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Lampiran 1. Surat Izin Penelitian dari PT Semen Tonasa



Nomor : 434/ST/22.00/07-2023
 Lampiran : -
 Perihal : Balasan Pengantar Pengambilan Data Awal Penelitian

Kepada Yth..

Dr. Wahiduddin, SKM.,M.Kes.
 Wakil Dekan Bidang Akademik Dan Kemahasiswaan
UNIVERSITAS HASANUDDIN
 di-
 Makassar

Dengan hormat,

Sehubungan dengan korespondensi dari Universitas Hasanuddin Fakultas Kesehatan Masyarakat, No: 22779/UN4.14/PT.01.04/2023, Tanggal 22 Juni 2023. Perihal Pengantar Pengambilan Data Awal Penelitian, maka bersama ini kami sampaikan, bahwa permohonan atas nama di bawah ini dapat disetujui :

| <u>Nama</u> | <u>Stambuk</u> | <u>Jurusan</u> |
|-------------|----------------|----------------------|
| Achmad | K062222007 | Kesehatan Lingkungan |

Judul Skripsi : *Analisis Risiko Kesehatan Lingkungan Paparan PM 2,5 dan Gas SO2 pada Pekerja di Unit Produksi PT Semen Tonasa.*

Jadwal pelaksanaan Kerja Praktek tanggal 1 s/d 31 Agustus, untuk itu diharapkan hadir di Gedung Diklat PT Semen Tonasa pada tanggal 1 Agustus 2023 jam 08.00 WITA, serta membawa kelengkapan sebagai berikut :

1. Pas foto berwarna latar merah ukuran 2x3cm dan 3x4cm masing-masing 1 (satu) lembar.
2. Fotokopi kartu BPJS Kesehatan Aktif
3. Fotokopi Kartu BPJS Ketenagakerjaan Aktif disertai bukti bayar.
4. Fotokopi Kartu Tanda Mahasiswa
5. Fotokopi KTP
6. Surat keterangan berbadan sehat dari dokter perusahaan.
7. Peserta sudah melaksanakan vaksin min. dosis 2, dibuktikan dengan cetak sertifikat vaksin.

Go
Beyond
Next

PT SEMEN TONASA
 Biringene, Pangkep, Sulawesi Selatan, 90651 Telp. (410)-312-345



8. Semua peserta wajib melakukan screening kesehatan di Semen Tonasa Medical Center pada H-1 Pembekalan.
9. Berpakaian sopan/memakai seragam atau almamater resmi dari institusi dan bersepatu.
10. Untuk peserta penempatan pabrik agar membawa Alat Pelindung Diri (APD) berupa helm proyek warna biru dan sepatu safety.
11. Peserta yang tidak bisa melengkapi persyaratan dan tidak hadir saat pembekalan maka tidak bisa melanjutkan dan melaksanakan kegiatan di PT Semen Tonasa.

Demikian kami sampaikan, atas perhatiannya diucapkan terima kasih.

Pangkep, 19 Juli 2023
SM of HC Operational


 WIDYA KURNIASARI RAHIM 

Tembusan:

1. SM of Safety, Health & Environment

Lampiran 2. Rekomendasi Etik Penelitian



KEMENTERIAN PENDIDIKAN, KEBUDAYAAN
RISET, DAN TEKNOLOGI
UNIVERSITAS HASANUDDIN
FAKULTAS KESEHATAN MASYARAKAT
Jln.Perintis Kemerdekaan Km.10 Makassar 90245, Telp.(0411) 585658,
E-mail : fkunhas@gmail.com, website: <https://fkunhas.ac.id/>

REKOMENDASI PERSETUJUAN ETIK

Nomor : 466/UN4.14.1/TP.01.02/2024

Tanggal: 19 Februari 2024

Dengan ini Menyatakan bahwa Protokol dan Dokumen yang Berhubungan dengan Protokol berikut ini telah mendapatkan Persetujuan Etik :

