@yahoo.com

T U B E I

Kode Pos 39164

BERITA ACARA

**RAPAT TIM TEKNIS TERHADAP PEMBAHASAN DRAFT DOKUMEN ANDAL DAN RKL -
RPL UNTUK KEGIATAN RENCANA PEMBANGUNAN PEMBANGKIT LISTRIK TENAGA
PANAS BUMI (PLTP) HULULAIS (2X55 MW) KECAMATAN LEBONG SELATAN DAN
KECAMATAN LEBONG TENGAH
KABUPATEN LEBONG PROVINSI BENGKULU
NOMOR : 660 / 32 /DLH/2018**

Hari/tanggal : Jumat, 27 Juli 2018
Tempat : Ruang Pertemuan Hotel Dinda Ceria Kabupaten Lebong
Pemrakarsa kegiatan : PT. PLN (PERSERO) UIP Pembangkit Sumatera
Penanggung jawab : Weddy Bernadi Sudirman
Jabatan : General Manager (Surat Direktur Utama PT. PLN Nomor :
0153,STg/SDM.08.01/DIR/2017)
Pimpinan Rapat : Ketua Tim Teknis Komisi Penilai AMDAL Daerah Kabupaten
Lebong

- A. Peserta pembahasan yang hadir adalah sebagaimana yang terlampir pada daftar hadir.
- B. Rapat Tim Teknis Terhadap Pembahasan Draft Dokumen Andal Dan RKL - RPL Untuk Kegiatan Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2x55 MW) Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu oleh PT. PLN (Persero) UIP Pembangkit Sumatera, pemrakarsa menyepakati untuk melakukan perbaikan, masukan dan saran dari tim ahli dan tim teknis baik yang disampaikan secara lisan maupun tertulis.
- C. Saran, Masukan dan Tanggapan dari peserta Anggota Rapat Tim Teknis Pembahasan Dokumen ANDAL dan RKL - RPL Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 x 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu secara rinci adalah sebagaimana terlampir dalam notulen dan merupakan bagian yang tidak terpisahkan dari berita acara ini.
- D. Pemrakarsa diperkenankan untuk melakukan penyempurnaan Dokumen ANDAL dan RKL - RPL Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 x 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu.

**Peserta Rapat Tim Teknis Pembahasan ANDAL dan RKL – RPL Rencana
Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 x 55 MW)
di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong
Provinsi Bengkulu**

NO	NAMA	JABATAN	TANDATANGAN
1	Prof.Dr.Ir. Alnopri, M.S.	Pakar Bidang Perencanaan Pembangunan (UNIB)	1
2	Prof. Dr. Iskandar, SH, M.Hum	Pakar Lingkungan Hidup (UNIB)	2
3	Dra. Harmiati, M. Si	Pakar Bidang Sosial Budaya (UNIHAZ)	3
4	Pakri Fahmi, SE, M.Si	Pakar Bidang Ekonomi (UNIHAZ)	4
5	Rizal, ST	Tim Teknis (Dinas Perkim Kab. Lebong)	5
6	Indra Syarifudin, ST	Tim Teknis (Dinas PUPRP Kab. Lebong) PMPTSP	6
7	Rusmianah, SE	Tim Teknis (DLH Kab. Lebong)	7
8	Heru Mayrotafajri, AMKL	Tim Teknis (Dinas Kesehatan Kab. Lebong)	8
9	Salvatori Wansoni, ST	Tim Teknis (Bappeda Kab. Lebong)	9
10	Dra. Dian Marthiani	Tim Teknis (Disnakertrans Kab. Lebong)	10
11	Ir. Emi Nurlela	Tim Teknis (Fungsional Distankan Kab. Lebong)	11
12	Yustin Iskandarmuda, SH, MH	Tim Teknis (BPN Kab. Lebong)	12
13	Harya Sidharta	Manager Perencanaan PLN UIP KITSUM	13
14	Ryan Nugraha	Pemrakarsa PLN UIP KITSUM	14
15	Alfi Sukri	Pemrakarsa PLN UIP KITSUM	15
16	Ir. Gde Karya Abdullah	Konsultan PT. Nusa Buana Cipta	16
17	Suparjo	Konsultan PT. Nusa Buana Cipta	17
18	Ir. Arif Ashari	Konsultan PT. Nusa Buana Cipta	18
19	Drs. Sulistyو Wibowo	Konsultan PT. Nusa Buana Cipta	19
20	M.A. Riri Ridwan, SKM	Konsultan PT. Nusa Buana Cipta	20

- E. Dokumen ANDAL dan RKL - RPL hasil perbaikan akan disampaikan oleh pemrakarsa kepada sekretariat Komisi Penilai AMDAL Daerah Kabupaten Lebong selambat-lambatnya 10 (sepuluh) hari kerja setelah notulensi diterima.
- F. Penyampaian Dokumen ANDAL dan RKL - RPL perbaikan sesuai dengan saran, masukan dan tanggapan dari Tim Teknis Komisi Penilai AMDAL Daerah Kabupaten Lebong akan diverifikasi oleh Sekretariat Komisi Penilai AMDAL Daerah Kabupaten Lebong.
- G. Peserta rapat Tim Teknis Pembahasan ANDAL dan RKL - RPL Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 x 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu menyatakan dapat diterbitkannya persetujuan ANDAL dan RKL - RPL setelah perbaikan.

Demikian Berita Acara ini dibuat dengan sebenar-benarnya.

Pemrakarsa
PLN UIP KITSUM
Manager Perencanaan


Ir. HARYA SIDHARTA, MBA
NIP. 6794003E

Ketua Tim Teknis Komisi Penilai AMDAL
Daerah Kabupaten Lebong


ROZI, ST
NIP.19770502 200903 1 002

Mengetahui
Kepala DLH Kabupaten Lebong
Selaku Ketua Komisi Penilai Amdal
Kabupaten Lebong



ZAMHARI, SH, MH
NIP.19720808 199803 1 002



PEMERINTAH KABUPATEN LEBONG
DINAS LINGKUNGAN HIDUP

Jalan Raya Dua Jalur Komplek Perkantoran email: blhkp_lebong@yahoo.com

TUBEI

Kode Pos 39164

**NOTULENSI PEMBAHASAN DOKUMEN ANDAL DAN RKL – RPL RENCANA
PEMBANGUNAN PEMBANGKIT LISTRIK TENAGA PANAS BUMI (PLTP) HULULAIS
(2X55 MW) KECAMATAN LEBONG SELATAN DAN KECAMATAN LEBONG TENGAH
KABUPATEN LEBONG PROVINSI BENGKULU**

Jumat, 27 Juli 2018

I. Dasar Pelaksanaan

Surat Undangan Kepala Dinas Lingkungan Hidup Kabupaten Lebong Nomor: 005/447/DLH/2018

Tanggal 20 Juli 2018 perihal : Undangan

II. Pelaksanaan Rapat Tim Teknis

- a. Hari/tanggal : Jumat, 27 Juli 2018
- b. Waktu : 09.00 WIB s.d selesai
- c. Tempat : Ruang Pertemuan Hotel Dinda Ceria Kabupaten Lebong
- d. Acara : Rapat Tim Teknis Pembahasan ANDAL dan RKL – RPL Rencana
Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 x
55 MW) oleh PT. PLN (Persero) UIP Pembangkit Sumatera.
- e. Pemimpin Rapat : Ketua Tim Teknis Komisi Penilai AMDAL Daerah Kabupaten Lebong.
- f. Peserta Rapat :

NO	NAMA	JABATAN
1	Prof.Dr.Ir. Alnopri, M.S.	Pakar Bidang Perencanaan Pembangunan (UNIB)
2	Prof. Dr. Iskandar, SH, M.Hum	Pakar Lingkungan Hidup (UNIB)
3	Dra. Harmiati, M. Si	Pakar Bidang Sosial Budaya (UNIHAZ)
4	Pakri Fahmi, SE, M.Si	Pakar Bidang Ekonomi (UNIHAZ)
5	Rizal, ST	Tim Teknis (Dinas Perkim Kab. Lebong)
6	Indra Syarifudin, ST	Tim Teknis (Dinas PUPRP Kab. Lebong)
7	Rusmianah, SE	Tim Teknis (DLH Kab. Lebong)
8	Heru Mayrotafajri, AMKL	Tim Teknis (Dinas Kesehatan Kab. Lebong)
9	Salvatori Wansoni, ST	Tim Teknis (Bappeda Kab. Lebong)
10	Dra. Dian Marthiani	Tim Teknis (Disnakertrans Kab. Lebong)
11	Ir. Emi Nurlela	Tim Teknis (Fungsional Distankan Kab. Lebong)
12	Yustin Iskandarmuda, SH, MH	Tim Teknis (BPN Kab. Lebong)
13	Harya Sidharta	Manager Perencanaan PLN UIP KITSUM
14	Ryan Nugraha	Pemrakarsa PLN UIP KITSUM
15	Alfi Sukri	Pemrakarsa PLN UIP KITSUM
16	Ir. Gde Karya Abdullah	Konsultan PT. Nusa Buana Cipta
17	Suparjo	Konsultan PT. Nusa Buana Cipta
18	Ir. Arif Ashari	Konsultan PT. Nusa Buana Cipta

III. Hasil



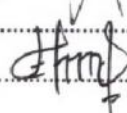
NO	HALAMAN	HASIL KOREKSI
NAMA : Prof.Dr.Ir. Alnopri, MS		
1.	-	<ul style="list-style-type: none"> - Amanah dari permen LH No 08 Tahun 2012 bahwa pelaksanaan rapat Tim teknis bisa dilakukan apabila dihadiri salah satu tim teknis dan pihak pemrakarsa maka Rapat Tim Teknis bisa dilakukan. Apabila pihak pemrakarsa bukan dihadiri oleh pimpinan maka harus ada surat kuasa dari pimpinan kepada perwakilan yang diberi kuasa untuk menghadiri Rapat Tim teknis. - Kondisi rona awal akses jalan kelurahan Taba Anyar menuju lokasi harus ditampilkan photo terbaru April 2018 - Di dalam dokumen tidak dicantumkan kapasitas uap semua yang diproduksi selama 30 tahun - Dengan adanya kejadian longsor di wilayah PT. Pertamina Geothermal tertanam trauma masyarakat terhadap proyek - proyek baru maka itu hendaknya pemrakarsa kegiatan harus diperhatikan dan dimanage sebaik mungkin. - Saran terdahulu pada rapat tim teknis terhadap dokumen kerangka acuan (KA) untuk rute/lintas pengangkutan material terdapat beberapa pilihan rute sebaiknya dipilih satu pilihan rute dari beberapa pilihan rute tersebut. Pada dokumen ANDAL ini masih tetap tertulis seperti pada dokumen KA maka diharapkan untuk memperbaiki dengan memilih salah satu pilih rute/lintasan pengangkutan material. - Dalam daftar istilah, pengertian Brine berbeda dengan yang tercantum pada halaman 1-5 Pemilihan Teknologi PLTP Hululais, untuk itu harus dilakukan perbaikan mengenai hal tersebut
NAMA : Prof.Dr. Iskandar, SH,M.Hum		
2.	-	<ul style="list-style-type: none"> - Apakah tokoh masyarakat yang diundang dalam sidang komisi merupakan masyarakat yang terkena dampak? - Terkait dengan potensi panas bumi sebagai bahan baku PLTP, tidak ada ketersediaan data anatar lain : <ol style="list-style-type: none"> 1. kapasitas atau system yang tersediakan 2. berapa sumur yang akan digali - Pada Bab I (latar belakang) perlu dicantumkan system pada proses pengolahan PLTP - Halaman 2-5 harus di deskripsikan lebih rinci terkait Windrose dalam wilayah studi - Pada Bab III, tidak terdapat data mengenai : <ol style="list-style-type: none"> 1. Pengelolaan Tingkat kerusakan sawah 2. Flora & fauna - Terdapat ketidakkonsisten dalam Dampak Penting Hipotetik didokumen KA dengan dokumen ANDAL - Bab IV, Penjelasan tentang pengelolaan kebisingan dan Mitigasi bencana Radius 100 meter di areal turbin harus dijelaskan lebih lanjut - Daftar pustaka yang referensinya yang tidak relevan diganti dan ditambahkan Peraturan yaitu Undang-Undang Ketenagalistrikan beserta Perda Ketenagalistrikan dan Undang-Undang Panas Bumi beserta Perda Panas Bumi - Cara penulisan pada dokumen ANDAL tidak mengikuti hirarki - Bagian akhir Lampiran harus dilampirkan rona lingkungan hidup, dasar teori dan asumsi
NAMA : Pakri Fahmi, SE,M.SI		
3.	-	<ul style="list-style-type: none"> - Pada waktu rapat tim teknis KA disarankan untuk menambahkan anggota tim konsultan dari bidang ekonomi - Masalah peningkatan pendapatan masyarakat diperjelas terutama pekerja yang terkena dampak kegiatan
NAMA : Dra. Harmiati, M.SI		
4.	-	<ul style="list-style-type: none"> - Masih sering ditemukan tipe tulisan yang berbeda, penulisan rangkap/double dalam dokumen ANDAL ini. - Pada DPH (Dampak Penting Hipotetik) harus diperbaiki lagi mengenai Pengurangan lahan produksi, pada table I-10 tidak tertulis tetapi pada penjesannya tertulis & pada bagan alir tertulis dampak pontesialnya - Hal II-23 s/d II-41 Di dalam penulisan banyak penjelasan yang double. Penjelasan terlalu panjang sehingga membuat yang membaca sulit mengerti. Untuk itu, disempurnakan kembali dokumen ANDAL - Dampak Sosial , Pembahasan data tentang penduduk - Sumber pendidikan data apakah dari monograpi dari desa/kelurahan , kenapa tidak kecamatan dalam angka

Nama : Indra Syarifudin, ST		
5.	-	<ul style="list-style-type: none"> - Dokumen RKL-RPL berupa draft atau sudah merupakan hasil maka itu diperlukan penjelasan secara rinci dari konsultan mengenai rencana pengelolaan dan pemantauan - Dalam dokumen belum dijelaskan mengenai mitigasi bencana - Pada Peta lokasi tertulis sungai cikotok, diperbaiki penulisannya menjadi air kotok - Tidak adanya penjelasan mengenai antipasti menghadapi kerawanan bencana karena pada peta kontur, kab lebong termasuk dalam kategori rawan gagal teknologi
NAMA : Rizal, ST		
6.	-	<ul style="list-style-type: none"> - Peta geologi diperbaiki & dijelaskan susunan batuan di dalam lokasi - Apakah pernah dilakukan uji geotek di lokasi? - Melampirkan SK penetapan lokasi dari Bupati Lebong (izin prinsip) - Dalam hal mobilisasi alat harus dijelaskan jadwal mobilisasi/pengangkutan alat ataupun material - Peta geologi harus diperjelas lagi mengenai jenis bantuan lokasi kegiatan dan dilakukan uji geotek di lokasi kegiatan
Nama : Salvatori Wansoni, ST		
7.	-	- Hipotesis mengenai kejadian tak terduga belum ada dalam dokumen
NAMA Yustin Iskandar Muda, SH, MH		
8.		<ul style="list-style-type: none"> - Lokasi kegiatan sudah dikeluarkan berdasarkan pertimbangan teknis pertanahan - Poin satu merupakan dasar untuk di kelurkan izin penetapan lokasi - Status tanah tidak dalam kawasan hutan - Pembebasan tanah, untuk mengeluarkan izin penetapan lokasi, BPN
Nama : Pemrakarsa / Konsultan		
10		Semua kesalahan redaksi akan diperbaiki dan semua saran ataupun masukan akan ditambahkan dalam upaya penyempurnaan dokumen Andal, RKL-RPL


Dibuat di : Lebong
Pada Tanggal : 27 Juli, 2018

NOTULIS :

1. Inten Diana Putri
2. Danur Ahlul
3. Helen Dwita



.....

