

DVOPER DOO
Nušićeva 10/IV/20
11000 BELGRADE

Belgrade, May 3, 2021

Report No.: 51040501

REPORT ON ENVIRONMENTAL NOISE MEASUREMENT

PROJECT: EISA ZRENJANIN

CONTINUOUS 24-HOUR MEASUREMENTS
SHORT-TERM MEASUREMENTS

LOCATION OF MEASUREMENT: Territory of the Municipality of Zrenjanin, locations in the vicinity of the future waste water treatment plant

Measurement date: From May 21, 2021 through May 24, 2021

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1. GENERAL INFORMATION

1.1 INFORMATION ABOUT THE ORGANISATION TO MEASURE NOISE

Business name: ANAHEM d.o.o.

Legal form: Limited Liability Company

Registered seat: Belgrade

Full business name: Preduzeće za proizvodnju, promet i usluge "ANAHEM" d.o.o. (ANAHEM, a Limited Liability Company for Manufacture, Trade and Services)

Address: Mocartova 10, Belgrade, Serbia

Personal ID No. (MB): 17615980

Personal Tax ID No. (PIB): 103604091

Registration date: December 27, 2005

Registration No.: BD 50388

Telephone: +381 11 3422 800

Fax: +381 11 3422 900

E-mail: office@anahem.org

Authority No. for noise measurements: 353-01-00989/2020-03 dated May 27, 2020

Accreditation Certificate No.: 01-261 of March 25, 2021

Person responsible for signing the Environmental Noise Measurement Report: Vojislav Popović, MScEE

1.2 DATA ON MEASURING EQUIPMENT

No.	Name / Manufacturer	Type	Class	Serial No.	Calibration Date
1.	Sound Level Meter Bruel&Kjaer	BK 2250	1	2551226	June 22, 2020
2.	Condenser Microphone Bruel&Kjaer	BK 4189	1	2550210	June 22, 2020
3.	Acoustic Calibrator Bruel&Kjaer	BK 4231	1	2147255	June 22, 2020
4.	Termohigroanemometar TESTO	TESTO 435	/	02489196	June 22, 2020
5.	Barometer TESTO	TESTO 511	/	39108883/403	Aug. 18, 2019

2. MEASUREMENT TASK

2.1 SUBJECT OF MEASUREMENT

Continuous 24-hour measurement of noise levels in the open, on the territory of the Municipality of Zrenjanin and in the immediate vicinity of the location designated for the construction of the waste water treatment plant. Measuring points are defined in accordance with the request made by the Ordering Party, based on the EISA ZRENJANIN Project.

2.2 MEASUREMENT BASIS

Request made by the Ordering Party: E-mail dated April 29, 2021

2.3 LEGAL DOCUMENTS

- Law on Protection from Environmental Noise (*Official Gazette of the Republic of Serbia*, Nos. 36/09 and 88/10)
- Regulations on Methods of Measuring Noise, the Content and Scope of the Noise Measurement Report (*Official Gazette of the Republic of Serbia*, No. 72/10)
- Ordinance on Noise Indicators, Limit Values, Methods for the Assessment of Noise Indicators, Disturbing and Harmful Effects of Environmental Noise (*Official Gazette of the Republic of Serbia*, No. 75/10)
- SRPS ISO 1996-1:2019 Acoustics – Description, Measurement and Assessment of Environmental Noise – Part 1: Basic Quantities and Assessment Procedures
- SRPS ISO 1996-2:2019 Acoustics – Description, Measurement and Assessment of Environmental Noise – Part 2: Determination of Sound Pressure Levels

3. CONDITIONS AND RESULTS OF MEASUREMENT

3.1 DESCRIPTION OF THE LOCATION OF MEASUREMENT

Locations of measurement are situated on the territory of the Municipality of Zrenjanin, on the east brims of the Mužlja settlement and on the west border of the Ečka – Jugoistok Industrial Zone located on the right hand-side of Belgrade – Zrenjanin Highway. Positions of measuring points and their interactions in the space are presented in the figure below (the map is taken from Google Earth).



3.2 DATA ON NOISE SOURCES

In Measuring Points 2 and 3 (MT2, MT3), neighbourhood noise is prevailing – human activities in the adjacent yards, fieldworks performed with the utilisation of agricultural machinery, sounds of nature – birds singing, occasional barking of dogs. Measuring Points 1 and 4 (MT1, MT4) are located in the vicinity of Belgrade-Zrenjanin Highway and they are exposed to the impact of traffic going on along that traffic route and noise coming from the adjacent industrial complexes. In the Measuring Point 1, the impact of activities going on in the yard in which the measuring point is placed is also significant.

3.3 DATA ON MEASURING PLACES

MEASURING PLACE 1: On the left side of Belgrade – Zrenjanin Highway, at the yard of the house owned by Bojan Gavrić, situated at the following address: Pančevačka bb, Zrenjanin.

MEASURING PLACE 2: At the yard of the house situated in 149 Hunjadi Janoš Street, Zrenjanin.

MEASURING PLACE 3: At the yard of the house situated in 169 Hunjadi Janoš Street, Zrenjanin

MEASURING PLACE 4: On the right side of Belgrade-Zrenjanin Highway, on the perimeter of the Ečka – Jugoistok Industrial Zone, across the petrol station of NIS Petrol.

3.4 METHOD OF MEASUREMENT

SRPS ISO 1996-1:2019 Acoustics - Description, Measurement and Assessment of Environmental Noise - Part 1: Basic Quantities and Assessment Procedures

SRPS ISO 1996-2:2019 Acoustics - Description, Measurement and Assessment of Environmental Noise - Part 2: Determination of Sound Pressure Levels

3.5 DATA ON MEASURING EQUIPMENT

No.	Name / Manufacturer	Type	Class	Serial No.
1.	Sound Level Meter Bruel&Kjaer	BK 2250	1	2551226
2.	Condenser Microphone Bruel&Kjaer	BK 4189	1	2550210
3.	Acoustic Calibrator Bruel&Kjaer	BK 4231	1	2147255
4.	Sound Level Meter Lutron	SL 403SD	1	I 531570
5.	Sound Level Meter Lutron	SL 403SD	1	I 531573
6.	Sound Level Meter Lutron	SL 403SD	1	I 531576
7.	Sound Level Meter Lutron	SL 403SD	1	I 526267

3.6 GENERAL NOTES

For all measurements that have been made, "**FAST**" dynamic feature of the sound level measurement has been used.