| | | | |
|-----------------------------------|---|---|------------------------------------|
| No. Protokol | 5224072054 | No. Sponsor Protokol | |
| Peneliti Utama | Achmad | Sponsor | Pribadi |
| Judul Peneliti | Analisis Risiko Kesehatan Lingkungan Paparan PM 2.5 Dan Gas Sulfur Dioksida (SO₂) Pada Pekerja Di Unit Produksi PT Semen Tonasa | | |
| No.Versi Protokol | 1 | Tanggal Versi | 05 Februari 2024 |
| No.Versi PSP | 1 | Tanggal Versi | 05 Februari 2024 |
| Tempat Penelitian | PT. Semen Tonasa Unit V, Pangkajene dan Kepulauan | | |
| Judul Review | <input type="checkbox"/> Exempted <input checked="" type="checkbox"/> Expedited <input type="checkbox"/> Fullboard | Masa Berlaku 19 Februari 2024 Sampai 19 Februari 2025 | Frekuensi review lanjutan |
| Ketua Komisi Etik Penelitian | Nama : Prof.dr.Veni Hadju,M.Sc,Ph.D | Tanda tangan | Tanggal 19 Februari 2024 |
| Sekretaris komisi Etik Penelitian | Nama : Dr. Wahiduddin, SKM.,M.Kes | Tanda tangan | Tanggal 19 Februari 2024 |

Kewajiban Peneliti Utama :

1. Menyerahkan Amandemen Protokol untuk persetujuan sebelum di implementasikan
2. Menyerahkan Laporan SAE ke Komisi Etik dalam 24 Jam dan dilengkapi dalam 7 hari dan Laporan SUSAR dalam 72 Jam setelah Peneliti Utama menerima laporan
3. Menyerahkan Laporan Kemajuan (progress report) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah
4. Menyerahkan laporan akhir setelah Penelitian berakhir
5. Melaporkan penyimpangan dari protocol yang disetujui (protocol deviation/violation)
6. Mematuhi semua peraturan yang ditentukan

Lampiran 3. Kuisisioner dan lembar *Informed Consent*

KUESIONER

ANALISIS RISIKO KESEHATAN LINGKUNGAN PAJANAN PM_{2,5} DAN Gas SO₂ PADA PEKERJA DI UNIT PRODUKSI PT. SEMEN TONASA

| INFORMED CONSENT | |
|---|--|
| <p>Mohon maaf saya menyita waktu Bapak/Ibu beberapa menit. Saya Achmad, Mahasiswa Program Magister Kesehatan Lingkungan Universitas Hasanuddin bermaksud untuk meminta keterangan/informasi kepada Bapak/Ibu terkait dengan penelitian saya mengenai Analisis Risiko Kesehatan Lingkungan Paparan PM_{2,5} Dan Gas SO₂ pada pekerja di Unit Produksi PT Semen Tonasa. Pada penelitian ini, saya akan melakukan wawancara kepada Bapak/Ibu tentang faktor paparan yang terjadi di tempat kerja anda. Jadi, saya akan meminta kesediaan Bapak/Ibu untuk di wawancarai. Adapun informasi tambahan yang ingin saya peroleh adalah berat badan, umur, posisi pekerjaan, lama bekerja, jumlah jam kerja sehari, dan berapa hari kerja yang dalam sebulan.</p> <p>Penelitian ini bersifat sukarela. Semua data-data berupa identitas maupun hasil penelitian akan dijamin kerahasiannya. Namun, Bapak/Ibu tidak bersedia ikut dalam penelitian dalam penelitian ini, hal ini diserahkan kembali pada pertimbangan Bapak/Ibu. Apabila ada hal yang ingin ditanyakan atau didiskusikan dipersilahkan menghubungi kontak (085255918125) yang tersedia. Saat ini, apakah Bapak/Ibu bersedia berpartisipasi dalam survei ini? Apakah saya dapat memulai wawancara ini?</p> | |
| <p>BILA RESPONDEN SETUJU UNTUK DIWAWANCARAI, WAWANCARA DIMULAI.</p> <p>BILA RESPONDEN TIDAK SETUJU DIWAWANCARAI, AKHIRI DAN CARI RESPONDEN LAIN SESUAI RENCANA SAMPLING</p> | |
| A. LOKASI PENELITIAN | |
| A1. Unit Produksi | |
| A2. Area Produksi | |
| B. WAKTU WAWANCARA | |
| B1. Tgl/bln/thn | |
| <p>PETUNJUK PENGISIAN:</p> <ol style="list-style-type: none"> 1. Lingkari kode jawaban jika kode jawaban berupa angka 2. Pindahkan kode jawaban yang dilingkari jika pada kolom jawaban disediakan kotak | |

3. Jika satu pertanyaan terdiri dari beberapa bagian, lingkari kode jawaban dari setiap bagian tersebut dan isikan pada kotak yang disediakan
4. Tulislah jawaban yang diminta jika terdapat perintah sebutkan atau catatlah
5. Jika jawaban bukan berupa pilihan maka isilah kotak atau (.....) yang disediakan

