Appendix 2 – Noise

Appendix 2.1 Noise Monitoring Methodology

1. Noise monitoring of up to **5 sensitive receptors/locations** along the road within the Project Affected Area (150m either side of road), which have the potential to be affected by the project during either the construction or operational phases. *Noise monitoring at the airport must be included as per EIA public consultation request*.
2. Three (3) locations to be monitored for 3 consecutive daylight hours between 10:00 and 17:00 and for one hour each during the night time: Lastva Grbaljska, Health Care facilities - Polyclinic "Hipokrat" in Radanovici, and Grbalj stadium.
3. Two (2) locations to be monitored for a full 24 hours. : Radanovici School and Tivat Airport
4. Monitoring locations used in the study will be representative of the land uses as defined below where they occur within the study area and would be designed to provide a representative baseline noise climate of the study area covering **both daytime and night-time and weekday and weekend periods**.

    - **Day time and night time (during weekdays)** monitoring needed for the school
    - **Day time, night time and (during weekday and weekend ((saturday))** monitoring needed for all other locations

5. Class 1 data logging sound level meters to be used, set to monitor at 15minute periods and set to record in "A" weighting, Fast response. Sound level meters to record LAeq, LA10, LA90 LMax and LMin to be recorded logged on autorepeat periods.
6. The calibration certification of the measurement tools used will need to be provided. The measurement tools will need to be locally calibrated at the start and end of each survey period, with any deviation from the calibration tone noted and corrected.
7. A grid reference of the actual position used (along with a plan and photos) and detailed subjective field notes of the key sources or any a-typical activities during the surveys to be provided.
8. The data will need to be supplied as excel spreadsheets clearly identified and linked to each monitoring position.

Deliverables

1. Noise monitoring data to be provided by lab and translated by E3 where required
2. Earth Active to review findings
3. E3 to answer any further questions that Earth Active may have.

Appendix 3 - Air

3.1 Air Quality Monitoring Methodology

Objective:

To provide information on the existing air quality in the vicinity of the proposed project, focussing on key pollutants related to traffic.

Method:

Monitoring to be undertaken for PM10, PM2.5, NOx / NO2.

Monitoring to be undertaken in accordance with relevant approved reference method i.e.
EN12341:2014
EN14211: 2012

If approved reference methods cannot be followed then provide explanation of why not and identify any implications with respect to the results obtained.

Monitoring to be undertaken **at three locations:**

- Roadside: within 1 - 5 m of kerb, ideally close to the location of the Radanovici traffic counter.
- Representative sensitive receptor: Radanovici school
- Background: Lastva Grbaljska (aresidential receptor 250 m from the road and not adjacent to any other major roads / land uses that could substantially affect the results)

Deliverables:

1. Results to be provided as concentrations (mg/m3 or microg/m3).
2. Commentary to be provided on the results in relation to compliance with the EU air quality standards.
3. Data and results to be translated into English as necessary.
4. Recommendations for any further monitoring given relatively short monitoring period available.

3.2 Air Quality Monitoring Locations

ANNEX 2. Photos of measuring points with air monitoring equipment

Figures 1-4. Mobile unit and sequential sampling device for particulate matter in the ambient air (measuring point 1)

Figures 5-8. Mobile unit and sequential sampling device for particulate matter in the ambient air (measuring point 2)

Figures 9-10. Mobile unit and sequential sampling device for particulate matter in the ambient air (measuring point 3)

Source: CENTER FOR ECO-TOXICOLOGICAL RESEARCH PODGORICA

3.3 – Air Quality Monitoring- Exec Summary

MEASUREMENT RESULTS

Measurement results of air, baseline condition, on the Tivat-Jaz main road, at three measuring points for a period of seven days (Test report No. 00-45/2 of February 14th 2020.) have been observed in relation to the norms prescribed by the Regulation on determining the types of pollutants, threshold limit values and other air quality standards ("Official Gazette of Montenegro" No. 25/12).

An overview of air quality is given according to the pollutants:

NITROGEN MONOXIDE, NO

No limit values are prescribed for this pollutant. Even so, one-hour mean values for nitrogen monoxide are presented graphically in the Report. Graphically overview was made in order to observe the relation between the measured values of this pollutant at measuring points in the immediate vicinity of the main road and measuring point outside the direct influence of traffic roads.

NITROGEN DIOXIDE, NO_2

Measurement results of nitrogen dioxide (one-hour mean value) were compared with the prescribed limit value for the one-hour mean value (200 µg / m^3).

- All measurements of one-hour mean values of the nitrogen dioxide were below the prescribed limit values during the seven-days measurement (the values are presented only graphically because of the extensive data).

TOTAL NITROGEN OXIDES (NO_X), EXPRESSED AS NO_2 (NO + NO_2)

A critical level for the protection of ecosystems and vegetation of 30 µg/m3, for the annual mean value, is prescribed for NOx. This method of monitoring is only performed at locations outside the direct influence of traffic and other emission sources.

SUSPENDED PARTICULATE MATTER PM_{10}

The daily mean values of PM10 were compared with the prescribed limit value for the daily mean value (50µg / m3). The limit value must not be exceeded more than 35 times during the year.

- All measurements of daily mean values of the suspended particulate matter (PM_{10}), were below the prescribed limit value of 50 g / m^3.

SUSPENDED PARTICULATE MATTER $PM_{2.5}$

Quality standards for suspended particulate matter ($PM_{2.5}$) are prescribed on an annual basis.

Article I. RECOMMENDATION

As stated in the introduction, a request for air measurement and a short time period during which it was necessary to carry out the said tests (baseline condition), does not satisfy the time limit[1] prescribed by the Rulebook on the manner and conditions for monitoring the quality of air ("Official Gazette of Montenegro", No. 21/11, 32/16). We believe that future monitoring and measurement of air quality, during construction work, should be planned in accordance with the Rulebook on the manner and conditions for monitoring the quality of air ("Official Gazette of Montenegro", No. 21/11, 32/16). After completion of the work, it is necessary to perform control measurements in the same positions.

Report prepared by:	
Radomir Zujovic, Air and Working Environment Analysis Division, Head	
Sinisa Popovic, Air and Working Environment Analysis Division, external experts	
Field survey and samples were performed by:	
Ivan Djurovic, chemical field technician	
Petar Galicic, chemical field technician	
Petar Pavicevic, chemical field technician	
Laboratory testing were performed by:	
Sinisa Popovic, Air and Working Environment Analysis Division, external experts	

Source: CENTER FOR ECO-TOXICOLOGICAL RESEARCH PODGORICA

[1] To satisfy the criterion for a time minimum of 14% annually

3.4 Air Quality Monitoring Results

Type of testing	**Immission measurement of ambient air quality. Tivat-Jaz main road - Baseline Conditions**
Number of Report	00-45/2
Date of issue of the report	February 14th 2020
INFORMATION ABOUT ORDERING PARTY	
Name	E3 Consulting – Podgorica
Number and date of the request	00-45 January 15th 2020
Adress and phone/fax	Street Jola Piletica No. 24, Podgorica
INFORMATION ABOUT SAMPLE	
Sampling date	•Measurement point 1, measurement period January 20th - 27th 2020. •Measurement point 2, measurement period January 27th - February 03rd 2020. •Measurement point 3, measurement period February 03rd - 10th 2020.
Sampling method	Rulebook on the manner and conditions for monitoring the quality of air ("Official Gazette of Montenegro", No. 21/11, 32/16)
Type of sampling	Ambient air quality
Testing required	NO, NO_2, PM_{10} , $PM_{2.5}$
Annexes	1. Photos of measuring points with air quality monitoring equipment

Danijela Sukovic
Director, Department of Laboratory Diagnostics and Radiation Protection

Statement:
1. The test results only apply to the tested sample.
2. The Testing Report can only be copied as a whole.
3. The name " LLC Center for Ecotoxicological Research Podgorica" in the text of the declaration or for advertising purposes without the consent of the Center is not allowed.

CONTENT

General information about an authorized organization that performs the measurement

Organization name	Center for Eco-Toxicological Research Podgorica - CETI
Headquarters	Podgorica
Address	Blvd Šarla de Gola No. 2
Phone / fax number	+ 382 (0)20 658 090/ +382 20 658 092
Email	info@ceti.co.me
Contact person	Radomir Žujović

General information on the applicant

Applicant's name	E Consulting
Headquarters	Podgorica
Address	Jola Piletica 24, 81000 Podgorica
Tel./fax	Tel: +382 20 227 501/Fax: +382 20 227 502/Mob: +382 69 459 926
Email	milica.dakovic@e3consulting.co.me
Contact person	Milica Dakovic

Basis for measurement realization

According to the request no 00-45 since January 15th 2020, measurement of zero state of the air quality, on the Tivat-Jaz road section, was performed. The required parameters were measured for seven days at three measuring points.

The Rulebook on the manner and conditions for monitoring the quality of air ("Official Gazette of Montenegro", No. 21/11, 32/16) stipulates that periodic air quality measurements must be evenly distributed throughout the year. That includes the following options:

- 24 hourly measurement once a week during the year, randomly selected day, or
- measuring eight weeks (evenly distributed during the year) so to be representative of different climatic and other conditions, i.e. to meet the criterion for a time minimum of 14% annually.

This method of measurement requires a minimum period of one year, which would significantly affect the time frames for the beginning of works on the Tivat-Jaz boulevard construction. In order to overcome the problem of the time frame, in accordance with the request and the short time period during which it was necessary to carry out the aforementioned measurement, the realization of air quality measurements at three measuring points was started.

The measurement was performed in the following time periods:

- Measurement point 1, measurement period January 20th - 27th 2020.
- Measurement point 2, measurement period January 27th - February 03rd 2020.

- Measurement point 3, measurement period February 03rd - 10th 2020.

Measuring points

Measuring positions, locations for measuring air quality are determined by the contracting authority. The choice of micro-locations in the field was further conditioned by the infrastructure needed for the implementation of monitoring, access roads and available energy connections required for the measuring equipment operation. When establishing measurement sites, the following factors were considered at the micro location: sources of interference, security, access and visibility of the sampling site with respect to the environment. In accordance with the above, air quality measurement equipment, a mobile unit and suspended particulate samplers were installed at the nearest facilities (the closest facilities where it was possible to install the equipment - electrical connection).

The locations, measurement points, where the air quality measurements were made are presented in Table 1 and Figure 1.

Table 1. Measuring points

Measurement point	Latitude	Longitude
Measurement point 1-Radanovici, courtyard of Nikola Djurkovic primary school.	42^0 21’ 38.52’’	18^0 45’ 34.56’’
Measurement point 2-Radanovici, next to the Tivat-Jaz road section (courtyard of Donkovic pottery salon).	42^0 22’ 55.68’’	18^0 44’ 48.52’’
Measurement point 3-Radanovici, about 220m from the main road Tivat-Jaz.	42^0 18’ 38.46’’	18^0 48’ 4.14’’

Description of macrolocation and microlocation

Measurement point 1-Radanovici, courtyard of Nikola Djurkovic primary school. 1-5 m from the main road.
Measurement point 2-Radanovici, courtyard of Donkovic pottery salon. About 1-5 m from the main road.
Measurement point 3, Lastva Grbaljska. About 220m northeast of the main road and about 4700m northeast of the sea. The measuring position is beyond direct influence of traffic roads and other point and surface sources.

