

## DAFTAR PUSTAKA

- Alter, N.C. *et al.* (2024) "Quantifying the association between PM2.5 air pollution and IQ loss in children: a systematic review and meta-analysis," *Environmental Health: A Global Access Science Source*, 23(1). Tersedia pada: <https://doi.org/10.1186/s12940-024-01122-x>.
- Alves, C. *et al.* (2013) "Comfort parameters and particulate matter (PM10 and PM2.5) in school classrooms and outdoor air," *Aerosol and Air Quality Research*, 13(5), hal. 1521–1535. Tersedia pada: <https://doi.org/10.4209/aaqr.2012.11.0321>.
- Amin, M., Handika, R. A., Putri, R. M., Phairuang, W., Hata, M., Tekasakul, P., & Furuuchi, M. (2021). Size-segregated particulate mass and carbonaceous components in roadside and riverside environments. *Applied Sciences*, 11(21), 10214.
- Ana Turyanti (2011) "Analisis Faktor Meteorologi Terhadap Konsentrasi PM 10 Menggunakan Regresi Linier Berganda(Studi Kasus: Daerah Dago Pkar dan Cisaranten,Bandung)," 1(3), hal. 21–29.
- Anzira, A. dan Ahmad, D. (2020) "Model Matematika Efek Perpindahan Polutan Pada Kolam Pertama Ke Kolam Kedua Dipengaruhi Adveksi Dan Dispersi," *UNPjoMath*, 3(1), hal. 1–6.
- Barn, P. *et al.* (2018) "The effect of portable HEPA filter air cleaners on indoor PM2.5 concentrations and second hand tobacco smoke exposure among pregnant women in Ulaanbaatar, Mongolia: The UGAAR randomized controlled trial," *Science of the Total Environment*, 615, hal. 1379–1389. Tersedia pada: <https://doi.org/10.1016/j.scitotenv.2017.09.291>.
- Burnett, R. *et al.* (2018) "Global estimates of mortality associated with longterm exposure to outdoor fine particulate matter," *Proceedings of the National Academy of Sciences of the United States of America*, 115(38), hal. 9592–9597. Tersedia pada: <https://doi.org/10.1073/pnas.1803222115>.
- Hidayat, A. (2019) "Dampak Polusi Udara Pada Kesehatan Jantung," *Universitas Medan Area*, (November), hal. 1–12.
- Kalaiarasan, G. *et al.* (2017) "Source apportionment of PM2.5 particles: Influence of outdoor particles on indoor environment of schools using chemical mass balance," *Aerosol and Air Quality Research*, 17(2), hal. 616–625. Tersedia pada: <https://doi.org/10.4209/aaqr.2016.07.0297>.
- Karaoghlanian, N. *et al.* (2022) "Low cost air quality sensors 'PurpleAir' calibration and inter-calibration dataset in the context of Beirut, Lebanon," *Data in Brief*, 41, hal. 108008. Tersedia pada: <https://doi.org/10.1016/j.dib.2022.108008>.
- Kushwaha Meenakshi *et al.* (2020) "Penggunaan Terintegrasi Sensor Berbiaya Rendah untuk Memperkuat Manajemen Kualitas Udara." Tersedia pada: <http://creativecommons>.
- Li, W. *et al.* (2022) "A review of respirable fine particulate matter (PM2.5)-

- induced brain damage,” *Frontiers in Molecular Neuroscience*, 15. Tersedia pada: <https://doi.org/10.3389/fnmol.2022.967174>.
- Maddu, A., Sardy, S. dan Zain, H. (2008) “Sensor Serat Optik Dengan Cladding Polianilin Nanostruktur Untuk Mendeteksi UAP HCl,” 8(1), hal. 1–11.
- Maharani, S. dan Aryanta, W.R. (2023) “Dampak Buruk Polusi Udara Bagi Kesehatan Dan Cara Meminimalkan Risikonya,” *Jurnal Ecocentrism*, 3(2), hal. 47–58. Tersedia pada: <https://doi.org/10.36733/jeco.v3i2.7035>.
- Mendell, M.J. dan Heath, G.A. (2005) “Do indoor pollutants and thermal conditions in schools influence student performance? A critical review of the literature,” *Indoor Air*, 15(1), hal. 27–52. Tersedia pada: <https://doi.org/10.1111/j.1600-0668.2004.00320.x>.
- Park, D.Y. *et al.* (2024) “Fine dust inflow paths and heating load variation based on field measurement of air tightness in two Korean schools,” *Heliyon*, 10(4), hal. e26284. Tersedia pada: <https://doi.org/10.1016/j.heliyon.2024.e26284>.
- Park, J.H. *et al.* (2020) “Effects of air cleaners and school characteristics on classroom concentrations of particulate matter in 34 elementary schools in Korea,” *Building and Environment*, 167(June 2019), hal. 106437. Tersedia pada: <https://doi.org/10.1016/j.buildenv.2019.106437>.
- Ridayanti, D.D.P. (2022) “Risiko Paparan Debu/Particulate Matter (PM<sub>2,5</sub>) Terhadap Kesehatan Masyarakat (Studi Kasus: Tempat Pembuatan Batu Bata di Desa Kaloran, Kecamatan Ngronggot, Nganjuk),” *Penelitian Kesehatan Suara Forikes*, 13(April), hal. 1–7.
- Riederer, A.M. *et al.* (2021) “Effectiveness of portable HEPA air cleaners on reducing indoor PM<sub>2.5</sub> and NH<sub>3</sub> in an agricultural cohort of children with asthma: A randomized intervention trial,” *Indoor Air*, 31(2), hal. 454–466. Tersedia pada: <https://doi.org/10.1111/ina.12753>.
- Rita, D.D.L. *et al.* (2016) “Indeks Kualitas Lingkungan Hidup (PM<sub>10</sub> AND PM<sub>2.5</sub>),” *jurnal Eco Lab*, 10(1), hal. 1–7.
- Rosalia, O., Wispriyono, B. dan Kusnoputranto, H. (2018) “Karakteristik Risiko Kesehatan Non Karsinogen Pada Remaja Siswa Akibat Paparan Inhalasi Debu Particulate Matter <2,5 (PM<sub>2,5</sub>),” *Media Kesehatan Masyarakat Indonesia*, 14(1), hal. 26. Tersedia pada: <https://doi.org/10.30597/mkmi.v14i1.2079>.
- Ruchjana, B.N. *et al.* (2021) “Peramalan Konsentrasi Particulate Matter 2.5 (PM<sub>2.5</sub>) menggunakan Model Vector Autoregressive dengan Metode Maximum Likelihood Estimation,” *KUBIK: Jurnal Publikasi Ilmiah Matematika*, 6(1), hal. 1–12. Tersedia pada: <https://doi.org/10.15575/kubik.v6i1.8046>.
- Ścibor, M., Bokwa, A. dan Balcerzak, B. (2020) “Impact of wind speed and apartment ventilation on indoor concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> in Kraków, Poland,” *Air Quality, Atmosphere and Health*, 13(5), hal. 553–562. Tersedia pada: <https://doi.org/10.1007/s11869-020->

00816-8.

- Shidki, H. *et al.* (2020) "Terbuka Di Universitas Telkom Indoor Air Quality Analysis of Open Offices in Telkom," 7(1), hal. 1121–1128.
- Silitonga, A. dan Wispriyono, B. (2020) "Analisis Risiko Kesehatan Pajanan Inhalasi Debu Particulate Matter 2.5 pada Siswa Sekolah Menengah Pertama di Kota Depok Tahun 2018," *Jurnal Nasional Kesehatan Lingkungan Global*, 1(1), hal. 10–16. Tersedia pada: <https://doi.org/10.7454/jnklg.v1i1.1031>.
- Sugiarti (2009) "Gas Pencemar Udara dan Pengaruhnya Bagi Kesehatan Manusia," *Jurnal Chemical*, 10(1), hal. 50–58. Tersedia pada: <https://ojs.unm.ac.id/chemica/article/download/399/17>.
- Wibowo, J.. (2022) "Peran pemerintah dan masyarakat negara finlandia dalam menangani permasalahan polusi udara," (June), hal. 0–10.
- Zhang, G. *et al.* (2006) "Indoor environmental quality in a 'low allergen' school and three standard primary schools in Western Australia," *Indoor Air*, 16(1), hal. 74–80. Tersedia pada: <https://doi.org/10.1111/j.1600-0668.2005.00405.x>.
- Zehnder C, Manoylov K, Mutiti S, *et al.* Introduction to environmental science: 2nd edition. Biological Sciences Open Textbooks. Published 2018. <https://oer.galileo.usg.edu/biology-textbooks/4>
- World Health Organization, New WHO Global Air Quality Guidelines Aim to Save Millions of Lives from Air Pollution, 2021. September 22), <https://www.who.int/news/item/22-09-2021-new-who-global-air-quality-guidelines-aim-to-save-millions-of-lives-from-air-pollution>
- U.S. Department of Energy. Specification for HEPA Filters Used by DOE Contractors-DOE Technical Standard. Available online: <https://www.standards.doe.gov/standards-documents/3000/3020-astd-2015> (accessed on 26 September 2021)
- Bennett, D.H.; Moran, R.E.; Krakowiak, P.; Tancredi, D.J.; Kenyon, N.J.; Williams, J.; Fisk, W.J. Reductions in particulate matter concentrations resulting from air filtration: A randomized sham-controlled crossover study. *Indoor Air* 2022, 32, e12982
- Pemerintah Indonesia. (2021). *Peraturan Pemerintah Nomor 22 Tahun 2021 tentang Penyelenggaraan Perlindungan dan Pengelolaan Lingkungan Hidup*. Lembaran Negara Republik Indonesia Tahun 2021 Nomor 34.
- Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia. (2020). *Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 14 Tahun 2020 tentang Indeks Standar Pencemar Udara*. Berita Negara Republik Indonesia Tahun 2020 Nomor 441.
- World Health Organization, *WHO global air quality guidelines: particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide*, World Health Organization, Geneva, 2021

## LAMPIRAN

### Lampiran 1 Surat Izin Penelitian untuk SDN 040448 Kabanjahe



**Kementerian Kesehatan**  
Direktorat Jenderal  
Sumber Daya Manusia Kesehatan  
**Poltekkes Medan**  
Jalan Jamin Ginting KM. 13,5  
Medan, Sumatera Utara 20137  
(061) 8368633  
<https://poltekkes-medan.ac.id>

NOMOR : PP.06.02/XIV.14/396/2025  
Lampiran : -  
Perihal : Permohonan Izin Studi Penelitian

Kabanjahe, 25 Mei 2025

Kepada Yth : Kepala Sekolah SD Negeri 040448 Kabanjahe  
Di  
Tempat

Dengan Hormat,

Bersama ini datang menghadap Saudara, Mahasiswa Sarjana Terapan Sanitasi Jurusan Kesehatan Lingkungan Kemenkes Poltekkes Medan :

Nama : Imabila Rahma Dinda  
NIM : P00933221029

Yang bermaksud akan mengadakan studi penelitian ke SD Negeri 040448 Kabanjahe, yang Bapak/Ibu pimpin dalam rangka menyusun Skripsi dengan judul:

" ANALISIS KUALITAS UDARA TERHADAP PAPARAN PARTIKULAT (PM<sub>2.5</sub>) DALAM RUANGAN LINGKUNGAN SEKOLAH MENGGUNAKAN *LOW-COST SENSOR* KECAMATAN KABANJAHE KABUPATEN KARO TAHUN 2025"

Perlu kami tambahkan bahwa penelitian ini digunakan semata mata hanya untuk menyelesaikan tugas akhir dan perkembangan ilmu pengetahuan.

Demikian disampaikan, atas perhatian Bapak/Ibu, diucapkan terima kasih.

Ketua Jurusan Sanitasi Politeknik Kesehatan  
Kementerian Kesehatan Medan,



Haesti Sembiring SST MSc  
NIP. 197206181997032003



Kementerian Kesehatan tidak menerima suap dan/atau gratifikasi dalam bentuk apapun. Jika terdapat potensi suap atau gratifikasi silakan laporkan melalui HALO KEMENKES 1500567 dan <https://whs.kemkes.go.id>. Untuk verifikasi keaslian tandatangan elektronik, silakan unggah dokumen pada laman <https://tic.keminfo.go.id/verify/PDF>.  
*Dokumen ini telah ditandatangani secara elektronik menggunakan sertifikat elektronik yang diterbitkan oleh Balai Besar Sertifikasi Elektronik (BSrE), Badan Siber dan Sandi Negara*

## Lampiran 2 Surat Izin Penelitian untuk SDN 040445 Kabanjahe



**Kementerian Kesehatan**  
Direktorat Jenderal  
Sumber Daya Manusia Kesehatan  
**Poltekkes Medan**  
Jalan Jamin Ginting KM. 13.5  
Medan, Sumatera Utara 20137  
(061) 8368633  
<https://poltekkes-medan.ac.id>

NOMOR : PP.06.02/XIV.14/396/2025  
Lampiran : -  
Perihal : Permohonan Izin Studi Penelitian

Kabanjahe, 25 Mei 2025

Kepada Yth : Kepala Sekolah SD Negeri 040448 Kabanjahe

Di

Tempat

Dengan Hormat,

Bersama ini datang menghadap Saudara, Mahasiswa Sarjana Terapan Sanitasi Jurusan Kesehatan Lingkungan Kemenkes Poltekkes Medan :

Nama : Imabila Rahma Dinda  
NIM : P00933221029

Yang bermaksud akan mengadakan studi penelitian ke SD Negeri 040448 Kabanjahe, yang Bapak/Ibu pimpin dalam rangka menyusun Skripsi dengan judul:

" ANALISIS KUALITAS UDARA TERHADAP PAPARAN PARTIKULAT ( $PM_{2.5}$ ) DALAM RUANGAN LINGKUNGAN SEKOLAH MENGGUNAKAN *LOW-COST* SENSOR KECAMATAN KABANJAHE KABUPATEN KARO TAHUN 2025"

Perlu kami tambahkan bahwa penelitian ini digunakan semata mata hanya untuk menyelesaikan tugas akhir dan perkembangan ilmu pengetahuan.

Demikian disampaikan, atas perhatian Bapak/Ibu, diucapkan terima kasih.

Ketua Jurusan Sanitasi Politeknik Kesehatan  
Kementerian Kesehatan Medan,



Haesti Sembiring SST MSc  
NIP. 197206181997032003



Kementerian Kesehatan tidak menerima suap dan/atau gratifikasi dalam bentuk apapun. Jika terdapat potensi suap atau gratifikasi silakan laporkan melalui HALO KEMENKES 1500567 dan <https://whs.kemkes.go.id>. Untuk verifikasi keaslian tandatangan elektronik, silakan unggah dokumen pada laman <https://tte.kominfo.go.id/verifyPDF/>.