C. DATA KARAKTERISTIK

| | | |
|----|---|--|
| C1 | Nomor urut responden | |
| C2 | Nama responden | |
| C3 | Umur ... Tahun | |
| C4 | Berat Badan ... Kg (<i>Body Weight</i> , BW) | |

D. AKTIVITAS DAN KEGIATAN

| | | |
|----|---|--|
| D1 | Posisi Pekerjaan/jabatan ... | |
| D2 | Sudah berapa lama bapak bekerja pada unit Produksi PT Semen tonasa? (... Tahun), (Exposure Duration, ED) | |
| D3 | Dalam sehari bekerja, berapa jam berada di luar ruangan pada area unit Produksi tempat bapak bekerja? (... Jam), (Exposure Time, ET) | |
| D4 | Dalam Sebulan berapa hari anda bekerja? | |
| D5 | Dalam setahun, berapa hari bapak mengambil istirahat bekerja (cuti)? (... hari), (Exposure Frekuensi, EF) | |
| D6 | Apakah Anda Menggunakan Alat Pelindung Diri (APD) saat bekerja | |
| D7 | Seberapa sering Anda menggunakan APD saat bekerja di luar ruangan pada area Produksi? 1. Selalu 2. Jarang 3. Sekali-sekali 4. Tidak Pernah | |
| D8 | Jenis APD apa yang biasa Anda gunakan? (Jawaban boleh lebih dari 1 pilihan) 1. Helmet 2. Ear plug/Ear Muff 3. Masker 4. Safety Shoes 5. Safety Glasses 6. Kaos tangan | |

E. GANGGUAN KESEHATAN DAN GEJALA PENYAKIT

| | | |
|----|---|--|
| E1 | Keluhan Kesehatan yang di derita selama tiga tahun terakhir: ... | |
| E2 | Sifat penyakit tersebut: 1. Terus menerus 2. Hilang kambuh | |
| E3 | Usaha dalam pengobatan | |

| | | |
|----|---|--|
| | 1. Pengobatan sendiri 2. Ke tempat pelayanan kesehatan yang ditanggung oleh perusahaan (Rumah sakit / Puskesmas / Klinik) | |
| E4 | Jika Pengobatan dilakukan ke tempat pelayanan kesehatan, apa diagnosa dokter ketika anda memeriksakan kesehatan (.....) | |

Lampiran 4. Hasil uji laboratorium



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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 25, 2023 to September 26, 2023

DATE OF ANALYSIS : September 25, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
Time of sampling: 09.30 – 09.00 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Raw Mill 3
Coordinate S: 04° 47' 24.70"
E: 119° 37' 06.82"

| Parameter | Sampling Periode | Unit | Test Results | Methods |
|-----------------------------------|------------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 45.5 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 99.0 | SNI 7119.14-2016 |

Field Data
Temperature : 23.5 – 33.5 °C
Humidity : 55 – 75 %
Pressure : 758.0 – 760.2 mmHg
Wind Speed : 0.0 – 1.9 m/s
Wind Direction : South-North
Weather : Clear

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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 24, 2023 to September 25, 2023

DATE OF ANALYSIS : September 24, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
Time of sampling: 09.15 – 08.45 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Raw Mill 2
Coordinate S: 04° 47' 24.60"
E: 119° 37' 05.51"

| Parameter | Sampling Periode | Unit | Test Results | Methods |
|-----------------------------------|------------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 43.5 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 98.1 | SNI 7119.14-2016 |

Field Data
 Temperature : 23.5 – 33.0 °C
 Humidity : 59 – 81 %
 Pressure : 758.5 – 760.9 mmHg
 Wind Speed : 0.0 – 1.5 m/s
 Wind Direction : South-North
 Weather : Clear

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Issuing Office:

REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 23, 2023 to September 24, 2023

DATE OF ANALYSIS : September 23, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
Time of sampling: 09.00 – 08.30 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Raw Mill 1
Coordinate S: 04° 47' 26.46"
E: 119° 37' 05.61"

| Parameter | Sampling Periode | Unit | Test Results | Methods |
|-----------------------------------|------------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 54.3 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 107.5 | SNI 7119.14-2016 |

Field Data
Temperature : 23.9 – 33.5 °C
Humidity : 50 – 77 %
Pressure : 757.4 – 760.5 mmHg
Wind Speed : 0.0 – 1.7 m/s
Wind Direction : South-North
Weather : Clear

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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 22, 2023 to September 23, 2023

DATE OF ANALYSIS : September 22, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
 Time of sampling: 09.00 – 08.30 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Area Packer 3
 Coordinate S: 04° 47' 30.50"
 E: 119° 36' 54.41"

| Parameter | Sampling Period | Unit | Test Results | Methods |
|-----------------------------------|-----------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 62.5 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 151.2 | SNI 7119.14-2016 |