.....

.....

Mengetahui/Menyetujui
Kepala Dinas Lingkungan Hidup Kabupaten Lebong
Selaku
Ketua Komisi Penilai AMDAL Daerah Kabupaten Lebong



ZAMHARI, SH, MH
NIP.19720808 199803 1 006

Ketua Tim Teknis AMDAL Kabupaten Lebong


ROZI, ST
NIP.197705022009031002

**RAPAT TIM TEKNIK PEMBAHASAN DOKUMEN ANDAL, RKL- RPL
RENCANA PEMBANGUNAN PLTP HULULAIS (2 x 55 MW)
DI KECAMATAN LEBONG SELATAN DAN KECAMATAN LEBONG TENGAH KABUPATEN LEBONG**

Hari/Tanggal

: Jum'at, 27 Juli 2018

Tempat

: Aula Rapat Hotel Dinda Ceria Kec. Leborg Utara

Pemrakarsa



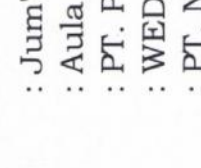





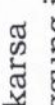
: PT. PLN (PERSERO) UIP PEMBANGKIT SUMATERA










Penanggung jawab Pemrakarsa






: WEDDY B. SUDIRMAN

Konsultan

: PT. NUSA BUANA Cipta

No.	Nama	Jabatan dalam Tim	Instansi	TANDA TANGAN
1	Zamhari, SH, MH	Ketua Komisi	DLH Leborg	
2	Rozi, ST	Ketua Tim Teknis	DLH Leborg	
3	Prof. Dr. Ir. Alnopri, MS	Tenaga Ahli/Pakar	UNIB (Ahli/Pakar Bidang Perencanaan Pembangunan)	
4	Dr. Gunggung Senoaji, S.Hut, MP	Tenaga Ahli/Pakar	UNIB (Ahli/Pakar Bidang Biogeofisik-Kimia)	
5	Prof. Dr. Iskandar, SH, M.Hum	Tenaga Ahli/Pakar	UNIB (Ahli/Pakar Bidang Lingkungan Hidup)	
6	Dra. Harmiati, M.Si	Tenaga Ahli/Pakar	UNIHAZ (Ahli/Pakar Bidang Sosial Budaya)	
7	dr. Esther Meylina S	Tenaga Ahli/Pakar	DINKES Leborg (Ahli/Pakar Bidang Kesehatan)	
8	Pakri Fahmi, SE, M.Si	Tenaga Ahli/Pakar	UNIHAZ (Ahli/Pakar Bidang Ekonomi)	
9	Salvatori Wansoni, ST	Anggota Tim Teknis	BAPPEDA Kabupaten Leborg	

10	Yustin Iskandar Muda, SH, MH	Anggota Tim Teknis	BPN Kabupaten Lebong		10.	
11	Jimmy Tri Susilo, S.St.Pi	Anggota Tim Teknis	Dinas Pertanian dan Perikanan Kabupaten Lebong	11.		
12	Rizal, ST	Anggota Tim Teknis	Dinas Perumahan dan Kawasan Permukiman Kabupaten Lebong		12.	
13	Indra Gunawan, S.Pi, M.Si	Anggota Tim Teknis	Dinas Ketahanan Pangan Kabupaten Lebong	13.		
14	Indra Syarifudin, ST	Anggota Tim Teknis	Dinas PMPTSP Kab. Lebong		14.	
15	Dra. Dian Marthiani	Anggota Tim Teknis	Staf Bupati	15.		
16	Heru Mayrotafajri, AMKL	Anggota Tim Teknis	Dinas Kesehatan Kab. Lebong		16.	
17	Marhama, SH	Anggota Tim Teknis	Dinas PUPR Kabupaten Lebong	17.		
18	Rusmianah, SE	Anggota Tim Teknis	DLH Kabupaten Lebong		18.	
19	Ir. Emi Nurlela	Anggota Tim Teknis	Fungsional Dinas Pertanian dan Perikanan Kab. Lebong	19.		
20	Wirna Ningsih, SH., MH	Anggota Tim Teknis	DLH Kabupaten Lebong		20.	
21	Nasip Irianto, S.Hut	Anggota Tim Teknis	DLH Kabupaten Lebong	21.		
22	Eka Rani, ST	Anggota Tim Teknis	DLH Kabupaten Lebong		22.	

23	Reki Reardo, ST	Anggota Tim Teknis	DLH Kabupaten Lebong	23.	
24	Purwo Setyadi Y, ST	Anggota Tim Teknis	DLH Kabupaten Lebong	24.	
25	Rianna, S.Si	Anggota Tim Teknis	DLH Kabupaten Lebong	25.	
26	Inten Diana Putri, Amd	Anggota Tim Teknis	DLH Kabupaten Lebong	26.	
27	Marika Hafiedzani, S.Si	Anggota Tim Teknis	DLH Kabupaten Lebong	27.	
28	Danur Ahlul URP, S.Si	Anggota Tim Teknis	DLH Kabupaten Lebong	28.	
29	HARYA S	PLN VIP KITSUM		29.	
30	RYANI NUGRAHA	PLN VIP KITSUM		30.	
31	ALPI SYUKA	PLN UPPKISUMA		31.	
32	Supar Jo	Konsultan		32.	
33	SULISTYO WIBOWO	Konsultan		33.	
34	ARIF ASHARI	Konsultan		34.	
35	Gede Karya	--		35.	
36	M.A. RIRI RIDWAN	--		36.	
37				37.	
38				38.	

39				39.
40				40.



NIP.19770502 200903 1 002



PEMERINTAH KABUPATEN LEBONG
DINAS LINGKUNGAN HIDUP
Jalan Raya Dua Jalur Komplek Perkantoran email: *blhkp_lebong@yahoo.com*

T U B E I

Kode Pos 39164

**NOTULENSI PEMBAHASAN DOKUMEN ANDAL DAN RKL – RPL RENCANA
PEMBANGUNAN PEMBANGKIT LISTRIK TENAGA PANAS BUMI (PLTP) HULULAIS
(2X55 MW) KECAMATAN LEBONG SELATAN DAN KECAMATAN LEBONG TENGAH
KABUPATEN LEBONG PROVINSI BENGKULU**

Jumat, 27 Juli 2018

I. Dasar Pelaksanaan

Surat Undangan Kepala Dinas Lingkungan Hidup Kabupaten Lebong Nomor: 005/447/DLH/2018

Tanggal 20 Juli 2018 perihal : Undangan

II. Pelaksanaan Rapat Tim Teknis

- a. Hari/tanggal : Jumat, 27 Juli 2018
- b. Waktu : 09.00 WIB s.d selesai
- c. Tempat : Ruang Pertemuan Hotel Dinda Ceria Kabupaten Lebong
- d. Acara : Rapat Tim Teknis Pembahasan ANDAL dan RKL – RPL Rencana
Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 x
55 MW) oleh PT. PLN (Persero) UIP Pembangkit Sumatera.
- e. Pemimpin Rapat : Ketua Tim Teknis Komisi Penilai AMDAL Daerah Kabupaten Lebong.
- f. Peserta Rapat :

NO	NAMA	JABATAN
1	Prof.Dr.Ir. Alnopri, M.S.	Pakar Bidang Perencanaan Pembangunan (UNIB)
2	Prof. Dr. Iskandar, SH, M.Hum	Pakar Lingkungan Hidup (UNIB)
3	Dra. Harmiati, M. Si	Pakar Bidang Sosial Budaya (UNIHAZ)
4	Pakri Fahmi, SE, M.Si	Pakar Bidang Ekonomi (UNIHAZ)
5	Rizal, ST	Tim Teknis (Dinas Perkim Kab. Lebong)
6	Indra Syarifudin, ST	Tim Teknis (Dinas PUPRP Kab. Lebong)
7	Rusmianah, SE	Tim Teknis (DLH Kab. Lebong)
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9	Salvatori Wansoni, ST	Tim Teknis (Bappeda Kab. Lebong)
10	Dra. Dian Marthiani	Tim Teknis (Disnakertrans Kab. Lebong)
11	Ir. Emi Nurlela	Tim Teknis (Fungsional Distankan Kab. Lebong)
12	Yustin Iskandarmuda, SH, MH	Tim Teknis (BPN Kab. Lebong)
13	Harya Sidharta	Manager Perencanaan PLN UIP KITSUM
14	Ryan Nugraha	Pemrakarsa PLN UIP KITSUM
15	Alfi Sukri	Pemrakarsa PLN UIP KITSUM
16	Ir. Gde Karya Abdullah	Konsultan PT. Nusa Buana Cipta
17	Suparjo	Konsultan PT. Nusa Buana Cipta
18	Ir. Arif Ashari	Konsultan PT. Nusa Buana Cipta

III. Hasil

NO	HALAMAN	HASIL KOREKSI
NAMA : Prof.Dr.Ir. Alnopri, MS		
1.	-	<ul style="list-style-type: none"> - Amanah dari permen LH No 08 Tahun 2012 bahwa pelaksanaan rapat Tim teknis bisa dilakukan apabila dihadiri salah satu tim teknis dan pihak pemrakarsa maka Rapat Tim Teknis bisa dilakukan. Apabila pihak pemrakarsa bukan dihadiri oleh pimpinan maka harus ada surat kuasa dari pimpinan kepada perwakilan yang diberi kuasa untuk menghadiri Rapat Tim teknis. - Kondisi rona awal akses jalan kelurahan Taba Anyar menuju lokasi harus ditampilkan photo terbaru April 2018 - Di dalam dokumen tidak dicantumkan kapasitas uap semua yang diproduksi selama 30 tahun - Dengan adanya kejadian longsor di wilayah PT. Pertamina Geothermal tertanam trauma masyarakat terhadap proyek - proyek baru maka itu hendaknya pemrakarsa kegiatan harus diperhatikan dan dimanage sebaik mungkin. - Saran terdahulu pada rapat tim teknis terhadap dokumen kerangka acuan (KA) untuk rute/lintas pengangkutan material terdapat beberapa pilihan rute sebaiknya dipilih satu pilihan rute dari beberapa pilihan rute tersebut. Pada dokumen ANDAL ini masih tetap tertulis seperti pada dokumen KA maka diharapkan untuk memperbaiki dengan memilih salah satu pilih rute/lintasan pengangkutan material. - Dalam daftar istilah, pengertian Brine berbeda dengan yang tercantum pada halaman 1-5 Pemilihan Teknologi PLTP Hululais, untuk itu harus dilakukan perbaikan mengenai hal tersebut
NAMA : Prof.Dr. Iskandar, SH,M.Hum		
2.	-	<ul style="list-style-type: none"> - Apakah tokoh masyarakat yang diundang dalam sidang komisi merupakan masyarakat yang terkena dampak? - Terkait dengan potensi panas bumi sebagai bahan baku PLTP, tidak ada ketersediaan data anatar lain : <ol style="list-style-type: none"> 1. kapasitas atau system yang tersediakan 2. berapa sumur yang akan digali - Pada Bab I (latar belakang) perlu dicantumkan system pada proses pengolahan PLTP - Halaman 2-5 harus di deskripsikan lebih rinci terkait Windrose dalam wilayah studi - Pada Bab III, tidak terdapat data mengenai : <ol style="list-style-type: none"> 1. Pengelolaan Tingkat kerusakan sawah 2. Flora & fauna - Terdapat ketidakkonsisten dalam Dampak Penting Hipotetik didokumen KA dengan dokumen ANDAL - Bab IV, Penjelasan tentang pengelolaan kebisingan dan Mitigasi bencana Radius 100 meter di areal turbin harus dijelaskan lebih lanjut - Daftar pustaka yang referensinya yang tidak relavan diganti dan ditambahkan Peraturan yaitu Undang-Undang Ketenagalistrikan beserta Perda Ketenagalistrikan dan Undang-Undang Panas Bumi beserta Perda Panas Bumi - Cara penulisan pada dokumen ANDAL tidak mengikuti hirarki - Bagian akhir Lampiran harus dilampirkan rona lingkungan hidup, dasar teori dan asumsi
NAMA : Pakri Fahmi, SE,M.SI		
3.	-	<ul style="list-style-type: none"> - Pada waktu rapat tim teknis KA disarankan untuk menambahkan anggota tim konsultan dari bidang ekonomi - Masalah peningkatan pendapatan masyarakat diperjelas terutama pekerja yang terkena dampak kegiatan
NAMA : Dra. Harmiati, M.SI		
4.	-	<ul style="list-style-type: none"> - Masih sering ditemukan tipe tulisan yang berbeda, penulisan rangkap/double dalam dokumen ANDAL ini. - Pada DPH (Dampak Penting Hipotetik) harus diperbaiki lagi mengenai Pengurangan lahan produksi, pada table I-10 tidak tertulis tetapi pada penjesannya tertulis & pada bagan alir tertulis dampak pontesialnya - Hal II-23 s/d II-41 Di dalam penulisan banyak penjelasan yang double. Penjelasannya terlalu panjang sehingga membuat yang membaca sulit mengerti. Untuk itu, disempurnakan kembali dokumen ANDAL - Dampak Sosial , Pembahasan data tentang penduduk - Sumber pendidikan data apakah dari monografi dari desa/kelurahan , kenapa tidak kecamatan dalam angka