Dokumen ini telah ditandatangani secara elektronik menggunakan sertifikat elektronik yang diterbitkan oleh Balai Besar Sertifikasi Elektronik (BSrE), Badan Siber dan Sandi Negara

### Lampiran 3 Surat Balasan SDN 040448 Kabanjahe



PEMERINTAH KABUPATEN KARO  
**SD NEGERI 040448 KABANJAHE**  
KECAMATAN KABANJAHE  
Jalan Veteran No. 58 – Kec. Kabanjahe – Kab. Karo – 22111  
Email : [sdn040448kabanjahe@gmail.com](mailto:sdn040448kabanjahe@gmail.com) NPSN : 10202104 NSS : 101070301006

Kabanjahe, 10 Juni 2025

Nomor : 400.7.22.1/04/SD/VI/2025  
Lampiran : -  
Perihal : **Balasan Izin Penelitian**

Kepada Yth  
Ketua Jurusan Kesehatan Lingkungan  
Politeknik Kesehatan Kemenkes Medan  
Di -  
Tempat

Dengan hormat,

Sehubungan dengan surat yang saya terima dari Politeknik Kesehatan Kemenkes Medan Nomor : PP.06.02/XIV.14/396/2025, perihal Permohonan Izin Studi Penelitian di SD Negeri 040448 Kabanjahe, Kec. Kabanjahe, Kab. Karo, maka dengan ini kami sampaikan Bahwa :

Nama : IRNABILA RAHMA DINDA  
NIM : P00933221029  
Judul Skripsi : ANALISIS KUALITAS UDARA TERHADAP PAPARAN  
PARTIKULAT (PM<sub>2,5</sub>) DALAM RUANGAN LINGKUNGAN  
SEKOLAH MENGGUNAKAN LOW-COST SENSOR  
KECAMATAN KABANJAHE KABUPATEN KARO TAHUN 2025

Dengan ini, kami pihak SD Negeri 040448 Kabanjahe memberi izin kepada nama diatas untuk melakukan penelitian di SD Negeri 040448 Kabanjahe, Kec. Kabanjahe, Kab. Karo.

Demikian surat ini diperbuat sesuai dengan sebenarnya, untuk dipergunakan seperlunya.

Mengetahui  
Kepala SD Negeri 040448 Kabanjahe



**ANITA BR PERANGIN ANGIN, S.Pd**  
NIP. 19701205 199305 2 001

## Lampiran 4 Surat Balasan SDN 040445 Kabanjahe



PEMERINTAH KABUPATEN KARO  
**SD NEGERI 040445 KABANJAHE**  
KECAMATAN KABANJAHE

Jl. Pahlawan No. 1B – Gung Leto – Kec. Kabanjahe – Kab. Karo – 22111  
Email : [sdn45kabanjahe@gmail.com](mailto:sdn45kabanjahe@gmail.com) NPSN : 10202101 NSS : 101070301003

Kabanjahe, 26 Juni 2025

Nomor : 800.1.4.1/150/SD.03/VI/2025  
Lampiran : -  
Perihal : **Balasan Izin Penelitian**

Kepada Yth

Ketua Jurusan Kesehatan Lingkungan  
Politeknik Kesehatan Kemenkes Medan  
Di –

Tempat

Dengan hormat,

Sehubungan dengan surat yang saya terima dari Politeknik Kesehatan Kemenkes Medan Nomor : PP.06.02/XIV.14/396/2025, perihal Permohonan Izin Studi Penelitian di SD Negeri 040445 Kabanjahe, Kec. Kabanjahe, Kab. Karo, maka dengan ini kami sampaikan

Bahwa :

Nama : IRNABILA RAHMA DINDA  
NIM : P00933221029  
Judul Skripsi : ANALISIS KUALITAS UDARA TERHADAP PAPARAN  
PARTIKULAT (PM<sub>2,5</sub>) DALAM RUANGAN  
LINGKUNGAN SEKOLAH MENGGUNAKAN LOW-  
COST SENSOR KECAMATAN KABANJAHE  
KABUPATEN KARO TAHUN 2025

Dengan ini, kami pihak SD Negeri 040445 Kabanjahe memberi izin kepada nama diatas untuk melakukan penelitian di SD Negeri 040445 Kabanjahe, Kec. Kabanjahe, Kab. Karo.

Demikian surat ini diperbuat sesuai dengan sebenarnya, untuk di pergunakan seperlunya.



Mengetahui,  
Kepala SD Negeri 040445 Kabanjahe

ROSBITINA BR PINEM, S.Pd  
NIP. 19650707 198712 2 002

Lampiran 5 Tabel Konsentrasi PM<sub>2.5</sub> Dalam Ruangan Pada Sekolah SDN 040448 (Dekat Jalan Raya)  
 Hari ke 1 (Selasa, 27 Mei 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 7.00  | 18.90                                               | 18.87                                               | 18.88                                                       |
| 8.00  | 12.55                                               | 12.58                                               | 12.56                                                       |
| 9.00  | 36.17                                               | 36.28                                               | 36.23                                                       |
| 10.00 | 31.79                                               | 31.48                                               | 31.64                                                       |
| 11.00 | 17.41                                               | 17.53                                               | 17.47                                                       |
| 12.00 | 17.13                                               | 17.17                                               | 17.15                                                       |
| 13.00 | 11.02                                               | 10.69                                               | 10.86                                                       |
| 14.00 | 10.51                                               | 10.12                                               | 10.32                                                       |
| 15.00 | 12.83                                               | 12.63                                               | 12.73                                                       |
| 16.00 | 22.27                                               | 21.78                                               | 22.03                                                       |
| 17.00 | 28.53                                               | 28.20                                               | 28.37                                                       |
| 18.00 | 35.97                                               | 35.90                                               | 35.93                                                       |
| 19.00 | 45.44                                               | 45.18                                               | 45.31                                                       |
| 20.00 | 41.02                                               | 40.92                                               | 40.97                                                       |
| 21.00 | 37.37                                               | 37.21                                               | 37.29                                                       |
| 22.00 | 29.29                                               | 28.67                                               | 28.98                                                       |
| 23.00 | 24.52                                               | 24.32                                               | 24.42                                                       |
| 00.00 | 24.79                                               | 24.64                                               | 24.72                                                       |
| 01.00 | 14.41                                               | 14.03                                               | 14.22                                                       |
| 02.00 | 8.41                                                | 8.36                                                | 8.39                                                        |
| 03.00 | 7.85                                                | 7.84                                                | 7.85                                                        |
| 04.00 | 5.56                                                | 5.40                                                | 5.48                                                        |
| 05.00 | 8.31                                                | 8.07                                                | 8.19                                                        |
| 06.00 | 12.53                                               | 12.41                                               | 12.47                                                       |

Hari ke 2 (Rabu, 28 Mei 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 7.00  | 40.76                                               | 40.29                                               | 40.52                                                       |
| 8.00  | 34.15                                               | 33.87                                               | 34.01                                                       |
| 9.00  | 27.41                                               | 26.94                                               | 27.17                                                       |
| 10.00 | 18.32                                               | 17.76                                               | 18.04                                                       |
| 11.00 | 16.69                                               | 16.59                                               | 16.64                                                       |
| 12.00 | 17.88                                               | 18.13                                               | 18.00                                                       |
| 13.00 | 13.76                                               | 13.58                                               | 13.67                                                       |
| 14.00 | 23.57                                               | 23.07                                               | 23.32                                                       |
| 15.00 | 21.81                                               | 21.59                                               | 21.70                                                       |
| 16.00 | 17.32                                               | 17.12                                               | 17.22                                                       |
| 17.00 | 28.49                                               | 28.36                                               | 28.43                                                       |
| 18.00 | 35.90                                               | 35.84                                               | 35.87                                                       |
| 19.00 | 45.44                                               | 45.18                                               | 45.31                                                       |
| 20.00 | 41.02                                               | 40.92                                               | 40.97                                                       |
| 21.00 | 37.17                                               | 37.00                                               | 37.08                                                       |
| 22.00 | 29.29                                               | 28.67                                               | 28.98                                                       |
| 23.00 | 24.52                                               | 24.32                                               | 24.42                                                       |
| 00.00 | 24.79                                               | 24.64                                               | 24.72                                                       |
| 01.00 | 14.41                                               | 14.03                                               | 14.22                                                       |
| 02.00 | 8.41                                                | 8.36                                                | 8.39                                                        |
| 03.00 | 7.85                                                | 7.84                                                | 7.85                                                        |
| 04.00 | 5.56                                                | 5.40                                                | 5.48                                                        |
| 05.00 | 8.43                                                | 8.19                                                | 8.31                                                        |
| 06.00 | 12.53                                               | 12.41                                               | 12.47                                                       |

Hari ke 3 (Kamis, 29 Mei 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 7.00  | 17.70                                               | 17.49                                               | 17.60                                                       |
| 8.00  | 16.03                                               | 15.64                                               | 15.83                                                       |
| 9.00  | 8.39                                                | 8.10                                                | 8.24                                                        |
| 10.00 | 8.16                                                | 7.70                                                | 7.93                                                        |
| 11.00 | 8.79                                                | 8.65                                                | 8.72                                                        |
| 12.00 | 9.35                                                | 9.21                                                | 9.28                                                        |
| 13.00 | 9.67                                                | 9.41                                                | 9.54                                                        |
| 14.00 | 16.64                                               | 16.47                                               | 16.55                                                       |
| 15.00 | 18.21                                               | 18.03                                               | 18.12                                                       |
| 16.00 | 19.20                                               | 19.31                                               | 19.26                                                       |
| 17.00 | 20.89                                               | 20.76                                               | 20.82                                                       |
| 18.00 | 36.60                                               | 36.28                                               | 36.44                                                       |
| 19.00 | 47.57                                               | 47.61                                               | 47.59                                                       |
| 20.00 | 40.99                                               | 40.93                                               | 40.96                                                       |
| 21.00 | 44.25                                               | 44.10                                               | 44.17                                                       |
| 22.00 | 44.53                                               | 44.54                                               | 44.54                                                       |
| 23.00 | 44.69                                               | 44.38                                               | 44.54                                                       |
| 00.00 | 47.52                                               | 47.07                                               | 47.30                                                       |
| 01.00 | 44.55                                               | 44.29                                               | 44.42                                                       |
| 02.00 | 39.44                                               | 39.42                                               | 39.43                                                       |
| 03.00 | 35.96                                               | 35.98                                               | 35.97                                                       |
| 04.00 | 17.79                                               | 17.69                                               | 17.74                                                       |
| 05.00 | 19.01                                               | 18.80                                               | 18.90                                                       |
| 06.00 | 26.21                                               | 26.08                                               | 26.14                                                       |

Hari ke 4 (Jumat, 30 Mei 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 7.00  | 25.67                                               | 25.12                                               | 25.39                                                       |
| 8.00  | 25.20                                               | 24.77                                               | 24.98                                                       |
| 9.00  | 12.91                                               | 12.50                                               | 12.71                                                       |
| 10.00 | 23.87                                               | 23.55                                               | 23.71                                                       |
| 11.00 | 19.25                                               | 19.06                                               | 19.16                                                       |
| 12.00 | 22.17                                               | 21.76                                               | 21.96                                                       |
| 13.00 | 20.84                                               | 20.66                                               | 20.75                                                       |
| 14.00 | 35.41                                               | 34.92                                               | 35.16                                                       |
| 15.00 | 29.85                                               | 29.76                                               | 29.81                                                       |
| 16.00 | 29.91                                               | 29.93                                               | 29.92                                                       |
| 17.00 | 28.88                                               | 28.23                                               | 28.56                                                       |
| 18.00 | 43.56                                               | 43.38                                               | 43.47                                                       |
| 19.00 | 53.59                                               | 52.76                                               | 53.17                                                       |
| 20.00 | 52.49                                               | 52.18                                               | 52.33                                                       |
| 21.00 | 59.25                                               | 58.49                                               | 58.87                                                       |
| 22.00 | 58.01                                               | 56.97                                               | 57.49                                                       |
| 23.00 | 40.97                                               | 40.69                                               | 40.83                                                       |
| 00.00 | 29.28                                               | 28.58                                               | 28.93                                                       |
| 01.00 | 27.48                                               | 27.21                                               | 27.34                                                       |
| 02.00 | 29.98                                               | 29.25                                               | 29.61                                                       |
| 03.00 | 32.26                                               | 31.82                                               | 32.04                                                       |
| 04.00 | 33.56                                               | 33.31                                               | 33.43                                                       |
| 05.00 | 34.09                                               | 33.58                                               | 33.83                                                       |
| 06.00 | 33.76                                               | 33.23                                               | 33.49                                                       |

Hari ke 5 (Sabtu, 31 Mei 2025)

| Jam   | PM <sub>2.5</sub> a | PM <sub>2.5</sub> b | Rata Rata PM <sub>2.5</sub> |
|-------|---------------------|---------------------|-----------------------------|
| 7.00  | 36.59               | 35.79               | 36.19                       |
| 8.00  | 29.97               | 29.66               | 29.82                       |
| 9.00  | 22.00               | 21.68               | 21.84                       |
| 10.00 | 15.59               | 15.92               | 15.76                       |
| 11.00 | 17.99               | 17.98               | 17.99                       |
| 12.00 | 13.69               | 13.68               | 13.69                       |
| 13.00 | 18.45               | 18.31               | 18.38                       |
| 14.00 | 14.45               | 14.27               | 14.36                       |
| 15.00 | 17.23               | 17.20               | 17.22                       |
| 16.00 | 25.53               | 25.15               | 25.34                       |
| 17.00 | 28.96               | 28.40               | 28.68                       |
| 18.00 | 62.69               | 62.76               | 62.72                       |
| 19.00 | 65.49               | 66.02               | 65.75                       |
| 20.00 | 56.92               | 56.91               | 56.92                       |
| 21.00 | 59.52               | 59.45               | 59.48                       |
| 22.00 | 52.50               | 52.60               | 52.55                       |
| 23.00 | 55.70               | 55.40               | 55.55                       |
| 00.00 | 45.67               | 45.51               | 45.59                       |
| 01.00 | 40.22               | 40.01               | 40.12                       |
| 02.00 | 40.66               | 40.46               | 40.56                       |
| 03.00 | 33.96               | 33.64               | 33.80                       |
| 04.00 | 35.36               | 34.95               | 35.16                       |
| 05.00 | 35.75               | 35.43               | 35.59                       |
| 06.00 | 36.05               | 35.93               | 35.99                       |

Hari ke 6 (Minggu, 1 Juni 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 7.00  | 43.23                                               | 43.01                                               | 43.12                                                       |
| 8.00  | 28.56                                               | 28.64                                               | 28.60                                                       |
| 9.00  | 16.54                                               | 16.67                                               | 16.60                                                       |
| 10.00 | 18.13                                               | 17.66                                               | 17.90                                                       |
| 11.00 | 12.25                                               | 11.97                                               | 12.11                                                       |
| 12.00 | 11.29                                               | 11.33                                               | 11.31                                                       |
| 13.00 | 8.92                                                | 8.80                                                | 8.86                                                        |
| 14.00 | 7.71                                                | 7.66                                                | 7.68                                                        |
| 15.00 | 9.14                                                | 9.11                                                | 9.12                                                        |
| 16.00 | 9.85                                                | 9.78                                                | 9.81                                                        |
| 17.00 | 17.08                                               | 17.03                                               | 17.05                                                       |
| 18.00 | 27.80                                               | 27.74                                               | 27.77                                                       |
| 19.00 | 45.84                                               | 45.95                                               | 45.90                                                       |
| 20.00 | 60.19                                               | 59.85                                               | 60.02                                                       |
| 21.00 | 48.81                                               | 48.68                                               | 48.75                                                       |
| 22.00 | 43.15                                               | 43.04                                               | 43.09                                                       |
| 23.00 | 37.58                                               | 37.52                                               | 37.55                                                       |
| 00.00 | 41.88                                               | 41.80                                               | 41.84                                                       |
| 01.00 | 38.74                                               | 38.61                                               | 38.68                                                       |
| 02.00 | 32.21                                               | 31.95                                               | 32.08                                                       |
| 03.00 | 32.14                                               | 32.00                                               | 32.07                                                       |
| 04.00 | 21.59                                               | 21.75                                               | 21.67                                                       |
| 05.00 | 18.81                                               | 18.39                                               | 18.60                                                       |
| 06.00 | 40.33                                               | 40.03                                               | 40.18                                                       |