In all measuring points, measured noise has the following characteristics:

- According to the timeline: **Variable** (noise level changes of more than 5 dB);
- According to the frequency content: **Broadband**.

Pursuant to the Ordinance on Noise Indicators, Limit Values, Methods for the Assessment of Noise Indicators, Disturbing and Harmful Effects of Environmental Noise (*Official Gazette of the Republic of Serbia*, No. 75/10), the time period of 24 hours is divided into three reference time intervals: day (06.00-18.00 hours), evening (18.00-22.00 hours) and night (22.00-06.00hours). Therefore, the reference time intervals for each individual measurement (12 hours, 4 hours or 8 hours) are provided in the tables presenting measurement results, besides measurement intervals.

3.6. MEASUREMENT RESULTS*

MEASURING PLACE 1 (MT1) – CONTINUOUS MEASUREMENT

MEASURING PLACE 1: On the left side of Belgrade – Zrenjanin Highway, at the yard of the house owned by Bojan Gavrić, situated at the following address: Pančevačka bb, Zrenjanin

Measuring point: On the fence of the yard, at the distance of 100 m from the edge of the carriageway, at the height of 1.5 m above the ground.

GPS: N 45° 20' 58,24"
E 20° 25' 13,97"

RESULTS OF MEASUREMENT IN THE MEASURING PLACE 1

Ref. time interval	Day				Evening			Night		
	13 ²⁴ -18 ⁰⁰	06 ⁰⁰ -18 ⁰⁰		06 ⁰⁰ -12 ³⁹	18 ⁰⁰ -22 ⁰⁰			22 ⁰⁰ -06 ⁰⁰		
Measurement date	May 21	May 22	May 23	May 24	May 21	May 22	May 23	May 22	May 23	May 24
Equivalent level L_{Aeq} [dB(A)]	(61.0)	57.0	54.9	(47.3)	65.1	61.7	61.6	55.1	57.7	56.5
Authoritative level L_{Req} [dB(A)]	61	57	55	47	65	62	62	55	58	57
$L_{min}^{(1)}$ [dB(A)]	38.8	32.6	32.4	36.2	42.0	45.9	43.4	32.7	33.4	32.2
$L_{max}^{(2)}$ [dB(A)]	75.2	74.7	67.9	63.6	78.6	68.7	67.5	67.8	63.3	64.6
$L_1^{(3)}$ [dB(A)]	67.3	66.7	66.5	56.6	76.7	65.9	66.9	61.4	62.2	62.3
$L_{10}^{(3)}$ [dB(A)]	64.4	63.2	59.1	49.3	65.4	64.5	64.5	59.1	60.7	60.3
$L_{50}^{(3)}$ [dB(A)]	58.3	43.1	41.9	43.6	61.4	60.8	60.8	53.0	57.7	55.5
$L_{90}^{(3)}$ [dB(A)]	43.3	38.5	35.4	40.8	55.5	57.6	57.4	38.0	41.5	38.7
$L_{99}^{(3)}$ [dB(A)]	40.4	34.1	33.3	38.2	42.3	50.4	45.3	33.6	37.0	33.2

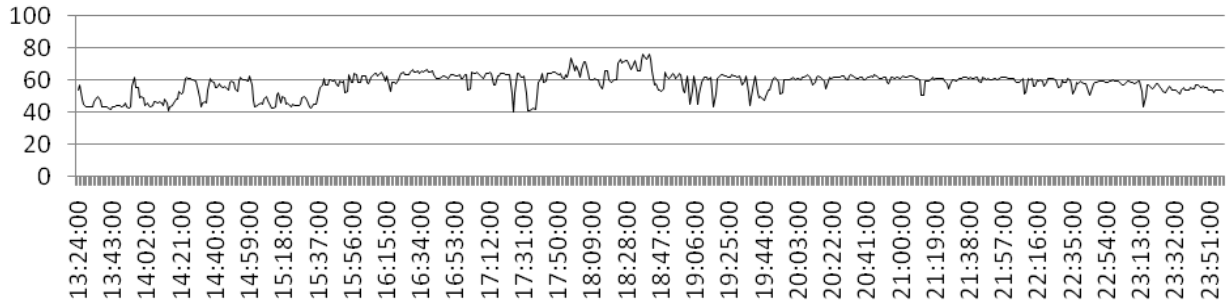
(1) Minimal noise level in the observed time interval

(2) Maximum noise level in the observed time interval

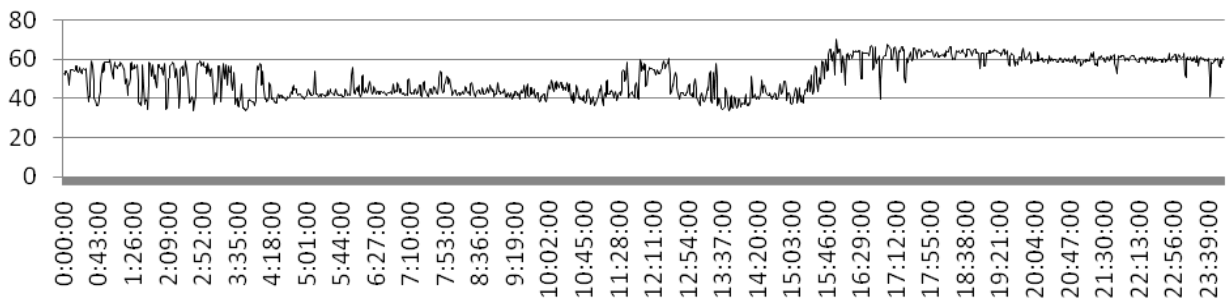
(3) N % noise level L_N (N=1, 10, 50, 90 and 99) in the observed time interval (noise level which is exceeded in N % of the measured time interval)