Field Data
 Temperature : 23.0 – 33.3 °C
 Humidity : 63 – 76 %
 Pressure : 757.9 – 760.2 mmHg
 Wind Speed : 0.0 – 2.0 m/s
 Wind Direction : East-West
 Weather : Clear

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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 21, 2023 to September 22, 2023

DATE OF ANALYSIS : September 21, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
 Time of sampling: 09.00 – 08.30 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Area Packer 2
 Coordinate S: 04° 47' 29.83"
 E: 119° 36' 52.80"

| Parameter | Sampling Periode | Unit | Test Results | Methods |
|-----------------------------------|------------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 76.1 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 178.9 | SNI 7119.14-2016 |

Field Data
 Temperature : 23.5 – 33.0 °C
 Humidity : 55 – 78 %
 Pressure : 758.5 – 760.5 mmHg
 Wind Speed : 0.0 – 2.3 m/s
 Wind Direction : East-West
 Weather : Clear

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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 20, 2023 to September 21, 2023

DATE OF ANALYSIS : September 20, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
 Time of sampling: 09.15 – 08.45 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Area Packer 1
 Coordinate S: 04° 47' 29.80"
 E: 119° 36' 53.37"

| Parameter | Sampling Periode | Unit | Test Results | Methods |
|-----------------------------------|------------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 59.5 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 198.5 | SNI 7119.14-2016 |

Field Data
 Temperature : 23.8 – 33.5 °C
 Humidity : 52 – 75 %
 Pressure : 758.1 – 760.5 mmHg
 Wind Speed : 0.0 – 1.8 m/s
 Wind Direction : South-North
 Weather : Clear

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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 19, 2023 to September 20, 2023

DATE OF ANALYSIS : September 19, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
 Time of sampling: 09.00 – 08.30 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Area Kiln 3
 Coordinate S: 04° 47' 25.03"
 E: 119° 36' 59.30"

| Parameter | Sampling Periode | Unit | Test Results | Methods |
|-----------------------------------|------------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 68.5 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 59.8 | SNI 7119.14-2016 |

Field Data
 Temperature : 23.3 – 33.2 °C
 Humidity : 59 – 85 %
 Pressure : 759.5 – 760.8 mmHg
 Wind Speed : 0.0 – 1.8 m/s
 Wind Direction : South-North
 Weather : Clear

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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 18, 2023 to September 19, 2023

DATE OF ANALYSIS : September 18, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
 Time of sampling: 08.30 – 08.00 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Area Kiln 2
 Coordinate S: 04° 47' 25.19"
 E: 119° 37' 01.47"

| Parameter | Sampling Periode | Unit | Test Results | Methods |
|-----------------------------------|------------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 67.2 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 65.2 | SNI 7119.14-2016 |

Field Data
 Temperature : 23.0 – 33.5 °C
 Humidity : 58 – 82 %
 Pressure : 758.2 – 761.0 mmHg
 Wind Speed : 0.0 – 1.6 m/s
 Wind Direction : South-North
 Weather : Clear

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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 17, 2023 to September 18, 2023

DATE OF ANALYSIS : September 17, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
 Time of sampling: 09.00 – 08.00 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Area Kiln 1
 Coordinate S: 04° 47' 26.70"
 E: 119° 37' 01.42"

| Parameter | Sampling Period | Unit | Test Results | Methods |
|-----------------------------------|-----------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 74.8 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 78.6 | SNI 7119.14-2016 |

Field Data
 Temperature : 23.5 – 33.5 °C
 Humidity : 51 – 78 %
 Pressure : 757.9 – 761.8 mmHg
 Wind Speed : 0.0 – 2.0 m/s
 Wind Direction : South-North
 Weather : Clear

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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 16, 2023 to September 17, 2023

DATE OF ANALYSIS : September 16, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
 Time of sampling : 08.30 – 08.25 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Area Finish Mill 3
 Coordinate S : 04° 47' 28.61"
 E : 119° 37' 00"

| Parameter | Sampling Periode | Unit | Test Results | Methods |
|-----------------------------------|------------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 44.4 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 170.5 | SNI 7119.14-2016 |

Field Data
 Temperature : 25 – 33 °C
 Humidity : 55 – 71 %
 Pressure : 751.8 – 761.6 mmHg
 Wind Speed : 0.0 – 2.4 m/s
 Wind Direction : South-East
 Weather : Clear

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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 15, 2023 to September 16, 2023