Hari ke 7 (Senin, 2 Juni 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 7.00  | 43.89                                               | 44.12                                               | 44.00                                                       |
| 8.00  | 28.72                                               | 28.89                                               | 28.81                                                       |
| 9.00  | 15.99                                               | 16.14                                               | 16.07                                                       |
| 10.00 | 24.50                                               | 24.75                                               | 24.62                                                       |
| 11.00 | 17.45                                               | 17.47                                               | 17.46                                                       |
| 12.00 | 25.55                                               | 25.63                                               | 25.59                                                       |
| 13.00 | 13.60                                               | 13.72                                               | 13.66                                                       |
| 14.00 | 13.67                                               | 13.59                                               | 13.63                                                       |
| 15.00 | 14.57                                               | 14.48                                               | 14.52                                                       |
| 16.00 | 20.96                                               | 20.85                                               | 20.91                                                       |
| 17.00 | 22.29                                               | 22.64                                               | 22.47                                                       |
| 18.00 | 27.72                                               | 27.39                                               | 27.55                                                       |
| 19.00 | 32.81                                               | 32.49                                               | 32.65                                                       |
| 20.00 | 38.89                                               | 38.93                                               | 38.91                                                       |
| 21.00 | 41.36                                               | 40.83                                               | 41.09                                                       |
| 22.00 | 42.47                                               | 42.37                                               | 42.42                                                       |
| 23.00 | 39.37                                               | 39.39                                               | 39.38                                                       |
| 00.00 | 29.92                                               | 29.93                                               | 29.93                                                       |
| 01.00 | 20.32                                               | 19.97                                               | 20.14                                                       |
| 02.00 | 13.14                                               | 12.97                                               | 13.06                                                       |
| 03.00 | 19.27                                               | 19.11                                               | 19.19                                                       |
| 04.00 | 9.92                                                | 10.08                                               | 10.00                                                       |
| 05.00 | 6.69                                                | 6.65                                                | 6.67                                                        |
| 06.00 | 25.24                                               | 25.04                                               | 25.14                                                       |

Hari ke 8 (Selasa, 3 Juni 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 7.00  | 41.83                                               | 41.57                                               | 41.70                                                       |
| 8.00  | 17.60                                               | 17.43                                               | 17.51                                                       |
| 9.00  | 11.45                                               | 11.12                                               | 11.29                                                       |
| 10.00 | 13.16                                               | 12.89                                               | 13.03                                                       |
| 11.00 | 15.35                                               | 15.33                                               | 15.34                                                       |
| 12.00 | 14.17                                               | 14.08                                               | 14.13                                                       |
| 13.00 | 11.71                                               | 11.85                                               | 11.78                                                       |
| 14.00 | 11.26                                               | 11.01                                               | 11.13                                                       |
| 15.00 | 13.85                                               | 13.56                                               | 13.70                                                       |
| 16.00 | 17.45                                               | 17.44                                               | 17.44                                                       |
| 17.00 | 21.43                                               | 21.20                                               | 21.31                                                       |
| 18.00 | 39.56                                               | 39.64                                               | 39.60                                                       |
| 19.00 | 50.81                                               | 50.72                                               | 50.76                                                       |
| 20.00 | 50.26                                               | 50.68                                               | 50.47                                                       |
| 21.00 | 58.88                                               | 58.97                                               | 58.92                                                       |
| 22.00 | 73.68                                               | 73.40                                               | 73.54                                                       |
| 23.00 | 67.00                                               | 66.88                                               | 66.94                                                       |
| 00.00 | 54.56                                               | 54.24                                               | 54.40                                                       |
| 01.00 | 42.76                                               | 42.67                                               | 42.71                                                       |
| 02.00 | 36.90                                               | 36.63                                               | 36.77                                                       |
| 03.00 | 27.97                                               | 27.76                                               | 27.87                                                       |
| 04.00 | 27.75                                               | 27.08                                               | 27.42                                                       |
| 05.00 | 28.80                                               | 28.31                                               | 28.56                                                       |

Lampiran 6 Tabel Konsentrasi PM<sub>2,5</sub> Dalam Ruangan Pada sekolah SDN 040445 (jauh dari jalan raya)

Hari ke 1 (Selasa, 27 Mei 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 07.00 | 30.03                                               | 27.63                                               | 28.83                                                       |
| 08.00 | 7.35                                                | 6.72                                                | 7.03                                                        |
| 09.00 | 12.71                                               | 12.09                                               | 12.40                                                       |
| 10.00 | 13.78                                               | 12.79                                               | 13.29                                                       |
| 11.00 | 17.06                                               | 16.06                                               | 16.56                                                       |
| 12.00 | 19.10                                               | 18.23                                               | 18.67                                                       |
| 13.00 | 7.97                                                | 7.80                                                | 7.88                                                        |
| 14.00 | 8.00                                                | 7.53                                                | 7.76                                                        |
| 15.00 | 12.00                                               | 11.64                                               | 11.82                                                       |
| 16.00 | 19.50                                               | 19.42                                               | 19.46                                                       |
| 17.00 | 26.81                                               | 26.28                                               | 26.55                                                       |
| 18.00 | 41.63                                               | 40.94                                               | 41.29                                                       |
| 19.00 | 42.54                                               | 41.80                                               | 42.17                                                       |
| 20.00 | 37.44                                               | 36.84                                               | 37.14                                                       |
| 21.00 | 31.65                                               | 31.02                                               | 31.33                                                       |
| 22.00 | 27.38                                               | 26.78                                               | 27.08                                                       |
| 23.00 | 23.06                                               | 21.82                                               | 22.44                                                       |
| 00.00 | 34.03                                               | 33.37                                               | 33.70                                                       |
| 01.00 | 38.43                                               | 37.52                                               | 37.98                                                       |
| 02.00 | 34.46                                               | 33.96                                               | 34.21                                                       |
| 03.00 | 30.11                                               | 29.26                                               | 29.69                                                       |
| 04.00 | 26.82                                               | 25.92                                               | 26.37                                                       |
| 05.00 | 28.42                                               | 27.58                                               | 28.00                                                       |
| 06.00 | 38.89                                               | 37.70                                               | 38.30                                                       |

Hari ke 2 (Rabu, 28 Mei 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 07.00 | 56.56                                               | 53.29                                               | 54.93                                                       |
| 08.00 | 35.75                                               | 33.96                                               | 34.85                                                       |
| 09.00 | 27.05                                               | 25.04                                               | 26.04                                                       |
| 10.00 | 22.03                                               | 20.00                                               | 21.02                                                       |
| 11.00 | 27.47                                               | 25.15                                               | 26.31                                                       |
| 12.00 | 15.54                                               | 14.03                                               | 14.79                                                       |
| 13.00 | 12.06                                               | 11.56                                               | 11.81                                                       |
| 14.00 | 21.94                                               | 20.07                                               | 21.00                                                       |
| 15.00 | 20.60                                               | 18.31                                               | 19.46                                                       |
| 16.00 | 18.72                                               | 16.82                                               | 17.77                                                       |
| 17.00 | 27.86                                               | 26.91                                               | 27.39                                                       |
| 18.00 | 35.76                                               | 34.41                                               | 35.08                                                       |
| 19.00 | 37.77                                               | 36.70                                               | 37.23                                                       |
| 20.00 | 35.45                                               | 34.22                                               | 34.83                                                       |
| 21.00 | 30.57                                               | 29.37                                               | 29.97                                                       |
| 22.00 | 24.35                                               | 22.89                                               | 23.62                                                       |
| 23.00 | 18.59                                               | 18.06                                               | 18.32                                                       |
| 00.00 | 20.94                                               | 20.28                                               | 20.61                                                       |
| 01.00 | 9.55                                                | 9.43                                                | 9.49                                                        |
| 02.00 | 7.21                                                | 6.83                                                | 7.02                                                        |
| 03.00 | 7.47                                                | 7.37                                                | 7.42                                                        |
| 04.00 | 6.07                                                | 5.73                                                | 5.90                                                        |
| 05.00 | 7.38                                                | 7.03                                                | 7.21                                                        |
| 06.00 | 8.66                                                | 8.20                                                | 8.43                                                        |

Hari ke 3 (Kamis, 29 Mei 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 07.00 | 8.64                                                | 8.26                                                | 8.45                                                        |
| 08.00 | 9.70                                                | 9.19                                                | 9.45                                                        |
| 09.00 | 6.30                                                | 5.98                                                | 6.14                                                        |
| 10.00 | 7.01                                                | 6.89                                                | 6.95                                                        |
| 11.00 | 7.94                                                | 7.80                                                | 7.87                                                        |
| 12.00 | 8.96                                                | 8.99                                                | 8.98                                                        |
| 13.00 | 7.94                                                | 7.56                                                | 7.75                                                        |
| 14.00 | 12.52                                               | 12.26                                               | 12.39                                                       |
| 15.00 | 16.01                                               | 15.25                                               | 15.63                                                       |
| 16.00 | 16.05                                               | 15.60                                               | 15.83                                                       |
| 17.00 | 19.40                                               | 18.81                                               | 19.10                                                       |
| 18.00 | 33.75                                               | 32.61                                               | 33.18                                                       |
| 19.00 | 40.51                                               | 39.18                                               | 39.84                                                       |
| 20.00 | 33.16                                               | 32.12                                               | 32.64                                                       |
| 21.00 | 35.97                                               | 34.64                                               | 35.30                                                       |
| 22.00 | 42.86                                               | 41.17                                               | 42.01                                                       |
| 23.00 | 41.58                                               | 40.21                                               | 40.89                                                       |
| 00.00 | 48.82                                               | 47.65                                               | 48.24                                                       |
| 01.00 | 44.29                                               | 42.75                                               | 43.52                                                       |
| 02.00 | 39.61                                               | 38.26                                               | 38.93                                                       |
| 03.00 | 35.27                                               | 34.23                                               | 34.75                                                       |
| 04.00 | 25.18                                               | 24.01                                               | 24.59                                                       |
| 05.00 | 19.58                                               | 18.86                                               | 19.22                                                       |
| 06.00 | 27.13                                               | 25.93                                               | 26.53                                                       |

Hari ke 4 (Jumat, 30 Mei 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 07.00 | 16.99                                               | 16.24                                               | 16.62                                                       |
| 08.00 | 16.81                                               | 15.68                                               | 16.25                                                       |
| 09.00 | 9.10                                                | 8.90                                                | 9.00                                                        |
| 10.00 | 15.04                                               | 14.39                                               | 14.71                                                       |
| 11.00 | 16.51                                               | 15.61                                               | 16.06                                                       |
| 12.00 | 18.31                                               | 17.60                                               | 17.96                                                       |
| 13.00 | 17.50                                               | 16.52                                               | 17.01                                                       |
| 14.00 | 35.09                                               | 33.61                                               | 34.35                                                       |
| 15.00 | 28.73                                               | 27.32                                               | 28.02                                                       |
| 16.00 | 28.74                                               | 27.45                                               | 28.09                                                       |
| 17.00 | 27.71                                               | 26.33                                               | 27.02                                                       |
| 18.00 | 41.15                                               | 39.87                                               | 40.51                                                       |
| 19.00 | 51.59                                               | 49.57                                               | 50.58                                                       |
| 20.00 | 52.09                                               | 49.73                                               | 50.91                                                       |
| 21.00 | 58.83                                               | 56.35                                               | 57.59                                                       |
| 22.00 | 56.02                                               | 53.80                                               | 54.91                                                       |
| 23.00 | 39.03                                               | 37.52                                               | 38.28                                                       |
| 00.00 | 28.53                                               | 26.69                                               | 27.61                                                       |
| 01.00 | 27.59                                               | 26.60                                               | 27.10                                                       |
| 02.00 | 30.66                                               | 29.56                                               | 30.11                                                       |
| 03.00 | 32.61                                               | 31.54                                               | 32.07                                                       |
| 04.00 | 33.88                                               | 32.45                                               | 33.16                                                       |
| 05.00 | 33.56                                               | 32.45                                               | 33.01                                                       |
| 06.00 | 31.34                                               | 29.98                                               | 30.66                                                       |

Hari ke 5 (Sabtu, 31 Mei 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 07.00 | 49.69                                               | 46.07                                               | 47.88                                                       |
| 08.00 | 24.95                                               | 23.54                                               | 24.24                                                       |
| 09.00 | 19.72                                               | 18.21                                               | 18.97                                                       |
| 10.00 | 22.87                                               | 20.36                                               | 21.62                                                       |
| 11.00 | 16.13                                               | 15.05                                               | 15.59                                                       |
| 12.00 | 12.92                                               | 12.40                                               | 12.66                                                       |
| 13.00 | 16.67                                               | 15.31                                               | 15.99                                                       |
| 14.00 | 13.08                                               | 11.80                                               | 12.44                                                       |
| 15.00 | 15.70                                               | 14.55                                               | 15.13                                                       |
| 16.00 | 23.92                                               | 22.85                                               | 23.38                                                       |
| 17.00 | 24.25                                               | 23.46                                               | 23.86                                                       |
| 18.00 | 49.53                                               | 47.66                                               | 48.60                                                       |
| 19.00 | 60.34                                               | 58.09                                               | 59.21                                                       |
| 20.00 | 53.60                                               | 51.54                                               | 52.57                                                       |
| 21.00 | 54.84                                               | 52.42                                               | 53.63                                                       |
| 22.00 | 47.82                                               | 46.31                                               | 47.06                                                       |
| 23.00 | 55.88                                               | 53.15                                               | 54.51                                                       |
| 00.00 | 44.55                                               | 43.05                                               | 43.80                                                       |
| 01.00 | 39.43                                               | 38.10                                               | 38.76                                                       |
| 02.00 | 41.34                                               | 39.84                                               | 40.59                                                       |
| 03.00 | 33.49                                               | 32.43                                               | 32.96                                                       |
| 04.00 | 34.15                                               | 32.73                                               | 33.44                                                       |
| 05.00 | 36.36                                               | 35.03                                               | 35.69                                                       |
| 06.00 | 37.03                                               | 35.67                                               | 36.35                                                       |

Hari ke 6 (Minggu, 1 Juni 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 07.00 | 37.83                                               | 36.27                                               | 37.05                                                       |
| 08.00 | 26.65                                               | 25.64                                               | 26.14                                                       |
| 09.00 | 14.70                                               | 14.22                                               | 14.46                                                       |
| 10.00 | 16.74                                               | 15.94                                               | 16.34                                                       |
| 11.00 | 12.42                                               | 12.18                                               | 12.30                                                       |
| 12.00 | 11.46                                               | 11.23                                               | 11.34                                                       |
| 13.00 | 8.84                                                | 8.80                                                | 8.82                                                        |
| 14.00 | 7.56                                                | 7.41                                                | 7.49                                                        |
| 15.00 | 10.63                                               | 10.81                                               | 10.72                                                       |
| 16.00 | 11.58                                               | 11.37                                               | 11.48                                                       |
| 17.00 | 19.31                                               | 18.98                                               | 19.15                                                       |
| 18.00 | 27.41                                               | 26.81                                               | 27.11                                                       |
| 19.00 | 42.89                                               | 41.73                                               | 42.31                                                       |
| 20.00 | 45.37                                               | 44.08                                               | 44.72                                                       |
| 21.00 | 44.08                                               | 42.78                                               | 43.43                                                       |
| 22.00 | 40.64                                               | 39.38                                               | 40.01                                                       |
| 23.00 | 35.80                                               | 34.43                                               | 35.12                                                       |
| 00.00 | 44.02                                               | 42.80                                               | 43.41                                                       |
| 01.00 | 42.41                                               | 40.91                                               | 41.66                                                       |
| 02.00 | 34.61                                               | 33.11                                               | 33.86                                                       |
| 03.00 | 33.97                                               | 32.91                                               | 33.44                                                       |
| 04.00 | 22.24                                               | 21.35                                               | 21.80                                                       |
| 05.00 | 20.67                                               | 19.68                                               | 20.18                                                       |
| 06.00 | 39.20                                               | 37.77                                               | 38.48                                                       |