Figure 1. Measurement sites

Source: Google Earth

Measured pollutants

Monitoring included the measurement of basic pollutants in accordance with the requirement presented in table 2:

Table 2- Measurement /pollutants analyzed

Ordinal number	Formula	Name of pollutant	Unit of measurement	Averaging time
1.	NO	Nitrogen monoxide	µg/m^3	1h/24h
2.	NO_2	Nitrogen dioxide	µg/m^3	1h/24h
3.	NO_X	The total concentration of nitrogen oxides expressed as NO2	µg/m^3	1h/24h
4.	PM_{10}	Suspended particles with diameter less than 10 µm	µg/m^3	24h
5.	$PM_{2.5}$	Suspended particles with diameter less than 2.5 µm	µg/m^3	24h

Methods

The following methods, shown in Table 3, were used to carry out measurements in accordance with the Rulebook on the manner and conditions for monitoring the quality of air ("Official Gazette of Montenegro", No. 21/11, 32/16).

Table 3. Used measurement methods

Standard reference method / name	**Label**
Standard method for the measurement of the concentration of nitrogen dioxide and nitrogen monoxide by chemiluminescence	MEST EN 14211:2014
Standard method for the measurement of the concentration of carbon monoxide by non-dispersive infrared spectroscopy	MEST EN 14626:2014
Standard gravimetric measurement method for the determination of the PM10 or PM2,5 mass concentration of suspended particulate matter	MEST EN 12341:2016

The methods listed in Table 3 are accredited in accordance with the MEST ISO / IEC 17025: 2011 standard by the Accreditation Body of Montenegro.

Equipment used in the measurement

Measurements were made with a mobile unit equipped with an air sampling system and measuring equipment for gaseous pollutants, PM_{10} and $PM_{2.5}$ sampling, and the analysis of the collected samples was performed with laboratory equipment, Table 4.

Tabele 4. Equipment list

Measuring/field equipment			
Ordinal number	**Name of measuring devices**	**Manufacturer**	**Model**
1.	Ambient NOx monitor	Horiba	APNA 370
2.	System for sampling of PM10 suspended particulate	TCR Tecora	Sky Post
Laboratory equipment			
3.	Analytical balance Sartorius (type: BP 211 D; accuracy class I, minimum fraction d = 0.00001 g)		

The measurement uncertainty of the instruments satisfy the data quality objectives. It has been evaluated on the basis of type approvals and performance tests in reference laboratories, in accordance with relevant standards.

Legislation

Indicative imission measurements, processing and analysis of results were performed in accordance with:

- Law on air protection („Official Gazette of Montenegro “, No. 25/10, 40/11, 43/15)
- Regulation on determining the types of pollutants, threshold limit values and other air quality standards ("Official Gazette of Montenegro", No 25/12)

- Rulebook on the manner and conditions for monitoring the quality of air ("Official Gazette of Montenegro", No. 21/11, 32/16).
- Regulation on the establishment of a network of measuring points for monitoring air quality ("Official Gazette of Montenegro", 44/10 and 13/11)

Measurement result

This Report presents the results of seven days of air quality measurements carried out at three measurement points. The measurement results are presented in parallel with the prescribed limit values as follows:

a) tabular:

- Daily mean value during the seven-days measurement for NO, NO_2, NOx, suspended particles PM_{10}, $PM_{2.5.}$

b) graphic:

- One-hour mean value NO and NO_2
- Daily mean value of suspended particles PM_{10}

Tabular overview of measurement results, measuring point 1

The mean daily values of suspended particulate matter PM_{10}, $PM_{2.5}$ and gaseous pollutants: nitrogen monoxide, nitrogen dioxide and total nitrogen oxides are shown in Table 5.

Table 5. Daily mean values of PM_{10}, $PM_{2.5}$, NO, NO_2

Measured period	PM_{10}	$PM_{2.5}$	NO	NO_2	NO_X
	µg/m3				
20-21.01	12.91	10.73	24.35	18.88	56.13
21-22.01	13.80	10.27	24.17	18.27	55.25
22-23.01	19.35	14.82	29.79	20.06	65.65
23-24.01	16.73	12.09	28.67	23.17	67.04
24-25.01	28.27	19.09	25.84	28.74	68.28
25-26.01	15.80	9.78	13.77	24.17	45.24
26-27.01	9.00	6.27	11.53	17.61	35.24
Limit Value (daily mean value)	50				
Limit value (annual mean value)	40	25		40	
Critical level for the protection of ecosystems and vegetation					30

(Annual mean value)					

Statistical processing of mean daily values of suspended particulate matter PM_{10}, $PM_{2.5,}$ and one-hour mean values of nitrogen dioxide are shown in Tables 6, 7 and 8.

Table 6. Statistical processing of PM10 suspended particulate measurement results

Number of 24-hour measurements		7
Minimum 24-hour value (μg/m^3)		9.00
Maximum 24-hour value (μg/m^3)		28.27
Mean 24-hour averaging time (μg / m3)		16.55
Median 24-hour averaging time (μg / m3)		15.80
Number of exceedances of the 24-hour limit value		0
Limit values		
Averaging time	Limit value	Acceptable limits
Daily mean value	50 μg/m^3	It must not be exceeded more than 35 times a year
Annual mean value	40 μg/m^3	None

Table 7. Statistical processing of PM 2.5 suspended particulate measurement results

Number of 24-hour measurements		7
Minimum 24-hour value (μg/m3)		6.27
Maximum 24-hour value (μg/m3)		19.09
Mean 24-hour averaging time (μg / m3)		11.86
Median 24-hour averaging time (μg / m3)		10.73
Limit values		
Averaging time	Limit value	Acceptable limits
Annual mean value	25 μg/m^3	None
Target value (health protection)		
Annual mean value	25 μg/m^3	

Table 8. Statistical processing of nitrogen dioxide measurements results

Number of one-hour measurements		168
Minimum one-hour mean value (μg/m^3)		2.75
Maximum one-hour mean value (μg/m^3)		65.69
Mean value of the one-hour average time (μg/m^3)		21.56
Median of the one-hour average time		19.02
Number of exceedance of one-hour limit value		0
Mean value of the NO_X ($NO+NO_2$) (μg/m^3)		56.12
Limit values		
Averaging time	Limit value	Acceptable limit
One-hour mean value	200 μg/m^3	It must not be exceeded more than 18 times a year
Annual mean value	40 μg/m^3	None

Graphical overview of measurement results at the measuring point 1:

- One-hour mean values of nitrogen monoxide and nitrogen dioxide (Figures 2 and 3)
- Daily mean values of PM_{10} during a measuring period of seven-days (Figure 4)