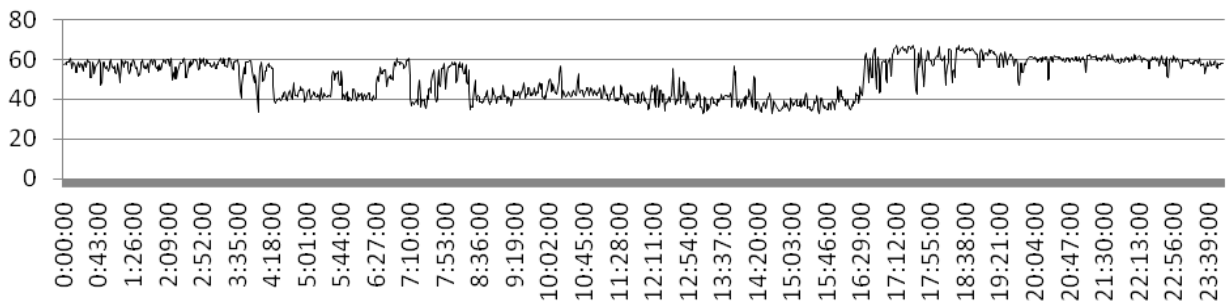
MT1_21.05.2021



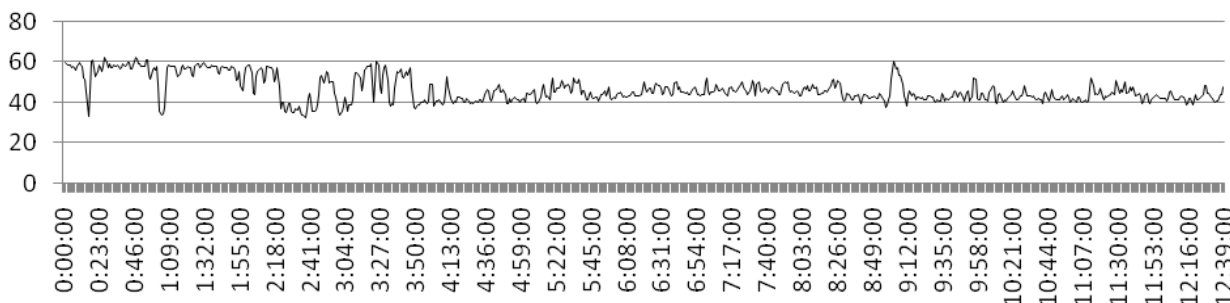
MT1_22.5.2021



MT1_23.5.2021



MT1_24.5.2021



MEASURING PLACE 1 (MT1) – SHORT-TERM MEASUREMENT

MEASURING PLACE 1: On the left side of Belgrade – Zrenjanin Highway, at the yard of the house owned by Bojan Gavrić, situated at the following address: Pančevačka bb, Zrenjanin

Measuring point: Besides the fence of the yard, at the distance of 100 m from the edge of the carriageway, at the height of 1.5 m above the ground.

GPS: N 45° 20' 58,24"
E 20° 25' 13,97"

Sources of noise:

DAY: May 21, 2021 (13⁰⁷-13²²)

At the moment of measurement, dominant sources of noise were the following: traffic on Belgrade-Zrenjanin Highway; occasional barking of dogs (at the yard of the building, at the distance of cc. 40m, there is a cage with three German Shepherds); industrial facilities in the vicinity – equable noise. Other sources of noise were: noise from human activities at the adjacent yard; distant birds chirping. These sources of noise did not have significant impact on measurement results.

DAY: May 24, 2021 (12⁴²-12⁵⁷)

At the moment of measurement, dominant sources of noise were the following: traffic on Belgrade-Zrenjanin Highway; industrial facilities in the vicinity – equable noise; sound of a lawn mower at the adjacent yard. Other sources of noise were: wind blows; birds singing in the distance. These sources of noise did not have significant impact on measurement results.



RESULTS OF THE SHORT-TERM MEASUREMENT IN THE MEASURING PLACE 1 (MT1)		
Reference time interval	Daytime (06 ⁰⁰ -18 ⁰⁰)	
Measurement date	May 21, 2021	May 24, 2021
Measurement time interval	13 ⁰⁷ -13 ²²	12 ⁴² -12 ⁵⁷
Air temperature °C	25.1	24.6
Relative humidity %	54	49
Air pressure hPa	1012.5	1015.6
Wind speed m/s	2.5	1.1
Equivalent level L _{Aeq} [dB(A)]	45.6	45.4
Authoritative level L _{Req} [dB(A)]	46	45
L _{min} ⁽¹⁾ [dB(A)]	37.5	39.7
L _{max} ⁽²⁾ [dB(A)]	62.7	52.6
L ₁ ⁽³⁾ [dB(A)]	54.4	49.8
L ₁₀ ⁽³⁾ [dB(A)]	47.9	47.2
L ₅₀ ⁽³⁾ [dB(A)]	43.9	45.3
L ₉₀ ⁽³⁾ [dB(A)]	40.6	41.9
L ₉₉ ⁽³⁾ [dB(A)]	39.0	40.4

(1) Minimal noise level in the observed time interval

(2) Maximum noise level in the observed time interval

(3) N % noise level L_N (N=1, 10, 50, 90 and 99) in the observed time interval (noise level that has been exceeded in N % of the measured time interval)

MEASURING PLACE 2 (MT2) – CONTINUOUS MEASUREMENT

MEASURING PLACE 2: At the yard of the house situated in 149 Hunjadi Janoš Street, Zrenjanin

Measuring point: On the pole near the residential building, at the distance of 12m from the pole, at the height of 3 m above the ground.

GPS: N 45° 20' 44,29"
E 20° 24' 51,82"

RESULTS OF THE MEASUREMENT IN THE MEASURING PLACE 2

Ref. time interval	Day				Evening			Night		
	11 ⁰⁸ -18 ⁰⁰	06 ⁰⁰ -18 ⁰⁰	06 ⁰⁰ -13 ⁴⁴		18 ⁰⁰ -22 ⁰⁰			22 ⁰⁰ -06 ⁰⁰		
Measurement date	21.05	22.05	23.05	24.05	21.05	22.05	23.05	22.05	23.05	24.05
Equivalent level $L_{Aeq} [dB(A)]$	(50.8)	61.5	50.6	(50.7)	51.4	51.1	51.5	40.4	45.3	47.1
Authoritative level $L_{Req} [dB(A)]$	51	62	51	51	51	51	52	40	45	47
$L_{min}^{(1)} [dB(A)]$	33.5	33.5	34.0	34.7	39.1	35.0	38.5	33.4	32.0	32.3
$L_{max}^{(2)} [dB(A)]$	66.4	79.4	69.5	67.1	75.9	67.1	68,7	54.3	66.4	64.0
$L_1^{(3)} [dB(A)]$	62.5	75.2	62.6	61.5	59.4	61.3	61.8	47.8	56.7	60.5
$L_{10}^{(3)} [dB(A)]$	54.6	62.4	53.6	54.0	48.4	53.9	54.0	42.7	46.1	47.4
$L_{50}^{(3)} [dB(A)]$	44.2	43.7	43.4	42.8	43.4	43.0	45.0	39.1	40.5	38.5
$L_{90}^{(3)} [dB(A)]$	38.5	38.2	37.4	38.0	42.3	40.2	41.9	35.6	34.8	33.9
$L_{99}^{(3)} [dB(A)]$	35.5	35.2	35.0	35.6	41.3	37.2	39.4	33.9	33.1	33.2