Hari ke 7 (Senin, 2 Juni 2025)

| Jam   | PM <sub>2.5</sub> a<br>(µg/m <sup>3</sup> ) | PM <sub>2.5</sub> b<br>(µg/m <sup>3</sup> ) | Rata Rata PM <sub>2.5</sub><br>(µg/m <sup>3</sup> ) |
|-------|---------------------------------------------|---------------------------------------------|-----------------------------------------------------|
| 07.00 | 69.72                                       | 64.02                                       | 66.87                                               |
| 08.00 | 20.53                                       | 19.37                                       | 19.95                                               |
| 09.00 | 24.78                                       | 23.01                                       | 23.89                                               |
| 10.00 | 22.53                                       | 20.98                                       | 21.75                                               |
| 11.00 | 24.91                                       | 22.60                                       | 23.75                                               |
| 12.00 | 21.38                                       | 19.90                                       | 20.64                                               |
| 13.00 | 13.02                                       | 12.38                                       | 12.70                                               |
| 14.00 | 13.01                                       | 12.52                                       | 12.76                                               |
| 15.00 | 15.00                                       | 14.07                                       | 14.53                                               |
| 16.00 | 20.58                                       | 19.63                                       | 20.11                                               |
| 17.00 | 22.21                                       | 21.75                                       | 21.98                                               |
| 18.00 | 28.88                                       | 28.20                                       | 28.54                                               |
| 19.00 | 33.72                                       | 32.64                                       | 33.18                                               |
| 20.00 | 32.12                                       | 31.11                                       | 31.61                                               |
| 21.00 | 33.69                                       | 32.52                                       | 33.10                                               |
| 22.00 | 38.55                                       | 37.39                                       | 37.97                                               |
| 23.00 | 33.08                                       | 32.07                                       | 32.57                                               |
| 00.00 | 23.61                                       | 22.76                                       | 23.19                                               |
| 01.00 | 17.84                                       | 17.46                                       | 17.65                                               |
| 02.00 | 13.10                                       | 12.77                                       | 12.94                                               |
| 03.00 | 12.55                                       | 12.20                                       | 12.38                                               |
| 04.00 | 9.56                                        | 9.29                                        | 9.42                                                |
| 05.00 | 7.85                                        | 7.49                                        | 7.67                                                |
| 06.00 | 26.77                                       | 25.47                                       | 26.12                                               |

Hari ke 8 (Selasa, 3 Juni 2025)

| Jam   | PM <sub>2.5</sub> a<br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>2.5</sub> b<br>( $\mu\text{g}/\text{m}^3$ ) | Rata Rata PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| 07.00 | 46.97                                               | 43.90                                               | 45.43                                                       |
| 08.00 | 17.97                                               | 16.66                                               | 17.32                                                       |
| 09.00 | 14.27                                               | 13.00                                               | 13.63                                                       |
| 10.00 | 18.13                                               | 16.56                                               | 17.35                                                       |
| 11.00 | 30.05                                               | 28.03                                               | 29.04                                                       |
| 12.00 | 17.58                                               | 16.21                                               | 16.89                                                       |
| 13.00 | 9.45                                                | 9.09                                                | 9.27                                                        |
| 14.00 | 9.67                                                | 9.30                                                | 9.48                                                        |
| 15.00 | 13.82                                               | 13.38                                               | 13.60                                                       |
| 16.00 | 19.03                                               | 18.23                                               | 18.63                                                       |
| 17.00 | 22.74                                               | 21.81                                               | 22.27                                                       |
| 18.00 | 39.06                                               | 37.59                                               | 38.32                                                       |
| 19.00 | 45.57                                               | 44.19                                               | 44.88                                                       |
| 20.00 | 50.99                                               | 49.55                                               | 50.27                                                       |
| 21.00 | 57.21                                               | 55.12                                               | 56.16                                                       |
| 22.00 | 70.42                                               | 67.44                                               | 68.93                                                       |
| 23.00 | 63.88                                               | 61.00                                               | 62.44                                                       |
| 00.00 | 53.99                                               | 52.23                                               | 53.11                                                       |
| 01.00 | 42.71                                               | 41.42                                               | 42.07                                                       |
| 02.00 | 36.19                                               | 35.06                                               | 35.62                                                       |
| 03.00 | 26.56                                               | 25.66                                               | 26.11                                                       |
| 04.00 | 25.33                                               | 24.02                                               | 24.67                                                       |
| 05.00 | 27.58                                               | 26.30                                               | 26.94                                                       |

Lampiran 7 Tabel Konsentrasi PM<sub>2,5</sub> dalam ruangan Air Quality Indeks AQI SDN 040448 (dekat jalan raya)

Hari ke 1 (Selasa, 27 Mei 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 7.00  | 62.77                   | 62.67                   | 62.72                           |
| 8.00  | 44.58                   | 44.77                   | 44.68                           |
| 9.00  | 97.23                   | 97.23                   | 97.23                           |
| 10.00 | 94.35                   | 93.74                   | 94.05                           |
| 11.00 | 59.53                   | 59.67                   | 59.60                           |
| 12.00 | 61.60                   | 61.37                   | 61.48                           |
| 13.00 | 44.71                   | 43.74                   | 44.23                           |
| 14.00 | 41.29                   | 39.74                   | 40.52                           |
| 15.00 | 49.87                   | 49.13                   | 49.50                           |
| 16.00 | 72.84                   | 71.84                   | 72.34                           |
| 17.00 | 86.47                   | 85.83                   | 86.15                           |
| 18.00 | 103.23                  | 103.00                  | 103.11                          |
| 19.00 | 126.58                  | 125.87                  | 126.23                          |
| 20.00 | 115.70                  | 115.53                  | 115.62                          |
| 21.00 | 106.68                  | 106.26                  | 106.47                          |
| 22.00 | 88.03                   | 86.60                   | 87.32                           |
| 23.00 | 77.61                   | 77.06                   | 77.34                           |
| 00.00 | 78.53                   | 78.17                   | 78.35                           |
| 01.00 | 54.84                   | 53.55                   | 54.19                           |
| 02.00 | 35.13                   | 34.80                   | 34.97                           |
| 03.00 | 32.74                   | 32.61                   | 32.68                           |
| 04.00 | 23.10                   | 22.43                   | 22.77                           |
| 05.00 | 33.00                   | 32.16                   | 32.58                           |
| 06.00 | 50.20                   | 49.87                   | 50.03                           |

Hari ke 2 (Rabu, 28 Mei 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 7.00  | 115.10                  | 113.97                  | 114.53                          |
| 8.00  | 98.77                   | 98.26                   | 98.52                           |
| 9.00  | 84.20                   | 83.03                   | 83.62                           |
| 10.00 | 64.45                   | 63.26                   | 63.85                           |
| 11.00 | 61.03                   | 60.70                   | 60.87                           |
| 12.00 | 63.45                   | 64.10                   | 63.77                           |
| 13.00 | 54.37                   | 53.77                   | 54.07                           |
| 14.00 | 75.67                   | 74.63                   | 75.15                           |
| 15.00 | 71.77                   | 71.39                   | 71.58                           |
| 16.00 | 62.37                   | 61.83                   | 62.10                           |
| 17.00 | 86.19                   | 85.90                   | 86.05                           |
| 18.00 | 103.07                  | 102.83                  | 102.95                          |
| 19.00 | 126.58                  | 125.87                  | 126.23                          |
| 20.00 | 115.70                  | 115.53                  | 115.62                          |
| 21.00 | 106.19                  | 105.75                  | 105.97                          |
| 22.00 | 88.03                   | 86.60                   | 87.32                           |
| 23.00 | 77.61                   | 77.06                   | 77.34                           |
| 00.00 | 78.53                   | 78.17                   | 78.35                           |
| 01.00 | 54.84                   | 53.55                   | 54.19                           |
| 02.00 | 35.13                   | 34.80                   | 34.97                           |
| 03.00 | 32.74                   | 32.61                   | 32.68                           |
| 04.00 | 23.10                   | 22.43                   | 22.77                           |
| 05.00 | 33.47                   | 32.63                   | 33.05                           |
| 06.00 | 50.20                   | 49.87                   | 50.03                           |

Hari ke 3 (Kamis, 29 Mei 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 7.00  | 61.77                   | 61.61                   | 61.69                           |
| 8.00  | 58.80                   | 57.87                   | 58.33                           |
| 9.00  | 34.84                   | 33.74                   | 34.29                           |
| 10.00 | 33.97                   | 32.07                   | 33.02                           |
| 11.00 | 36.61                   | 36.03                   | 36.32                           |
| 12.00 | 39.00                   | 38.30                   | 38.65                           |
| 13.00 | 39.87                   | 38.87                   | 39.37                           |
| 14.00 | 59.30                   | 58.60                   | 58.95                           |
| 15.00 | 64.26                   | 63.81                   | 64.03                           |
| 16.00 | 66.33                   | 66.60                   | 66.47                           |
| 17.00 | 70.06                   | 69.68                   | 69.87                           |
| 18.00 | 104.90                  | 104.17                  | 104.53                          |
| 19.00 | 131.52                  | 131.74                  | 131.63                          |
| 20.00 | 115.80                  | 115.43                  | 115.62                          |
| 21.00 | 123.60                  | 123.37                  | 123.48                          |
| 22.00 | 124.35                  | 124.32                  | 124.34                          |
| 23.00 | 124.80                  | 124.00                  | 124.40                          |
| 00.00 | 131.71                  | 130.48                  | 131.10                          |
| 01.00 | 124.43                  | 123.70                  | 124.07                          |
| 02.00 | 111.71                  | 111.81                  | 111.76                          |
| 03.00 | 103.53                  | 103.67                  | 103.60                          |
| 04.00 | 63.26                   | 63.13                   | 63.19                           |
| 05.00 | 65.93                   | 65.47                   | 65.70                           |
| 06.00 | 81.32                   | 81.10                   | 81.21                           |

Hari ke 4 (Jumat, 30 Mei 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 7.00  | 80.13                   | 78.97                   | 79.55                           |
| 8.00  | 79.16                   | 78.16                   | 78.66                           |
| 9.00  | 51.93                   | 50.77                   | 51.35                           |
| 10.00 | 76.71                   | 76.10                   | 76.40                           |
| 11.00 | 66.40                   | 66.07                   | 66.23                           |
| 12.00 | 72.74                   | 71.84                   | 72.29                           |
| 13.00 | 69.83                   | 69.50                   | 69.67                           |
| 14.00 | 102.39                  | 101.13                  | 101.76                          |
| 15.00 | 89.06                   | 88.94                   | 89.00                           |
| 16.00 | 89.84                   | 89.90                   | 89.87                           |
| 17.00 | 86.97                   | 85.60                   | 86.28                           |
| 18.00 | 121.84                  | 121.52                  | 121.68                          |
| 19.00 | 142.50                  | 141.47                  | 141.98                          |
| 20.00 | 141.87                  | 141.42                  | 141.65                          |
| 21.00 | 153.20                  | 152.67                  | 152.93                          |
| 22.00 | 147.87                  | 146.97                  | 147.42                          |
| 23.00 | 115.63                  | 114.87                  | 115.25                          |
| 00.00 | 87.84                   | 86.32                   | 87.08                           |
| 01.00 | 84.00                   | 83.40                   | 83.70                           |
| 02.00 | 89.29                   | 87.74                   | 88.52                           |
| 03.00 | 94.20                   | 93.33                   | 93.77                           |
| 04.00 | 97.13                   | 96.52                   | 96.82                           |
| 05.00 | 98.33                   | 97.10                   | 97.72                           |
| 06.00 | 97.81                   | 96.48                   | 97.15                           |

Hari ke 5 (Sabtu, 31 Mei 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 7.00  | 104.77                  | 102.70                  | 103.73                          |
| 8.00  | 89.43                   | 88.67                   | 89.05                           |
| 9.00  | 72.48                   | 71.77                   | 72.13                           |
| 10.00 | 58.60                   | 59.40                   | 59.00                           |
| 11.00 | 63.42                   | 63.13                   | 63.27                           |
| 12.00 | 53.97                   | 53.90                   | 53.93                           |
| 13.00 | 64.81                   | 64.42                   | 64.61                           |
| 14.00 | 56.03                   | 55.43                   | 55.73                           |
| 15.00 | 62.13                   | 61.97                   | 62.05                           |
| 16.00 | 79.77                   | 79.00                   | 79.38                           |
| 17.00 | 87.84                   | 86.52                   | 87.18                           |
| 18.00 | 142.47                  | 142.17                  | 142.32                          |
| 19.00 | 155.84                  | 156.39                  | 156.11                          |
| 20.00 | 149.40                  | 149.17                  | 149.28                          |
| 21.00 | 152.71                  | 152.68                  | 152.69                          |
| 22.00 | 143.43                  | 143.57                  | 143.50                          |
| 23.00 | 150.19                  | 149.58                  | 149.89                          |
| 00.00 | 127.13                  | 126.80                  | 126.97                          |
| 01.00 | 113.87                  | 113.30                  | 113.58                          |
| 02.00 | 114.87                  | 114.40                  | 114.63                          |
| 03.00 | 98.32                   | 97.61                   | 97.97                           |
| 04.00 | 101.70                  | 100.73                  | 101.22                          |
| 05.00 | 102.65                  | 102.03                  | 102.34                          |
| 06.00 | 103.30                  | 103.03                  | 103.17                          |

Hari ke 6 (Minggu, 1 Juni 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 7.00  | 121.13                  | 120.61                  | 120.87                          |
| 8.00  | 86.37                   | 86.63                   | 86.50                           |
| 9.00  | 60.74                   | 61.00                   | 60.87                           |
| 10.00 | 64.17                   | 62.97                   | 63.57                           |
| 11.00 | 50.10                   | 49.13                   | 49.61                           |
| 12.00 | 46.90                   | 47.13                   | 47.02                           |
| 13.00 | 37.14                   | 36.59                   | 36.86                           |
| 14.00 | 32.07                   | 31.93                   | 32.00                           |
| 15.00 | 38.00                   | 38.06                   | 38.03                           |
| 16.00 | 40.90                   | 40.73                   | 40.82                           |
| 17.00 | 61.13                   | 61.16                   | 61.15                           |
| 18.00 | 85.47                   | 85.40                   | 85.43                           |
| 19.00 | 124.74                  | 124.81                  | 124.77                          |
| 20.00 | 149.60                  | 149.27                  | 149.43                          |
| 21.00 | 132.97                  | 132.65                  | 132.81                          |
| 22.00 | 120.90                  | 120.60                  | 120.75                          |
| 23.00 | 107.19                  | 107.06                  | 107.13                          |
| 00.00 | 117.80                  | 117.63                  | 117.72                          |
| 01.00 | 110.06                  | 109.65                  | 109.85                          |
| 02.00 | 94.63                   | 94.07                   | 94.35                           |
| 03.00 | 94.35                   | 93.97                   | 94.16                           |
| 04.00 | 71.33                   | 71.80                   | 71.57                           |
| 05.00 | 65.50                   | 64.60                   | 65.05                           |
| 06.00 | 114.07                  | 113.23                  | 113.65                          |