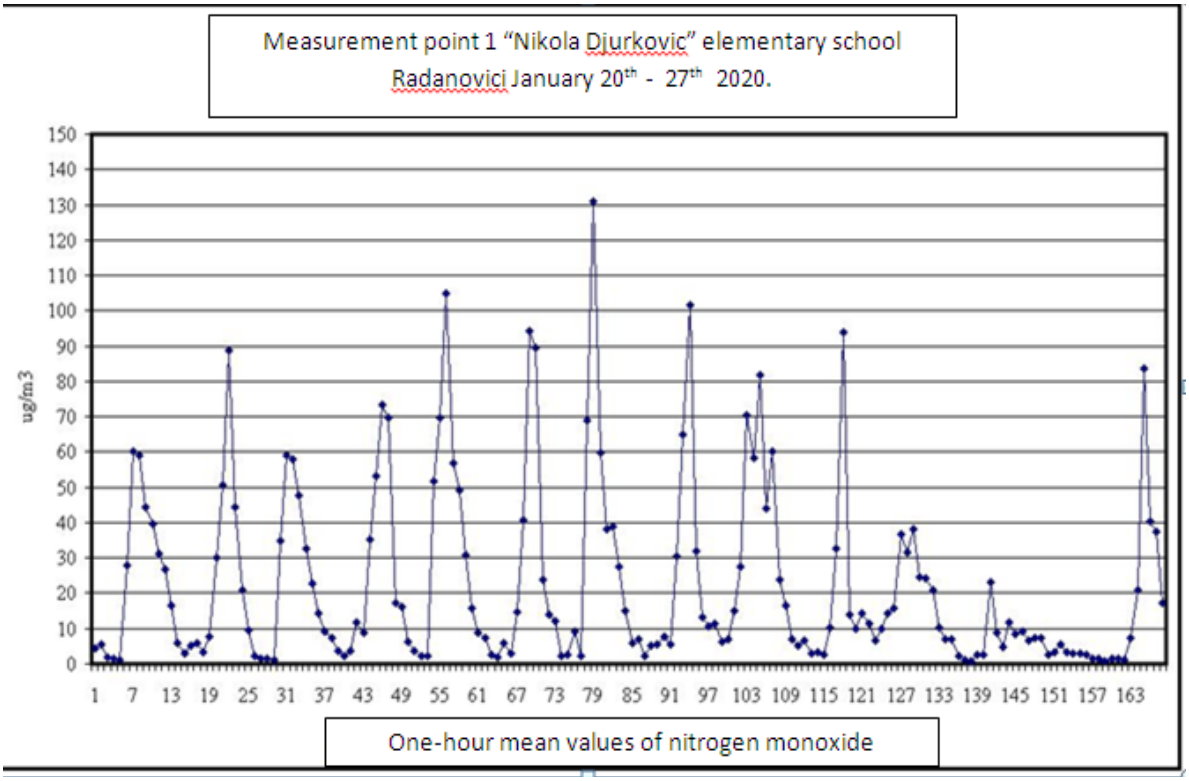

Figure 2. One-hour mean values of nitrogen monoxide

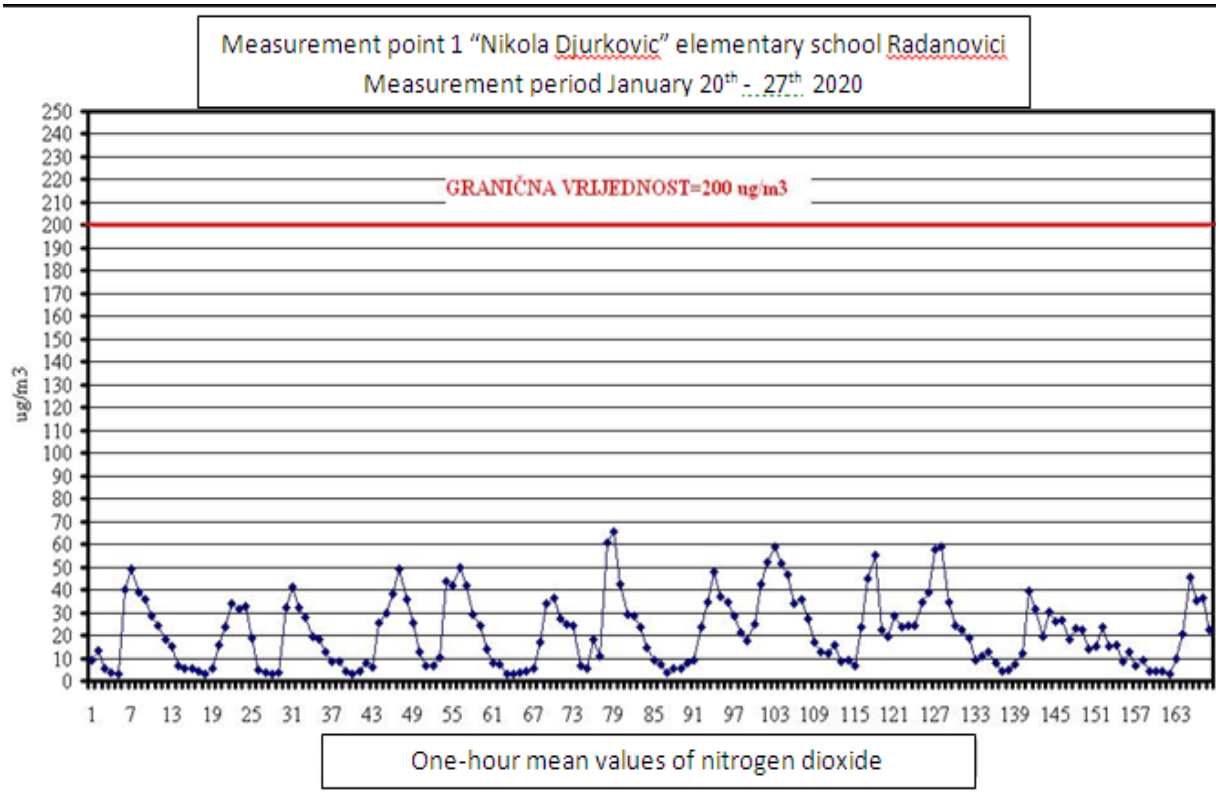

Figure 3. One-hour mean values od nitrogen dioxide

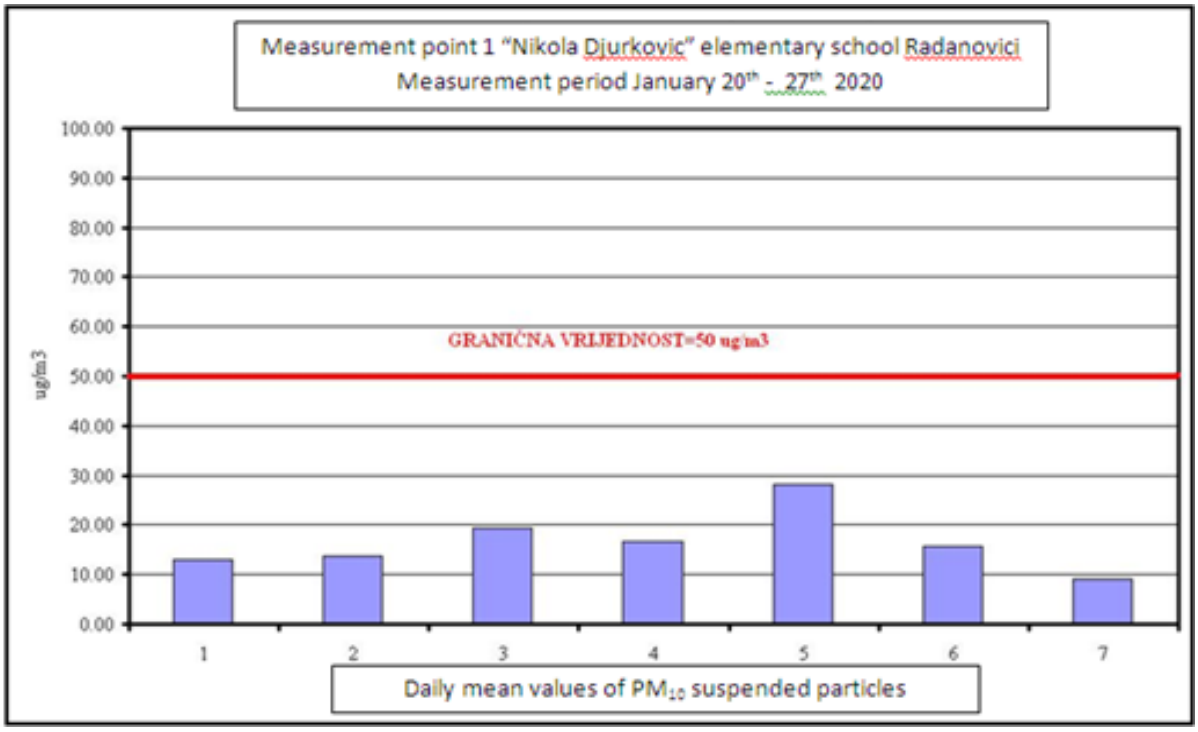

Figure 4. Daily mean values of PM_{10} suspended particles

Tabular overview of measurement results, measuring point 2

Daily mean values of suspended particulate matter PM_{10}, $PM_{2.5}$ and gaseous pollutants: nitrogen monoxide, nitrogen dioxide and total nitrogen oxides are shown in Table 9.

Table 9.Daily mean values of PM_{10}, $PM_{2.5}$, NO, NO_2

Measurement period	PM_{10}	$PM_{2.5}$	NO	NO_2	NO_x
	$\mu g/m^3$				
27-28.01	14.45	11.73	28.26	21.08	64.31
28-29.01	12.87	9.24	13.12	18.10	38.82
29-30.01	13.52	10.25	21.38	19.96	52.68
30-31.01	20.00	14.90	33.94	27.53	79.46
31.01-01.02	26.18	16.46	30.58	29.45	76.23
01-02.02	27.09	18.07	27.40	29.36	71.28
02-03.02	26.30	15.91	29.91	25.42	71.18
Limit value (Daily mean value)	50				
Limit value (Annual mean value)	40	25		40	
Critical level for the protection of ecosystems and vegetation (Annual mean value)					30

Statistical processing of the daily mean values of suspended particles PM10, PM2.5 and one-hour mean values of nitrogen dioxide are shown in Tables 10, 11 and 12.

Table 10. Statistical processing of PM_{10} suspended particulate measurement results

Number of 24-hour measurements		7
Minimum 24-hour value ($\mu g/m^3$)		12.87
Maximum 24-hour value ($\mu g/m^3$)		27.09
Mean 24-hour averaging time (µg / m3)		20.06
Median 24-hour averaging time (µg / m3)		20.00
Number of exceedances of the 24-hour limit value		0
Limit values		
Averaging time	Limit value	Acceptable limits
Daily mean value	50 $\mu g/m^3$	It must not be exceeded more than 35 times a year
Annual mean value	40 $\mu g/m^3$	None

Table 11. Statistical processing of $PM_{2.5}$ suspended particulate measurement results

Number of 24-hour measurements		7
Minimum 24-hour value (µg/m3)		9.24
Maximum 24-hour value (µg/m3)		18.07
Mean 24-hour averaging time (µg / m3)		13.79
Median 24-hour averaging time (µg / m3)		13.79
Limit values		
Averaging time	Limit value	Acceptable limits
Annual mean value	25 µg/m^3	None
Target value (health protection)		
Annual mean value	25 µg/m^3	

Table 12. Statistical processing of nitrogen dioxide measurements results

Number of one-hour measurements		168
Minimum one-hour mean value (µg/m^3)		2.99
Maximum one-hour mean value (µg/m^3)		67.16
Mean value of the one-hour average time (µg/m^3)		24.41
Median of the one-hour average time		22.15
Number of exceedance of one-hour limit value		0
Mean value of the NO_X ($NO+NO_2$) (µg/m^3)		64.85
Limit values		
Averaging time	Limit value	Acceptable limit
One-hour mean value	200 µg/m^3	It must not be exceeded more than 18 times a year
Annual mean value	40 µg/m^3	None

Graphical overview of measurement results at the measuring point 2:

- One-hour mean values of nitrogen monoxide and nitrogen dioxide (Figures 5 and 6)
- Daily mean values of PM10 during a measuring period of seven-days (Figure 7)