DATE OF ANALYSIS : September 15, 2023 to September 30, 2023

TESTED FOR : SO₂ and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
 Time of sampling : 08.30 – 08.25 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Area Finish Mill 2
 Coordinate S : 04° 47' 30.21"
 E : 119° 36' 58.39"

| Parameter | Sampling Periode | Unit | Test Results | Methods |
|-----------------------------------|------------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 40.5 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 166.7 | SNI 7119.14-2016 |

Field Data
 Temperature : 25 – 33 °C
 Humidity : 55 – 71 %
 Pressure : 751.8 – 761.6 mmHg
 Wind Speed : 0.0 – 2.4 m/s
 Wind Direction : South-East
 Weather : Clear

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Abdur Muhs Karim



Date: October 01, 2023



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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 14, 2023 to September 15, 2023

DATE OF ANALYSIS : September 14, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
Time of sampling : 08.30 – 08.25 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Area Finish Mill 1
Coordinate S : 04° 47' 27.79"
E : 119° 36' 58.29"

| Parameter | Sampling Period | Unit | Test Results | Methods |
|-----------------------------------|-----------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 42.2 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 159.8 | SNI 7119.14-2016 |

Field Data
Temperature : 25 – 33 °C
Humidity : 55 – 71 %
Pressure : 751.8 – 761.8 mmHg
Wind Speed : 0.0 – 2.4 m/s
Wind Direction : South-East
Weather : Clear

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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 13, 2023 to September 14, 2023

DATE OF ANALYSIS : September 13, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
 Time of sampling : 08.30 – 08.25 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Area Coal Mill 3
 Coordinate S : 04° 47' 26.14"
 E : 119° 37' 03.24"

| Parameter | Sampling Periode | Unit | Test Results | Methods |
|-----------------------------------|------------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 60.5 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 138.8 | SNI 7119.14-2016 |

Field Data
 Temperature : 25 – 33 °C
 Humidity : 55 – 71 %
 Pressure : 751.8 – 761.6 mmHg
 Wind Speed : 0.0 – 2.4 m/s
 Wind Direction : South-East
 Weather : Clear

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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 12, 2023 to September 13, 2023

DATE OF ANALYSIS : September 12, 2023 to September 30, 2023

TESTED FOR : SO₂, and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
Time of sampling : 08.30 – 08.25 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Area Coal Mill 2
Coordinate S : 04° 47' 27.64"
E : 119° 37' 02.99"

| Parameter | Sampling Periode | Unit | Test Results | Methods |
|-----------------------------------|------------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 58.9 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 144.5 | SNI 7119.14-2016 |

Field Data
Temperature : 25 – 33 °C
Humidity : 55 – 71 %
Pressure : 751.8 – 761.6 mmHg
Wind Speed : 0.0 – 2.4 m/s
Wind Direction : South-East
Weather : Clear

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REPORT OF ANALYSIS

CLIENT : PT. SEMEN TONASA

TYPE OF SAMPLE : AMBIENT AIR

DATE RECEIVED : September 11, 2023 to September 12, 2023

DATE OF ANALYSIS : September 11, 2023 to September 30, 2023

TESTED FOR : SO₂ and PM_{2.5}

DESCRIPTION OF SAMPLE : Sample was drawn by Sucofindo Makassar Laboratory.
Time of sampling : 08.30 – 08.25 WITA (±24 Hours)

SAMPLE IDENTIFICATION : Area Coal Mill 1
Coordinate S : 04° 47' 28.94"
E : 119° 37' 04.25"

| Parameter | Sampling Period | Unit | Test Results | Methods |
|-----------------------------------|-----------------|--------------------|--------------|------------------|
| Sulfur Dioxide (SO ₂) | 24 Hour | µg/Nm ³ | 54.4 | SNI 7119.7-2017 |
| PM _{2.5} | 24 Hours | µg/Nm ³ | 168.5 | SNI 7119.14-2016 |

Field Data
 Temperature : 25 – 33 °C
 Humidity : 55 – 71 %
 Pressure : 751.8 – 761.6 mmHg
 Wind Speed : 0.0 – 2.4 m/s
 Wind Direction : South-East
 Weather : Clear

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Lampiran 5. Dokumentasi Kegiatan



Pengambilan sampel PM_{2.5} dan SO₂ area Finish Mill dan Kiln



Pengambilan sampel PM_{2.5} dan SO₂ area Packer dan Raw Mill



Wawancara pekerja dan penimbangan berat badan area Packer dan Coal Mill



Wawancara pekerja dan penimbangan berat badan area Packer dan Finish Mill