Hari ke 7 (Senin, 2 Juni 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 7.00  | 122.42                  | 122.74                  | 122.58                          |
| 8.00  | 86.80                   | 87.30                   | 87.05                           |
| 9.00  | 59.48                   | 59.68                   | 59.58                           |
| 10.00 | 77.80                   | 78.27                   | 78.03                           |
| 11.00 | 62.68                   | 62.68                   | 62.68                           |
| 12.00 | 80.43                   | 80.73                   | 80.58                           |
| 13.00 | 53.73                   | 53.73                   | 53.73                           |
| 14.00 | 54.19                   | 54.10                   | 54.15                           |
| 15.00 | 56.23                   | 56.13                   | 56.18                           |
| 16.00 | 70.10                   | 69.87                   | 69.98                           |
| 17.00 | 72.90                   | 73.67                   | 73.28                           |
| 18.00 | 84.45                   | 83.87                   | 84.16                           |
| 19.00 | 95.63                   | 94.93                   | 95.28                           |
| 20.00 | 110.52                  | 110.55                  | 110.53                          |
| 21.00 | 115.70                  | 114.40                  | 115.05                          |
| 22.00 | 119.38                  | 119.13                  | 119.25                          |
| 23.00 | 111.52                  | 111.52                  | 111.52                          |
| 00.00 | 89.20                   | 89.17                   | 89.18                           |
| 01.00 | 68.68                   | 68.00                   | 68.34                           |
| 02.00 | 53.07                   | 52.63                   | 52.85                           |
| 03.00 | 62.13                   | 61.61                   | 61.87                           |
| 04.00 | 40.77                   | 41.37                   | 41.07                           |
| 05.00 | 27.87                   | 27.68                   | 27.77                           |
| 06.00 | 77.87                   | 77.20                   | 77.53                           |

Hari ke 8 (Selasa, 3 Juni 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 7.00  | 117.55                  | 116.87                  | 117.21                          |
| 8.00  | 61.90                   | 61.63                   | 61.77                           |
| 9.00  | 46.16                   | 44.94                   | 45.55                           |
| 10.00 | 50.27                   | 49.03                   | 49.65                           |
| 11.00 | 57.80                   | 57.73                   | 57.77                           |
| 12.00 | 53.60                   | 53.23                   | 53.42                           |
| 13.00 | 48.10                   | 48.50                   | 48.30                           |
| 14.00 | 46.32                   | 45.48                   | 45.90                           |
| 15.00 | 54.77                   | 54.13                   | 54.45                           |
| 16.00 | 62.65                   | 62.55                   | 62.60                           |
| 17.00 | 71.03                   | 70.61                   | 70.82                           |
| 18.00 | 112.17                  | 112.40                  | 112.28                          |
| 19.00 | 139.33                  | 139.23                  | 139.28                          |
| 20.00 | 138.39                  | 139.45                  | 138.92                          |
| 21.00 | 151.43                  | 151.93                  | 151.68                          |
| 22.00 | 160.65                  | 160.52                  | 160.58                          |
| 23.00 | 157.23                  | 157.20                  | 157.22                          |
| 00.00 | 147.03                  | 146.55                  | 146.79                          |
| 01.00 | 119.93                  | 119.90                  | 119.92                          |
| 02.00 | 105.32                  | 104.77                  | 105.05                          |
| 03.00 | 84.90                   | 84.43                   | 84.67                           |
| 04.00 | 84.68                   | 83.16                   | 83.92                           |
| 05.00 | 86.76                   | 85.72                   | 86.24                           |

Lampiran 8 Tabel Konsentrasi PM<sub>2,5</sub> dalam ruangan Air Quality Indeks AQI SDN 040445 (jauh dari jalan raya)

Hari ke 1 (Selasa, 27 Mei 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 07.00 | 75.16                   | 71.26                   | 73.21                           |
| 08.00 | 30.70                   | 27.97                   | 29.33                           |
| 09.00 | 45.58                   | 43.74                   | 44.66                           |
| 10.00 | 50.57                   | 47.67                   | 49.12                           |
| 11.00 | 59.48                   | 56.87                   | 58.18                           |
| 12.00 | 64.27                   | 62.03                   | 63.15                           |
| 13.00 | 33.26                   | 32.48                   | 32.87                           |
| 14.00 | 33.20                   | 31.40                   | 32.30                           |
| 15.00 | 46.77                   | 45.58                   | 46.18                           |
| 16.00 | 66.63                   | 66.30                   | 66.47                           |
| 17.00 | 82.94                   | 81.74                   | 82.34                           |
| 18.00 | 117.17                  | 115.50                  | 116.33                          |
| 19.00 | 119.45                  | 117.58                  | 118.52                          |
| 20.00 | 107.20                  | 105.80                  | 106.50                          |
| 21.00 | 93.10                   | 91.74                   | 92.42                           |
| 22.00 | 83.70                   | 82.53                   | 73.48                           |
| 23.00 | 74.58                   | 71.90                   | 73.24                           |
| 00.00 | 98.63                   | 96.90                   | 97.77                           |
| 01.00 | 109.32                  | 107.06                  | 108.19                          |
| 02.00 | 99.20                   | 98.10                   | 98.65                           |
| 03.00 | 89.73                   | 87.83                   | 88.78                           |
| 04.00 | 82.61                   | 80.71                   | 81.66                           |
| 05.00 | 86.07                   | 84.13                   | 85.10                           |
| 06.00 | 110.45                  | 107.58                  | 109.02                          |

Hari ke 2 (Rabu, 28 Mei 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 07.00 | 133.43                  | 128.20                  | 130.82                          |
| 08.00 | 102.61                  | 98.26                   | 100.44                          |
| 09.00 | 83.27                   | 78.83                   | 81.05                           |
| 10.00 | 72.55                   | 68.00                   | 70.27                           |
| 11.00 | 84.50                   | 79.60                   | 82.05                           |
| 12.00 | 57.13                   | 52.84                   | 54.98                           |
| 13.00 | 49.13                   | 47.27                   | 48.20                           |
| 14.00 | 72.13                   | 68.16                   | 70.15                           |
| 15.00 | 69.33                   | 64.47                   | 66.90                           |
| 16.00 | 65.32                   | 61.16                   | 63.24                           |
| 17.00 | 84.80                   | 82.80                   | 83.80                           |
| 18.00 | 102.84                  | 99.74                   | 101.29                          |
| 19.00 | 107.83                  | 105.23                  | 106.53                          |
| 20.00 | 101.77                  | 98.61                   | 100.19                          |
| 21.00 | 90.57                   | 88.00                   | 89.28                           |
| 22.00 | 77.29                   | 74.26                   | 75.77                           |
| 23.00 | 65.13                   | 63.83                   | 64.48                           |
| 00.00 | 70.23                   | 68.81                   | 69.52                           |
| 01.00 | 39.83                   | 39.40                   | 39.62                           |
| 02.00 | 30.06                   | 28.52                   | 29.29                           |
| 03.00 | 31.13                   | 30.67                   | 30.90                           |
| 04.00 | 25.23                   | 23.84                   | 24.53                           |
| 05.00 | 30.37                   | 28.93                   | 29.65                           |
| 06.00 | 36.07                   | 34.10                   | 35.08                           |

Hari ke 3 (Kamis, 29 Mei 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 07.00 | 35.87                   | 34.29                   | 35.08                           |
| 08.00 | 39.80                   | 38.03                   | 38.92                           |
| 09.00 | 26.29                   | 24.84                   | 25.56                           |
| 10.00 | 29.27                   | 28.67                   | 28.97                           |
| 11.00 | 33.16                   | 32.42                   | 32.79                           |
| 12.00 | 37.33                   | 37.47                   | 37.40                           |
| 13.00 | 32.90                   | 31.52                   | 32.21                           |
| 14.00 | 46.70                   | 45.77                   | 46.23                           |
| 15.00 | 59.35                   | 57.65                   | 58.50                           |
| 16.00 | 59.57                   | 58.63                   | 59.10                           |
| 17.00 | 66.74                   | 65.52                   | 66.13                           |
| 18.00 | 98.30                   | 95.63                   | 96.97                           |
| 19.00 | 114.48                  | 111.19                  | 112.84                          |
| 20.00 | 96.63                   | 94.07                   | 95.35                           |
| 21.00 | 103.61                  | 100.42                  | 102.02                          |
| 22.00 | 120.30                  | 116.03                  | 118.17                          |
| 23.00 | 117.16                  | 113.61                  | 115.39                          |
| 00.00 | 134.80                  | 132.00                  | 133.40                          |
| 01.00 | 123.68                  | 120.03                  | 121.85                          |
| 02.00 | 112.23                  | 108.93                  | 110.58                          |
| 03.00 | 102.10                  | 99.63                   | 100.87                          |
| 04.00 | 79.23                   | 76.71                   | 77.97                           |
| 05.00 | 67.00                   | 65.50                   | 66.25                           |
| 06.00 | 83.35                   | 80.74                   | 82.05                           |

Hari ke 4 (Jumat, 30 Mei 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 07.00 | 61.52                   | 59.43                   | 60.48                           |
| 08.00 | 60.58                   | 58.03                   | 59.31                           |
| 09.00 | 37.83                   | 37.07                   | 37.45                           |
| 10.00 | 56.29                   | 54.94                   | 55.61                           |
| 11.00 | 60.63                   | 58.60                   | 59.62                           |
| 12.00 | 64.48                   | 62.90                   | 63.69                           |
| 13.00 | 62.77                   | 60.60                   | 61.68                           |
| 14.00 | 101.45                  | 97.97                   | 99.71                           |
| 15.00 | 86.67                   | 83.67                   | 85.17                           |
| 16.00 | 87.42                   | 84.61                   | 86.02                           |
| 17.00 | 84.53                   | 81.60                   | 83.07                           |
| 18.00 | 116.10                  | 112.83                  | 114.47                          |
| 19.00 | 139.63                  | 135.93                  | 137.78                          |
| 20.00 | 141.47                  | 137.03                  | 139.25                          |
| 21.00 | 151.87                  | 148.52                  | 150.19                          |
| 22.00 | 144.40                  | 141.07                  | 142.73                          |
| 23.00 | 110.81                  | 107.13                  | 108.97                          |
| 00.00 | 86.20                   | 82.30                   | 84.25                           |
| 01.00 | 84.13                   | 82.06                   | 83.10                           |
| 02.00 | 90.73                   | 88.40                   | 89.57                           |
| 03.00 | 95.00                   | 92.68                   | 93.84                           |
| 04.00 | 97.83                   | 94.60                   | 96.22                           |
| 05.00 | 97.16                   | 94.65                   | 95.90                           |
| 06.00 | 92.27                   | 89.37                   | 90.82                           |

Hari ke 5 (Sabtu, 31 Mei 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 07.00 | 114.65                  | 108.84                  | 111.74                          |
| 08.00 | 78.53                   | 75.60                   | 77.07                           |
| 09.00 | 67.42                   | 64.29                   | 65.85                           |
| 10.00 | 74.17                   | 68.83                   | 71.50                           |
| 11.00 | 56.52                   | 53.29                   | 54.90                           |
| 12.00 | 50.93                   | 49.70                   | 50.32                           |
| 13.00 | 60.97                   | 57.97                   | 59.47                           |
| 14.00 | 52.50                   | 48.40                   | 50.45                           |
| 15.00 | 58.83                   | 55.87                   | 57.35                           |
| 16.00 | 76.42                   | 74.00                   | 75.21                           |
| 17.00 | 77.07                   | 75.43                   | 76.25                           |
| 18.00 | 125.48                  | 122.77                  | 124.13                          |
| 19.00 | 148.27                  | 145.67                  | 146.97                          |
| 20.00 | 144.61                  | 141.06                  | 142.84                          |
| 21.00 | 146.57                  | 142.77                  | 144.67                          |
| 22.00 | 132.39                  | 128.68                  | 130.53                          |
| 23.00 | 148.60                  | 145.13                  | 146.87                          |
| 00.00 | 124.42                  | 120.77                  | 122.60                          |
| 01.00 | 111.73                  | 108.53                  | 110.13                          |
| 02.00 | 116.52                  | 112.84                  | 114.68                          |
| 03.00 | 97.30                   | 94.83                   | 96.07                           |
| 04.00 | 98.81                   | 95.32                   | 97.06                           |
| 05.00 | 104.20                  | 100.83                  | 102.52                          |
| 06.00 | 105.71                  | 102.58                  | 104.15                          |

Hari ke 6 (Minggu, 1 Juni 2025)

| Jam   | PM2,5 AQI a | PM2,5 AQI b | Rata Rata PM2.5 AQI |
|-------|-------------|-------------|---------------------|
| 07.00 | 107.87      | 104.17      | 106.02              |
| 08.00 | 82.19       | 80.06       | 81.13               |
| 09.00 | 56.37       | 55.57       | 55.97               |
| 10.00 | 60.94       | 59.29       | 60.11               |
| 11.00 | 50.27       | 49.57       | 49.92               |
| 12.00 | 47.00       | 46.29       | 46.65               |
| 13.00 | 36.57       | 36.46       | 36.52               |
| 14.00 | 31.57       | 30.80       | 31.18               |
| 15.00 | 42.94       | 43.19       | 43.06               |
| 16.00 | 46.03       | 45.60       | 45.82               |
| 17.00 | 65.94       | 65.16       | 65.55               |
| 18.00 | 84.53       | 83.30       | 83.92               |
| 19.00 | 120.23      | 117.39      | 118.81              |
| 20.00 | 126.20      | 123.17      | 124.68              |
| 21.00 | 123.13      | 120.03      | 121.58              |
| 22.00 | 114.90      | 111.70      | 113.30              |
| 23.00 | 102.52      | 99.35       | 100.94              |
| 00.00 | 123.07      | 120.10      | 121.58              |
| 01.00 | 119.03      | 115.32      | 117.18              |
| 02.00 | 100.27      | 96.77       | 98.52               |
| 03.00 | 98.87       | 96.30       | 97.58               |
| 04.00 | 72.81       | 70.94       | 71.87               |
| 05.00 | 69.47       | 67.37       | 68.42               |
| 06.00 | 111.39      | 108.10      | 109.74              |

Hari ke 7 (Senin, 2 Juni 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 07.00 | 141.32                  | 134.74                  | 138.03                          |
| 08.00 | 69.23                   | 66.63                   | 67.93                           |
| 09.00 | 77.57                   | 74.07                   | 75.82                           |
| 10.00 | 73.55                   | 70.26                   | 71.90                           |
| 11.00 | 78.90                   | 73.80                   | 76.35                           |
| 12.00 | 71.03                   | 67.87                   | 69.45                           |
| 13.00 | 51.80                   | 50.23                   | 51.02                           |
| 14.00 | 51.97                   | 50.68                   | 51.32                           |
| 15.00 | 57.33                   | 55.33                   | 56.33                           |
| 16.00 | 69.26                   | 67.23                   | 68.24                           |
| 17.00 | 72.77                   | 71.70                   | 72.23                           |
| 18.00 | 87.32                   | 85.87                   | 86.60                           |
| 19.00 | 98.30                   | 95.70                   | 97.00                           |
| 20.00 | 94.19                   | 91.97                   | 93.08                           |
| 21.00 | 97.67                   | 94.83                   | 96.25                           |
| 22.00 | 109.63                  | 106.63                  | 108.13                          |
| 23.00 | 97.03                   | 94.59                   | 95.81                           |
| 00.00 | 75.73                   | 74.00                   | 74.87                           |
| 01.00 | 63.42                   | 62.68                   | 63.05                           |
| 02.00 | 52.70                   | 51.93                   | 52.32                           |
| 03.00 | 46.71                   | 45.87                   | 46.29                           |
| 04.00 | 39.50                   | 38.30                   | 38.90                           |
| 05.00 | 31.77                   | 30.52                   | 31.15                           |
| 06.00 | 80.47                   | 77.40                   | 78.93                           |