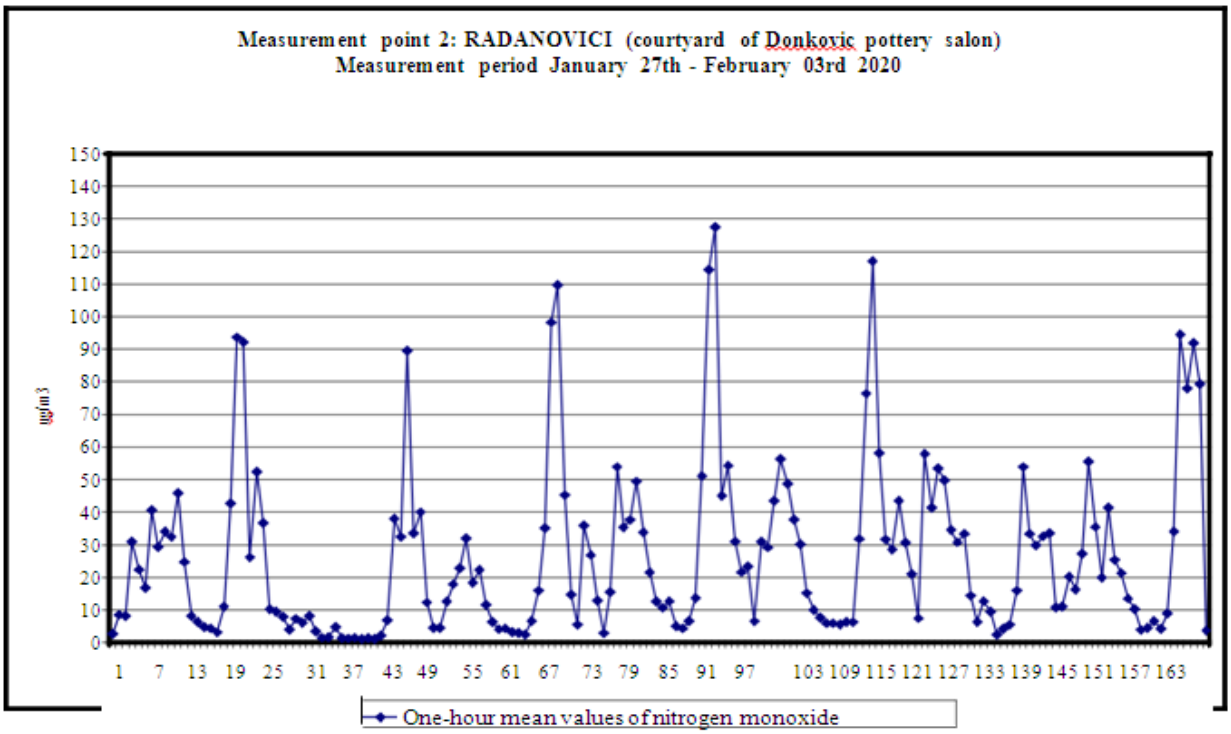

Figure 5: One-hour mean values of nitrogen monoxide

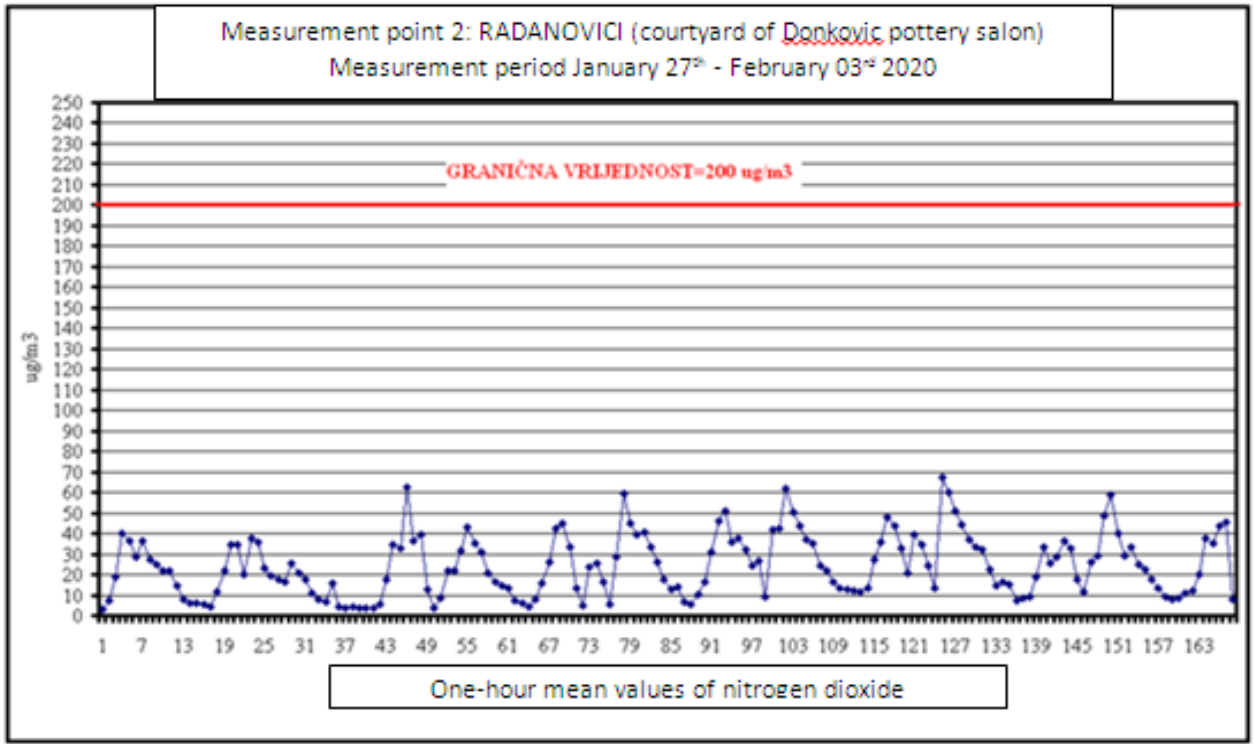

Figure 6: One-hour mean values of nitrogen dioxide

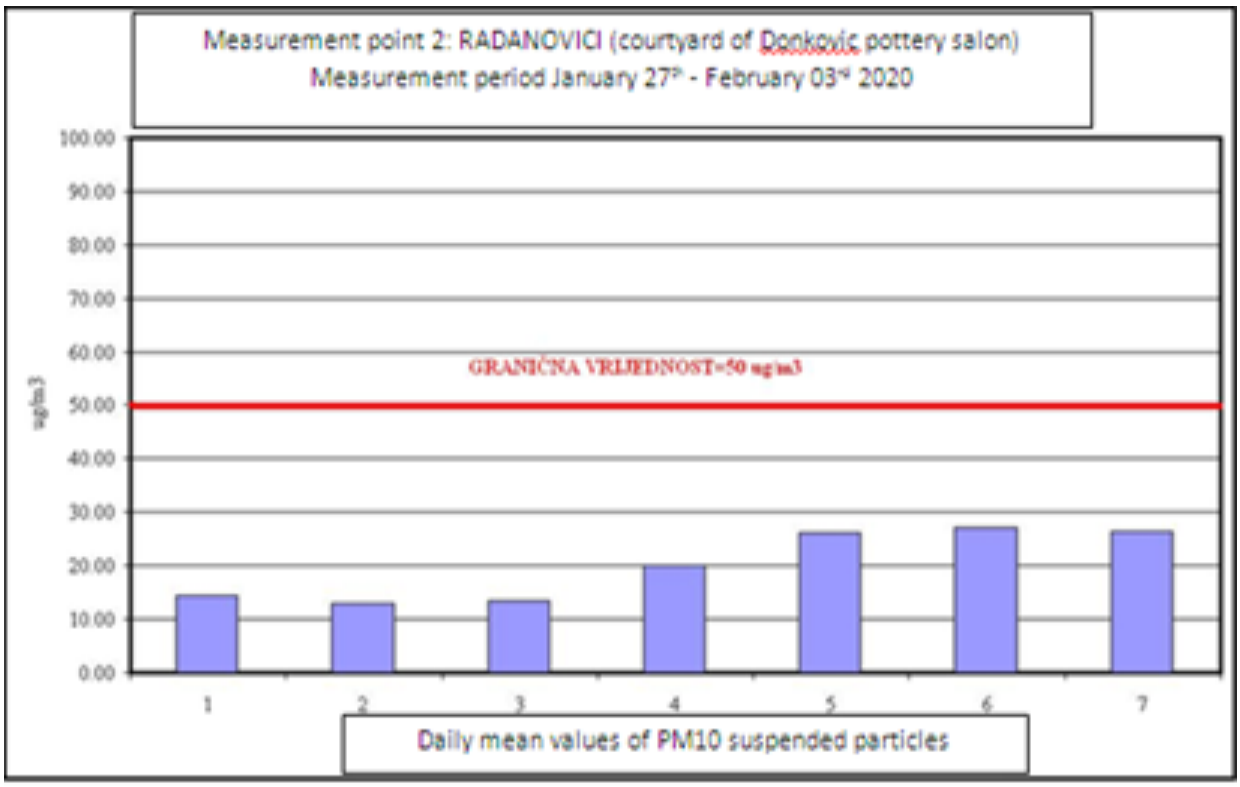

Figure 7: Daily mean values of PM10 suspended particles

Tabular overview of measurement results, measuring point 3

Daily mean values of suspended particulate matter PM10, PM2.5 and gaseous pollutants: nitrogen monoxide, nitrogen dioxide and total nitrogen oxides are shown in Table 13.

Table 13. Daily mean values of PM_{10}, $PM_{2.5}$, NO, NO_2

Measurement period	PM_{10}	$PM_{2.5}$	NO	NO_2	NO_x
	$\mu g/m^3$				
03-04.02	17.09	14.36	1.84	10.32	13.13
04-05.02	11.85	8.73	1.19	2.80	4.86
05-06.02	9.44	6.36	1.41	2.23	4.38
06-07.02	13.98	10.88	1.80	6.90	9.66
07-08.02	11.45	6.87	6.78	16.49	26.86
08-09.02	9.18	7.64	5.23	13.35	21.35
09-10.02	17.10	14.13	2.79	12.25	16.52
Limit value (Daily mean value)	50				
Limit value (annual mean value)	40	25		40	
Critical level for					30

the protection of ecosystems and vegetation (Annual mean value)					

Statistical processing of the daily mean values of suspended particles PM_{10}, $PM_{2.5}$ and one-hour mean values of nitrogen dioxide are shown in tables 14, 15 and 16.

Table 14. Statistical processing of PM_{10} suspended particulate measurement results

Number of 24-hour measurements		7
Minimum 24-hour value (µg/m^3)		9.18
Maximum 24-hour value (µg/m^3)		17.10
Mean 24-hour averaging time (µg / m3)		12.87
Median 24-hour averaging time (µg / m3)		11.85
Number of exceedances of the 24-hour limit value		0
Limit values		
Averaging time	Limit value	Acceptable limits
Daily mean value	50 µg/m^3	It must not be exceeded more than 35 times a year
Annual mean value	40 µg/m^3	None

Table 15. Statistical processing of $PM_{2.5}$ suspended particulate measurement results

Number of 24-hour measurements		7
Minimum 24-hour value (µg/m3)		6.36
Maximum 24-hour value (µg/m3)		14.36
Mean 24-hour averaging time (µg / m3)		9.85
Median 24-hour averaging time (µg / m3)		8.73
Limit values		
Averaging time	Limit value	Acceptable limits
Annual mean value	25 µg/m^3	None
Target value (health protection)		
Annual mean value	25 µg/m^3	

Table 16. Statistical processing of nitrogen dioxide measurements results

Number of one-hour measurements		164
Minimum one-hour mean value (µg/m^3)		0.36
Maximum one-hour mean value (µg/m^3)		46.67
Mean value of the one-hour average time (µg/m^3)		9.37
Median of the one-hour average time		5.48
Number of exceedance of one-hour limit value		0
Mean value of the NO_X ($NO+NO_2$) (µg/m^3)		13.82
Limit values		
Averaging time	Limit value	Acceptable limit
One-hour mean value	200 µg/m^3	It must not be exceeded more than 18 times a year
Annual mean value	40 µg/m^3	None

Graphical overview of measurement results at the measuring point 3:

- One-hour mean values of nitrogen monoxide and nitrogen dioxide (Figures 8 and 9)
- Daily mean values of PM_{10} during a measuring period of seven-days (Figure 10)