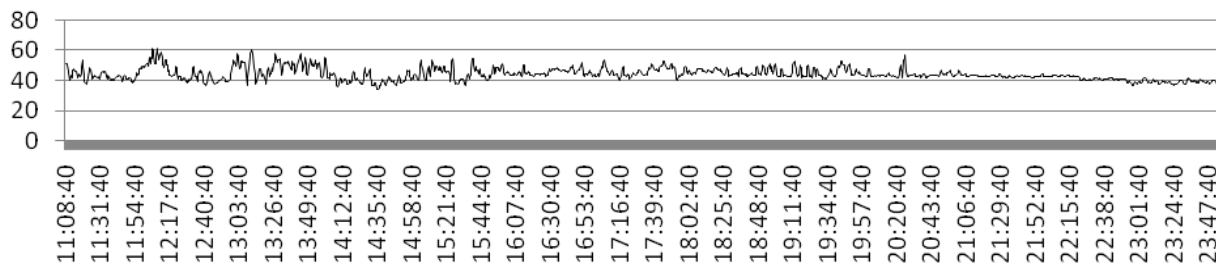
(1) Minimal noise level in the observed time interval

(2) Maximum noise level in the observed time interval

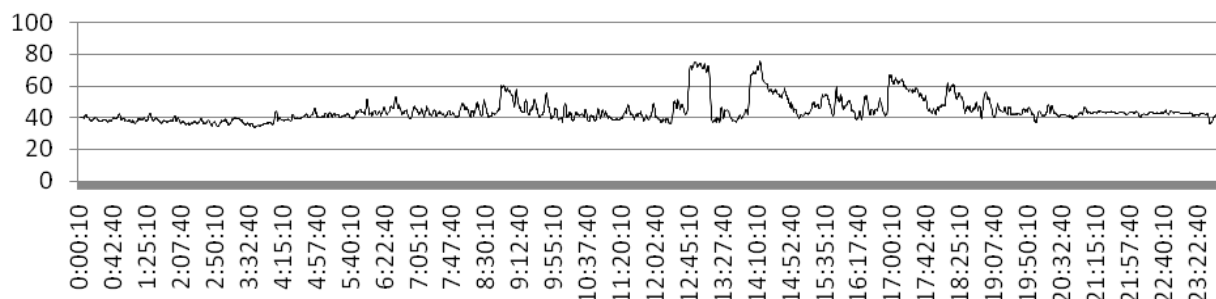
(3) N % noise level L_N (N=1, 10, 50, 90 and 99) in the observed time interval (noise level that has been exceeded in N % of the measured time interval)



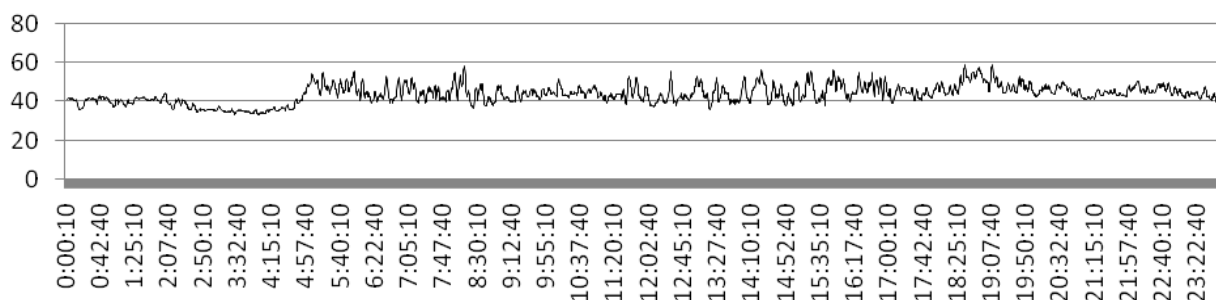
MT2_21.5.2021



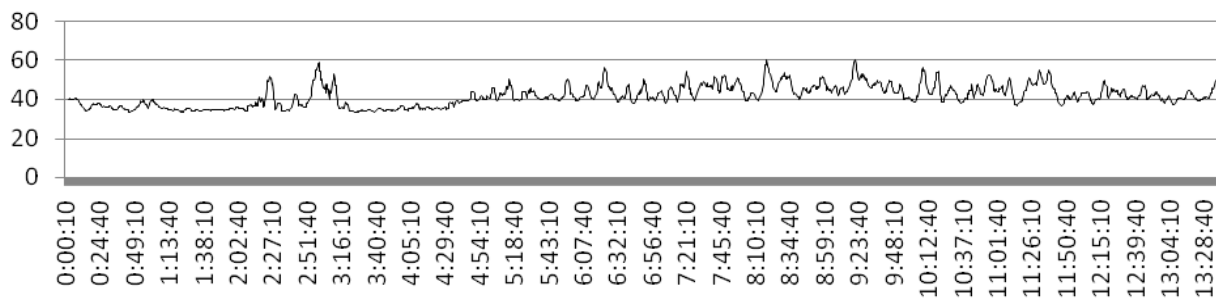
MT2_22.5.2021



MT2_23.5.2021



MT2_24.5.2021



MEASURING PLACE 2 (MT2) – SHORT-TERM MEASUREMENT

MEASURING PLACE 2: At the yard of the house situated in 149 Hunjadi Janoš Street, Zrenjanin

Measuring point: At the distance of 11m from the residential building, at the height of 1.5 m above the ground.

GPS: N 45° 20' 44,29"
E 20° 24' 51,82"

Sources of noise:

DAY: May 21, 2021 (11¹⁴-11³⁶)

At the moment of measurement, dominant sources of noise were the following: occasional traffic in Hunjadi Janoša Street; flight of an agricultural airplane, relatively far away from the measuring place; sound of trees. Other sources of noise: occasional barking of dogs at the distance; noise from human activities in the adjacent yards, hardly noticeable. These sources of noise did not have significant impact on the measurement results.