Hari ke 8 (Selasa, 3 Juni 2025)

| Jam   | PM <sub>2,5</sub> AQI a | PM <sub>2,5</sub> AQI b | Rata Rata PM <sub>2,5</sub> AQI |
|-------|-------------------------|-------------------------|---------------------------------|
| 07.00 | 123.35                  | 118.65                  | 121.00                          |
| 08.00 | 62.63                   | 58.97                   | 60.80                           |
| 09.00 | 51.65                   | 48.13                   | 49.89                           |
| 10.00 | 62.73                   | 59.03                   | 60.88                           |
| 11.00 | 90.73                   | 85.57                   | 88.15                           |
| 12.00 | 60.00                   | 57.10                   | 58.55                           |
| 13.00 | 39.37                   | 37.93                   | 38.65                           |
| 14.00 | 40.35                   | 38.84                   | 39.60                           |
| 15.00 | 54.30                   | 53.03                   | 53.67                           |
| 16.00 | 66.00                   | 64.23                   | 65.11                           |
| 17.00 | 73.93                   | 71.87                   | 72.90                           |
| 18.00 | 110.97                  | 107.29                  | 109.13                          |
| 19.00 | 126.87                  | 123.53                  | 125.20                          |
| 20.00 | 140.03                  | 136.61                  | 138.32                          |
| 21.00 | 149.10                  | 146.00                  | 147.55                          |
| 22.00 | 158.94                  | 157.35                  | 158.15                          |
| 23.00 | 155.73                  | 154.00                  | 154.87                          |
| 00.00 | 145.55                  | 142.55                  | 144.05                          |
| 01.00 | 119.93                  | 116.70                  | 118.32                          |
| 02.00 | 103.77                  | 100.94                  | 102.35                          |
| 03.00 | 81.93                   | 80.13                   | 81.03                           |
| 04.00 | 79.42                   | 76.58                   | 78.00                           |
| 05.00 | 84.26                   | 81.42                   | 82.84                           |

Lampiran 9 Hasil SPSS

**Tabel Uji Independent Sample T-test untuk melihat perbedaan di kedua kelompok (SDN 040448 dekat dan SDN 040445 jauh dari jalan raya)**

| Independent Samples Test |                             |                                        |      |                              |        |                 |                 |                       |                                           |                |
|--------------------------|-----------------------------|----------------------------------------|------|------------------------------|--------|-----------------|-----------------|-----------------------|-------------------------------------------|----------------|
|                          |                             | Levene's Test for Equality of Variance |      | t-test for Equality of Means |        |                 |                 |                       |                                           |                |
|                          |                             | F                                      | Sig. | t                            | df     | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |                |
|                          |                             |                                        |      |                              |        |                 |                 |                       | Lower                                     | Upper          |
| Konsentrasi Pm2,5        | Equal variances assumed     | .092                                   | .762 | .294                         | 46     | .770            | .94875          | 3.22232               | -5.53745                                  | <b>7.43495</b> |
|                          | Equal variances not assumed |                                        |      | .294                         | 45.625 | .770            | .94875          | 3.22232               | -5.53889                                  | <b>7.43639</b> |

**Tabel Uji Independent sample T test Untuk melihat perbedaan antara ada aktivitas dan tidak ada aktivitas di SDN 040448 Kabanjahe (dekat jalan raya)**

| Independent Samples Test |                             |                                         |      |                              |       |                 |                 |                       |                                           |                |
|--------------------------|-----------------------------|-----------------------------------------|------|------------------------------|-------|-----------------|-----------------|-----------------------|-------------------------------------------|----------------|
|                          |                             | Levene's Test for Equality of Variances |      | t-test for Equality of Means |       |                 |                 |                       |                                           |                |
|                          |                             | F                                       | Sig. | t                            | df    | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |                |
|                          |                             |                                         |      |                              |       |                 |                 |                       | Lower                                     | Upper          |
| Konsentrasi Pm2,5        | Equal variances assumed     | .010                                    | .925 | 2.831                        | 8     | .022            | 4.97600         | 1.75787               | .92236                                    | <b>9.02964</b> |
|                          | Equal variances not assumed |                                         |      | 2.831                        | 7.862 | .023            | 4.97600         | 1.75787               | .90990                                    | <b>9.04210</b> |

**Tabel Uji Independent sample T test Untuk melihat perbedaan antara Siang dan Malam di SDN 040448 Kabanjahe (dekat jalan raya)**

| Independent Samples Test |                             |                                         |      |                              |       |                 |                 |                       |                                           |          |
|--------------------------|-----------------------------|-----------------------------------------|------|------------------------------|-------|-----------------|-----------------|-----------------------|-------------------------------------------|----------|
|                          |                             | Levene's Test for Equality of Variances |      | t-test for Equality of Means |       |                 |                 |                       |                                           |          |
|                          |                             | F                                       | Sig. | t                            | df    | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |          |
|                          |                             |                                         |      |                              |       |                 |                 |                       | Lower                                     | Upper    |
| Konsentrasi              | Equal variances assumed     | 10.412                                  | .006 | -3.725                       | 14    | .002            | -14.54000       | 3.90355               | -22.91229                                 | -6.16771 |
|                          | Equal variances not assumed |                                         |      | -3.725                       | 9.053 | .005            | -14.54000       | 3.90355               | -23.36256                                 | -5.71744 |

**Tabel Uji Independent sample T test Untuk melihat perbedaan antara ada aktivitas dan tidak ada aktivitas di SDN 04044 Kabanjahe (Jauh dari jalan raya)**

|                   |                             | Independent Samples Test                |      |                              |       |                 |                 |                       |                                           |                 |
|-------------------|-----------------------------|-----------------------------------------|------|------------------------------|-------|-----------------|-----------------|-----------------------|-------------------------------------------|-----------------|
|                   |                             | Levene's Test for Equality of Variances |      | t-test for Equality of Means |       |                 |                 |                       |                                           |                 |
|                   |                             | F                                       | Sig. | t                            | df    | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |                 |
|                   |                             |                                         |      |                              |       |                 |                 |                       | Lower                                     | Upper           |
| konsentrasi pm2,5 | Equal variances assumed     | 2.763                                   | .135 | 2.898                        | 8     | .020            | 7.72600         | 2.66631               | 1.57748                                   | <b>13.87452</b> |
|                   | Equal variances not assumed |                                         |      | 2.898                        | 5.152 | .033            | 7.72600         | 2.66631               | .93241                                    | <b>14.51959</b> |

**Tabel Uji Independent sample T test Untuk melihat perbedaan antara Siang dan Malam di SDN 040445 Kabanjahe (Jauh dari jalan raya)**

|                   |                             | Independent Samples Test                |      |                              |       |                 |                 |                       |                                           |                |
|-------------------|-----------------------------|-----------------------------------------|------|------------------------------|-------|-----------------|-----------------|-----------------------|-------------------------------------------|----------------|
|                   |                             | Levene's Test for Equality of Variances |      | t-test for Equality of Means |       |                 |                 |                       |                                           |                |
|                   |                             | F                                       | Sig. | t                            | df    | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |                |
|                   |                             |                                         |      |                              |       |                 |                 |                       | Lower                                     | Upper          |
| Konsentrasi pm2,5 | Equal variances assumed     | 3.030                                   | .105 | 3.327                        | 13    | .005            | 12.14357        | 3.64969               | 20.02824                                  | <b>4.25890</b> |
|                   | Equal variances not assumed |                                         |      | 3.179                        | 8.331 | .012            | 12.14357        | 3.81952               | 20.89095                                  | <b>3.39620</b> |

Pedoman pengambilan keputusan dalam uji independent sample t-test menurut singgih santoso (2014) berdasarkan nilai signifikansi (sig) sebagai berikut:

- a. Jika nilai sig. (2-tailed)  $< 0,05$  maka  $H_0$  ditolak dan  $H_a$  diterima.
- b. Sebaliknya, jika nilai sig. (2-tailed)  $> 0,05$ , maka  $H_0$  diterima dan  $H_a$  ditolak.

Lampiran 10 Kondisi Bangunan Dan Kelas SDN 040448 Kabanjahe Dekat Jalan Raya



**Gambar 1. Kondisi Bangunan**



**Gambar 2. halaman sekolah dan kelas**



**Gambar 3. Ruangan Kelas SDN 040448**

Kondisi bangunan dan kelas yang SDN 040445 Kabanjahe (jauh dari jalan raya)



**Gambar 4. halaman sekolah**



**Gambar 5. Ruang Kelas**

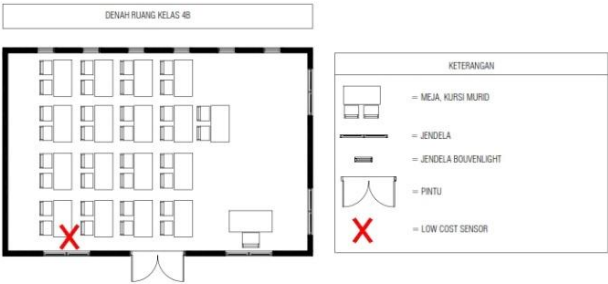


**Gambar 10. Ruang Kelas**

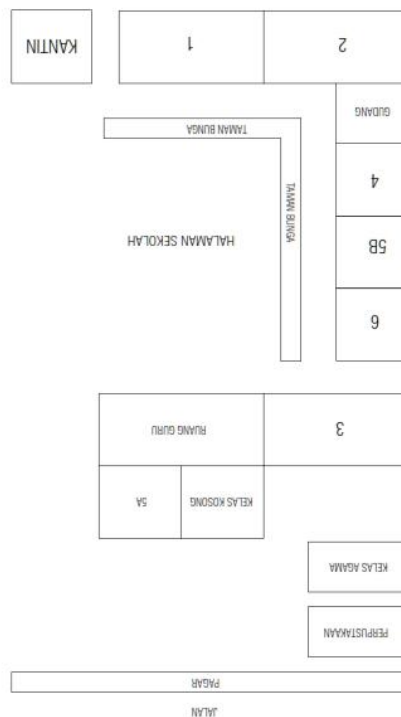
Lampiran 11 Desain Gambar



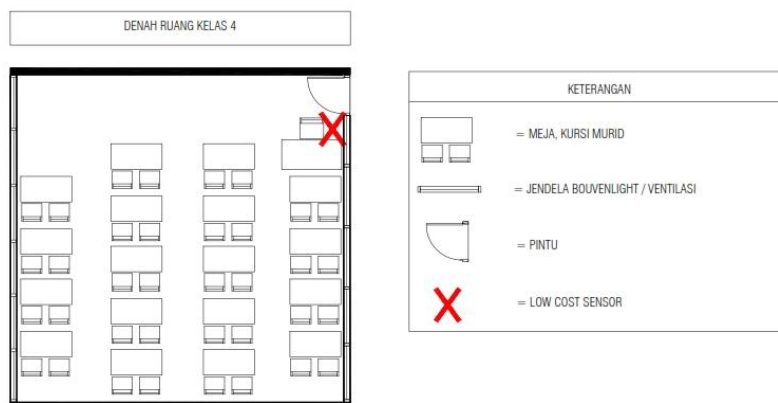
Gambar 6. Desain Lokasi SDN 040448 Kabanjahe



Gambar 7. Perletakkan Alat Low Cost Sensor



**Gambar 8. Desain Lokasi SDN 040445 Kabanjahe**



**Gambar 9. Perletakkan Alat Low Cost Sensor**

Lampiran 12 Tabel Observasi selama di lapangan SDN 040448 dan SDN 040445

SD : SDN 040448

Tanggal : Selasa 27 Mei 2025

|    | JAM                            | Durasi Kegiatan | Jenis Kegiatan          | Kendaraan Yang Masuk Kesekolah | Kendaraan Yang Kluar | Kepadatan Kendaraan                                                                                                                         |
|----|--------------------------------|-----------------|-------------------------|--------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | 06.56 (Jendela tengah Terbuka) |                 | Masuk Sekolah           | 7                              | 1                    | Kendaraan berlalu Lalang mengantarkan siswa (Padat)angkot,mobil pribadi,montr.54 di sekitaran kantor dinkes,bri,polres kepadatan berkurang. |
| 2  | 07.00(Pintu terbuka)           |                 | Piket kelas dan halaman |                                |                      | 10.23 kendaraan berlalu Lalang tapi tidak padat                                                                                             |
| 3  | 07.29                          |                 | Senam                   |                                |                      | 11.21 kendaraan berlalu Lalang tapi tidak padat                                                                                             |
| 4  | 07.39                          |                 |                         |                                |                      | 11.52 macet                                                                                                                                 |
| 5  | 07.42                          |                 | Ada yang nyapu          |                                |                      | 12.31 tidak padat bertahap                                                                                                                  |
| 6  | 08.11(Ada masih bermain)       |                 | Masuk kelas             |                                |                      | 11.46 macet sekali                                                                                                                          |
| 7  | 08.22                          |                 | Bermain dalam kelas     |                                |                      |                                                                                                                                             |
| 8  | 08.25                          |                 | Belajar                 |                                |                      |                                                                                                                                             |
| 9  | 09.13(Penjual 4 ksobakar)      |                 |                         |                                |                      |                                                                                                                                             |

|    |                      |  |                                       |  |  |  |
|----|----------------------|--|---------------------------------------|--|--|--|
| 10 | 09.26                |  |                                       |  |  |  |
| 11 | 09.42                |  |                                       |  |  |  |
| 12 | 10.00                |  |                                       |  |  |  |
| 13 | 10.05(Pintu<br>utup) |  |                                       |  |  |  |
| 14 | 10.47                |  | Pintu terbuka<br>sedikit              |  |  |  |
| 15 | 11.06                |  | Siswa buka<br>pintu                   |  |  |  |
| 16 | 11.06                |  | Istirahat                             |  |  |  |
| 17 | 11.07                |  | Tukang bakso<br>bakar kipas-<br>kipas |  |  |  |
| 18 | 11.19                |  | Pintu terbuka<br>lebar                |  |  |  |
| 19 | 11.23                |  | Masuk Kelas                           |  |  |  |
| 20 | 12.08                |  | Orang tua<br>murid<br>berdatangan     |  |  |  |
| 21 | 12.11                |  | Tutup pintu                           |  |  |  |
| 22 | 12.20                |  | Pulang                                |  |  |  |

SD : SDN 040445  
Tanggal : Selasa 27 Mei 2025

|    | jam         | Durasi Kegiatan | Jenis Kegiatan                    | Kendaraan Yang Masuk Kesekolah | Kendaraan Yang Kluar | Kepadatan Kendaraan |
|----|-------------|-----------------|-----------------------------------|--------------------------------|----------------------|---------------------|
| 1. | 06.59-07.45 |                 | Mengantarkan anak sekolah         |                                |                      | 64                  |
| 2  | 07.06-07.38 |                 | Guru masuk kesekolah              | 7                              |                      |                     |
| 3  | 07.12-07.22 |                 | Membersihkan ruangan dan lapangan |                                |                      |                     |
| 4  | 07.23-07.35 |                 | Anak -anak bermain                |                                |                      |                     |
| 5  | 07.36-08.06 |                 | Anak -anak berbaris dilapangan    |                                |                      |                     |
| 6  | 07.42-07.57 |                 | Senam                             |                                |                      |                     |
| 7  | 08.06-08.09 |                 | Memasuki kelas                    |                                |                      |                     |
| 8  | 08.22-09.47 |                 | Memilai pembelajaran              |                                |                      |                     |
| 9  | 09.46       |                 | Kendaraan masuk                   | 3                              |                      |                     |
| 10 | 09.47-10.09 |                 | Istirahan                         |                                |                      |                     |
| 11 | 10.10-11.10 |                 | Pembelajaran                      |                                |                      |                     |
| 12 | 10.11       |                 | Kendaraan kluar                   |                                | 4                    |                     |
| 13 | 11.00-11,18 |                 | Kelas 1 dan 2 pulang              |                                |                      | 15                  |
| 14 | 11,10-11.34 |                 | istirahan                         |                                |                      |                     |

|    |             |  |                |  |   |    |
|----|-------------|--|----------------|--|---|----|
| 15 | 11.34-12.30 |  | Pembelajaran   |  |   |    |
| 16 | 12.30       |  | Pulang sekolah |  |   | 28 |
| 17 | 12.38       |  | Guru pulang    |  | 1 |    |