Nama : Indra Syarifudin, ST		
5.	-	- Dokumen RKL-RPL berupa draft atau sudah merupakan hasil maka itu diperlukan penjelasan secara rinci dari konsultan mengenai rencana pengelolaan dan pemantauan - Dalam dokumen belum dijelaskan mengenai mitigasi bencana - Pada Peta lokasi tertulis sungai cikotok, diperbaiki penulisannya menjadi air kotok - Tidak adanya penjelasan mengenai antipasti menghadapi kerawanan bencana karena pada peta kontur, kab lebong termasuk dalam kategori rawan gagal teknologi
NAMA : Rizal, ST		
6.	-	- Peta geologi diperbaiki & dijelaskan susunan batuan di dalam lokasi - Apakah pernah dilakukan uji geotek di lokasi? - Melampirkan SK penetapan lokasi dari Bupati Lebong (izin prinsip) - Dalam hal mobilisasi alat harus dijelaskan jadwal mobilisasi/pengangkutan alat ataupun material - Peta geologi harus diperjelas lagi mengenai jenis bantuan lokasi kegiatan dan dilakukan uji geotek di lokasi kegiatan
Nama : Salvatori Wansoni, ST		
7.	-	- Hipotesis mengenai kejadian tak terduga belum ada dalam dokumen
NAMA Yustin Iskandar Muda, SH,MH		
8.	-	- Lokasi kegiatan sudah dikeluarkan berdasarkan pertimbangan teknis pertanahan - Poin satu merupakan dasar untuk di kelurkan izin penetapan lokasi - Status tanah tidak dalam kawasan hutan - Pembebasan tanah, untuk mengeluarkan izin penetapan lokasi, BPN
Nama : Pemrakarsa / Konsultan		
10	-	Semua kesalahan redaksi akan diperbaiki dan semua saran ataupun masukan akan ditambahkan dalam upaya penyempurnaan dokumen Andal, RKL-RPL

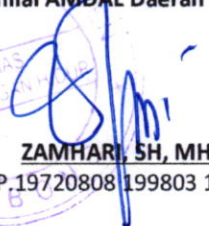
Dibuat di : Lebong
Pada Tanggal : 27 Juli, 2018

NOTULIS :

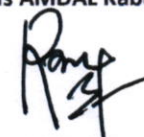
1. Inten Diana Putri
2. Danur Ahlul
3. Helen Dwita

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

Mengetahui/Menyetujui
Kepala Dinas Lingkungan Hidup Kabupaten Lebong
Selaku
Ketua Komisi Penilai AMDAL Daerah Kabupaten Lebong


ZAMHARI, SH, MH
NIP.197208081998031006

Ketua Tim Teknis AMDAL Kabupaten Lebong


ROZI, ST
NIP.197705022009031002



PEMERINTAH KABUPATEN LEBONG

DINAS LINGKUNGAN HIDUP

Jalan Dua Jalur Komplek Perkantoran email: blhkp_lebong@yahoo.com

T U B E I

Kode Pos 39164

BERITA ACARA

**RAPAT KOMISI PENILAI AMDAL TERHADAP PEMBAHASAN DRAFT DOKUMEN
ANDAL DAN RKL – RPL UNTUK KEGIATAN RENCANA PEMBANGUNAN PEMBANGKIT
LISTRIK TENAGA PANAS BUMI (PLTP) HULULAIS (2X55 MW) KECAMATAN LEBONG
SELATAN DAN KECAMATAN LEBONG TENGAH
KABUPATEN LEBONG PROVINSI BENGKULU**

NOMOR : 660 / 33 /DLH/2018

Hari/tanggal : Sabtu, 28 Juli 2018
Tempat : Ruang Pertemuan Hotel Dinda Ceria Kabupaten Lebong
Pemrakarsa kegiatan : PT. PLN (PERSERO) UIP Pembangkit Sumatera
Penanggung jawab : Weddy Bernadi Sudirman
Jabatan : General Manager (Berdasarkan Surat Direktur Utama PT. PLN
Nomor : 0153,STg/SDM.08.01/DIR/2017)
Pimpinan Rapat : Ketua Komisi Penilai AMDAL Daerah Kabupaten Lebong .

- A. Peserta pembahasan yang hadir adalah sebagaimana yang terlampir pada daftar hadir.
- B. Rapat Komisi Penilai Amdal Terhadap Pembahasan Draft Dokumen Andal Dan RKL - RPL Untuk Kegiatan Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2x55 MW) Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu oleh PT. PLN (Persero) UIP Pembangkit Sumatera, pemrakarsa menyepakati untuk melakukan perbaikan, masukan dan saran dari tim ahli, tim teknis, Wakil Masyarakat, LSM dan Anggota Komisi Penilai Amdal baik yang disampaikan secara lisan maupun tertulis.
- C. Saran, Masukan dan Tanggapan dari peserta Rapat Komisi Penilai Amdal Pembahasan Dokumen ANDAL dan RKL - RPL Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 x 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu secara rinci adalah sebagaimana terlampir dalam notulen dan merupakan bagian yang tidak terpisahkan dari berita acara ini.
- D. Pemrakarsa diperkenankan untuk melakukan penyempurnaan Dokumen ANDAL dan RKL - RPL Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 x 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu.
- E. Dokumen ANDAL dan RKL - RPL hasil perbaikan akan disampaikan oleh pemrakarsa kepada sekretariat Komisi Penilai AMDAL Daerah Kabupaten Lebong selambat-lambatnya 10 (sepuluh) hari kerja setelah notulensi diterima.

- F. Penyampaian Dokumen ANDAL dan RKL - RPL perbaikan sesuai dengan saran, masukan dan tanggapan dari Tim Teknis dan Peserta Rapat Komisi Penilai AMDAL Daerah Kabupaten Lebong akan diverifikasi oleh Sekretariat Komisi Penilai AMDAL Daerah Kabupaten Lebong.
- G. Peserta Rapat Komisi Penilai Amdal Pembahasan ANDAL dan RKL - RPL Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 x 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu menyatakan dapat diterbitkannya SK Kelayakan Lingkungan Hidup setelah perbaikan dan lolos verifikasi oleh sekretariat Komisi Penilai AMDAL Daerah Kabupaten Lebong.
- H. Komitmen Pemrakarsa Kegiatan dalam ketaatan terhadap Dokumen ANDAL, RKL-RPL yang telah sepakati dan disetujui dalam Rapat Komisi Penilai Amdal Kabupaten Lebong.

Demikian Berita Acara ini dibuat dengan sebenar-benarnya.


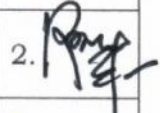
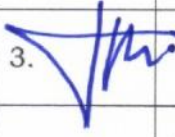
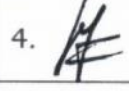
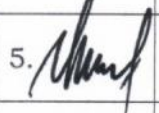
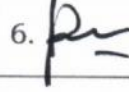


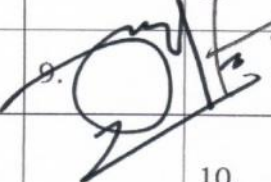

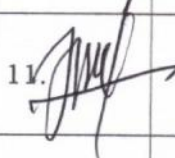


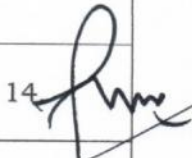
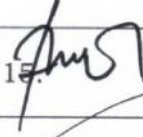
Pemrakarsa
PLN UIP KITSUM
Manager Perencanaan



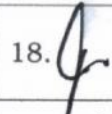
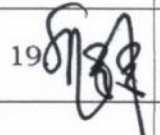

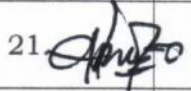
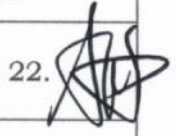

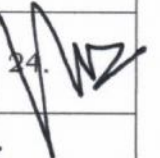
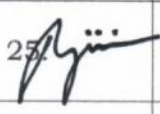

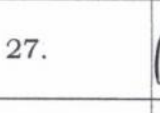
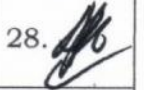
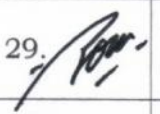


Ir. HARYA SIDHARTA, MBA
NIP. 6794003E

Mengetahui
Ketua Komisi Penilai Amdal
Kabupaten Lebong


ZAMHARI, SH, MH
NIP.19720808 199803 1 002

Peserta Rapat Komisi Penilai Amdal Pembahasan ANDAL dan RKL - RPL Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 x 55 MW) di Kecamatan Lebong Selatan dan Kecamatan Lebong Tengah Kabupaten Lebong Provinsi Bengkulu

No.	Nama	Jabatan dalam Tim	Instansi	TANDA TANGAN	
1	Zamhari, SH, MH	Ketua Komisi	DLH Lebong	1. 	
2	Rozi, ST	Ketua Tim Teknis	DLH Lebong		2. 
3	Prof. Dr. Ir. Alnopri, MS	Tenaga Ahli/Pakar	UNIB (Ahli/Pakar Bidang Perencanaan Pembangunan)	3. 	
4	Prof. Dr. Iskandar, SH, M.Hum	Tenaga Ahli/Pakar	UNIB (Ahli/Pakar Bidang Lingkungan Hidup)		4. 
5	Dra. Harmiati, M.Si	Tenaga Ahli/Pakar	UNIHAZ (Ahli/Pakar Bidang Sosial Budaya)	5. 	
6	Pakri Fahmi, SE, M.Si	Tenaga Ahli/Pakar	UNIHAZ (Ahli/Pakar Bidang Ekonomi)		6. 
7	Kepala Dinas Perkim	Anggota Komisi	Dinas Perumahan dan Kawasan Permukiman Kabupaten Lebong	7. 	
8	Kepala Dinas Ketahanan Pangan Kabupaten Lebong	Anggota Komisi	Dinas Ketahanan Pangan Kabupaten Lebong		8. 
9	Sekretaris DLH Kab. Lebong	Anggota Komisi	Dinas DLH Kabupaten Lebong	9. 	
10	Kabag. Hukum	Anggota Komisi	Sekretariat Daerah		10. 
11	Kabag. Ekonomi	Anggota Komisi	Sekretariat Daerah	11. 	
12	Kabid. PPKLH	Anggota Komisi	DLH Kabupaten Lebong		12. 
13	Kabid. Pengelolaan Sampah, LB3 & Peningkatan kapasitas	Anggota Komisi	DLH Kabupaten Lebong	13. 	
14	Kepala Dinas Kesehatan	Anggota Komisi	Dinas Kesehatan Kabupaten Lebong		14. 
15	Kepala Dinas PMPTSP	Anggota Komisi	Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu	15. 	

16	LSM AKAR	Anggota Komisi	LSM AKAR		16. 
17	LSM NAL	Anggota Komisi	LSM NAL	17. 	
18	Camat Lebong Selatan	Anggota Komisi	Kecamatan Lebong Selatan		18. 
19	Camat Lebong Tengah	Anggota Komisi	Kecamatan Lebong Tengah	19. 	
20	Marison	Anggota Komisi	Wakil Masyarakat Taba Anyar		20. 
21	Badarudin	Anggota Komisi	Wakil Masyarakat Turan Lalang	21. 	
22	Aprianto	Anggota Komisi	Wakil Masyarakat Kelurahan Mubai		22. 
23	Ahmad Suhada	Anggota Komisi	Wakil Masyarakat Danau Liang	23. 	
24	Harya Sidharta	Pemrakarsa	Manager Perencanaan PLN UIP KITSUM		24. 
25	Ryan Nugraha	Pemrakarsa	Pemrakarsa PLN UIP KITSUM	25. 	
26	Ir. Gde Karya Abdullah	Konsultan	Konsultan PT. Nusa Buana Cipta		26. 
27	Suparjo	Konsultan	Konsultan PT. Nusa Buana Cipta	27. 	
28	Ir. Arif Ashari	Konsultan	Konsultan PT. Nusa Buana Cipta		28. 
29	Drs. Sulistyowibowo	Konsultan	Konsultan PT. Nusa Buana Cipta	29. 	
30	M.A. Riri Ridwan, SKM	Konsultan	Konsultan PT. Nusa Buana Cipta		30. 



PEMERINTAH KABUPATEN LEBONG
DINAS LINGKUNGAN HIDUP

Jalan Raya Dua Jalur Komplek Perkantoran email: blhkp_lebong@yahoo.com

TUBEI

Kode Pos 39164

NOTULENSI RAPAT KOMISI PENILAI AMDAL
PEMBAHASAN DOKUMEN ANDAL DAN RKL – RPL RENCANA PEMBANGUNAN
PEMBANGKIT LISTRIK TENAGA PANAS BUMI (PLTP) HULULAIS (2X55 MW)
KECAMATAN LEBONG SELATAN DAN KECAMATAN LEBONG TENGAH KABUPATEN
LEBONG PROVINSI BENGKULU

Sabtu, 28 Juli 2018

I. Dasar Pelaksanaan

Surat Undangan Kepala Dinas Lingkungan Hidup Kabupaten Lebong Nomor: 005/1162/DLH/2018

Tanggal 20 Juli 2018 perihal : Undangan

II. Pelaksanaan Rapat Komisi Penilai :

- a. Hari/tanggal : Sabtu, 28 Juli 2018
- b. Waktu : 09.00 WIB s.d selesai
- c. Tempat : Ruang Pertemuan Hotel Dinda Ceria Kabupaten Lebong
- d. Acara : Rapat Komisi Penilai AMDAL Pembahasan ANDAL dan RKL – RPL Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 x 55 MW) oleh PT. PLN (Persero) UIP Pembangkit Sumatera.
- e. Pemimpin Rapat : Ketua Komisi Penilai AMDAL Daerah Kabupaten Lebong.
- f. Peserta Rapat :

No.	Nama	Jabatan dalam Tim	Instansi
1	Zamhari, SH, MH	Ketua Komisi	DLH Lebong
2	Rozi, ST	Ketua Tim Teknis	DLH Lebong
3	Prof. Dr. Ir. Alnopri, MS	Tenaga Ahli/Pakar	UNIB (Ahli/Pakar Bidang Perencanaan Pembangunan)
4	Prof. Dr. Iskandar, SH, M.Hum	Tenaga Ahli/Pakar	UNIB (Ahli/Pakar Bidang Lingkungan Hidup)
5	Dra. Harmiati, M.Si	Tenaga Ahli/Pakar	UNIHAZ (Ahli/Pakar Bidang Sosial Budaya)
6	Pakri Fahmi, SE, M.Si	Tenaga Ahli/Pakar	UNIHAZ (Ahli/Pakar Bidang Ekonomi)