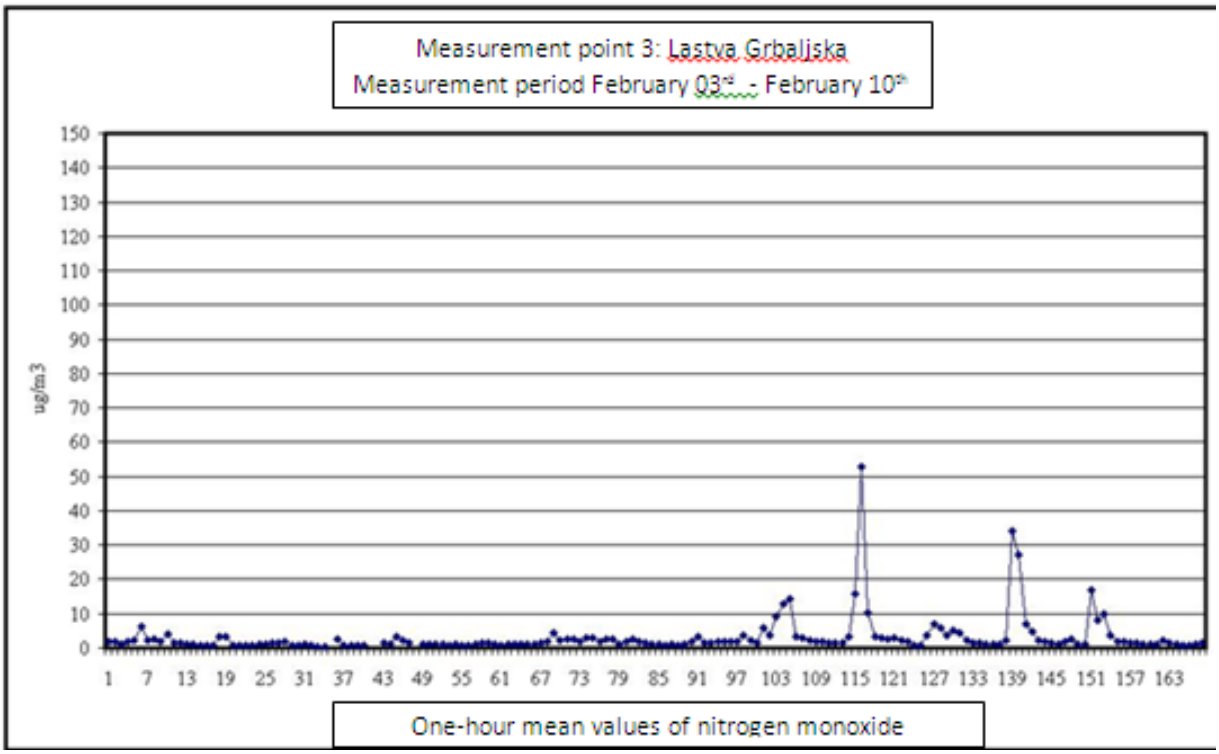

Figure 8: One-hour mean values of nitrogen monoxide

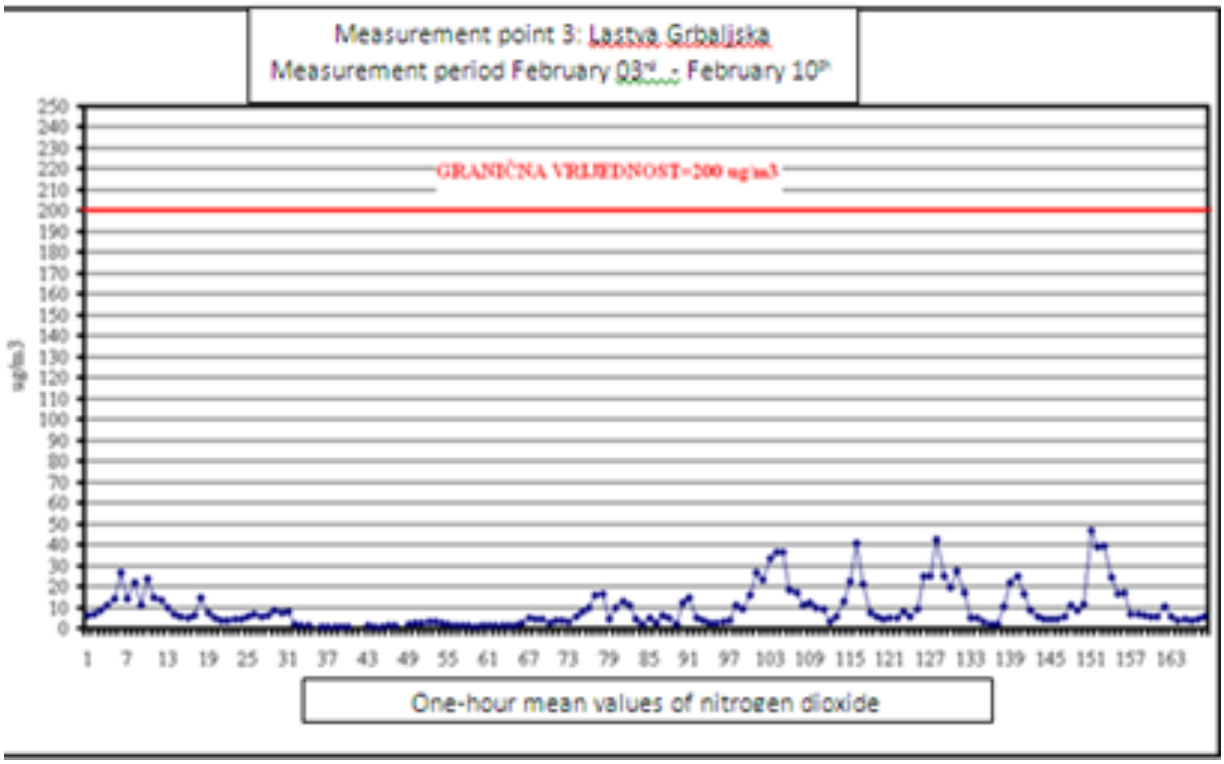

Figure 9: One-hour mean values of nitrogen dioxide

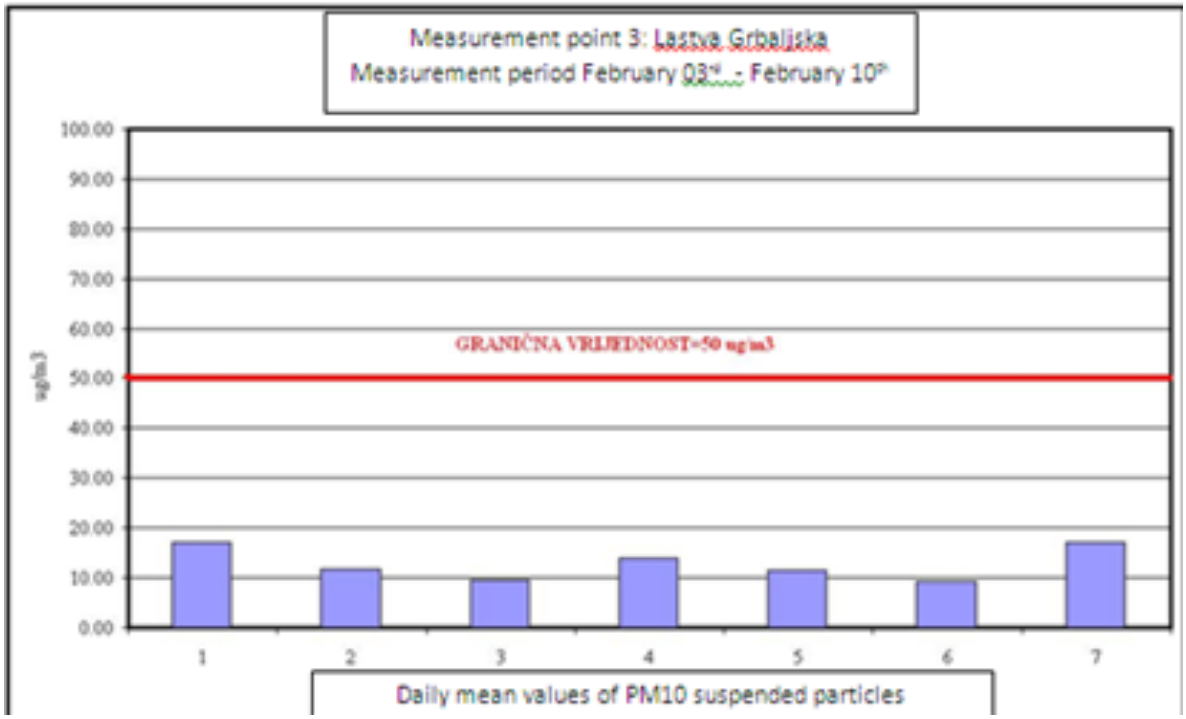

Figure 10. Daily mean values of PM_{10} suspended particles

Prepared by:	
Radimir Zujovic, Air and Working Environment Analysis Division, Head	
Sinisa Popovic, Air and Working Environment Analysis Division, external experts	
Field survey and samples were performed by:	
Radimir Zujovic, Air and Working Environment Analysis Division, Head	
Ivan Djurovic, chemical field technician	
Petar Galicic, chemical field technician	
Petar Pavicevic, chemical field technician	
Laboratory testing were performed by:	
Sinisa Popovic, Air and Working Environment Analysis Division, external experts	

Appendix 4 – Water

4.1 Water Quality Assessment Methodology

Objective: To determine status of (including existing water quality in) watercourses into which stormwater may drain from the upgraded road, especially those with the potential to affect the Tivat Sailine Ramsar site.

Approach
At each of the three rivers that the road crosses before draining into the Tivat Saline Ramsar site (ie Kolozun, Gradiosnica, Vodoljeznica) water quality sampling will be undertaken as outlined below.
4 samples in total

1. Kolozun river - upstream of the road,
2. Kolozun river - downstream of the road.
3. Gradiosnica river branch that flow directly to the sea - upstream of the road,
4. Gradiosnica river branch that flow directly to the sea - downstream from the road.

As we assume that the sampling can be done alongside the habitat mapping, further sampling should also be obtained if there are any areas where aquatic habitat looks particularly sensitive (E3 to advise).

During sampling the surveyors should take note of channel depth and width and water flow rate.
The following parameters should be tested for:

- General condition (DO, COD, pH, TSS)
- Metals (Cd, Cu, Zn)
- Hydrocarbons (TPH) BaP
- Nutrients (NH_4, NO_2, NO_3, Total P)

Deliverables

1. E3 to provide a brief summary of water quality results including analysis (and if needed translation) of data provided by lab
2. Earth Active to review findings
3. E3 to answer any further questions that Earth Active may have.

4.1 Water Quality Monitoring Results

LLC Center for Ecotoxicological Research Podgorica

SECTOR FOR LABORATORY DIAGNOSTICS AND RADIATION PROTECTION

TESTING REPORT

Type of test	Physico-chemical testing of surface waters
Number of Report	49/04/1
Date of issue of the report	January 28th 2020

INFORMATION ABOUT ORDERING PARTY AND USER OF SERVICE	
Name	E3 CONSULTING
Number of request/contract	00-45/1
Date of request submission	January 16th 2020

INFORMATION ABOUT SAMPLE	
Sampling date	January 20th 2020
Sample type	**Surface water**
Testing required	Physical and chemical analysis
Sampling carried out by	Petar Galicic, Ivan Djurovic, Ilija Resetar
Number of protocols in CETI	49/04

Statement:

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LLC Center for Ecotoxicological Research Podgorica

UNIT FOR CHEMICAL ANALYTICS, UNIT FOR ANALYTICS OF CHEMICAL ELEMENTS

RESULTS OF PHYSICAL-CHEMICAL ANALYSIS

Number of protocol	**49/04**						
Sampling date	**January 20th 2020**						
Sampling location	**Surface water Gradiosnica downstream (a branch toward the sea, downstream from the bridge)**						
Coordinates	**42° 24' 51.109" 018° 43' 3.576"**						
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC A1**	**MPC A2**	**MPC A3**	**Method mark**
Total suspended matter	mg/l	<0,2	*0*	*10*	*20*	*50*	SMVP.133
pH		7,9±0,3	*6,8-8,3*	*6,8-8,5*	*6,5-8,5*	*5,5-9*	MESTENISO 10523:2013*
Nitrates	mg/l	4,7±0,3	*10*	*20*	*25*	*50*	SMEW4500NO3B*
Nitrites	mg/l	<0,001	*<G,D,*	*0,003*	*0,005*	*0,02*	SMEW4500NO2B *
Copper	mg/l	0,011±0,001	*0,005*	*0,02*	*0,05*	*1*	MEST EN ISO 17294-2:2013*
Zinc	mg/l	0,023±0,001	*0,01*	*0,05*	*1*	*5*	MEST EN ISO 17294-2:2013*
Cadmium	mg/l	<0,0001	*0,000*	*0,001*	*0,005*	*0,005*	MEST EN ISO 17294-2:2013*
Total phosphorus	mg/l	0,13±0,01					
COD	mg/l 02	7,7±0,4	*1*	*2*	*4*	*8*	MEST ISO 6060:2011*
Dissolved oxygen	mg/l 02	11,7					SMVP.150
Ammonium ion	mg/l	0,11±0,02	*0,00*	*0,02*	*0,05*	*1*	SMVP.179*

Note: *- accredited method
GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

UNIT FOR ANALYTICS IN GAS CHROMATOGRAPHY AND PREPARATION OF ENVIRONMENTAL SAMPLES

CHEMICAL ANALYSIS RESULTS

Number of protocol		**49/04**					
Sampling date		**January 20th 2020**					
Sampling location		**Surface water Gradiosnica downstream (a branch toward the sea, downstream from the bridge)**					
Coordinates		**42° 24' 51.109" 018° 43' 3.576"**					
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC A1**	**MPC A2**	**MPC A3**	**Method mark**
Polycyclic aromatic hydrocarbons	mg/l	<0,00005	*<G.D.*	*0,0002*	*0,0002*	*0,001*	SMEW.6440C*
Naphtalene	mg/l	<0,000005					SMEW.6440C*
2-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
1-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
Acenaphtylene	mg/l	<0,000005					SMEW.6440C*
Acenaphtene	mg/l	<0,000005					SMEW.6440C*
Fluorene	mg/l	<0,000005					SMEW.6440C*
Phenanthrene	mg/l	<0,000005					SMEW.6440C*
Anthracene	mg/l	<0,000005					SMEW.6440C*
Fluoranthene	mg/l	<0,000005					SMEW.6440C*
Pyrene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)anthracene	mg/l	<0,000005					SMEW .6440C'*
Chrysene	mg/l	<0,000005					SMEW.6440C*
Benzo(b)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(k)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)pyrene	mg/l	<0,000005					SMEW.6440C*
Indeno(l,2,3-cd)pyrene	mg/l	<0,000005					SMEW.6440C*
Dibenzo(a,h)anthracene	mg/l	<0,000005					SMEW.6440C*
Benzo(g,h,i)perylene	mg/l	<0,000005					SMEW.6440C*
Total mineral oils	mg/l	<0,01	*<G.D*	*0,01*	*0,05*	*0,5*	DIN EN ISO 9377-2:2001*

Note: *- accredited method

GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

CONCLUSION

According to the results of physical and chemical analyze of sample of the surface water **Gradiosnica downstream** (a branch toward the sea, downstream from the bridge), at the request of E3 CONSULTING (no. of protocol CETI 49/04), **MEETS the A3** class of the Regulation on the classification and categorization of surface and ground water (Official Gazette of Montenegro no. 02/07).