SD : SDN 040445

Tanggal : Rabu 28 Mei 2025

|    | JAM         | Durasi Kegiatan | Jenis Kegiatan           | Kendaraan Yang Masuk Kesekolah | Kendaraan Yang Kluar | Kepadatan Kendaraan |
|----|-------------|-----------------|--------------------------|--------------------------------|----------------------|---------------------|
| 1. | 07.00       |                 | Mengantar anak sekolah   |                                |                      | 67                  |
| 2  | 07.05-07.27 |                 | Anak- Anak Kebersihan    |                                |                      |                     |
| 3  | 07.08       |                 | Penjual jajanan masuk    | 2                              |                      |                     |
| 4  | 07.17       |                 | Guru masuk kesekolah     | 6                              |                      |                     |
| 5  | 07.27-07.38 |                 | Anak-anak bermain        |                                |                      |                     |
| 6  | 07.39-08.29 |                 | Berbaris dilapangan      |                                |                      |                     |
| 7  | 07.45-08.29 |                 | Senam                    |                                |                      |                     |
| 8  | 08.26-09.47 |                 | Pembelajaran/masuk kelas |                                |                      |                     |
| 9  | 09.47-10.10 |                 | Istrahat Ke 1            |                                |                      |                     |
| 10 | 10.11-11.12 |                 | Pembelajaran/masuk kelas |                                |                      |                     |
| 11 | 10.17       |                 | Penjual Jajan Keluar     |                                |                      |                     |
| 12 | 11.08-11.12 |                 | Kelas 1,2, dan 4 Pulang  |                                |                      | 23                  |
| 13 | 11.12-11.29 |                 | Istrahat Ke 2            |                                |                      |                     |
| 14 | 11.30-12.25 |                 | Pembelajaran/masuk kelas |                                |                      |                     |
| 15 | 11.25-12.30 |                 | Pulang Sekolah           |                                |                      |                     |

|    |             |  |                    |  |   |    |
|----|-------------|--|--------------------|--|---|----|
| 16 | 11.26-12.30 |  | Dijemput Orang Tua |  |   | 43 |
| 17 | 12.30       |  | Guru Pulang        |  | 6 |    |

SD : SDN 040448  
Tanggal : Rabu 28 Mei 2025

|    | JAM                  | Durasi Kegiatan | Jenis Kegiatan                   | Kendaraan Yang Masuk Kesekolah | Kendaraan Yang Kluar | Kepadatan Kendaraan                                    |
|----|----------------------|-----------------|----------------------------------|--------------------------------|----------------------|--------------------------------------------------------|
| 1. | 07.08                |                 | 1.Orang tua mengantarkan sekolah | 13                             | 8                    | 1.Jalan raya macet ngantar sekolah 43                  |
| 2  | 07.10                |                 | 2.Membersihkan halaman           |                                |                      | 1. Banyak kantor dan parkir mobil (BRI,POLRES, DINKES) |
| 3  | 07.30-08.00          |                 | 3. Senam pagi                    |                                |                      | 5.Jalanan Berlubang                                    |
| 4  | 07.48 (Pintu buka )  |                 | 4. Baris dan masuk kelas         |                                |                      | 6.Jalan berlalu Lalang                                 |
| 5  | 07.59                |                 | 6. Istirahat                     |                                |                      | 17.Jalan Lumayan rame tapi tidak padat                 |
| 6  | 09.36 (Pintu tutup ) |                 | 8. Masuk kelas                   |                                |                      | 20.Banyak kendaraan menunggu didepan sekolah           |
| 7  | 09.41(Pintu buka )   |                 | 9. Olahraga                      |                                |                      | 22.jalan padat                                         |
| 8  | 09.59                |                 | 10. Masuk kelas                  |                                |                      |                                                        |
| 9  | 10.07                |                 | 11.Kluar Masuk Kelas             |                                |                      |                                                        |

|    |                                |  |                 |  |  |  |
|----|--------------------------------|--|-----------------|--|--|--|
| 10 | 10.36                          |  | 12. Istirahat   |  |  |  |
| 11 | 10.41                          |  | 13. Masuk kelas |  |  |  |
| 12 | 11.06                          |  | 19.Pulang       |  |  |  |
| 13 | 11.22                          |  | 21.Piket        |  |  |  |
| 14 | 11.28(Pintu<br>tutup )         |  |                 |  |  |  |
| 15 | 11.44(Pintu<br>buka )          |  |                 |  |  |  |
| 16 | 11.55(Pintu<br>tutup )         |  |                 |  |  |  |
| 17 | 11.57                          |  |                 |  |  |  |
| 18 | 12.23 (Pintu<br>buka sedikit ) |  |                 |  |  |  |
| 19 | 12.31                          |  |                 |  |  |  |
| 20 | 12.31                          |  |                 |  |  |  |
| 21 | 12.32                          |  |                 |  |  |  |
| 22 | 19.50                          |  |                 |  |  |  |

SD : SDN 040445  
Tanggal : Sabtu , 31 Mei 2025

|    | JAM         | Durasi Kegiatan | Jenis Kegiatan                                             | Kendaraan Yang Masuk Kesekolah | Kendaraan Yang Kluar | Kepadatan Kendaraan |
|----|-------------|-----------------|------------------------------------------------------------|--------------------------------|----------------------|---------------------|
| 1. | 06.00-07.46 |                 | Orang tua Mengantarkan anak sekolah                        |                                |                      | 63                  |
| 2  | 06.30-07.36 |                 | Kebersihan                                                 |                                |                      |                     |
| 3  | 07.16-07.40 |                 | Guru datang                                                | 3                              |                      |                     |
| 4  | 07.36-08.15 |                 | Anak -anak berkumpul dilapangan untuk ibadah               |                                |                      |                     |
| 5  | 08.16-08.20 |                 | Anak -anak masuk kekelas                                   |                                |                      |                     |
| 6  | 08.21-09.50 |                 | Pembelajaran                                               |                                |                      |                     |
| 7  | 08.21-09.50 |                 | Anak-anak kelas 4 keluar /mata pelajaran penjas kelapangan |                                |                      |                     |
| 8  | 09.50-10.10 |                 | Istirahat pertama                                          |                                |                      |                     |
| 9  | 10.10-11.13 |                 | Masuk kelas pembelajaran                                   |                                |                      |                     |
| 10 | 10.27       |                 | Kelas lima masak masak di depan kelas /samping kelas       |                                |                      |                     |

|    |             |  |                        |   |   |    |
|----|-------------|--|------------------------|---|---|----|
| 11 | 10.29       |  | Kendaraan masuk        | 1 |   |    |
| 12 | 10.32       |  | Kendaraan keluar       |   | 1 |    |
| 13 | 11.00-11.08 |  | Kelas 1,2 dan 3 pulang |   |   |    |
| 14 | 11.00-11.08 |  | Orang tua menjemput    |   |   | 46 |
| 15 | 11.13       |  | Pulang sekolah         |   |   | 42 |

SD : 040448 (4B)

TANGGAL : 31 MEI 2025

| NO. | JAM         | DURASI KEGIATAN | JENIS KEGIATAN                       | KENDERAAN YANG MASUK | KENDERAAN YANG KELUARAN | KEPADATAN KENDERAAN                                          |
|-----|-------------|-----------------|--------------------------------------|----------------------|-------------------------|--------------------------------------------------------------|
| 1.  | 07.00-07.30 |                 | Orang tua mengantar pergi sekolah    | 9                    | 3                       | Padat dikarenakan banyak orang tua mengantar anak sekolah 22 |
| 2.  | 007.30      |                 | Senam                                |                      |                         | Berlalu lalang kendaraan                                     |
| 3.  | 08.00       |                 | Masuk kelas                          |                      |                         |                                                              |
| 4.  | 08.11       |                 | Pintu tertutup                       |                      |                         |                                                              |
| 5.  | 09.27       |                 | Pintu terbuka                        |                      |                         |                                                              |
| 6.  | 09.37       |                 | Pintu tertutup                       |                      |                         |                                                              |
| 7.  | 09.41       |                 | Pintu terbuka                        |                      |                         |                                                              |
| 8.  | 09.41       |                 | Pintu tertutup                       |                      |                         |                                                              |
| 9.  | 09.41       |                 | Guru merokok                         |                      |                         |                                                              |
| 10. | 09.43       |                 | Istirahat                            |                      |                         |                                                              |
| 11. | 09.54       |                 | Bakso bakar kipas-kipas              |                      |                         |                                                              |
| 12. | 09.57       |                 | Masuk kelas                          |                      |                         |                                                              |
| 13. | 10.13       |                 | Buka pintu                           |                      |                         |                                                              |
| 14. | 10.14       |                 | Pintu tertutup                       |                      |                         | Jalanan tidak padat                                          |
| 15. | 10.37       |                 | Ada yang olahraga di halaman sekolah |                      |                         |                                                              |
| 16. | 11.00       |                 | Pintu terbuka lebar                  |                      |                         |                                                              |

|     |       |  |                                             |  |  |  |
|-----|-------|--|---------------------------------------------|--|--|--|
| 17. | 11.04 |  | Banyak wali murid menunggu di depan gerbang |  |  |  |
| 18. | 11.07 |  | Pulang                                      |  |  |  |
| 19. | 11.10 |  | Piket                                       |  |  |  |

SD : 040448 (4B)

TANGGAL : 02 juni 2025

| NO. | JAM             | DURASI<br>KEGIATAN | JENIS KEGIATAN                       | KENDERAAN<br>YANG<br>MASUK | KENDERAAN<br>YANG<br>KELUARAN | KEPADATAN<br>KENDERAAN |
|-----|-----------------|--------------------|--------------------------------------|----------------------------|-------------------------------|------------------------|
| 1.  | 06.50-<br>07.30 |                    | Orang tua mengantar<br>pergi sekolah | 13                         | 1                             | Padat                  |
| 2.  | 07.30-<br>08.00 |                    | Apel                                 |                            |                               |                        |
| 3.  | 08.00           |                    | Masuk kelas                          |                            |                               |                        |
| 4.  | 08.21           |                    | Pintu tertutup                       |                            |                               |                        |
| 5.  | 09.26           |                    | Pintu terbuka sedikit                |                            |                               |                        |
| 6.  | 09.41           |                    | istirahat                            |                            |                               |                        |
| 7.  | 09.57           |                    | Masuk kelas                          |                            |                               |                        |
| 8.  | 10.43           |                    | Pintu terbuka                        |                            |                               |                        |
| 9.  | 10.55           |                    | Pintu tertutup                       |                            |                               |                        |
| 10. | 11.10           |                    | Istirahat                            |                            |                               |                        |
| 11. | 11.21           |                    | Bakso bakar                          |                            |                               |                        |
| 12. | 11.29           |                    | Masuk kelas                          |                            |                               |                        |
| 13. | 11.31           |                    | Demo (Olahraga)                      |                            |                               | Macet                  |
| 14. | 12.14           |                    | Sebagian anak-anak<br>pulang         |                            |                               |                        |
| 15. | 12.35           |                    | pulang                               |                            |                               |                        |

SD : 040445

TANGGAL : senin,02 juni 2025

| NO. | JAM             | DURASI<br>KEGIATAN | JENIS KEGIATAN                 | KENDERAAN<br>YANG<br>MASUK | KENDERAAN<br>YANG<br>KELUARAN | KEPADATAN<br>KENDERAAN |
|-----|-----------------|--------------------|--------------------------------|----------------------------|-------------------------------|------------------------|
| 1.  | 06.00-<br>07.30 |                    | Orang tua mengantar            |                            | 3                             | 65                     |
| 2.  | 06.20-<br>07.20 |                    | Kebersihan                     |                            |                               |                        |
| 3.  | 06.49-<br>07.17 |                    | Guru datang                    | 1                          |                               |                        |
| 4.  | 07.20-<br>08.15 |                    | Upacara di lapangan            |                            |                               |                        |
| 5.  | 08.16-<br>08.50 |                    | Masuk kelas                    |                            |                               |                        |
| 6.  | 09.00           |                    | Anak SMP datang                | 2                          |                               |                        |
| 7.  | 09.05           |                    | Kendaraan masuk                | 1                          |                               |                        |
| 8.  | 09.17           |                    | Penjual jajanan masuk          | 1                          |                               |                        |
| 9.  | 09.25           |                    | Kendaraan masuk                | 1                          |                               |                        |
| 10. | 10.00           |                    | Istirahat istirahat<br>pertama |                            |                               |                        |
| 11. | 10.20-<br>11.10 |                    | Masuk kelas                    |                            |                               |                        |
| 12. | 11.05           |                    | Kelas 1,2,3 pulang             |                            |                               |                        |
| 13. | 11.08           |                    | Orang tua menjemput            |                            |                               | 33                     |
| 14. | 11.09           |                    | Anak SMP pulang                |                            | 2                             |                        |

|     |                 |  |                              |  |   |  |
|-----|-----------------|--|------------------------------|--|---|--|
| 15. | 11.10-<br>11.35 |  | Istirahat kedua              |  |   |  |
| 16. | 11.35           |  | Masuk kelas                  |  |   |  |
| 17. | 11.38           |  | Penjual jajanan keluar       |  | 1 |  |
| 18. | 11.40           |  | Kelas 5 bersih-bersih        |  |   |  |
| 19. | 12.10           |  | Kelas 4 olahraga di lapangan |  |   |  |

SD : 040448 (4B)

TANGGAL : 03 juni 2025

| NO. | JAM         | DURASI KEGIATAN | JENIS KEGIATAN          | KENDERAAN YANG MASUK | KENDERAAN YANG KELUARAN | KEPADATAN KENDERAAN                  |
|-----|-------------|-----------------|-------------------------|----------------------|-------------------------|--------------------------------------|
| 1.  | 07.00       |                 | Piket                   | 11                   | 2                       | Padat                                |
| 2.  | 07.00-07.30 |                 | Orang tua ngantar siswa |                      |                         |                                      |
| 3.  | 07.29       |                 | Baris                   |                      |                         |                                      |
| 4.  | 08..13      |                 | Masuk kelas             |                      |                         |                                      |
| 5.  | 08.47       |                 | Pintu terbuka           |                      |                         | Jalanan biasa tidak rame tidak padat |
| 6.  | 09.11       |                 | Pindah kelas            |                      |                         |                                      |
| 7.  | 09.42       |                 | Istirahat               |                      |                         |                                      |
| 8.  | 10.58       |                 | Masuk kelas             |                      |                         |                                      |
| 9.  | 10.35       |                 | Pintu tertutup          |                      |                         |                                      |
| 10. | 11.12       |                 | Istirahat               |                      |                         |                                      |
| 11. | 11.28       |                 | Masuk kelas             |                      |                         |                                      |
| 12. | 12.35       |                 | Pulang                  |                      |                         |                                      |