7	Kepala Dinas Perkim	Anggota Komisi	Dinas Perumahan dan Kawasan Permukiman Kabupaten Lebong
8	Kepala Dinas Ketahanan Pangan Kabupaten Lebong	Anggota Komisi	Dinas Ketahanan Pangan Kabupaten Lebong
9	Sekretaris DLH Kab. Lebong	Anggota Komisi	Dinas DLH Kabupaten Lebong
10	Kabag. Hukum	Anggota Komisi	Sekretariat Daerah
11	Kabag. Ekonomi	Anggota Komisi	Sekretariat Daerah
12	Kabid. PPKLH	Anggota Komisi	DLH Kabupaten Lebong
13	Kabid. Pengelolaan Sampah, LB3 & Peningkatan kapasitas	Anggota Komisi	DLH Kabupaten Lebong
14	Kepala Dinas Kesehatan	Anggota Komisi	Dinas Kesehatan Kabupaten Lebong
15	Kepala Dinas PMPTSP	Anggota Komisi	Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu
16	LSM AKAR	Anggota Komisi	LSM AKAR
17	LSM NAL	Anggota Komisi	LSM NAL
18	Camat Lebong Selatan	Anggota Komisi	Kecamatan Lebong Selatan
19	Camat Lebong Tengah	Anggota Komisi	Kecamatan Lebong Tengah
20	Marison	Anggota Komisi	Wakil Masyarakat Taba Anyar
21	Badarudin	Anggota Komisi	Wakil Masyarakat Turan Lalang
22	Aprianto	Anggota Komisi	Wakil Masyarakat Kelurahan Mubai
23	Ahmad Suhada	Anggota Komisi	Wakil Masyarakat Danau Liang
24	Harya Sidharta	Pemrakarsa	Manager Perencanaan PLN UIP KITSUM

25	Ryan Nugraha	Pemrakarsa	Pemrakarsa PLN UIP KITSUM
26	Ir. Gde Karya Abdullah	Konsultan	Konsultan PT. Nusa Buana Cipta
27	Suparjo	Konsultan	Konsultan PT. Nusa Buana Cipta
28	Ir. Arif Ashari	Konsultan	Konsultan PT. Nusa Buana Cipta
29	Drs. Sulistywo Wibowo	Konsultan	Konsultan PT. Nusa Buana Cipta
30	M.A. Riri Ridwan, SKM	Konsultan	Konsultan PT. Nusa Buana Cipta

III. Hasil



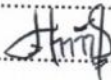
NO	HALAMAN	HASIL KOREKSI
NAMA : Sabahul kabag Hukum		
1.	-	<ul style="list-style-type: none"> - segi aturan jaminan asuransi terhadap pekerjaan dan kesehatan bagi pekerja - dampak apabila terjadi bencana saat rawan sebelumnya seperti, tanah lonsor - langkah yang di ambil oleh pihak pemrakarsa? - Segala kegiatan tetap mengacu pada perundang - undang
NAMA : Camat Lebong Tengah		
2.	-	<ul style="list-style-type: none"> - Lebih cendrung untuklebong selatan, dimana izin oprasional di Lebong Tengah - Saran <ul style="list-style-type: none"> - Menggalih hubungan kerjasama dengan pemerintah atau masyarakat - Mengembangkan hubungan baik, dan hubungan bisnis yang bermoral sesuai dengan undang-undang yang berlaku - Kepada masyarakat agar berusaha membantu kualitas masyarakat sekitar - Memberdayakan sumber daya manusia sebagai karyawan peusahaan
NAMA : Camat Lebong Selatan		
3.	-	<ul style="list-style-type: none"> - Stake holder dalam AMDAL sudah sangat tepat - Kejadian luapan air sudah ada kajian dampak lingkungan nya - Bagaimana solusi air tidak meluap di saluran kelurahan tes - Dampak lingkungan secara sosial. Didokumen salah satu desa di lebong selatan tidak termasuk desa maneb lau
Nama : Kepala Dinkes		
4.	-	<ul style="list-style-type: none"> - Bagaimana izin dan Oprasional - Dalam rencana pembangunan selalu menjalin hubungan baik kerja sama setiap stakfolder dengan masyarakat <ul style="list-style-type: none"> - Kondisi dengan masyarakat setempat (meningkat kualitas hidup) - Menghormati budaya local - Memberdayakan masyarkat lokal untuk pekerja dalam perusahaan
NAMA : konsultan /pemrakarsa		
5.	-	<ul style="list-style-type: none"> - Kedepannya PLN akan mengadakan sistem managemen kesehatan kerja yang sesuai dengan prosedur keselamatan saat terjadi bencana - Izin yang ada memang untuk kec, lebong selatan, namun PT.PLN - Pengawasan komunikasi kedepannya melalui UP kitsum berasal dari Palembang - Setiap 6 bulan sekali hal-hal yang dikhawatirkan tersebut akan dilakukan pemantauan - PT.PLN kedepannya akan memberikan bantuan pendidikan untuk masyarakat sekitar lokasi - Mengenai listrik bersubsidi untuk masyarakat Lebong Selatan, belum bias direalisasikan karena hal tersebut berkaitan dengan kebijakan
NAMA : ZAMHARI, SH,MH		
7.		<ul style="list-style-type: none"> - Harus memberdayakan SDM lokal - Putra daerah tidak hanya menjadi penonton, tetapi harus ikut dilibatkan - Penerimaan karyawan melalui sub kontraktor, sehingga PT.PLN harus diingatkan kembali kepada subkan untuk merekut karyawan lokal

Nama : kadespelabai		
8.		<ul style="list-style-type: none"> - Masyarakat kel. Mubai, sangat meresahkan masyarakat kel.mubai, silakan berjalan - Tenaga kerja jangan hanya 20%, masyarakat setempat ditempatkan di perusahaan sebagai karyawan (jangan hanya sebagai buruh kasar saja) - Sumber listrik sangat berlimpah di Lebong Selatan, tolong masyarakat lebong selatan disubsidikan dalam hal kelistrikan.
NAMA : tokohmasyarakat/ Badarudin		
9.		- Bagaimana cara menanggulangi bencana banjir di turan lalang?
NAMA : LSM Akar / Erwin Barsin		
10.		<ul style="list-style-type: none"> - Informasi sekecil apapun harus disampaikan kepada masyarakat setempat - EPIC : harus disampaikan sedetailnya manfaat kegiatan tersebut sehingga masyarakat . berhak menolak kegiatan tersebut. Hakmasyarakat terhadap sumber kehidupan - Isu pendidikan hak masyarakat : proses pendidikan dalam masyarakat sekitar

Dibuat di : Lebong
Pada Tanggal : 28 Juli, 2018

NOTULIS:

1. Inten Diana Putri
2. DanurAhlul
3. Helen Dwita


.....

.....

.....

Mengetahui/Menyetujui
Kepala Dinas Lingkungan Hidup Kabupaten Lebong
Selaku
Ketua Komisi Penilai AMDAL Daerah Kabupaten Lebong















Ketua Tim Teknis AMDAL Kabupaten Lebong


ROZI, ST
NIP.197705022009031002

RAPAT KOMISI PENILAI AMDAL
PEMBAHASAN DOKUMEN ANDAL, RKL- RPL RENCANA PEMBANGUNAN PLTP HULULAIS (2 x 55 MW)
DI KECAMATAN LEBONG SELATAN DAN KECAMATAN LEBONG TENGAH KABUPATEN LEBONG

Hari/Tanggal : Sabtu, 28 Juli 2018
 Tempat : Aula Rapat Hotel Dinda Ceria Kec. Lebong Utara
 Pemrakarsa : PT. PLN (PERSERO) UIP PEMBANGKIT SUMATERA
 Penanggung jawab Pemrakarsa : WEDDY B. SUDIRMAN
 Konsultan : PT. NUSA BUANA CIPTA

No.	Nama	Jabatan dalam Tim	Instansi	TANDA TANGAN
1	Zamhari, SH, MH	Ketua Komisi	DLH Lebong	
2	Rozi, ST	Ketua Tim Teknis	DLH Lebong	
3	Prof. Dr. Ir. Alnopri, MS	Tenaga Ahli/Pakar	UNIB (Ahli/Pakar Bidang Perencanaan Pembangunan)	
4	Dr. Gunggung Senoaji, S.Hut, MP	Tenaga Ahli/Pakar	UNIB (Ahli/Pakar Bidang Biogeofisik-Kimia)	
5	Prof. Dr. Iskandar, SH, M.Hum	Tenaga Ahli/Pakar	UNIB (Ahli/Pakar Bidang Lingkungan Hidup)	
6	Dra. Harmiati, M.Si	Tenaga Ahli/Pakar	UNIHAZ (Ahli/Pakar Bidang Sosial Budaya)	
7	dr. Esther Meylina S	Tenaga Ahli/Pakar	DINKES Lebong (Ahli/Pakar Bidang Kesehatan)	
8	Pakri Fahmi, SE, M.Si	Tenaga Ahli/Pakar	UNIHAZ (Ahli/Pakar Bidang Ekonomi)	
9	Kepala Bappeda	Anggota Komisi	BAPPEDA Kabupaten Lebong	

10	Kepala Dinas Pertanian dan Perikanan Kabupaten Lebong	Anggota Komisi	Dinas Pertanian dan Perikanan Kabupaten Lebong		10.
11	Kepala Dinas Perkim	Anggota Komisi	Dinas Perumahan dan Kawasan Permukiman Kabupaten Lebong		11.
12	Kepala Dinas Ketahanan Pangan Kabupaten Lebong	Anggota Komisi	Dinas Ketahanan Pangan Kabupaten Lebong		12.
13	Kepala Dinas PUPR Hub Kabupaten Lebong	Anggota Komisi	Dinas PUPR Hub Kabupaten Lebong		13.
14	Kabag. Hukum	Anggota Komisi	Sekretariat Daerah		14.
15	Kabag. Ekonomi	Anggota Komisi	Sekretariat Daerah		15.
16	Kabag. Pembangunan	Anggota Komisi	Sekretariat Daerah		16.
17	Sekretaris DLH Kab. Lebong	Anggota Komisi	Dinas PUPR Hub Kabupaten Lebong		17.
18	Kepala BPN Kab. Lebong	Anggota Komisi	Badan Pertanahan Nasional Kab. Lebong		18.
19	Kabid. PPKLH	Anggota Komisi	DLH Kabupaten Lebong		19.
20	Kabid. Pengelolaan Sampah, LB3 & Peningkatan kapasitas	Anggota Komisi	DLH Kabupaten Lebong		20.
21	Kepala Disnakertrans	Anggota Komisi	Dinas Ketenagakerjaan dan Transmigrasi Kab. Lebong		21.

22	Kepala Dinas Kesehatan	Anggota Komisi	Dinas Kesehatan Kabupaten Lebong	22.
23	Kepala Dinas PMPTSP	Anggota Komisi	Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu	23.
24	LSM AKAR	Anggota Komisi	LSM AKAR	24.
25	LSM NAL	Anggota Komisi	LSM NAL (41)	25.
26	Camat Lebong Selatan	Anggota Komisi	Kecamatan Lebong Selatan	26.
27	Camat Lebong Tengah	Anggota Komisi	Kecamatan Lebong Tengah	27.
28	Marison / YOG	Anggota Komisi	Wakil Masyarakat Taban Anyar	28.
29	Badarudin	Anggota Komisi	Wakil Masyarakat Turan Lalang	29.
30	Aprianto	Anggota Komisi	Wakil Masyarakat Kelurahan Mubai	30.
31	Ahmad Suhada	Anggota Komisi	Wakil Masyarakat Danau Liang	31.
32	M.A. Rizki Aidaan	Konvulta		32.
33	SUWISTYO WIBOWO	Konvultan		33.
34	ARIF BHTAY	Konvultan		34.
35	Gde Karya	---		35.

36	Suwarno	MDC			36.	<i>[Signature]</i>
37	Hanya S	MREN/Rencana Rencana	VIP KITSUM		37.	<i>[Signature]</i>
38	RYAN NIGRAHA	Rencana	PUN UIR KITSUM		38.	<i>[Signature]</i>
39	WINDA NGSIH. SH. PAH	Anggota Sekretariat	DLH		39.	<i>[Signature]</i>
40	AND I	MEDIA			40.	<i>[Signature]</i>
41					41.	
42					42.	
43					43.	
44					44.	
45					45.	





PEMERINTAH KABUPATEN LEBONG
DINAS LINGKUNGAN HIDUP

Jalan Raya Dua Jalur Komplek Perkantoran email: *blhkp_lebong@yahoo.com*

T U B E I

Kode Pos 39164

NOTULENSI RAPAT KOMISI PENILAI AMDAL
PEMBAHASAN DOKUMEN ANDAL DAN RKL – RPL RENCANA PEMBANGUNAN
PEMBANGKIT LISTRIK TENAGA PANAS BUMI (PLTP) HULULAIS (2X55 MW)
KECAMATAN LEBONG SELATAN DAN KECAMATAN LEBONG TENGAH KABUPATEN
LEBONG PROVINSI BENGKULU

Sabtu, 28 Juli 2018

I. Dasar Pelaksanaan

Surat Undangan Kepala Dinas Lingkungan Hidup Kabupaten Lebong Nomor: 005/1162/DLH/2018

Tanggal 20 Juli 2018 perihal : Undangan

II. Pelaksanaan Rapat Komisi Penilai :

- a. Hari/tanggal : Sabtu, 28 Juli 2018
- b. Waktu : 09.00 WIB s.d selesai
- c. Tempat : Ruang Pertemuan Hotel Dinda Ceria Kabupaten Lebong
- d. Acara : Rapat Komisi Penilai AMDAL Pembahasan ANDAL dan RKL – RPL Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2 x 55 MW) oleh PT. PLN (Persero) UIP Pembangkit Sumatera.
- e. Pemimpin Rapat : Ketua Komisi Penilai AMDAL Daerah Kabupaten Lebong.
- f. Peserta Rapat :

No.	Nama	Jabatan dalam Tim	Instansi
1	Zamhari, SH, MH	Ketua Komisi	DLH Lebong
2	Rozi, ST	Ketua Tim Teknis	DLH Lebong
3	Prof. Dr. Ir. Alnopri, MS	Tenaga Ahli/Pakar	UNIB (Ahli/Pakar Bidang Perencanaan Pembangunan)
4	Prof. Dr. Iskandar, SH, M.Hum	Tenaga Ahli/Pakar	UNIB (Ahli/Pakar Bidang Lingkungan Hidup)
5	Dra. Harmiati, M.Si	Tenaga Ahli/Pakar	UNIHAZ (Ahli/Pakar Bidang Sosial Budaya)
6	Pakri Fahmi, SE, M.Si	Tenaga Ahli/Pakar	UNIHAZ (Ahli/Pakar Bidang Ekonomi)