LLC Center for Ecotoxicological Research Podgorica

SECTOR FOR LABORATORY DIAGNOSTICS AND RADIATION PROTECTION

TESTING REPORT

Type of test	Physico-chemical testing of surface waters
Number of Report	46/04/1
Date of issue of the report	January 28th 2020

INFORMATION ABOUT ORDERING PARTY AND USER OF SERVICE	
Name	E3 CONSULTING
Number of request/contract	00-45/1
Date of request submission	January 16th 2020

INFORMATION ABOUT SAMPLE	
Sampling date	January 20th 2020
Sample type	**Surface water**
Testing required	Physical and chemical analysis
Sampling carried out by	Petar Galicic, Ivan Durovic, Ilija Resetar
Number of protocols in CETI	46/04

Statement:

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UNIT FOR CHEMICAL ANALYTICS, UNIT FOR ANALYTICS OF CHEMICAL ELEMENTS

RESULTS OF PHYSICAL-CHEMICAL ANALYSIS

Number of protocol	**46/04**						
Sampling date	**January 20th 2020**						
Sampling location	**Surface water Gradiosnica downstream (part of the Gradiosnica River that flows towards Saline - downstream)**						
Coordinates	**42° 23' 41.118" 018° 43' 32.588"**						
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC A1**	**MPC A2**	**MPC A3**	**Method mark**
Total suspended matter	mg/l	**14,7**	*0*	*10*	*20*	*50*	SMVP.133
pH		**7,7±0,3**	*6,8-8,3*	*6,8-8,5*	*6,5-8,5*	*5,5-9*	MESTENISO 10523:2013*
Nitrates	mg/l	**1,50±0,10**	*10*	*20*	*25*	*50*	SMEW4500NO3B*
Nitrites	mg/l	**<0,001**	*<GD*	*0,003*	*0,005*	*0,02*	SMEW4500NO2B *
Copper	mg/l	**0,0020±0,0001**	*0,005*	*0,02*	*0,05*	*1*	MEST EN ISO 17294-2:2013*
Zinc	mg/l	**0,0030±0,0001**	*0,01*	*0,05*	*1*	*5*	MEST EN ISO 17294-2:2013*
Cadmium	mg/l	**<0,0001**	*0,000*	*0,001*	*0,005*	*0,005*	MEST EN ISO 17294-2:2013*
Total phosphorus	mg/l	**0,082±0,007**					
COD	mg/l 02	**5,8±0,3**	*1*	*2*	*4*	*8*	MEST ISO 6060:2011*
Dissolved oxygen	mg/l 02	**10,4**					SMVP.150
Ammonium ion	mg/l	**0,24±0,03**	*0,00*	*0,02*	*0,05*	*1*	SMVP.179*

Note: *- accredited method
GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

UNIT FOR ANALYTICS IN GAS CHROMATOGRAPHY AND PREPARATION OF ENVIRONMENTAL SAMPLES

CHEMICAL ANALYSIS RESULTS

Number of protocol		**46/04**					
Sampling date		**January 20th 2020**					
Sampling location		**Surface water Gradiosnica downstream (part of the Gradiosnica River that flows towards Saline - downstream)**					
Coordinates		**42° 23' 41.118" 018° 43' 32.588"**					
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC A1**	**MPC A2**	**MPC A3**	**Method mark**
Polycyclic aromatic hydrocarbons	mg/l	<0,00005	*<G.D.*	*0,0002*	*0,0002*	*0,001*	SMEW.6440C*
Naphtalene	mg/l	<0,000005					SMEW.6440C*
2-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
1-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
Acenaphtylene	mg/l	<0,000005					SMEW.6440C*
Acenaphtene	mg/l	<0,000005					SMEW.6440C*
Fluorene	mg/l	<0,000005					SMEW.6440C*
Phenanthrene	mg/l	<0,000005					SMEW.6440C*
Anthracene	mg/l	<0,000005					SMEW.6440C*
Fluoranthene	mg/l	<0,000005					SMEW.6440C*
Pyrene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)anthracene	mg/l	<0,000005					SMEW .6440C'*
Chrysene	mg/l	<0,000005					SMEW.6440C*
Benzo(b)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(k)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)pyrene	mg/l	<0,000005					SMEW.6440C*
Indeno(l,2,3-cd)pyrene	mg/l	<0,000005					SMEW.6440C*
Dibenzo(a,h)anthracene	mg/l	<0,000005					SMEW.6440C*
Benzo(g,h,i)perylene	mg/l	<0,000005					SMEW.6440C*
Total mineral oils	mg/l	<0,01	*<G.D*	*0,01*	*0,05*	*0,5*	DIN EN ISO 9377-2:2001*

Note: *- accredited method

GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

CONCLUSION

According to the results of physical and chemical analyze of sample of the **Gradiosnica surface water, downstream** (part of the Gradiosnica River that flows towards Saline - downstream), at the request of E3 CONSULTING (no. of protocol CETI 46/04), **MEETS the A3** class of the Regulation on the classification and categorization of surface and ground water (Official Gazette of Montenegro no. 02/07).

LLC Center for Ecotoxicological Research Podgorica

SECTOR FOR LABORATORY DIAGNOSTICS AND RADIATION PROTECTION

TESTING REPORT

Type of test	Physico-chemical testing of surface waters
Number of Report	48/04/1
Date of issue of the report	January 28th 2020

INFORMATION ABOUT ORDERING PARTY AND USER OF SERVICE	
Name	E3 CONSULTING
Number of request/contract	00-45/1
Date of request submission	January 16th 2020

INFORMATION ABOUT SAMPLE	
Sampling date	January 20th 2020
Sample type	**Surface water**
Testing required	Physical and chemical analysis
Sampling carried out by	Petar Galicic, Ivan Djurovic, Ilija Resetar
Number of protocols in CETI	48/04

Statement:

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UNIT FOR CHEMICAL ANALYTICS

UNIT FOR ANALYTICS OF CHEMICAL ELEMENTS

RESULTS OF PHYSICAL-CHEMICAL ANALYSIS

Number of protocol	**48/04**						
Sampling date	**January 20th 2020**						
Sampling location	**Surface water Gradiosnica upstream (a branch toward the sea, upstream from the bridge)**						
Coordinates	**42° 24' 50.651" 018° 43' 4.483"**						
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC A1**	**MPC A2**	**MPC A3**	**Method mark**
Total suspended matter	mg/l	1,9	*0*	*10*	*20*	*50*	SMVP.133
pH		7,8±0,3	*6,8-8,3*	*6,8-8,5*	*6,5-8,5*	*5,5-9*	MESTENISO 10523:2013*
Nitrates	mg/l	4,5±0,3	*10*	*20*	*25*	*50*	SMEW4500NO3B*
Nitrites	mg/l	<0,001	*<G,D,*	*0,003*	*0,005*	*0,02*	SMEW4500NO2B *
Copper	mg/l	0,0020±0,0001	*0,005*	*0,02*	*0,05*	*1*	MEST EN ISO 17294-2:2013*
Zinc	mg/l	<0,001	*0,01*	*0,05*	*1*	*5*	MEST EN ISO 17294-2:2013*
Cadmium	mg/l	<0,001	*0,000*	*0,001*	*0,005*	*0,005*	MEST EN ISO 17294-2:2013*
Total phosphorus	mg/l	0,11±0,01					
COD	mg/l 02	4,3±0,2	*1*	*2*	*4*	*8*	MEST ISO 6060:2011*
Dissolved oxygen	mg/l 02	11,8					SMVP.150
Ammonium ion	mg/l	0,11±0,01	*0,00*	*0,02*	*0,05*	*1*	SMVP.179*

Note: *- accredited method

GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

UNIT FOR ANALYTICS IN GAS CHROMATOGRAPHY AND PREPARATION OF ENVIRONMENTAL SAMPLES
CHEMICAL ANALYSIS RESULTS

Number of protocol		**48/04**					
Sampling date		**January 20th 2020**					
Sampling location		**Surface water Gradiosnica upstream (a branch toward the sea, upstream from the bridge)**					
Coordinates		**42° 24' 50.651" 018° 43' 4.483"**					
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC A1**	**MPC A2**	**MPC A3**	**Method mark**
Polycyclic aromatic hydrocarbons	mg/l	<0,00005	*<G.D.*	*0,0002*	*0,0002*	*0,001*	SMEW.6440C*
Naphtalene	mg/l	<0,000005					SMEW.6440C*
2-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
1-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
Acenaphtylene	mg/l	<0,000005					SMEW.6440C*
Acenaphtene	mg/l	<0,000005					SMEW.6440C*
Fluorene	mg/l	<0,000005					SMEW.6440C*
Phenanthrene	mg/l	<0,000005					SMEW.6440C*
Anthracene	mg/l	<0,000005					SMEW.6440C*
Fluoranthene	mg/l	<0,000005					SMEW.6440C*
Pyrene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)anthracene	mg/l	<0,000005					SMEW .6440C'*
Chrysene	mg/l	<0,000005					SMEW.6440C*
Benzo(b)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(k)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)pyrene	mg/l	<0,000005					SMEW.6440C*
Indeno(l,2,3-cd)pyrene	mg/l	<0,000005					SMEW.6440C*
Dibenzo(a,h)anthracene	mg/l	<0,000005					SMEW.6440C*
Benzo(g,h,i)perylene	mg/l	<0,000005					SMEW.6440C*
Total mineral oils	mg/l	<0,01	*<G.D*	*0,01*	*0,05*	*0,5*	DIN EN ISO 9377-2:2001*

Note: *- accredited method
GD - limit of detection

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CONCLUSION

According to the results of physical and chemical analyze of sample of the surface water **Gradiosnica upstream** (a branch toward the sea, upstream from the bridge), at the request of E3 CONSULTING (no. of protocol CETI 48/04), **MEETS the A3** class of the Regulation on the classification and categorization of surface and ground water (Official Gazette of Montenegro no. 02/07).