SD : 040445

TANGGAL : 03 juni 2025

| NO. | JAM             | DURASI<br>KEGIATAN | JENIS KEGIATAN                               | KENDERAAN<br>YANG<br>MASUK | KENDERAAN<br>YANG<br>KELUARAN | KEPADATAN<br>KENDERAAN |
|-----|-----------------|--------------------|----------------------------------------------|----------------------------|-------------------------------|------------------------|
| 1.  | 06.30-<br>07.40 |                    | Orang tua mengantar<br>anak sekolah          |                            |                               | 65                     |
| 2.  | 06.20           |                    | Guru datang                                  |                            |                               |                        |
| 3.  | 06.30-<br>07.35 |                    | Kebersihan                                   | 4                          |                               |                        |
| 4.  | 06.24           |                    | Guru datang                                  | 3                          |                               |                        |
| 5.  | 07.36           |                    | Berbaris/senam                               |                            |                               |                        |
| 6.  | 07.39           |                    | Penjual jajanan masuk                        | 2                          |                               |                        |
| 7.  | 08.02           |                    | Masuk kelas/belajar                          |                            |                               |                        |
| 8.  | 09.27           |                    | Kendaraan keluar/guru<br>keluar              |                            | 2                             |                        |
| 9.  | 09.45           |                    | Istirahat pertama                            |                            |                               |                        |
| 10. | 10.07           |                    | Masuk kelas belajar                          |                            |                               |                        |
| 11. | 10.10-<br>11.08 |                    | Kelas 3 penjas di<br>lapangan (bermain bola) |                            |                               |                        |
| 12. | 11.08           |                    | Kelas 1,2,3 pulang                           |                            |                               |                        |
| 13. | 11.10           |                    | Orang tua menjemput                          |                            |                               | 32                     |
| 14. | 11.10-<br>11.35 |                    | Istirahat kedua                              |                            |                               |                        |
| 15. | 11.35           |                    | Masuk kelas/belajar                          |                            |                               |                        |

## Lampiran 13 Ethical Clearance (EC)



**Kementerian Kesehatan**  
**Poltekkes Medan**  
Komisi Etik Penelitian Kesehatan  
Jalan Jamin Ginting KM. 13,5  
Medan, Sumatera Utara 20137  
(061) 8368633  
<https://poltekkes-medan.ac.id>

**KETERANGAN LAYAK ETIK**  
*DESCRIPTION OF ETHICAL EXEMPTION*  
"ETHICAL EXEMPTION"

No.01.26.1738/KEPK/POLTEKKES KEMENKES MEDAN 2025

Protokol penelitian versi 1 yang diusulkan oleh :  
*The research protocol proposed by*

Peneliti utama : IRNABILA RAHMA DINDA  
*Principal In Investigator*

Nama Institusi : Poltekkes Kemenkes Medan  
*Name of the Institution*

Dengan judul:  
*Title*

**"ANALISIS KUALITAS UDARA TERHADAP PAPARAN PARTIKULAT (PM<sub>2.5</sub>) DALAM RUANGAN  
LINGKUNGAN SEKOLAH MENGGUNAKAN LOW-COST SENSOR KECAMATAN KABANJAHE  
KABUPATEN KARO TAHUN 2025"**

*"ANALYSIS OF AIR QUALITY TOWARDS PARTICULATE EXPOSURE (PM<sub>2.5</sub>) IN THE SCHOOL ENVIRONMENT USING  
LOW-COST SENSOR KABANJAHE DISTRICT, KARO REGENCY YEAR 2025"*

Dinyatakan layak etik sesuai 7 (tujuh) Standar WHO 2011, yaitu 1) Nilai Sosial, 2) Nilai Ilmiah, 3) Pemerataan Beban dan Manfaat, 4) Risiko, 5) Bujukan/Eksploitasi, 6) Kerahasiaan dan Privacy, dan 7) Persetujuan Setelah Penjelasan, yang merujuk pada Pedoman CIOMS 2016. Hal ini seperti yang ditunjukkan oleh terpenuhinya indikator setiap standar.

*Declared to be ethically appropriate in accordance to 7 (seven) WHO 2011 Standards, 1) Social Values, 2) Scientific Values, 3) Equitable Assessment and Benefits, 4) Risks, 5) Persuasion/Exploitation, 6) Confidentiality and Privacy, and 7) Informed Consent, referring to the 2016 CIOMS Guidelines. This is as indicated by the fulfillment of the indicators of each standard.*

Pernyataan Laik Etik ini berlaku selama kurun waktu tanggal 01 Agustus 2025 sampai dengan tanggal 01 Agustus 2026.

*This declaration of ethics applies during the period August 01, 2025 until August 01, 2026.*  
*Chairperson,*



Dr. Lestari Rahmah, MKT

**7 STANDAR**  
**NOMOR PROTOKOL : 015923127111122025051600378**

|       | 7-STANDAR KELAIKAN ETIK PENELITIAN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | SEKRETARIS |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1     | <b>Nilai Sosial / Klinis</b><br><i>Penelitian ini memenuhi standar Nilai Sosial/ Klinis, minimal terdapat satu diantara 7 (tujuh) nilai berikut ini :</i>                                                                                                                                                                                                                                                                                                                                                                                | Ya         |
| 1.1   | Terdapat Novelty (kebaruan).<br>Dalam penelitian ini terdapat nilai kebaruan, yaitu terdapat minimal satu dari 3 sifat berikut :                                                                                                                                                                                                                                                                                                                                                                                                         | Ya         |
|       | a. Potensi menghasilkan informasi yang valid sesuai dengan tujuan yang dinyatakan dalam protokol penelitian.                                                                                                                                                                                                                                                                                                                                                                                                                             | Ya         |
|       | b. Memiliki relevansi bermakna dengan masalah kesehatan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Ya         |
|       | c. Memiliki kontribusi terhadap suatu penciptaan/ kebermanfaatan dalam melakukan evaluasi intervensi kebijakan, atau sebagai bagian dari pelaksanaan kegiatan yang mempromosikan kesehatan individu atau masyarakat                                                                                                                                                                                                                                                                                                                      | Ya         |
| 1.2   | Sebagai upaya mendesiminasikan hasil                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Ya         |
| 1.3   | Relevansinya bermanfaat dengan masalah kesehatan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Ya         |
| 1.4   | Memberikan kontribusi promosi kesehatan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Ya         |
| 1.5   | Menghasilkan alternatif cara mengatasi masalah                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Ya         |
| 1.6   | Menghasilkan data & informasi yang dapat dimanfaatkan untuk pengambilan keputusan klinis/sosial                                                                                                                                                                                                                                                                                                                                                                                                                                          | Ya         |
| 1.7   | Terdapat uraian tentang penelitian lanjutan yang dapat dilakukan dari hasil penelitian yang sekarang                                                                                                                                                                                                                                                                                                                                                                                                                                     | Ya         |
| 2     | <b>Nilai Ilmiah</b><br><i>Penelitian ini memenuhi standar nilai ilmiah</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Ya         |
| 2.1.1 | Disain penelitian mengikuti kaidah ilmiah, yang menjelaskan secara rinci meliputi :                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Ya         |
|       | a. Desain penelitian;<br><i>Terdapat deskripsi detil tentang desain penelitian, untuk berbagai jenis penelitian.</i><br>1) Bila berupa kuesioner, terdapat uraian mengenai tatacara kuesioner, kartu buku harian dan bahan lain yang relevan digunakan untuk menjawab pertanyaan penelitian<br>2) Bila penelitian klinis dan atau ujicoba klinis, deskripsi harus meliputi apakah kelompok intervensi ditentukan secara non-random, random, (termasuk bagaimana metodenya), dan apakah blinded (single/double) atau terbuka (open-label) | Ya         |
|       | b. Tempat dan waktu penelitian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Ya         |
|       | c. Jenis sampel, besar sampel, kriteria inklusi dan eksklusi; teknik sampling<br><i>Terdapat uraian tentang jumlah subjek yang dibutuhkan sesuai tujuan penelitian dan bagaimana penentuannya secara statistik (tergantung relevansi)</i>                                                                                                                                                                                                                                                                                                | Ya         |
|       | d. Variabel penelitian dan definisi operasional;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Ya         |
|       | e. Instrument penelitian/alat untuk mengambil data/bahan penelitian ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Ya         |
|       | i. Rencana analisis data, jaminan kualitas pengumpulan, penyimpanan dan analisis data                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Ya         |

|     | 7-STANDAR KELAIKAN ETIK PENELITIAN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | SEKRETARIS |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 3   | <b>Pemerataan Beban dan Manfaat</b><br><i>Pemerataan beban dan manfaat mengharuskan peserta/ subjek diambil dari kualifikasi populasi di wilayah geografis di mana hasilnya dapat diterapkan. Protokol suatu penelitian mencerminkan adanya perhatian atas minimal satu diantara butir-butir di bawah ini:</i>                                                                                                                                                                                                                                                                                                        | Ya         |
| 3.2 | Rekrutmen subjek dilakukan berdasarkan pertimbangan ilmiah, dan tidak berdasarkan status sosial ekonomi, atau karena mudahnya subjek dimanipulasi atau dipengaruhi untuk mempermudah proses maupun pencapaian tujuan penelitian.<br>Bila pemilihan berdasarkan pada sosial ekonomi, harus atas dasar pertimbangan etik dan ilmiah<br>- Terdapat rincian kriteria subjek dan alasan penentuan yang tidak masuk kriteria dari kelompok kelompok berdasarkan umur, sex, faktor sosial atau ekonomi, atau alasan alasan lainnya                                                                                           | Ya         |
| 4   | <b>Potensi Manfaat dan Resiko</b><br><i>Risiko kepada subjek seminimal mungkin dengan keseimbangan memadai/tepat dalam kaitannya dengan prospek potensial manfaat terhadap individu, nilai sosial dan ilmiah suatu penelitian.</i> <ul style="list-style-type: none"> <li>• menyiratkan ketidaknyamanan, atau beban yang merugikan mulai dari yang amat kecil dan hampir pasti terjadi.</li> <li>• potensi subjek mengalami kerugian fisik, psikis, sosial, material</li> <li>• kerugian yang besar dan atau bermakna.</li> <li>• risiko kematian sangat tinggi, belum/tidak adanya perawatan yang efektif</li> </ul> | Ya         |
| 4.1 | Terdapat uraian potensi manfaat penelitian yang lebih besar bagi individu/subjek                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Ya         |
| 5   | <b>Bujukan/ Eksploitasi/ Inducement (undue)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Ya         |
| 5.1 | Terdapat penjelasan tentang insentif bagi subjek, dapat berupa material seperti uang, hadiah, layanan gratis jika diperlukan, atau lainnya, berupa non material: uraian mengenai kompensasi atau penggantian yang akan diberikan (dalam hal waktu, perjalanan, hari-hari yang hilang dari pekerjaan, dll)                                                                                                                                                                                                                                                                                                             | Ya         |
| 6   | <b>Rahasia dan Privacy</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Ya         |
| 6.4 | Peneliti menjaga kerahasiaan temuan tersebut, jika terpaksa maka peneliti membukan rahasia setelah menjelaskan kepada subjek ttg keharusannya peneliti menjaga rahasia dan seberapa besar peneliti telah melakukan pelanggaran atas prinsip ini, dengan membuka rahasia tersebut                                                                                                                                                                                                                                                                                                                                      | Ya         |
|     | a. Terdapat penjelasan bagaimana peneliti menjaga privacy dan kerahasiaan subjek sejak rekrutmen hingga penelitian selesai, bahkan jika terjadi pembatalan subjek karena subjek tidak memenuhi syarat sbg sampel                                                                                                                                                                                                                                                                                                                                                                                                      | Ya         |
| 7   | <b>Informed Consent</b><br><i>Penelitian ini dilengkapi dengan Persetujuan Setelah Penjelasan (PSP/Informed Consent-IC), merujuk pada 35 butir IC secara lengkap, termasuk uraian seperti berikut ini</i>                                                                                                                                                                                                                                                                                                                                                                                                             | Ya         |

## Lampiran 14 Lembar Bimbingan Skripsi

### KEMENTERIAN KESEHATAN POLITEKNIK KESEHATAN MEDAN

#### JURUSAN KESEHATAN LINGKUNGAN PRODI SARJANA TERAPAN SANITASI LINGKUNGAN TA 2024/2025

#### LEMBAR BIMBINGAN SKRIPSI

Nama Mahasiswa : Irnabila Rahma Dinda  
 NIM : P00933221029  
 Dosen Pembimbing : Restu Auliani, ST, Msi  
 Judul Skripsi : Analisis Kualitas udara terhadap Paparan Partikulat (Pm<sub>2.5</sub>) dalam ruangan lingkungan sekolah menggunakan low cost sensor, Kecamatan Kabanakhe Kabupaten, Kato Tahun 2025

| Pertemuan Ke | Hari/ Tanggal           | Materi Bimbingan       | Tanda Tangan Dosen                                                                    |
|--------------|-------------------------|------------------------|---------------------------------------------------------------------------------------|
| 1            | Senin, 20 Januari 2025  | ACC judul dan Bab 1    |    |
| 2            | Selasa, 21 Januari 2025 | Konsultasi bab 2       |    |
| 3            | Rabu, 22 Januari 2025   | bab 2 ACC              |   |
| 4            | Kamis, 23 Januari 2025  | Konsultasi bab 3       |  |
| 5            | Jumat, 24 Januari 2025  | bab 3 ACC              |  |
| 6            | Kamis, 30 Januari 2025  | Konsultasi bab 1, 2, 3 |  |
| 7            | Kamis, 12 Juni 2025     | bimbingan bab 4        |  |
| 8            | Jumat, 13 Juni 2025     | bimbingan bab 4        |  |
| 9            | Senin, 16 Juni 2025     | bimbingan bab 4        |  |
| 10           | Selasa, 17 Juni 2025    | ACC bab 4              |  |
| 11           | Rabu, 18 Juni 2025      | bimbingan bab 5        |  |
| 12           | Kamis 19 Juni 2025      | ACC bab 1, 2, 3, 4, 5  |  |
|              |                         |                        |                                                                                       |
|              |                         |                        |                                                                                       |
|              |                         |                        |                                                                                       |
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|              |                         |                        |                                                                                       |

Ketua Jurusan Kesehatan Lingkungan  
 Kemenkes Poltekkes Medan,

HAESTI SEMBIRING SST, MSc  
 NIP. 197206181997032003

## Lampiran 15 Lembar Perbaikan Hasil Sidang Skripsi

**LEMBAR PERBAIKAN HASIL SIDANG SKRIPSI**  
**MAHASISWA PRODI SARJANA TERAPAN SANITASI LINGKUNGAN**  
**KEMENKES POLTEKKES MEDAN**  
**TAHUN AJARAN 2024/2025**

Nama : Innabilla Rahma Dinda  
 NIM : 100933221027

|                                             | Hal Yang Disarankan Perbaikan                                                                                                                                                                                                                                                                                                                              | Disposisi                                                                             |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Pembimbing<br>Ratu Auliani<br>ST.M.Si       | Cek satuan ur semua tabel                                                                                                                                                                                                                                                                                                                                  |   |
| Penguji I<br>Dreng<br>M.Amin<br>ST.M.Eng    | <ul style="list-style-type: none"> <li>• Hilangkan kecepatan angin. km tidak sesuai dg kondisi, tampikan data</li> <li>• cek ukuran ventilasi</li> <li>• Layout selolah tambahkan . ukuran pintu, ukuran jendela,</li> <li>• dalam 1 hr pintu selolah terbuka/tertutup.</li> <li>• gambaran umum perbandingan "solusi" buat tabel perbandingan.</li> </ul> |  |
| Penguji II<br>Master<br>Puskesmas<br>pukes. | tambahkan faktor yang mempengaruhi kesimpulan kelayakan pnyang.                                                                                                                                                                                                                                                                                            | 26625<br>kp                                                                           |

KABANGJAH, 27 Juni 2025  
 Ketua Jurusan Kesehatan Lingkungan  
 Kemenkes Poltekkes Medan  
  
 Haesti Sembiring, SST, M.Sc  
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