7	Kepala Dinas Perkim	Anggota Komisi	Dinas Perumahan dan Kawasan Permukiman Kabupaten Lebong
8	Kepala Dinas Ketahanan Pangan Kabupaten Lebong	Anggota Komisi	Dinas Ketahanan Pangan Kabupaten Lebong
9	Sekretaris DLH Kab. Lebong	Anggota Komisi	Dinas DLH Kabupaten Lebong
10	Kabag. Hukum	Anggota Komisi	Sekretariat Daerah
11	Kabag. Ekonomi	Anggota Komisi	Sekretariat Daerah
12	Kabid. PPKLH	Anggota Komisi	DLH Kabupaten Lebong
13	Kabid. Pengelolaan Sampah, LB3 & Peningkatan kapasitas	Anggota Komisi	DLH Kabupaten Lebong
14	Kepala Dinas Kesehatan	Anggota Komisi	Dinas Kesehatan Kabupaten Lebong
15	Kepala Dinas PMPTSP	Anggota Komisi	Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu
16	LSM AKAR	Anggota Komisi	LSM AKAR
17	LSM NAL	Anggota Komisi	LSM NAL
18	Camat Lebong Selatan	Anggota Komisi	Kecamatan Lebong Selatan
19	Camat Lebong Tengah	Anggota Komisi	Kecamatan Lebong Tengah
20	Marison	Anggota Komisi	Wakil Masyarakat Taba Anyar
21	Badarudin	Anggota Komisi	Wakil Masyarakat Turan Lalang
22	Aprianto	Anggota Komisi	Wakil Masyarakat Kelurahan Mubai
23	Ahmad Suhada	Anggota Komisi	Wakil Masyarakat Danau Liang
24	Harya Sidharta	Pemrakarsa	Manager Perencanaan PLN UIP KITSUM

25	Ryan Nugraha	Pemrakarsa	Pemrakarsa PLN UIP KITSUM
26	Ir. Gde Karya Abdullah	Konsultan	Konsultan PT. Nusa Buana Cipta
27	Suparjo	Konsultan	Konsultan PT. Nusa Buana Cipta
28	Ir. Arif Ashari	Konsultan	Konsultan PT. Nusa Buana Cipta
29	Drs. Sulistyowibowo	Konsultan	Konsultan PT. Nusa Buana Cipta
30	M.A. Riri Ridwan, SKM	Konsultan	Konsultan PT. Nusa Buana Cipta

III. Hasil

NO	HALAMAN	HASIL KOREKSI
NAMA : Sabahul kabag Hukum		
1.	-	<ul style="list-style-type: none"> - segi aturan jaminaaan asuransi terhadap perkerjaan dan kesehatan bagi pekerja - dampak apabila terjadi bencana saat rawan sebelumnya seperti, tanah lonsor - langkah yang di ambil oleh pihak pemrakarsa? - Segala kegiatan tetap mengacu pada perundang - undang
NAMA : Camat Lebong Tengah		
2.	-	<ul style="list-style-type: none"> - Lebih cendrung untuklebong selatan, dimana izin oprasional di Lebong Tengah - Saran <ul style="list-style-type: none"> - Menggalih hubungan kerjasama dengan pemerintah atau masyarakat - Mengembangkan hubungan baik, dan hubungan bisnis yang bermoral sesuai dengan undang-undang yang berlaku - Kepada masyarakat agar berusaha membantu kualitas masyrakat sekitar - Memberdayakan sumber daya manusia sebagai karyawan peusahaan
NAMA : Camat Lebong Selatan		
3.	-	<ul style="list-style-type: none"> - Stake holder dalam AMDAL sudah sangat tepat - Kejadian luapan air sudah ada kajian dampak lingkungan nya - Bagaimana solusi air tidak meluap di saluran kelurahan tes - Dampak lingkungan secara sosial. Didokumen salah satu desa di lebong selatan tidak termasuk desa maneb lau
Nama : Kepala Dinkes		
4.	-	<ul style="list-style-type: none"> - Bagaimana izin dan Oprasional - Dalam rencana pembangunan selalu menjalin hubungan baik kerja sama setiap stakfolder dengan masyrakat <ul style="list-style-type: none"> - Kondisi dengan masyrakat setempat (meningkat kualitas hidup) - Menghormati budaya local - Memberdayakan masyarkat lokal untuk pekerja dalam perusahaan
NAMA : konsultan /pemrakarsa		
5.	-	<ul style="list-style-type: none"> - Kedepannya PLN akan mengadakan sistem managemen kesehatan kerja yang sesuai dengan prosedur keselamatan saat terjadi bencana - Izin yang ada memang untuk kec, lebong selatan, namun PT.PLN - Pengawasan komunikasi kedepannya melalui UP kitsum berasal dari Palembang - Setiap 6 bulan sekali hal-hal yang dikhawatirkan tersebut akan dilakukan pemantauan - PT.PLN kedepannya akan memberikan bantuan pendidikan untuk masyrakat sekitar lokasi - Mengenai listrik bersubsidi untuk masyrakat Lebong Selatan, belum bias direalisasikan karena hal tersebut berkaitan dengan kebijakan
NAMA : ZAMHARI, SH,MH		
7.	-	<ul style="list-style-type: none"> - Harus memberdayakan SDM lokal - Putra daerah tidak hanya menjadi penonton, tetapi harus ikut dilibatkan - Penerimaan karyawan melalui sub kontraktor, sehingga PT.PLN harus diingatkan kembali kepada subkan untuk merekut karyawan lokal

Nama : kades pelabai		
8.		- Masyarakat kel. Mubai, sangat meresahkan masyarakat kel.mubai, silakan berjalan - Tenaga kerja jangan hanya 20%, masyarakat setempat ditempatkan di perusahaan sebagai karyawan (jangan hanya sebagai buruh kasar saja) - Sumber listrik sangat berlimpah di Lebong Selatan, tolong masyarakat lebong selatan disubsidikan dalam hal kelistrikan.
NAMA : tokoh masyarakat/ Badarudin		
9.		- Bagaimana cara menanggulangi bencana banjir di turanalang?
NAMA : LSM Akar / Erwin Barsin		
10.		- Informasi sekecil apapun harus disampaikan kepada masyarakat setempat - EPIC : harus disampaikan sedetailnya manfaat kegiatan tersebut sehingga masyarakat . berhak menolak kegiatan tersebut. Hak masyarakat terhadap sumber kehidupan - Isu pendidikan hak masyarakat : proses pendididkan dalam masyarakat sekitar


Dibuat di : Lebong
Pada Tanggal : 28 Juli, 2018

NOTULIS :


1. Inten Diana Putri
2. Danur Ahlul
3. Helen Dwita

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

Mengetahui/Menyetujui
Kepala Dinas Lingkungan Hidup Kabupaten Lebong
Selaku
Ketua Komisi Penilai AMDAL Daerah Kabupaten Lebong


ZAMHARI, SH, MH
NIP.19720808 199803 1 006

Ketua Tim Teknis AMDAL Kabupaten Lebong


ROZI, ST
NIP.197705022009031002

APPENDIX 12.
MINUTES OF MEETING ON REPAIRMENT
REPORT

**NOTULENSI RAPAT KOMISI PENILAIAN AMDAL
PEMBAHASAN DOKUMEN ANDAL DAN RKL-RPL RENCANA PEMBANGUNAN
PEMBANGKIT LISTRIK TENAGA PANAS BUMI (PLTP) HULULAIS (2X55 MW)
KEC. LEBONG SELATAN DAN KEC. LEBONG TENGAH KAB. LEBONG
PROVINSI BENGKULU**

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
Rapat Tim Teknis, Jumat 27 Juli 2018				
1.	Prof. Dr. Ir. Alnopri, MS			
		- Amanah dari Permen LH No 08 Tahun 2012 bahwa pelaksanaan rapat tim teknis bisa dilakukan apa bila dihadiri salah satu tim teknis dan pihak pemrakarsa maka Rapat Tim Teknis bisa dilakukan. Apabila pihak pemrakarsa bukan dihadiri oleh pimpinan maka harus ada surat kuasa dari pimpinan kepada perwakilan yang diberi kuasa untuk menghadiri Rapat Tim Teknis.	- Perwakilan dari pemrakarsa yang hadir di rapat tim teknis dan tim komisi telah menggunakan surat kuasa dari General Manager yang disampaikan kepada Ketua Tim Komisi dan Tim Teknis.	-
		- Kondisi rona awak akses jalan kelurahan Taba Anyar menuju lokasi harus ditampilkan foto terbaru April 2018.	- Telah dicantumkan foto terbaru April 2018 jalan akses	Andal - 2-42 - 2-43
		- Didalam dokumen tidak dicantumkan kapasitas uap semua yang diproduksi selama 30 tahun.	- Telah dicantumkan kapasitas uap: Berdasarkan hasil studi kelayakan (FS) Pertamina Geothermal Energy (PGE), kapasitas uap panas bumi Hululais mencukupi untuk menghasilkan listrik 110 MW. Pada FS tercantum telah diuji potensi uap dari 3 sumur menghasilkan uap setara listrik 40 MW; dan telah dibor 10 sumur (setara 130 MW atau setara uap 950 ton/hari).	Andal - I-1
		- Dengan adanya kejadian longsor di wilayah PT Pertamina Geothermal tertanam trauma masyarakat terhadap proyek-proyek baru maka itu hendaknya	- Telah dicantumkan: sosialisasi akan dilakukan kepada masyarakat untuk mengurangi trauma masyarakat	Andal I-13 RKL 2-1

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		pemrakarsa kegiatan harus diperhatikan dan di manage sebaik mungkin.		
		- Saran dahulu pada rapat tim teknis terhadap dokumen Kerangka Acuan (KA) untuk rute/lintas pengangkutan material terdapat beberapa pilhan rute tersebut. Pada dokumen ANDAL ini masih tetap tertulis seperti pada dokumen KA maka diharapkan untuk memperbaiki dengan memilih salah satu rute/lintas pengangkutan material.	Diperbaiki 2.1.3.3.9. Lalu Lintas Dengan kemungkinan alternative jalur mobilisasi baik melalui Pelabuhan Pulau Baai di Bengkulu atau melalui pelabuhan-pelabuhan di wilayah Palembang, akan melalui ruas jalan Batas Provinsi Sumatera Selatan (Lubuk Linggau). Skenario mobilisasi peralatan adalah : <ul style="list-style-type: none"> • Mobilisasi peralatan (alat-alat berat melalui ruas jalan Batas Provinsi Sumatera Selatan (Lubuk Linggau) (Lubuk Linggau – Curup – Kota Donok) dengan pertimbangan peralatan konstruksi yang akan digunakan banyak berada di Palembang. • Mobilisasi unit-unit power plan melalui Pelabuhan Pulau Baai Bengkulu – Kepahiang – Kota Donok. 	Andal 2-42 2-43
		- Dalam daftar istilah, pengertian Brine berbeda dengan yang tercantum pada halaman 1-5 Pemilihan Teknologi PLTP Hululais, untuk itu hars dilakukan perbaikan mengenai hal tersebut.	- Telah diperbaiki pengertian Brine	Andal I-5
2.	Prof. Dr. Iskandar, SH,M.Hum			
		- Apakah tokoh masyarakat yang diundang dalam sidang komisi merupakan masyarakat yang terkena dampak?	- tokoh masyarakat yang diundang dalam sidang komisi merupakan masyarakat yang terkena dampak	-
		- Terkait dengan potensi panas bumi sebagai bahan baku PLTP, tidak ada ketersediaan data antara lain; <ol style="list-style-type: none"> 1. Kapasitas atau system yang tersediakan. 2. Barapa sumur yang akan digali. 	- Telah dicantumkan kapasitas uap: Berdasarkan hasil studi kelayakan (FS) Pertamina Geothermal Energy (PGE), kapasitas uap panas bumi Hululais mencukupi untuk menghasilkan listrik 110 MW. Pada FS tercantum telah diuji potensi uap dari 3 sumur menghasilka uap setara	Andal - I-1

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
			listrik 40 MW; dan telah telah dibor 10 sumur (setara 130 MW atau setara uap 950 ton/hari).	
		- Pada Bab I (latar belakang) perlu dicantumkan system pada proses pengolahan PLTP	- Telah ditambahkan: sistem PLTP: teknologi yang digunakan adalah teknologi siklus penguapan tunggal (<i>single flash steam cycle</i>). Siklus penguapan tunggal cocok untuk sistem temperatur tinggi baik pada lingkungan reservoir dominasi air maupun pada reservoir dominasi uap	Andal I-5
		- Pada halaman 2-5 harus dideskripsikan lebih rinci terkait windrose dalam wilayah studi.	- Telah dicantumkan windrose pada wilayah studi.	Andal 2-4 sampai 2-11
		- Pada Bab III tidak terdapat data mengenai; 1. Pengelolaan tingkat kerusakan sawah. 2. Flora dan Fauna	- 1. Dalam perkembangannya pemilihan lokasi PLTP tidak pada lahan sawah, melainkan pada lahan berupa semak belukar, tanaman kopi, dan tanaman keras lainnya - Flora dan fauna tidak dikategorikan sebagai dampak penting hipotetik (DTPH)	Andal I-13 Andal I-37
		- Terdapat ketidakkonsisten dalam Dampak Penting Hipotetik di dokumen KA dengan dokumen ANDAL.	- Telah diperbaiki konsistensi	-
		- Bab IV, penjelasan tentang pengelolaan kebisingan dan mitigasi bencana radius 100 meter di areal turbin harus dijelaskan lebih lanjut.	- Telah dicantumkan mitigasi bencana radius 100 meter di areal turbin	RKL-RPL - 2-15
		- Daftar pustaka yang referensinya tidak relevan diganti dan ditambahkan peraturan yaitu Undang-Undang ketenagalistrikan beserta Perda ketenagalistrikan dan Undang-Undang Panas Bumi beserta Perda Panas Bumi.	- Daftar pustaka telah diperbaiki, telah dicantumkan <i>Peraturan Pemerintah Nomor 23 Tahun 2014 tentang Perubahan Atas Peraturan Pemerintah Nomor 14 Tahun 2012 tentang Kegiatan Usaha Penyediaan Tenaga Listrik</i> ; Undang-Undang RI Nomor 21 Tahun 2014 Tentang Panas Bumi. -	Daftar Pustaka
		- Cara penulisan pada dokumen ANDAL tidak	- Telah diperbaiki penulisan dokumen ANDAL	-