LLC Center for Ecotoxicological Research Podgorica

SECTOR FOR LABORATORY DIAGNOSTICS AND RADIATION PROTECTION

TESTING REPORT

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Number of Report	47/04/1
Date of issue of the report	January 28th 2020

INFORMATION ABOUT ORDERING PARTY AND USER OF SERVICE	
Name	E3 CONSULTING
Number of request/contract	00-45/1
Date of request submission	January 16th 2020

INFORMATION ABOUT SAMPLE	
Sampling date	January 20th 2020
Sample type	**Surface water**
Testing required	Physical and chemical analysis
Sampling carried out by	Petar Galicic, Ivan Durovic, Ilija Resetar
Number of protocols in CETI	47/04

Statement:

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UNIT FOR CHEMICAL ANALYTICS, UNIT FOR ANALYTICS OF CHEMICAL ELEMENTS

RESULTS OF PHYSICAL-CHEMICAL ANALYSIS

Number of protocol	**47/04**						
Sampling date	**January 20th 2020**						
Sampling location	**Surface water Gradiosnica upstream (part of the Gradiosnica River that flows towards Saline - upstream)**						
Coordinates	**42° 24' 4.330" 018° 43' 48.064"**						
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC A1**	**MPC A2**	**MPC A3**	**Method mark**
Total suspended matter	mg/l	2,2	*0*	*10*	*20*	*50*	SMVP.133
pH		7,6±0,3	*6,8-8,3*	*6,8-8,5*	*6,5-8,5*	*5,5-9*	MESTENISO 10523:2013*
Nitrates	mg/l	0,51±0,03	*10*	*20*	*25*	*50*	SMEW4500NO3B*
Nitrites	mg/l	<0,001	*<G,D,*	*0,003*	*0,005*	*0,02*	SMEW4500NO2B *
Copper	mg/l	0,0020±0,0001	*0,005*	*0,02*	*0,05*	*1*	MEST EN ISO 17294-2:2013*
Zinc	mg/l	0,022±0,001	*0,01*	*0,05*	*1*	*5*	MEST EN ISO 17294-2:2013*
Cadmium	mg/l	<0,0001	*0,000*	*0,001*	*0,005*	*0,005*	MEST EN ISO 17294-2:2013*
Total phosphorus	mg/l	0,11±0,01					
COD	mg/l 02	4,6±0,3	*1*	*2*	*4*	*8*	MEST ISO 6060:2011*
Dissolved oxygen	mg/l 02	9,3					SMVP.150
Ammonium ion	mg/l	0,16±0,02	*0,00*	*0,02*	*0,05*	*1*	SMVP.179*

Note: *- accredited method
GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

UNIT FOR ANALYTICS IN GAS CHROMATOGRAPHY AND PREPARATION OF ENVIRONMENTAL SAMPLES

CHEMICAL ANALYSIS RESULTS

Number of protocol		**47/04**					
Sampling date		**January 20th 2020**					
Sampling location		**Surface water Gradiosnica upstream (part of the Gradiosnica River that flows towards Saline - upstream)**					
Coordinates		**42° 24' 4.330" 018° 43' 48.064"**					
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC A1**	**MPC A2**	**MPC A3**	**Method mark**
Polycyclic aromatic hydrocarbons	mg/l	<0,00005	*<G.D.*	*0,0002*	*0,0002*	*0,001*	SMEW.6440C*
Naphtalene	mg/l	<0,000005					SMEW.6440C*
2-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
1-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
Acenaphtylene	mg/l	<0,000005					SMEW.6440C*
Acenaphtene	mg/l	<0,000005					SMEW.6440C*
Fluorene	mg/l	<0,000005					SMEW.6440C*
Phenanthrene	mg/l	<0,000005					SMEW.6440C*
Anthracene	mg/l	<0,000005					SMEW.6440C*
Fluoranthene	mg/l	<0,000005					SMEW.6440C*
Pyrene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)anthracene	mg/l	<0,000005					SMEW .6440C'*
Chrysene	mg/l	<0,000005					SMEW.6440C*
Benzo(b)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(k)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)pyrene	mg/l	<0,000005					SMEW.6440C*
Indeno(l,2,3-cd)pyrene	mg/l	<0,000005					SMEW.6440C*
Dibenzo(a,h)anthracene	mg/l	<0,000005					SMEW.6440C*
Benzo(g,h,i)perylene	mg/l	<0,000005					SMEW.6440C*
Total mineral oils	mg/l	<0,01	*<G.D*	*0,01*	*0,05*	*0,5*	DIN EN ISO 9377-2:2001*

Note: *- accredited method

GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

CONCLUSION

According to the results of physical and chemical analyze of sample of the **Gradiosnica surface water, upstream** (part of the Gradiosnica River that flows towards Saline - upstream), at the request of E3 CONSULTING (no. of protocol CETI 47/04), **MEETS the A3** class of the Regulation on the classification and categorization of surface and ground water (Official Gazette of Montenegro no. 02/07).

LLC Center for Ecotoxicological Research Podgorica

SECTOR FOR LABORATORY DIAGNOSTICS AND RADIATION PROTECTION

TESTING REPORT

Type of test	Physico-chemical testing of surface waters
Number of Report	43/04/1
Date of issue of the report	January 28th 2020

INFORMATION ABOUT ORDERING PARTY AND USER OF SERVICE	
Name	E3 CONSULTING
Number of request/contract	00-45/1
Date of request submission	January 16th 2020

INFORMATION ABOUT SAMPLE	
Sampling date	January 20th 2020
Sample type	**Surface water**
Testing required	Physical, chemical and microbiological analysis
Sampling carried out by	Petar Galicic, Ivan Djurovic, Ilija Resetar
Number of protocol in CETI	43/04

Statement:

1. The test results only apply to the tested sample.
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UNIT FOR CHEMICAL ANALYTICS

UNIT FOR ANALYTICS OF CHEMICAL ELEMENTS

RESULTS OF PHYSICAL-CHEMICAL ANALYSIS

Number of protocol	**43/04**						
Sampling date	**January 20th 2020**						
Sampling location	**Surface water Kolozun downstream from the road, toward Salina**						
Coordinates	**42° 23' 27.571"** **018° 43' 39.744"**						
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC Al**	**MPC A2**	**MPC A3**	**Method mark**
Total suspended matter	mg/l	2,8	*0*	*10*	*20*	*50*	SMVP.133
pH		7,5±0,3	*6,8-8,3*	*6,8-8,5*	*6,5-8,5*	*5,5-9*	MESTENISO 10523:2013*
Nitrates	mg/l	0,77±0,05	*10*	*20*	*25*	*50*	SMEW4500NO3B*
Nitrites	mg/l	<0,001	*<G,D,*	*0,003*	*0,005*	*0,02*	SMEW4500NO2B *
Copper	mg/l	<0,001	*0,005*	*0,02*	*0,05*	*1*	MEST EN ISO 17294-2:2013*
Zinc	mg/l	<0,001	*0,01*	*0,05*	*1*	*5*	MEST EN ISO 17294-2:2013*
Cadmium	mg/l	<0,0001	*0,000*	*0,001*	*0,005*	*0,005*	MEST EN ISO 17294-2:2013*
Total phosphorus	mg/l	0,065±0,005					
COD	mg/l 02	1,9±0,1	*1*	*2*	*4*	*8*	MEST ISO 6060:2011*
Dissolved oxygen	mg/l 02	10,0					SMVP.150
Ammonium ion	mg/l	0,13±0,02	*0,00*	*0,02*	*0,05*	*1*	SMVP.179*

Note: *- accredited method
GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

UNIT FOR ANALYTICS IN GAS CHROMATOGRAPHY AND PREPARATION OF ENVIRONMENTAL SAMPLES

CHEMICAL ANALYSIS RESULTS

Number of protocol		**43/04**					
Sampling date		**January 20th 2020**					
Sampling location		**Surface water Kolozun downstream from the road, toward Salina**					
Coordinates		**42° 23' 27.571" 018° 43' 39.744"**					
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC Al**	**MPC A2**	**MPC A3**	**Method mark**
Polycyclic aromatic hydrocarbons	mg/l	<0,00005	*<G.D.*	*0,0002*	*0,0002*	*0,001*	SMEW.6440C*
Naphtalene	mg/l	<0,000005					SMEW.6440C*
2-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
1-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
Acenaphtylene	mg/l	<0,000005					SMEW.6440C*
Acenaphtene	mg/l	<0,000005					SMEW.6440C*
Fluorene	mg/l	<0,000005					SMEW.6440C*
Phenanthrene	mg/l	<0,000005					SMEW.6440C*
Anthracene	mg/l	<0,000005					SMEW.6440C*
Fluoranthene	mg/l	<0,000005					SMEW.6440C*
Pyrene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)anthracene	mg/l	<0,000005					SMEW .6440C'*
Chrysene	mg/l	<0,000005					SMEW.6440C*
Benzo(b)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(k)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)pyrene	mg/l	<0,000005					SMEW.6440C*
Indeno(l,2,3-cd)pyrene	mg/l	<0,000005					SMEW.6440C*
Dibenzo(a,h)anthracene	mg/l	<0,000005					SMEW.6440C*
Benzo(g,h,i)perylene	mg/l	<0,000005					SMEW.6440C*
Total mineral oils	mg/l	<0,01	<G.D	0,01	0,05	0,5	DIN EN ISO 9377-2:2001*

Note: *- accredited method

GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

CONCLUSION

According to the results of physical and chemical analyze of sample of the surface water **Kolozun, downstream from the road toward Salina**, at the request of E3 CONSULTING (no. of protocol CETI 43/04), **MEETS THE A3** class of the Regulation on the classification and categorization of surface and ground water (Official Gazette of Montenegro no. 02/07).

LLC Center for Ecotoxicological Research Podgorica

SECTOR FOR LABORATORY DIAGNOSTICS AND RADIATION PROTECTION

TESTING REPORT

Type of test	Physico-chemical testing of surface waters
Number of Report	42/04/1
Date of issue of the report	January 28th 2020

INFORMATION ABOUT ORDERING PARTY AND USER OF SERVICE	
Name	E3 CONSULTING
Number of request/contract	00-45/1
Date of request submission	January 16th 2020

INFORMATION ABOUT SAMPLE	
Sampling date	January 20th 2020
Sample type	**Surface water**
Testing required	Physical and chemical analysis
Sampling carried out by	Petar Galicic, Ivan Djurovic, Ilija Resetar
Number of protocol in CETI	42/04

Statement:

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UNIT FOR CHEMICAL ANALYTICS

UNIT FOR ANALYTICS OF CHEMICAL ELEMENTS

RESULTS OF PHYSICAL-CHEMICAL ANALYSIS

Number of protocol	**42/04**						
Sampling date	**January 20th 2020**						
Sampling location	**Surface water Kolozun upstream from the road 150 m**						
Coordinates	**42° 21' 34.241" 018° 45' 40.983"**						
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC Al**	**MPC A2**	**MPC A3**	**Method mark**
Total suspended matter	mg/l	1,8	0	10	20	50	SMVP.133
pH		7,8±0,3	6,8-8,3	6,8-8,5	6,5-8,5	5,5-9	MESTENISO 10523:2013*
Nitrates	mg/l	0,60±0,04	10	20	25	50	SMEW4500NO3B*
Nitrites	mg/l	<0,001	<G,D,	0,003	0,005	0,02	SMEW4500NO2B *
Copper	mg/l	<0,001	0,005	0,02	0,05	1	MEST EN ISO 17294-2:2013*
Zinc	mg/l	<0,001	0,01	0,05	1	5	MEST EN ISO 17294-2:2013*
Cadmium	mg/l	<0,0001	0,000	0,001	0,005	0,005	MEST EN ISO 17294-2:2013*
Total phosphorus	mg/l	0,072±0,005					
COD	mg/l 02	3,5±0,2	1	2	4	8	MEST ISO 6060:2011*
Dissolved oxygen	mg/l 02	12,1					SMVP.150
Ammonium ion	mg/l	0,06±0,01	0,00	0,02	0,05	1	SMVP.179*