DAY: May 24, 2021 (14⁰⁷-14¹⁷)

At the moment of measurement, dominant sources of noise were the following: occasional traffic in Hunjadi Janoša Street; sound of trees; birds singing and chirping. Other sources of noise: occasional barking of dogs at the distance; noise from human activities in the adjacent yards, hardly noticeable. These sources of noise did not have significant impact on the measurement results.



RESULTS OF THE SHORT-TERM MEASUREMENT AT THE MEASURING PLACE 2 (MT2)		
Reference time interval	Daytime (06 ⁰⁰ -18 ⁰⁰)	
Measurement date	May 21, 2021	May 24, 2021
Measurement time interval	11 ¹⁴ -11 ³⁶	14 ⁰⁷ -14 ¹⁷
Air temperature °C	23.4	24.1
Relative humidity %	54	50
Air pressure hPa	1012.8	1015.9
Wind speed m/s	2.5	1.0
Equivalent level L _{Aeq} [dB(A)]	42.4	41.4
Authoritative level L _{Req} [dB(A)]	42	41
L _{min} ⁽¹⁾ [dB(A)]	32.5	35.0
L _{max} ⁽²⁾ [dB(A)]	59.4	56.2
L ₁ ⁽³⁾ [dB(A)]	50.8	45.2
L ₁₀ ⁽³⁾ [dB(A)]	44.6	43.2
L ₅₀ ⁽³⁾ [dB(A)]	40.4	41.0
L ₉₀ ⁽³⁾ [dB(A)]	36.8	38.9
L ₉₉ ⁽³⁾ [dB(A)]	34.7	37.0

(1) Minimal noise level in the observed time interval

(2) Maximum noise level in the observed time interval

(3) N % noise level L_N (N=1, 10, 50, 90 and 99) in the observed time interval (noise level that has been exceeded in N % of the measured time interval)

MEASURING PLACE 3 (MT3) – CONTINUOUS MEASUREMENT

MEASURING PLACE 3: At the yard of the house situated in 169 Hunjadi Janoša Street, Zrenjanin										
Measuring point: On the perimeter of the parcel of land, at the height of 1.5 m above the ground.								GPS: N 45° 20' 31,83" E 20° 24' 57,25"		
RESULTS OF THE MEASUREMENT AT THE MEASURING PLACE 3										
Ref. time interval	Day				Evening			Night		
	12 ³⁴ -18 ⁰⁰	06 ⁰⁰ -18 ⁰⁰		06 ⁰⁰ -13 ⁰⁸	18 ⁰⁰ -22 ⁰⁰			22 ⁰⁰ -06 ⁰⁰		
Measurement date	21.05	22.05	23.05	24.05	21.05	22.05	23.05	22.05	23.05	24.05
Equivalent level L _{Aeq} [dB(A)]	(42.9)	53.0	45.2	(48.1)	44.0	44.8	47.2	40.9	42.8	39.7
Authoritative level L _{Req} [dB(A)]	43	53	45	48	44	45	47	41	43	40
L _{min} ⁽¹⁾ [dB(A)]	30.9	31.4	30.3	32.5	34.6	34.6	34.0	31.5	30.9	31.4
L _{max} ⁽²⁾ [dB(A)]	60.3	80.9	65.9	66.6	64.1	59.0	62.0	54.9	60.1	54.4
L ₁ ⁽³⁾ [dB(A)]	54.0	56.4	57.5	62.3	50.6	56.3	57.2	51.8	55.0	49.3
L ₁₀ ⁽³⁾ [dB(A)]	45.1	46.1	46.2	47.0	44.6	48.0	50.2	44.3	44.8	43.6
L ₅₀ ⁽³⁾ [dB(A)]	37.6	39.5	38.8	39.7	39.0	37.2	41.9	35.2	35.4	34.8
L ₉₀ ⁽³⁾ [dB(A)]	35.7	36.5	36.3	36.6	35.5	35.2	35.8	33.5	33.4	33.0
L ₉₉ ⁽³⁾ [dB(A)]	33.5	34.2	33.8	35.0	34.9	34.7	34.7	32.3	31.9	31.9

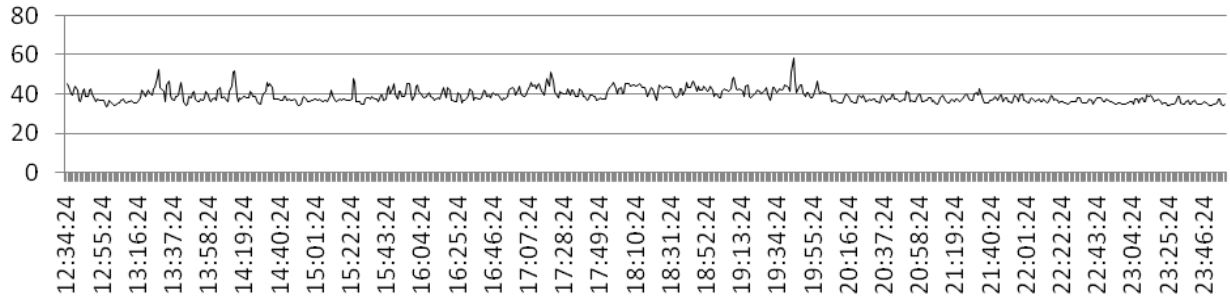
(1) Minimal noise level in the observed time interval

(2) Maximum noise level in the observed time interval

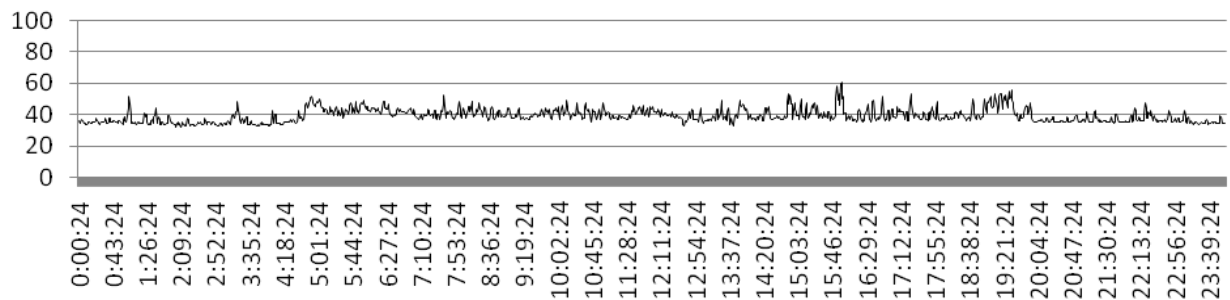
(3) N % noise level L_N (N=1, 10, 50, 90 and 99) in the observed time interval (noise level that has been exceeded in N % of the measured time interval)