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		mengikuti hirarki.	mengikuti hirarki	
		- Bagian akhir lampiran harus dilampirkan rona lingkungan hidup, dasar teori dan asumsi.	Landasan teori ditambahkan pada lampiran	Lampiran
3.	Pakri Fahmi, SE,M.SI			
		- Pada waktu rapat tim teknis KA disarankan untuk menambahkan anggota tim konsultan dari bidang ekonomi.	- Telah dicantumkan tim bidang sosial ekonomi	-
		- Masalah peningkatan pendapatan masyarakat diperjelas terutama pekerja yang terkena dampak kegiatan.	- Telah ditambahkan dampak peningkatan pendapatan masyarakat: Besaran dampak peningkatan pendapatan merupakan besaran penambahan pendapatan, yaitu sesuai besarnya upah minimal regional (UMR) Kabupaten Lebong	Andal - III-20
4.	Dra. Harmiati, M.SI			
		- Masih sering ditemukan tipe tulisan yang berbeda, penulisan rangkap/double dalam dokumen ANDAL ini.	- Telah diperbaiki penulisan	-
		- Pada DPH (Dampak Penting Hipotetik) harus diperbaiki lagi mengenai pengurangan lahan produksi, pada tabel I-10 tidak tertulis tetapi pada penjelasannya tertulis & pada bagan alir tertulis dampak potensial.	- Telah diperbaiki DPH pengurangan lahan produksi: telah tercantum pada tabel I-10.	Andal I-28
		- Hal II-23 s/d II-41 Di dalam penulisan banyak penjelasan yang double. Penjelasannya terlalu panjang sehingga membuat yang membaca sulit mengerti. Untuk itu, disempurnakan kembali dokumen ANDAL.	- Telah diperbaiki	Andal II-23 sampai II-41
		- Dampak Sosial, pembahasan data tentang penduduk.	- Telah ditambahkan pembahasan data penduduk	Andal II-23
		- Sumber pendidikan data apakah dari monografi dari desa/kelurahan, kenapa tidak kecamatan dalam	- Data statistik Kecamatan Lebong Selatan dan Lebong Tengah Dalam Angka 2017 belum mencantumkan data pendidikan,	Andal II-25

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		angka.	sehingga menggunakan data Monografi Kelurahan/Desa.	Sampai II-26
5.	Rizal, ST			
		- Peta Geologi diperbaiki & dijelaskan susunan bantuan di dalam lokasi.	- Telah ditambahkan susunan batuan geologi: Stratigrafi lokasi geothermal Hululais merupakan batuan vulkanik Tertiary – Quarternary (basal, andesit, dacite dan pyroclastics)	Andal II-14
		- Apakah pernah dilakukan uji Geotek dilokasi?	- Uji geotek bagian studi kelayakan (FS)	-
		- Melampirkan SK penetapan lokasi dari Bupati Lebong (Izin Prinsip).	- Telah dilampirkan izin Prinsip dari Bupati Lebong	lampiran
		- Dalam hal mobilisasi alat harus dijelaskan jadwal mobilisasi/pengangkutan alat ataupun material.	- Telah dicantumkan: jadwal Mobilisasi alat dan material pada jam-jam tidak sibuk.	Andal I-12 I-17
		- Peta Geologi harus diperjelas lagi mengenai jenis bantuan lokasi kegiatan dan dilakukan uji Geotek dilokasi kegiatan.	- Telah dicantumkan jenis batuan: Stratigrafi lokasi geothermal Hululais merupakan batuan vulkanik Tertiary – Quarternary (basal, andesit, dacite dan pyroclastics)	Andal II-14
6.	Salvatori Wansoni, ST			
		Hipotetis mengenai kejadian tak terduga belum ada dalam dokumen.	Telah dicantumkan sistem tanggap darurat untuk kejadian tak terduga.	Lampiran RKL-RPL
7.	Yustin Iskandar Muda, SH,MH			
		- Lokasi kegiatan sudah dikeluarkan berdasarkan pertimbangan teknis pertahanan.	Telah dilampirkan izin lokasi.	Lampiran
		- Poin satu merupakan dasar untuk dikeluarkan Izin Penetapan Lokasi.	Telah dilampirkan izin lokasi.	Lampiran
		- Status tanah tidak dalam kawasan hutan.	Telah dilampirkan izin lokasi.	Lampiran
		- Pembebasan tanah, untuk mengeluarkan Izin Penetapan Lokasi, BPN.	Telah dilampirkan izin (penetapan) lokasi.	Lampiran

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
8.	Pemrakarsa			
		Semua kesalahan redaksi akan diperbaiki dan semua saran ataupun masukan akan ditambahkan dalam upaya penyempurnaan dokumen Andal, RKL-RPL.	Telah diperbaiki dokumen Andal, RKL-RPL sesuai saran masukan.	
9.	Dra. Harmiati, M.Si			
1	II-14	Belum ada pedoman tentang perekrutan tenaga kerja padahal beberapa peraturan berdasarkan undang-undang ketenagakerjaan di Indonesia perlu dicantumkan, untuk memberikan jaminan penghasilan, keselamatan dan kesehatan kerja bagi tenaga kerja.	Telah dicantumkan undang-undang ketenagakerjaan sebagian acuan penerimaan tenaga kerja.	Andal I-15 Daftar pustaka.
2	I-25 s/d I-28	Pada dampak potensial tahap prakonstruksi tidak ada pembebasan lahan sementara pada tabel I.10 evaluasi dampak potensial dimasukkan pembebasan lahan, sehingga terjadi ketidak konsistenan antara tabel I.10 dengan dampak potensial pembangunan PLTP Hululais 2x55 Mw.	Telah dicantumkan dampak pembebasan lahan tahap prakonstruksi, yaitu: berkurang lahan produktif.	Andal I-24.
3	I-25	Dampak potensial tahap konstruksi; Berkurangnya lahan produktif, penurunan kualitas biota tidak dimasukkan dalam tabel I.10. Menurut saya tidak perlu dimasukkan dalam dampak potensial hal I-25. Karena hal ini tidak relevan sementara untuk kualitas air tanah perlu dibuat dalam tabel I.10	Telah diperbaiki, telah dicantumkan penurunan kualitas air tanah, sebagai tidak DPH dikelola dipantau.	Andal I-47
4	KA Andal	Populasi 80 orang yang diambil sebagai objek penelitian.	Jumlah responden ditambah menjadi 100 karena ada penambahan wilayah studi	Andal 2-22
5	II-23 s/d II-41	Sumber data monografi kelurahan-kelurahan wilayah studi dan desa wilayah studi apakah ini benar karena proyeksi?	Sumber data dari monografi dan Kecamatan Dalam Angka 2017. Beberapa data di wilayah Kelurahan dan Desa merupakan hasil olahan merujuk pada data monografi desa maupun kecamatan dalam angka.	Andal 2-23
10.	Prof.Dr.Ir. Alnopri, M.s. (Fakultas Pertanian Univ. Bengkulu)			

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
1	Umum	<p>KA-ANDAL Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2X55 MW) Kec. Lebong Selatan dan Kec. Lebong Tengah Kab. Lebong (tanggal 3 Maret 2018).</p> <ul style="list-style-type: none"> - Saran perbaikan pada pembahasan KA-ANDAL masih banyak belum diperbaiki. - Banyak terjadi kesalahan ketik dan ejaan. - Dokumen dikoreksi dulu oleh kolektor. <p>Kata Pengantar Hanya untuk dokumen ANDAL tanpa RKL-RPL.</p>	Telah diperbaiki kata pengantar.	
2	Iv Daftar Isi	Tambahkan kata Lampiran	Telah ditambahkan Lampiran	
3	1-2	<ul style="list-style-type: none"> - Lampiran 3,4,5 tidak sesuai dengan lampiran yang ada. - Lampiran 3. Akta Pendirian Perusahaan. - Lampiran 4. Company Profile Perusahaan. - Lampiran 5. Struktur Organisasi Perusahaan. 	- Telah diperbaiki lampiran	Lampiran
4	1-2	<ul style="list-style-type: none"> - Tabel Penggunaan Lahan (diberi nomor). - Luas sebanyak 86.400 meter persegi, - Halaman 1-13 PLTP Hulu Lais 2x 55 MW membutuhkan lahan seluas 15 hektar???? Jelaskan (apakah di luar keperluan gedung administrasi, guard house, masjid dll) 	<ul style="list-style-type: none"> - Telah dicantumkan nomor tabel penggunaan lahan (tabel 1-2); - Lahan 15 ha untuk semua keperluan termasuk gedung administrasi, guard house, masjid 	<p>Andal:</p> <ul style="list-style-type: none"> - I-2
5	1-5	<ul style="list-style-type: none"> - Energi panas bumi dst..... - Istilah <i>brine</i> (fluida air asin panas). - Daftar Istilah; <p>Brine adalah air dan partikel pada yang dihasilkan dari pemisahan uap air diseparator???? jelaskan</p>	Telah diperbaiki istilah brine.	<p>Andal:</p> <ul style="list-style-type: none"> - I-5
6	1-9	<p>Prinsip Kerja PLTP Hulu Lais 2x 55 MW disajikan dalam gambar diagram di bawah (mana???) Sebaiknya merujuk langsung ke gambar yang ada (gambar 1.3 ???? halaman 1-11)</p>	Telah dicantumkan narasi merujuk pada nomor gambar 1-3.	<p>Andal:</p> <ul style="list-style-type: none"> - I-9

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		Saran berlaku untuk semua rujukan gambar.		
7	1-13	- Tanaman kopi tertulis 2 kali.	- Telah diperbaiki	Andal: - I-13
		- Sama persis dengan dokumen KA halaman II-11.	- Telah diperbaiki	Andal: - I-13
		- Pembangkit Sumatera = UIP KITSUM.	- Telah diperbaiki: UIP KITSUM (Pembangkit Sumatera)	Andal: - I-13
8	1-17	- Saran pada pembahasan KA belum diikuti.	- Telah diperbaiki sesuai Saran pada pembahasan KA	-
		- Lintas Route mobilisasi alat dan material???? Disajikan pada halaman 2-46 jalur mana yang akan dipakai.	- Kedua jalur route akan digunakan untuk mobilisasi alat dan material	Andal: - 2-46
9	1-18	Bagaimana cara penghitungan Disposal Area seluas 42.500 meter persegi dapat menampung tanah lunak/gembur sebanyak 680.000 meter kubik.	Penghitungan kapasitas disposal sesuai kajian studi kelayakan (FS)	Andal I-3
10	1-22	- Jumlah uap yang dibutuhkan sebanyak 865 ton/jam -	- Telah dicantumkan jumlah uap yang dibutuhkan	Andal 1-22
		- Berapa kapasitas uap dari sumur produksi (PGE), belum ada keterangan sebelumnya. Hal ini penting berkaitan dengan <i>Sustainable</i> PLTP Hululais 2 x 55 MW.	- Telah dicantumkan kapasitas uap: Berdasarkan hasil studi kelayakan (FS) Pertamina Geothermal Energy (PGE), kapasitas uap panas bumi Hululais mencukupi untuk menghasilkan listrik 110 MW. Pada FS tercantum telah diuji potensi uap dari 3 sumur menghasilkan uap setara listrik 40 MW; dan telah dibor 10 sumur (setara 130 MW atau setara uap 950 ton/hari).	Andal - I-1
		- Masa operasi selama 30 tahun (hal. 1-23)	- Telah dicantumkan masa operasi 30 tahun, dan bisa dilanjutkan	Andal - 1-23
11	1-26	- Evaluasi dampak potensial.	- Telah dicantumkan evaluasi dampak potensial;	Andal - 1-28

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		- Sama dengan KA.	- Sama dengan yang tercantum pada KA	Andal - 1-28
		- Pelingkupan dst... yang dianggap tidak tidak penting????, sehingga diperoleh daftar dampak penting hipotetik dst.	- Proses pelingkupan telah dicantumkan.	Andal - 1-61
12	1-62	1.3.2 Batas Waktu Kajian Pertanyaan sama dengan pembahasan KA : mana tabel diatas yang menyajikan batas waktu kajian untuk setiap dampak penting hipotetik (DPH).	Telah dicantumkan rujukan nomor tabel pada narasi	Andal - 1-62
13	BAB 2	- Deskripsi Rona Lingkungan Hidup Awal	- Telah dicantumkan Deskripsi Rona Lingkungan Hidup Awal	- Bab 2
		- Data dan tampilan sudah sesuai dengan KA halaman	- Telah dicantumkan data	-
14	2-24	Tertulis Desa Danau Lalang seharusnya Desa Danau Liang.	Telah diperbaiki Desa Danau Liang	Andal - 1-62
15	2-43	Saran pada pembahasan KA untuk Gambar 2.19 belum diperbaiki (foto tanggal 1 september 2015) padahal Deskripsi Roa Lingkungan Hidup Awal ini tahun 2018 ????	- Telah dicantumkan foto terbaru April 2018 jalan akses	Andal - 2-42 - 2-43
16	BAB 3	Prakiraan Dampak Penting Teknis : Halaman 3-2 letaknya sesudah halaman 3-5 perbaiki.	Telah diperbaiki susunan halaman	
17	3-5	Peristiwa longsor yang menyebabkan banjir bandang pada tahun 2016 ??? Menimbulkan resepsi negatif terhadap kegiatan baru di wilayah proyek..... perlu diperhatikan dalam kegiatan Pembangunan PLTP.	- Telah dicantumkan: sosialisasi akan dilakukan kepada masyarakat untuk mengurangi trauma masyarakat	Andal I-13 RKL 2-1
18	BAB 4	- Evaluasi secara holistic terhadap dampak lingkungan.	- Telah dicantumkan Evaluasi secara holistic terhadap dampak lingkungan	Andal - 4-1
		- Kelayakan lingkungan hidup. Mengacu pasal 15 Permen LHRI No.08 tahun 2013 tentang Tata Laksana Penilaian dan Pemeriksaan	- Telah dicantumkan Kelayakan lingkungan hidup	Andal - 4-17