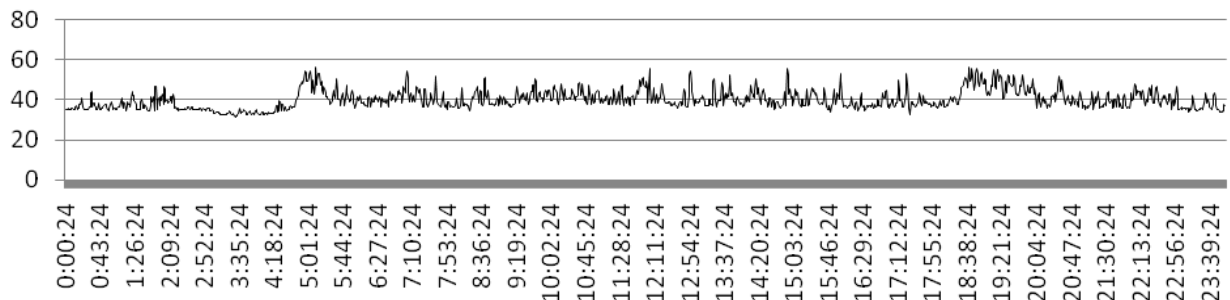
MT3_21.5.2021



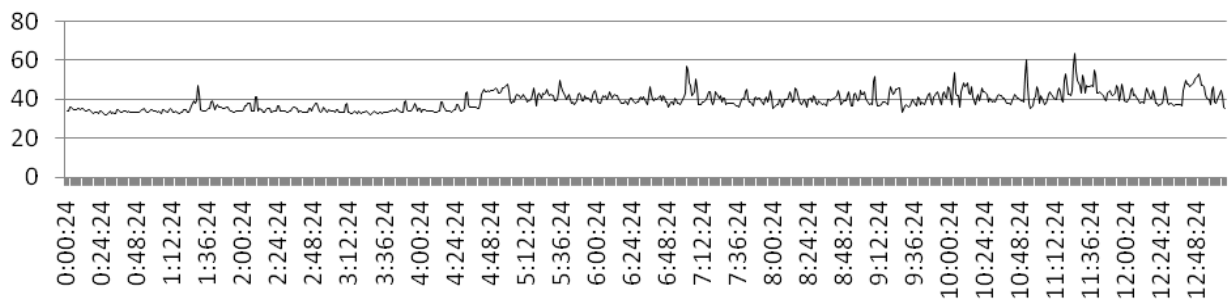
MT3_22.5.2021



MT3_23.5.2021



MT3_24.5.2021



MEASURING PLACE 3 (MT3) – SHORT-TERM MEASUREMENT

MEASURING PLACE 3: At the yard of the house situated in 169 Hunjadi Janoška Street, Zrenjanin

Measuring place: On the perimeter of the parcel of land, at the height of 1.5 m above the ground.

GPS: N 45° 20' 31,83"
E 20° 24' 57,25"

Sources of noise:

DAY: May 21, 2021 (11⁵⁵-12¹¹)

At the moment of measurement, dominant sources of noise were the following: occasional traffic in Hunjadi Janoška Street; sound of trees; birds singing and chirping. Other sources of noise: occasional barking of dogs at the distance; noise from human activities in the adjacent yards, hardly noticeable. These sources of noise did not have significant impact on the measurement results.

DAY: May 24, 2021 (13¹¹-13²⁶)

At the moment of measurement, dominant sources of noise were the following: occasional traffic in Hunjadi Janoška Street; sound of trees; birds singing and chirping; sound of an automatic lawn sprinkler. Other sources of noise: occasional barking of dogs at the distance; noise from human activities in the adjacent yards, hardly noticeable. These sources of noise did not have significant impact on the measurement results.



RESULTS OF THE SHORT-TERM MEASUREMENT IN THE MASURING PLACE 3 (MT3)		
Reference time interval	Daytime (06 ⁰⁰ -18 ⁰⁰)	
Measurement date	May 21, 2021	May 24, 2021
Measurement time interval	11 ⁵⁵ -12 ¹¹	13 ¹¹ -13 ²⁶
Air temperature °C	25.6	24.2
Relative humidity %	54	50
Air pressure hPa	1012.9	1015.9
Wind speed m/s	2.5	0.8
Equivalent level L _{Aeq} [dB(A)]	40.2	40.6
Authoritative level L _{Req} [dB(A)]	40	41
L _{min} ⁽¹⁾ [dB(A)]	32.5	35.0
L _{max} ⁽²⁾ [dB(A)]	64.2	51.1
L ₁ ⁽³⁾ [dB(A)]	47.2	46.4
L ₁₀ ⁽³⁾ [dB(A)]	42.7	42.5
L ₅₀ ⁽³⁾ [dB(A)]	38.6	40.1
L ₉₀ ⁽³⁾ [dB(A)]	36.4	38.1
L ₉₉ ⁽³⁾ [dB(A)]	34,8	37,0

(1) Minimal noise level in the observed time interval

(2) Maximum noise level in the observed time interval

(3) N % noise level L_N (N=1, 10, 50, 90 and 99) in the observed time interval (noise level that has been exceeded in N % of the measured time interval)

MEASURING PLACE 4 (MT4) – CONTINUOUS MEASUREMENT

MEASURING PLACE 4: On the right side of Belgrade-Zrenjanin Highway, on the perimeter of the Ečka-Jugoistok Industrial Zone, across the petrol station of NIS Petrol

Measuring point: At the distance of 41 m from the edge of the carriageway, at the height of 3 m above the ground.

GPS: N 45° 20' 56,96"
E 20° 25' 21,06"

RESULTS OF THE MEASUREMENT IN THE MEASURING PLACE 4

Ref. time interval	Day				Evening			Night		
	14 ⁰⁰ -18 ⁰⁰	06 ⁰⁰ -18 ⁰⁰		06 ⁰⁰ -12 ⁰³	18 ⁰⁰ -22 ⁰⁰			22 ⁰⁰ -06 ⁰⁰		
Measurement date	21.05	22.05	23.05	24.05	21.05	22.05	23.05	22.05	23.05	24.05
Equivalent level $L_{Aeq} [dB(A)]$	(63.2)	62.2	61.2	(62.6)	61.3	60.3	61.8	55.5	55.5	57.2
Authoritative level $L_{Req} [dB(A)]$	63	62	61	63	61	60	62	56	56	57
$L_{min}^{(1)} [dB(A)]$	45.3	42.4	41.6	44.5	42.9	39.9	41.2	35	35.5	33.5
$L_{max}^{(2)} [dB(A)]$	74.2	73.1	76.8	69.2	74.5	68.6	72.8	72.2	68.8	72.2
$L_1^{(3)} [dB(A)]$	70.3	69.4	69.5	68.8	68.4	67.8	67.9	65.0	64.5	66.5
$L_{10}^{(3)} [dB(A)]$	66.2	65.8	65.1	66.5	64.9	63.9	65.1	60.3	60.6	62.0
$L_{50}^{(3)} [dB(A)]$	61.9	60.5	58.0	61.3	58.9	58.3	60.3	47.2	46.9	48.6
$L_{90}^{(3)} [dB(A)]$	53.7	50.7	46.8	49.6	47.5	46.8	51.7	39.8	40.2	38.8
$L_{99}^{(3)} [dB(A)]$	46.2	45.6	43.8	45.4	44.2	41.8	43.6	35.9	36.5	34.9

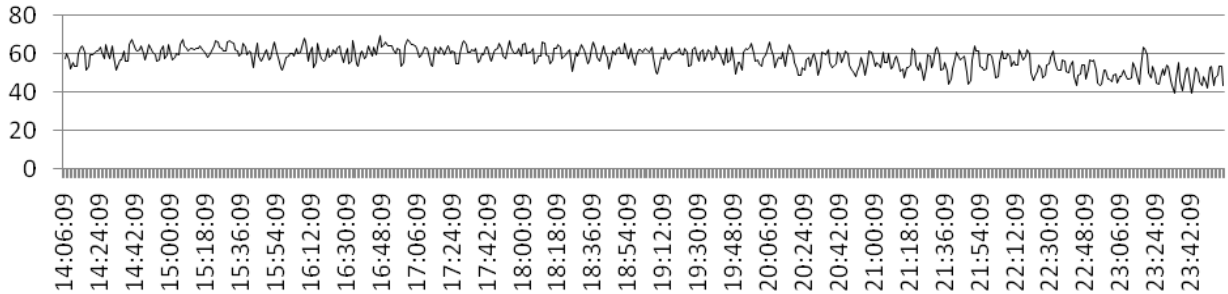
(1) Minimal noise level in the observed time interval

(2) Maximum noise level in the observed time interval

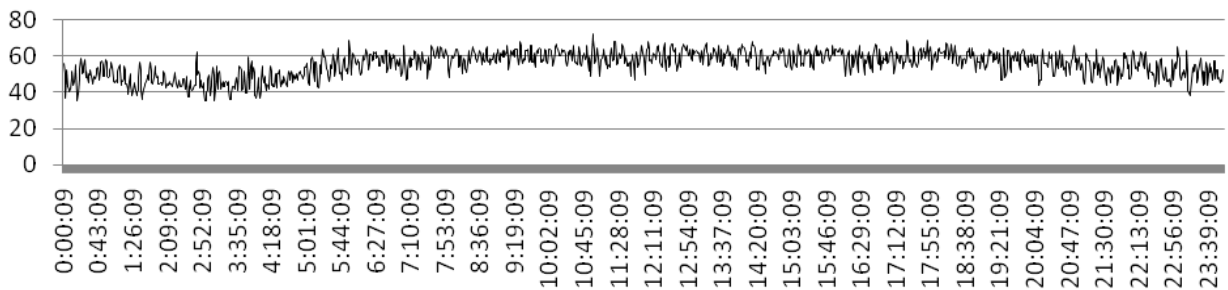
(3) N % noise level L_N (N=1, 10, 50, 90 and 99) in the observed time interval (noise level that has been exceeded in N % of the measured time interval)



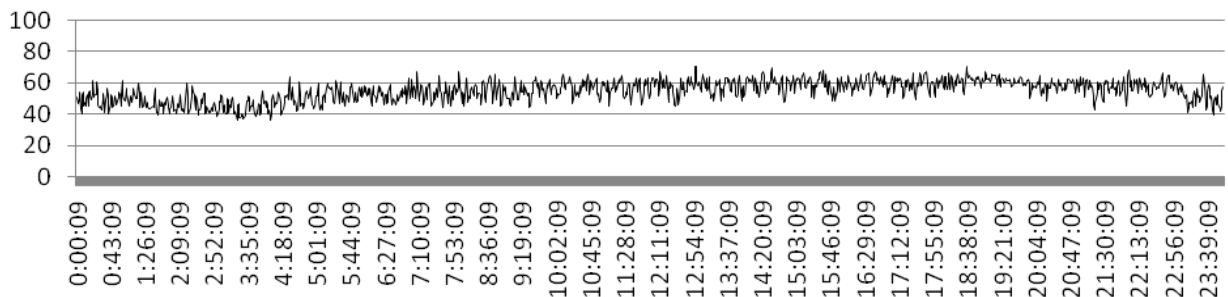
MT4_21.5.2021



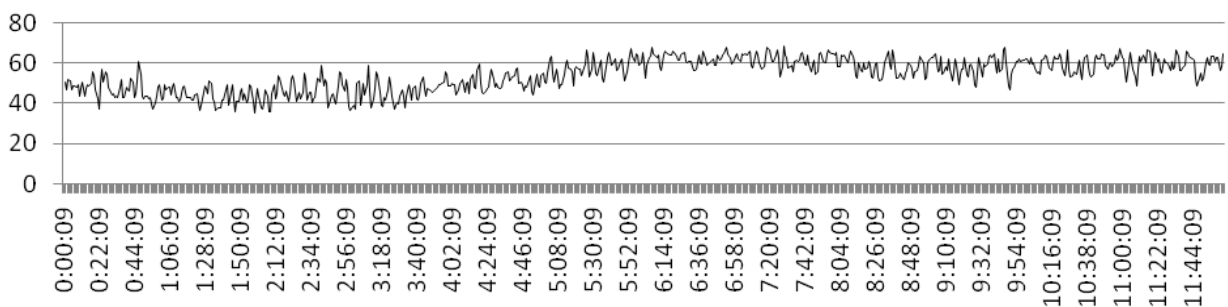
MT4_22.5.2021



MT4_23.5.2021



MT4_24.5.2021



MEASURING PLACE 4 (MT4) – SHORT-TERM MEASUREMENT

MEASURING PLACE 4: On the right side of Belgrade-Zrenjanin Highway, on the perimeter of the Ečka-Jugoistok Industrial Zone, across the petrol station of NIS Petrol

Measuring place: At the distance of 41 m from the edge of the carriageway, at the height of 3 m above the ground.