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		Dokumen LH serta Penerbitan Izin Lingkungan		
		- 6. Kemampuan pemrakarsa dalam menanggulangi dampak negatif.... Tambahkan sudah melalui pendekatan teknologi, sosial dan kelembagaan.	- Telah ditambahkan: Kemampuan pemrakarsa menanggulangi dampak negatif melalui pendekatan teknologi, sosial dan kelembagaan	Andal - 4-18
	RKL-RPL			
1	Kata Pengantar	Buat kaitan antara RKL-RPL dengan Dokumen ANDAL, jangan sama persing dengan Dokumen ANDAL.	Kata pengantar diperbaiki, dibedakan antara kata pengantar Andal dan kata pengantar RKL-RPL.	Kata pengantar
2	Pendahuluan	Ok.		
3	RKL-RPL	Tata urut Dampak Lingkungan yang dikelola (RKL sudah sama dengan tata urut jenis dampak yang timbul RPL).	Tata urut Dampak Lingkungan yang dikelola (RKL sudah sama dengan tata urut jenis dampak yang timbul RPL)	RKL-RPL
4	Jumlah dan Jenis Izin PPLH	Cantumkan semua perizinan perlindungan dan pengelolaan LH yang dibutuhkan berdasarkan RKL, selain : - Perizinan Penyimpanan Sementara (TPS) limbah B3 - Perizinan pembuangan air limbah (Outlet IPAL) ke saluran/sungai.	Telah dicantumkan izin PPLH: - Perizinan Penyimpanan Sementara (TPS) limbah B3 - Perizinan pembuangan air limbah (Outlet IPAL) ke saluran/sungai	RKL-RPL - 4-1
5	Pernyataan komitmen Pelaksanaan RKL-RPL	Ok		
B	Uji Tahap Proyek			
1	Apakah lokasi rencana usaha dan/atau kegiatan sudah sesuai dengan tata ruang	Tim Teknis wajib menilai kesesuaian lokasi rencana usaha dan/atau kegiatan dengan tata ruang dan kesesuaian dengan peta indikatif penundaan izin baru (PIPIB).	Telah dicantumkan kesesuaian lokasi kegiatan dengan tata ruang dan kesesuaian dengan peta indikatif penundaan izin baru (PIPIB)	Andal 1-2

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
2	Apakah dokumen Amdal yang disampaikan untuk usaha dan/atau kegiatan masih dalam tahap perencanaan atau tidak	Apabila usaha dan/atau kegiatan yang diajukan telah dilakukan prakonstruksi, konstruksi, operasi dan/atau pascaoperasi maka usaha dan/atau kegiatan wajib ditolak dan tidak dapat dilakukan penilaian di KPA.	kegiatan yang diajukan dalam tahap perencanaan. Penyusunan Amdal setelah FS	Andal 1-1
Keterangan :				
1. Apakah lokasi rencana usaha dan/atau kegiatan sudah sesuai dengan rencana tata ruang (kaji ulang sehingga tidak melanggar aturan).				
2. Pertegas apakah bersamaan atau tidak dengan pembuatan dokumen FS, MP, SP dan DED.				
C	Uji Kualitas Dokumen			
1		- DPH beserta parameternya.	- Telah dicantumkan DPH beserta parameternya.	Andal 1-62
		- Rona LH awal.	- Telah dicantumkan Rona LH awal.	Andal 2-1
		- Prakiraan besaran dampak sifat penting.	- Telah dicantumkan Prakiraan besaran dampak sifat penting.	Andal 3-1
		- Evaluasi dampak secara holistik.	- Telah dicantumkan Evaluasi dampak secara holistik.	Andal 4-1
		- RKL-RPL	- Telah dicantumkan RKL-RPL	RKL-RPL 2-1 3-1
		- Jenis izin PPLH yang diperlukan.	- Telah dicantumkan Jenis izin PPLH yang diperlukan.	RKL-RPL 4-1
11.	DRA. Dian Marthiani (Dinas Tenaga Kerja dan Imigrasi Kab. Lebong)			
1		Agar penerimaan tenaga kerja lokal lebih banyak	Telah dicantumkan prioritas tenaga kerja dari	RKL-RPL

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		daripada tenaga kerja dari luar .	masyarakat setempat.	2-7
Sabtu 28 Juli 2018				
1.	Sabahul Kabag Hukum			
		- Segi aturan jaminan asuransi terhadap pekerjaan dan kesehatan pekerja	- Telah dicantumkan jaminan asuransi terhadap pekerjaan dan kesehatan pekerja.	RKL-RPL 2-7 2-16.
		- Dampak apabila terjadi bencana saat rawan sebelumnya seperti, tanah longsor.	- Telah dicantumkan sistem tanggap darurat	Lampiran
2.	Camat Lebong Tengah			
		- Lebih cenderung untuk Lebong Selatan, dimana izin operasional di Lebong Tengah. - Saran a. Menggalih hubungan kerjasama dengan pemerintah atau masyarakat. b. Mengembangkan hubungan baik, dan hubungan bisnis yang bermoral sesuai dengan undang-undang yang berlaku. c. Kepada masyarakat agar berusaha membantu kualitas masyarakat sekitar. d. Memberdayakan sumber daya manusia sebagai karyawan perusahaan.	- Letak lahan PLTP masuk wilayah Kecamatan Lebong Selatan, sedangkan wilayah sebaran dampak lingkungan meliputi Kecamatan Lebong Tengah. - Telah diperbaiki: a. Melaksanakan hubungan kerjasama dengan pemerintah atau masyarakat. b. Mengembangkan hubungan baik, dan hubungan bisnis yang bermoral sesuai dengan undang-undang yang berlaku. c. Membantu masyarakat dalam berusaha ekonomi. d. Memberdayakan sumber daya manusia sebagai karyawan.	Andal; 1-1; RKL-RPL: 2-6
3.	Camat Lebong Tengah			
		- <i>Stake Holder</i> dalam AMDAL sudah sangat tepat.	- Telah dicantumkan <i>Stake Holder</i> dalam AMDAL.	
		- Kejadian luapan air sudah ada kajian dampak lingkungannya.	- Telah dicantumkan kajian potensi luapan air.	RKL-RPL 2-10

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		- Bagaimana solusi agar air tidak meluap di saluran kelurahan tes.	- Telah dicantumkan pengelolaan solusi agar air tidak meluap di saluran kelurahan tes.	RKL-RPL 2-10
		- Dampak lingkungan secara sosial. Di dokumen salah satu desa di Lebong Selatan tidak termasuk desa Maneblau	- Dalam perbaikan telah dimasukkan Desa Manai Balu Kecamatan lebong Selatan.	Andal 1-1
4.	Kepala Dinkes			
		- Bagaimana izin dan Operasional.	- Izin operasional akan diurus setelah izin lingkungan.	
		- Dalam rencana pembangunan selalu menjalin hubungan baik kerja sama setiap stack holder dengan masyarakat a. Kondisi dengan masyarakat setempat (meningkat Kualitas hidup) b. Menghormati budaya lokal	- Telah dicantumkan: selalu menjalin hubungan baik kerja sama setiap stack holder dengan masyarakat: a. Meningkatkan kualitas hidup masyarakat b. Menghormati budaya lokal	RKL-RPL 2-7
		- Memberdayakan masyarakat lokal untuk pekerja dalam perusahaan.	- Dalam program RKL, penerimaan tenaga kerja lokal diprioritaskan.	RKL-RPL 2-6
5.	Konsultan/Pemrakarsa			
		- Kedepannya PLN akan mengadakan sistem manajemen kesehatan kerja yang sesuai dengan prosedur keselamatan saat terjadi bencana.	- PLN akan mengadakan sistem manajemen kesehatan kerja	RKL-RPL 2-19
		- Izin yang ada memang untuk Kec. Lebong Selatan namun PT. PLN	- PLN akan melaksanakan pengelolaan lingkungan pada Kecamatan Lebong Tengah dan Kecamatan Lebong Selatan.	RKL-RPL 2-12
		- Pengawasan komunikasi kedepannya melalui UP Kitsum berasal dari Palembang.	- Pengawasan pembangunan oleh UP Kitsum Palembang	RKL-RPL 2-12
		- Setiap 6 bulan sekali hal-hal yang dikhawatirkan tersebut akan dilakukan pemantauan.	- Pemantauan akan dilakukan rutin setiap 6 bulan	RKL-RPL 3-3
		- PT. PLN kedepannya akan memberikan bantuan pendidikan untuk masyarakat sekitar lokasi.	- PLN akan memberikan bantuan pendidikan untuk masyarakat sekitar lokasi	RKL-RPL 2-6
		- Mengenai listrik bersubsidi untuk masyarakat	- Mengenai listrik bersubsidi untuk masyarakat	-

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		Lebong Selatan belum bisa direalisasikan karena hal tersebut berkaitan dengan kebijakan.	Lebong Selatan berkaitan dengan kebijakan.	
6.	Zamhari, SH, MH			
		<ul style="list-style-type: none"> - Harus memberdayakan SDM lokal. - Putra Daerah tidak hanya menjadi penonton, tetapi harus ikut dilibatkan. - Penerimaan karyawan melalui sub kontraktor, sehingga PT. PLN harus diingatkan kembali kepada subkan untuk merekrut karyawan lokal. 	<ul style="list-style-type: none"> - Program CSR diarahkan antara lain ke bidang pendidikan. - Dalam program RKL, penerimaan tenaga kerja lokal diprioritaskan. 	RKL-RPL 2-6
7.	Kades Pelabai			
		<ul style="list-style-type: none"> - Masyarakat Kel. Mubai sangat meresahkan masyarakat Kel. Mubai, silakan berjalan. 	<ul style="list-style-type: none"> - PLN akan melakukan hubungan kerja sama dengan Kelurahan dan Desa sekitar 	RKL-RPL 2-5
		<ul style="list-style-type: none"> - Tenaga kerja jangan hanya 20% , masyarakat setempat di tempatkan diperusahaan sebagai karyawan (jangan hanya sebagai buruh kasar saja). 	<ul style="list-style-type: none"> - Dalam penerimaan tenaga kerja lokal kesempatan terbuka untuk karyawan sesuai dengan kebutuhan. 	RKL-RPL 2-6
		<ul style="list-style-type: none"> - Sumber listrik sangat berlimpah di Lebong Selatan, tolong masyarakat Lebong Selatan disubsidikan dalam hal kelistrikan. 	<ul style="list-style-type: none"> - subsidi kelistrikan mengikuti kebijakan pemerintah 	-
8.	Badarudi (Tokoh Masyarakat)			
		<ul style="list-style-type: none"> - Bagaimana cara menanggulangi bencana banjir di Turan Lalang 	<ul style="list-style-type: none"> - Telah dicantumkan pengelolaan dampak potensi banjir. 	RKL-RPL 2-10
9.	Erwin Barsin (LSM Akar)			
		<ul style="list-style-type: none"> - Informasi sekecil apapun harus disampaikan kepada masyarakat setempat.. 	<ul style="list-style-type: none"> - Pemantauan lingkungan akan dilaporkan setiap 6 bulan sekali, masyarakat bisa mengakses ke DLH Kab. Lebong 	RKL-RPL 2-6
		<ul style="list-style-type: none"> - EPIC : Harus disampaikan sedetailnya manfaat kegiatan tersebut sehingga masyarakat berhak menolak kegiatan tersebut. Hak masyarakat terhadap sumber kehidupan. 	<ul style="list-style-type: none"> - Proses AMDAL termasuk keterbukaan informasi dengan menyampaikan dampak positif maupun negatif dari rencana Pembangunan PLTP Hululais 	RKL-RPL 2-6

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		- Isu pendidikan hak masyarakat : Proses pendidikan dalam masyarakat sekitar.	- Program CSR diarahkan antara lain ke bidang pendidikan	RKL-RPL 2-6
10.	Prof . Dr. Iskandar, SH.,M.Hum			
1	Susunan Keanggotaan Komisi Penilai AMDAL	1. Salah satu komponen Komisi Penilai AMDAL yaitu warga masyarakat yang terkena dampak. Masyarakat yang terkena dampak melalui wakilnya yang duduk dalam komisi penilaian AMDAL terlibat dalam proses pengambilan keputusan terkait dengan rekomendasi kelayakan atau ketidaklayakan atas rencana usaha dan/atau kegiatan yang berdampak penting terhadap lingkungan.	Telah dilibatkan Masyarakat yang terkena dampak melalui wakilnya yang duduk dalam komisi penilaian AMDAL dalam proses pengambilan keputusan terkait dengan rekomendasi kelayakan atau ketidaklayakan atas rencana usaha dan/atau kegiatan yang berdampak penting terhadap lingkungan	Berita acara rapat Komisi Penilaian Amdal
		2. Pada Lampiran I Keputusan Bupati Lebong No. 265 Tahun 2017 Tentang Susunan Keanggotaan Komisi Penilai AMDAL Kabupaten Lebong, Anggota Komisi No. 33 yaitu Tokoh Masyarakat. Pertanyaannya apakah tokoh masyarakat dimaksud merupakan perwakilan dari masyarakat yang terkena dampak? Berapa orang jumlah tokoh masyarakat dimaksud? Hal ini penting, guna menghindari konflik dengan masyarakat dikemudian hari.	tokoh masyarakat merupakan perwakilan dari masyarakat yang terkena dampak	Berita acara rapat Komisi Penilaian Amdal
2	Potensi Panas Bumi Untuk Keberlanjutan PLTP	1. Berdasarkan pada KA-Andal, di Hulu Lais Kab. Lebong memiliki potensi panas bumi sebesar ±300 MW. Namun dari potensi tersebut dalam dokumen ANDAL tidak ada penjelasan berapa kapasitas yang telah tereksplorasi yang dapat digunakan/dimanfaatkan untuk pembangkit listrik?, berapa kapasitas masing-masing?, bila akan melakukan perluasan wilayah, tentu membutuhkan waktu untuk kajian/eksplorasi, kajian Amdal/kelayakan lingkungan dan pengurusan aspek perizinan?	- Telah dicantumkan kapasitas uap: Berdasarkan hasil studi kelayakan (FS) Pertamina Geothermal Energy (PGE), kapasitas uap panas bumi Hululais mencukupi untuk menghasilkan listrik 110 MW. Pada FS tercantum telah diuji potensi uap dari 3 sumur menghasilkan uap setara listrik 40 MW; dan telah telah dibor 10 sumur (setara 130 MW atau setara uap 950 ton/hari).	Andal - I-1
		2. Hal ini penting karena ketersediaan panas bumi akan menjamin keberlanjutan bagi Proyek Pembangunan Pembangkit Listrik Tenaga Panas	- Telah dicantumkan kapasitas uap: Berdasarkan hasil studi kelayakan (FS) Pertamina Geothermal Energy (PGE),	Andal - I-1