GPS: N 45° 20' 56,96"
E 20° 25' 21,06"

Sources of noise:

DAY: May 21, 2021 (13³²-13⁴⁷)

At the moment of measurement, dominant sources of noise were the following: traffic on Belgrade-Zrenjanin Highway (243 light vehicles and 36 trucks during the period of 15 minutes); industrial facilities in the vicinity – equable noise. Other sources of noise: wind blows; birds signing in the distance. These sources of noise did not have significant impact on the measurement results.

DAY: May 24, 2021 (12¹⁶-12³¹)

At the moment of measurement, dominant sources of noise were the following: traffic on Belgrade-Zrenjanin Highway (159 light vehicles and 19 trucks during the period of 15 minutes); industrial facilities in the vicinity – equable noise. Other sources of noise: wind blows; birds signing in the distance. These sources of noise did not have significant impact on the measurement results.



RESULTS OF THE SHORT-TERM MEASUREMENTS IN THE MEASURING POINT 4 (MT4)		
Reference time interval	Daytime (06 ⁰⁰ -18 ⁰⁰)	
Measurement date	May 21, 2021	May 24, 2021
Measurement time interval	13 ³² -13 ⁴⁷	12 ¹⁶ -12 ³¹
Air temperature °C	26.7	23.5
Relative humidity %	53	46
Air pressure hPa	1012.2	1015.8
Wind speed m/s	1.5	1.5
Equivalent level L _{Aeq} [dB(A)]	58.0	57.2
Authoritative level L _{Req} [dB(A)]	58	57
L _{min} ⁽¹⁾ [dB(A)]	41.3	37.7
L _{max} ⁽²⁾ [dB(A)]	68.3	77.4
L ₁ ⁽³⁾ [dB(A)]	64.3	66.1
L ₁₀ ⁽³⁾ [dB(A)]	61.0	59.9
L ₅₀ ⁽³⁾ [dB(A)]	56.8	52.9
L ₉₀ ⁽³⁾ [dB(A)]	49.7	45.8
L ₉₉ ⁽³⁾ [dB(A)]	43.8	40.8

(1) Minimal noise level in the observed time interval

(2) Maximum noise level in the observed time interval

(3) N % noise level L_N (N=1, 10, 50, 90 and 99) in the observed time interval (noise level that has been exceeded in N % of the measured time interval)

4. CONCLUSION

In accordance with the systematic 24-hour measuring of the environmental noise level on the territory of the Municipality of Zrenjanin, in the very vicinity of the location designated for the construction of the waste water treatment plant and the Regulations on Methods of Measuring Noise, the Content and Scope of the Noise Measurement Report (*Official Gazette of the Republic of Serbia*, No. 72/10) as well as the Ordinance on Noise Indicators, Limit Values, Methods for the Assessment of Noise Indicators, Disturbing and Harmful Effects of Environmental Noise (*Official Gazette of the Republic of Serbia*, No. 75/10), it may be concluded the following:

- The authoritative noise levels in Measuring Places 1 and 4 (MT1, MT4) **COMPLY WITH** the maximum permitted noise levels in the open, during **daytime and in the evening hours**, in Zone 5 defined pursuant to the Ordinance on Noise Indicators, Limit Values, Methods for the Assessment of Noise Indicators, Disturbing and Harmful Effects of Environmental Noise (*Official Gazette of the Republic of Serbia*, No. 75/10), but **DO NOT COMPLY WITH** the maximum permitted noise value for the night time;
- The authoritative noise levels in Measuring Places 2 and 3 (MT2, MT3) **COMPLY WITH** the maximum permitted noise levels in the open, during **daytime, in the evening hours and during night time** in zones 3, 4 and 5 defined pursuant to the Ordinance on Noise Indicators, Limit Values, Methods for the Assessment of Noise Indicators, Disturbing and Harmful Effects of Environmental Noise (*Official Gazette of the Republic of Serbia*, No. 75/10).

For better understanding of noise levels in a measuring place, besides the equivalent noise level (which serves as the basis for the determination of the authoritative noise level), levels expressed in percentages have to be seen. N % noise level L_N (N=1, 10, 50, 90 and 99) in the observed time interval was the level of noise that has been exceeded in N % of the measured time interval. L_1 and L_{10} express higher levels (events causing noise and individual noise level peaks). L_{90} and L_{99} reflect the basic noise level, which is in this case neighbourhood noise without traffic and short-term events causing noise, originating from activities of people and domestic animals.

Report made by: Vojislav Popović, MScE

Head of Noise Testing Laboratory

Place of seal

Vojislav Popović, MScEE

End of the Noise Measurement Report

5. SCHECULE

5.1 TABLE 1 ORDINANCES ON NOISE INDICATORS

5.1 TABLE 1 ORDINANCE ON NOISE INDICATORS

Table 1 Limit values of noise indicators in the open

Zone	Purpose of the area	Noise level in dB (A)	
		day and night	night
1	Areas designated for leisure time and recreation, hospital zones and recovery facilities, cultural and historical locations, big parks	50	40
2	Tourist areas, camps and school zones	50	45
3	Purely residential areas	55	45
4	Business and residential areas, trade and residential areas and play yards for children	60	50
5	Downtown area, craftsmen', trade and administrative zone with flats, zone along motorways, highways and urban traffic routes	65	55
6	Industrial and warehouse zones, zones designated for servicing and transportation terminals without residential facilities	Along the borderlines of this zone, the noise level must not exceed the noise level limit of the adjacent zone	