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		Bumi (PLTP) Hululais dengan kapasitas 110 MW. Karena kapasitas potensi 300 MW merupakan angka estimasi/perkiraan, jadi belum tentu potensi tersebut dapat dieksploitasi semua karena disebabkan berbagai kendala teknis dan non teknis.	kapasitas uap panas bumi Hululais mencukupi untuk menghasilkan listrik 110 MW. Pada FS tercantum telah diuji potensi uap dari 3 sumur menghasilkan uap setara listrik 40 MW; dan telah dibor 10 sumur (setara 130 MW atau setara uap 950 ton/hari).	
		3. Selain berkaitan dengan berkelanjutan, juga akan berkaitan dengan harga listrik yang dihasilkan dari PLTP tersebut. Perusahaan tentu saja harus memperhitungkan biaya investasi. Jika listriknya dipatok oleh PLN terlalu mahal, tentunya akan menjadi beban bagi pelanggan listrik atau rakyat.	Harga listrik ditentukan oleh pemerintah	
3	Materi Muatan dokumen ANDAL	1. Pada Bab 1 Pendahuluan perlu dicantumkan kapasitas eksisting ketersediaan panas bumi untuk saat ini dan berikutnya	- Telah dicantumkan kapasitas uap: Berdasarkan hasil studi kelayakan (FS) Pertamina Geothermal Energy (PGE), kapasitas uap panas bumi Hululais mencukupi untuk menghasilkan listrik 110 MW. Pada FS tercantum telah diuji potensi uap dari 3 sumur menghasilkan uap setara listrik 40 MW; dan telah dibor 10 sumur (setara 130 MW atau setara uap 950 ton/hari).	Andal - I-1
		2. Pada bab 2, belum menguraikan kondisi kualitatif dan kuantitatif sumber daya alam yang ada disekitar lokasi PLTP, baik yang sudah atau yang akan dimanfaatkan maupun yang masih dalam bentuk potensi. Penyajian kondisi sumberdaya alam ini perlu dikemukakan dalam peta dan/atau diuraikan dalam tabel, lihat halaman 2.49. pada bab ini juga, terkait dengan data lalulintas menggunakan data tahun 2015, sebaiknya menggunakan data terbaru, lihat halaman 2.43 s/d 2.45.	Data lalulintas tahun 2015 dicantumkan sebagai rona awal. Telah ditambahkan data panjang jalan tahun 2016 (dari Kabupaten Lebong Dalam Angka Tahun 2017).	Andal 2-44.
		3. Pada Bab 3, Prakiraan dampak penting, tidak mencantumkan prakiraan kerusakan sawah, berkurangnya flora dan fauna, sebagaimana	- 1. Dalam perkembangannya pemilihan lokasi PLTP tidak pada lahan sawah, melainkan pada lahan berupa semak belukar, tanaman	Andal I-13

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		tercantum dalam KA-ANDAL, demikian pula dengan dokumen RKL-RPL, komponen tersebut tidak diuraikan bagaimana pengelolaan dan pemantauannya.	kopi, dan tanaman keras lainnya - Flora dan fauna tidak dikategorikan sebagai dampak penting hipotetik (DTPH)	Andal I-37
		4. Pada Bab 4, sebaiknya dibuatkan deskripsi terhadap arahan pengelolaan dan pemantauan lingkungan hidup, sehingga dapat lebih jelas uraian dari masing-masing komponen dampak yang akan dikelola dan dipantau; Misalnya aspek peningkatan aspek kebisingan pada tahap operasi, tidak hanya sekedar memelihara mesin secara rutin dan antisipasi pada kondisi darurat mengalirkan uap melalui <i>rock muffler</i> . Tetapi perlu mitigasi disaat terjadi gangguan turbin yang ekstrim, karena tingkat kebisingannya dapat mencapai radius 1000 meter sehingga diperlukan <i>buffer zone</i> bising dengan radius 1000 meter atau lebih yang merupakan area kosong dan bebas dari pemukiman. Jika hanya 60-70 meter, pada kondisi ekstrim tentunya tidak cukup memadai (lihat halaman 4.4, dan 4.15).	Telah dicantumkan pengelolaan kebisingan pada keadaan darurat dengan mengalokasikan <i>buffer zone</i> bising pohon-pohon (yang dapat menyerap kebisingan) pada area kosong.	RKL-RPL 2-20
11.	Eka Rani (Dinas Lingkungan Hidup)			
		Dampak penting yang dikelola dan dipantau salah satunya erosi. Pada tahap konstruksi dampak penting erosi dimasukkan dal tabel matrik pengelolaan dan pemantauan, akan tetapi pada tahap operasi dampak penting erosi tidak dimasukkan dalam tabel matrik pengelolaan dan pemantauan, seharusnya dampak erosi tetap dimasukkan mengingat pengoperasian PLTP ±30 tahun dan wilayah lokasi kegiatan berada pada daerah rawan longsor catatan: - Dampak erosi dipantau setiap 6 bulan sekali di 3 titik pemantauan - Dampak erosi wajib dimasukkan dalam tahap operasi.	- Telah dicantumkan pengelolaan erosi pada RKL-RPL pada tahap konstruksi dan tahap operasi. - Telah dicantumkan pada RKL-RPL pemantauan erosi setiap 6 bulan tahap konstruksi dan tahap operasi.	RKL-RPL 2-34 RKL-RPL 3-30

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
12.	Rizal			
		<ul style="list-style-type: none"> - Dalam pelaksanaan rencana pembangunan PLTP Hululais (2x55 watt), apakah telah dikeluarkannya surat keputusan Bupati Lebong tentang penetapan lokasi dan apakah seluruh lahan yang akan digunakan telah dibebaskan. - Terkait dengan mobilisasi alat yang akan digunakan dengan kelas jalan di Kab. Lebong seharusnya sudah dapan menentukan jalur pengangkutan dan waktu pelaksanaan pengangkutan alat yang akan digunakan. - Sebelum melaksanakan pembangunan diminta kepada pihak pelaksana untuk mengajukan permohonan IMB kepada pemerintah Kab. Lebong - Peta geologi diperbaiki. - Dokumen dicek kembali. - Jadwal mobilisasi alat harus lebih jelas. - Program CSR. 	<ul style="list-style-type: none"> - Telah dilampirkan izin lokasi dari Pemerintah Kabupaten Lebong: Pembebasan lahan masih dalam proses. - Telah dicantumkan jalur pengangkutan alat dan material; - Permohonan IMB akan diajukan setelah terbit izin lingkungan; - Telah dicantumkan peta geologi; - Dokumen telah diperbaiki; - Jadwal mobilisasi telah dicantumkan; - Program CSR dimasukkan dalam RKL-RPL. 	<p>Lampiran Andal 2-43</p> <p>Andal 2-15</p> <p>Andal 1-12</p> <p>1-17</p> <p>RKL-RPL 2-5</p> <p>2-6.</p>
13.	Pakri Fahmi (Univ. Prof. DR. Hazairin, SH)			
1	Administrasi	<ul style="list-style-type: none"> - Dalam Lampiran Rencana Pengelolaan Lingkungan Hidup dan Rencana Pemantauan Lingkungan Hidup (RKL-RPL), belum dilampirkan data dan informasi lain yang relevan dan dianggap perlu. 	<ul style="list-style-type: none"> - Telah dilampirkan surat pernyataan kesanggupan melaksanakan Rencana Pengelolaan Lingkungan Hidup dan Rencana Pemantauan Lingkungan Hidup (RKL-RPL). 	Lampiran RKL-RPL
		<ul style="list-style-type: none"> - Dalam Dokumen Analisis Dampak Lingkungan Hidup (ANDAL), pada halaman daftar isi terdapat dua daftar isi, yang keduanya berbeda, sehingga membingungkan dalam mencari halaman yang dibutuhkan. Agar diperbaiki sesuai dengan yang sebenarnya pada Dokumen ini. 	<ul style="list-style-type: none"> - Telah diperbaiki daftar isi Dalam Dokumen Analisis Dampak Lingkungan Hidup (ANDAL). 	Daftar isi
2	3-19	Sebagaimana yang diuraikan pada Tahapan Konstruksi jumlah penduduk yang terkena dampak sebanyak jumlah tenaga kerja yang akan diserap, yakni sejumlah 193 orang, dari jumlah tersebut, artinya bagi masyarakat	<ul style="list-style-type: none"> - Jumlah 193 orang adalah total jumlah tenaga kerja yang dibutuhkan dalam tahap konstruksi, dari jumlah ini sebagian besar dapat diisi dari tenaga kerja lokal sesuai dengan keahlian dan 	Andal 1-15

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		yang lahannya terkena pembebasan dan mereka tidak mempunyai lahan lain untuk tempat mencari nafkah, maka perusahaan harus lebh memprioritaskan untuk diterima sebagai pekerja di proyek tersebut, meskipun tetap mengikuti ketentuan dari perusahaan yang akan membangun proyek tersebut.	kebutuhannya, namun sebagian kecil (Manager Proyek, Site Manajer dll) didatangkan dari luar.	
	3-30	Seperti yang dijelaskan bahwasannya Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi ini, pada tahap operasi akan menyerap tenaga kerja sebanyak 80 orang, dari jumlah itu, pada Dokumen ini tidak ada rincian yang jelas tentang jenis pekerjaan apa saja dan tingkat pendidikan yang bisa diterima menjadi pekerjanya, sehingga belum bisa disimpulkan bahwa tenaga yang akan direkrut tersebut berasal dari desa atau kecamatan yang menjadi lokasi proyek ini, oleh karenanya saran kami, agar 80 tenaga kerja yang akan diterima tersebut dijelaskan secara rinci dalam dokumen ini.	Jumlah 80 orang adalah total jumlah tenaga kerja yang dibutuhkan dalam tahap operasi, dari jumlah ini sebagian besar dapat diisi dari tenaga kerja lokal sesuai dengan keahlian dan kebutuhannya. Pada tabel Kebutuhan Tenaga Kerja Operasi telah dirinci termasuk jumlah kebutuhan sehingga pelamar kerja (Lokal) dapat memilih sesuai bidang keahliannya.	Andal 1-21
3	3-19	Pada uraian-uraian sebelumnya, bahwa desa yang merupakan lokasi proyek tersebut hanya ada 3 desa yang terdiri dari : Ds. Mubai, Ds, Turan Lalang dan Ds. Danau Liang. Kemudian pada uraian selanjutnya, termasuk yang ada dihalaman 3-19, bahwa desa dan kelurahan yang terkena dampak ada 6 yakni : Kel. Mubai, Kel. Tabak Anyar, Kel. Tes, Kel. Turan Lalang dan Ds. Danau Liang. Dengan kenyataan ini, agar dijelaskan tentang kelurahan-kelurahan yang terkena dampak tersebut. Kemudian Mubai itu desa atau kelurahan?	Pada pra survai hanya Kelurahan Mubai (Bukan desa), Kelurahan Turan Lalang Kecamatan Lebong Selatan dan Desa Danau Liang Kecamatan Lebong Tengah yang menjadi wilayah survai lokasi ternyata beberapa kelurahan berdekatan dan dilalui jalur mobolisasi-demobilisasi sehingga kami masukkan menjadi wilayah studi tambahan yaitu Kelurahan Tabak Anyar dan kelurahan Tes. Dari hasil rapat konsultasi teknis Camat Lebong Selatan mengusulkan penambahan Desa Manai Blau yang wilayahnya berdekatan dengan lokasi PLTP Hululais sehingga diputuskan termasuk yang terdampak. Lokasi proyek PLTP berada di Kelurahan Mubai Kecamatan Lebong Selatan, sedangkan wilayah lain adalah terdampak sehingga wilayah studi sosial menjadi 4 kelurahan, 2 desa dalam 2 kecamatan di	Andal 1-63

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
			kabupaten Lebong, yaitu Kelurahan Mubai, Kelurahan Turan Lalang, Kelurahan Taba Anyar, Kelurahan Tes dan Desa Manai Blau di wilayah Kecamatan Lebong Selatan dan Desa Danau Liang di Kecamatan Lebong Tengah.	
4		Analisis Sosial Ekonomi dan Budaya, dalam Dokumen ANDAL dan RKL-RPL Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi (PLTP) Hululais (2x55 MW) ini, menurut saya masih sangat perlu di pertajam lagi, terutama tentang solusi bagi masyarakat kehilangan mata pencahariannya akibat dibangunnya proyek tersebut.	Telah dicantumkan pengelolaan dampak sosial Masyarakat yang terdampak langsung terutama yang lahannya dibebaskan dan kehilangan mata pencaharian akan menjadi perhatian pemrakarsa.	RKL-RPL 2-5 2-6
5		Salah satu konflik yang akan sangat besar kemungkinannya terjadi adalah dalam hal membebaskan lahan, terutama pembebasan kebun masyarakat, yang selama ini sudah menjadi lahan usaha masyarakat disekitarnya. Pada kenyataannya ini agar pihak perusahaan dapat melakukan dengan sebaik-baiknya, dalam arti tidak merugikan masyarakat dan tidak menghilangkan mata pencaharian masyarakat yang telah lebih dahulu menjadikan itu sebagai sumber kehidupannya.	Pembebasan lahan akan dilakukan melalui musyawarah masyarakat pemilik lahan dengan PT PLN sebagai pembeli lahan.	RKI-RPL 2-7
6		Sebagaimana yang telah diuraikan secara luas dalam Dokumen ANDAL dan RKL-RPL ini tentang apa saja yang akan dilakukan oleh pihak perusahaan, dalam upaya mengelola Lingkungan Hidup disekitar pertambangan agar benar-benar diwujudkan secara nyata.	PLN akan melaksanakan pengelolaan dan pemantauan lingkungan yang tertera dalam dokumen ANDAL dan RKL-RPL.	Surat pernyataan pemrakarsa
14.	Gunawan Wibisono (DLH Kab. Lebong)			
		Sebaiknya penurunan kualitas air pada tahap operasi dan konstruksi disamakan antara lain parameter: - PH - DO - BOD	- Telah disamakan parameter penurunan kualitas air pada tahap operasi dan konstruksi	RKL-RPL 3-26

NO	HALAMAN (BAB)	SARAN DAN MASUKAN PERBAIKAN	TANGGAPAN SARAN DAN MASUKAN PERBAIKAN	HAL
		<ul style="list-style-type: none"> - COD - Nitrat - Nitrit - TSS - Minyak Lemak - Kekeruhan 		
15.	Chandra .SE			
		Kecamatan Lebong Selatan termasuk daerah yang rawan longsor, untuk itu disarantani pemantauan terhadap erosi dilakukan juga hingga tahap operasi (30 tahun) di tiga (3) titik dengan periode setiap enam (6) bulan sekali.	Telah dicantumkan pemantauan erosi tahap operasi setiap enam (6) bulan	RKL-RPL 3-30