Note: *- accredited method

GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

UNIT FOR ANALYTICS IN GAS CHROMATOGRAPHY AND PREPARATION OF ENVIRONMENTAL SAMPLES

CHEMICAL ANALYSIS RESULTS

Number of protocol		**42/04**					
Sampling date		**January 20th 2020**					
Sampling location		**Surface water Kolozun upstream from the road 150 m**					
Coordinates		**42° 21' 34.241" 018° 45' 40.983"**					
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC Al**	**MPC A2**	**MPC A3**	**Method mark**
Polycyclic aromatic hydrocarbons	mg/l	<0,00005	<G.D.	0,0002	0,0002	0,001	SMEW.6440C*
Naphtalene	mg/l	<0,000005					SMEW.6440C*
2-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
1-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
Acenaphtylene	mg/l	<0,000005					SMEW.6440C*
Acenaphtene	mg/l	<0,000005					SMEW.6440C*
Fluorene	mg/l	<0,000005					SMEW.6440C*
Phenanthrene	mg/l	<0,000005					SMEW.6440C*
Anthracene	mg/l	<0,000005					SMEW.6440C*
Fluoranthene	mg/l	<0,000005					SMEW.6440C*
Pyrene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)anthracene	mg/l	<0,000005					SMEW .6440C'*
Chrysene	mg/l	<0,000005					SMEW.6440C*
Benzo(b)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(k)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)pyrene	mg/l	<0,000005					SMEW.6440C*
Indeno(l,2,3-cd)pyrene	mg/l	<0,000005					SMEW.6440C*
Dibenzo(a,h)anthracene	mg/l	<0,000005					SMEW.6440C*
Benzo(g,h,i)perylene	mg/l	<0,000005					SMEW.6440C*
Total mineral oils	mg/l	<0,01	<G.D	0,01	0,05	0,5	DIN EN ISO 9377-2:2001*

Note: *- accredited method

GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

CONCLUSION

According to the results of physical and chemical analyze of sample of the surface water **Kolozun, upstream from the road 150m**, at the request of E3 CONSULTING (no. of protocol CETI 42/04), **MEETS THE A2** class of the Regulation on the classification and categorization of surface and ground water (Official Gazette of Montenegro no. 02/07).

LLC Center for Ecotoxicological Research Podgorica

SECTOR FOR LABORATORY DIAGNOSTICS AND RADIATION PROTECTION

TESTING REPORT

Type of test	Physico-chemical testing of surface waters
Number of Report	45/04/1
Date of issue of the report	January 28th 2020

INFORMATION ABOUT ORDERING PARTY AND USER OF SERVICE	
Name	E3 CONSULTING
Number of request/contract	00-45/1
Date of request submission	January 16th 2020

INFORMATION ABOUT SAMPLE	
Sampling date	January 20th 2020
Sample type	**Surface water**
Testing required	Physical and chemical analysis
Sampling carried out by	Petar Galicic, Ivan Djurovic, Ilija Resetar
Number of protocol in CETI	45/04

Statement:

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UNIT FOR CHEMICAL ANALYTICS

UNIT FOR ANALYTICS OF CHEMICAL ELEMENTS

RESULTS OF PHYSICAL-CHEMICAL ANALYSIS

Number of protocol	**45/04**						
Sampling date	**January 20th 2020**						
Sampling location	**Surface water Vodoljeznica downstream (a branch of the Vodoljeznica river flowing downstream from the road toward Salina)**						
Coordinates	**42° 23' 39.936" 018° 44' 5.110"**						
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC Al**	**MPC A2**	**MPC A3**	**Method mark**
Total suspended matter	mg/l	11,4	*0*	*10*	*20*	*50*	SMVP.133
pH		7,5±0,3	*6,8-8,3*	*6,8-8,5*	*6,5-8,5*	*5,5-9*	MESTENISO 10523:2013*
Nitrates	mg/l	1,15±0,08	*10*	*20*	*25*	*50*	SMEW4500NO3B*
Nitrites	mg/l	<0,001	*<G,D,*	*0,003*	*0,005*	*0,02*	SMEW4500NO2B *
Copper	mg/l	0,0020±0,0001	*0,005*	*0,02*	*0,05*	*1*	MEST EN ISO 17294-2:2013*
Zinc	mg/l	0,0020±0,0001	*0,01*	*0,05*	*1*	*5*	MEST EN ISO 17294-2:2013*
Cadmium	mg/l	<0,0001	*0,000*	*0,001*	*0,005*	*0,005*	MEST EN ISO 17294-2:2013*
Total phosphorus	mg/l	0,12±0,01					
COD	mg/l 02	5,4±0,3	*1*	*2*	*4*	*8*	MEST ISO 6060:2011*
Dissolved oxygen	mg/l 02	7,7					SMVP.150
Ammonium ion	mg/l	0,21±0,03	*0,00*	*0,02*	*0,05*	*1*	SMVP.179*

Note: *- accredited method

GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

UNIT FOR ANALYTICS IN GAS CHROMATOGRAPHY AND PREPARATION OF ENVIRONMENTAL SAMPLES

CHEMICAL ANALYSIS RESULTS

Number of protocol		**45/04**					
Sampling date		**January20th 2020**					
Sampling location		**Surface water Vodoljeznica downstream (a branch of the Vodoljeznica river flowing downstream from the road toward Salina)**					
Coordinates		**42° 23' 39.936" 018° 44' 5.110"**					
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC Al**	**MPC A2**	**MPC A3**	**Method mark**
Polycyclic aromatic hydrocarbons	mg/l	<0,00005	*<G.D.*	*0,0002*	*0,0002*	*0,001*	SMEW.6440C*
Naphtalene	mg/l	<0,000005					SMEW.6440C*
2-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
1-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
Acenaphtylene	mg/l	<0,000005					SMEW.6440C*
Acenaphtene	mg/l	<0,000005					SMEW.6440C*
Fluorene	mg/l	<0,000005					SMEW.6440C*
Phenanthrene	mg/l	<0,000005					SMEW.6440C*
Anthracene	mg/l	<0,000005					SMEW.6440C*
Fluoranthene	mg/l	<0,000005					SMEW.6440C*
Pyrene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)anthracene	mg/l	<0,000005					SMEW .6440C'*
Chrysene	mg/l	<0,000005					SMEW.6440C*
Benzo(b)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(k)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)pyrene	mg/l	<0,000005					SMEW.6440C*
Indeno(l,2,3-cd)pyrene	mg/l	<0,000005					SMEW.6440C*
Dibenzo(a,h)anthracene	mg/l	<0,000005					SMEW.6440C*
Benzo(g,h,i)perylene	mg/l	<0,000005					SMEW.6440C*
Total mineral oils	mg/l	<0,01	*<G.D*	*0,01*	*0,05*	*0,5*	DIN EN ISO 9377-2:2001*

Note: *- accredited method

GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

CONCLUSION

According to the results of physical and chemical analyze of sample of the surface water **Vodoljeznica downstream** (a branch of the Vodoljeznica river flowing downstream from the road toward Salina), at the request of E3 CONSULTING (no. of protocol CETI 45/04), **MEETS THE A3** class of the Regulation on the classification and categorization of surface and ground water (Official Gazette of Montenegro no. 02/07).

LLC Center for Ecotoxicological Research Podgorica

SECTOR FOR LABORATORY DIAGNOSTICS AND RADIATION PROTECTION

TESTING REPORT

Type of test	Physico-chemical testing of surface waters
Number of Report	44/04/1
Date of issue of the report	January 28th 2020

INFORMATION ABOUT ORDERING PARTY AND USER OF SERVICE	
Name	E3 CONSULTING
Number of request/contract	00-45/1
Date of request submission	January 16th 2020

INFORMATION ABOUT SAMPLE	
Sampling date	January 20th 2020
Sample type	**Surface water**
Testing required	Physical and chemical analysis
Sampling carried out by	Petar Galicic, Ivan Djurovic, Ilija Resetar
Number of protocol in CETI	44/04

Statement:

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2. The Testing Report can only be copied as a whole.
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LLC Center for Ecotoxicological Research Podgorica

UNIT FOR CHEMICAL ANALYTICS

UNIT FOR ANALYTICS OF CHEMICAL ELEMENTS

RESULTS OF PHYSICAL-CHEMICAL ANALYSIS

Number of protocol	**44/04**						
Sampling date	**January 20th 2020**						
Sampling location	**Surface water Vodoljeznica upstream (a branch of the Vodoljeznica river flowing toward Salina - upstream from the road)**						
Coordinates	**42° 23' 40.506" 018° 44' 25.072"**						
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC Al**	**MPC A2**	**MPC A3**	**Method mark**
Total suspended matter	mg/l	68,9	*0*	*10*	*20*	*50*	SMVP.133
pH		7,4±0,3	*6,8-8,3*	*6,8-8,5*	*6,5-8,5*	*5,5-9*	MESTENISO 10523:2013*
Nitrates	mg/l	1,11±0,08	*10*	*20*	*25*	*50*	SMEW4500NO3B*
Nitrites	mg/l	<0,001	*<G,D,*	*0,003*	*0,005*	*0,02*	SMEW4500NO2B *
Copper	mg/l	0,050±0,003	*0,005*	*0,02*	*0,05*	*1*	MEST EN ISO 17294-2:2013*
Zinc	mg/l	0,015±0,001	*0,01*	*0,05*	*1*	*5*	MEST EN ISO 17294-2:2013*
Cadmium	mg/l	<0,0001	*0,000*	*0,001*	*0,005*	*0,005*	MEST EN ISO 17294-2:2013*
Total phosphorus	mg/l	0,101±0,008					
COD	mg/l 02	27,2±1,6	*1*	*2*	*4*	*8*	MEST ISO 6060:2011*
Dissolved oxygen	mg/l 02	9,9					SMVP.150
Ammonium ion	mg/l	0,35±0,05	*0,00*	*0,02*	*0,05*	*1*	SMVP.179*

Note: *- accredited method

GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

UNIT FOR ANALYTICS IN GAS CHROMATOGRAPHY AND PREPARATION OF ENVIRONMENTAL SAMPLES

CHEMICAL ANALYSIS RESULTS

Number of protocol		**44/04**					
Sampling date		**January 20th 2020**					
Sampling location		**Surface water Vodoljeznica upstream (a branch of the Vodoljeznica river flowing toward Salina - upstream from the road)**					
Coordinates		**42° 23' 40.506" 018° 44' 25.072"**					
Parameter	**Unit of measure**	**Results of analyze**	**MPC A**	**MPC Al**	**MPC A2**	**MPC A3**	**Method mark**
Polycyclic aromatic hydrocarbons	mg/l	<0,00005	*<G.D.*	*0,0002*	*0,0002*	*0,001*	SMEW.6440C*
Naphtalene	mg/l	<0,000005					SMEW.6440C*
2-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
1-Methylnaphtalene	mg/l	<0,000005					SMEW.6440C*
Acenaphtylene	mg/l	<0,000005					SMEW.6440C*
Acenaphtene	mg/l	<0,000005					SMEW.6440C*
Fluorene	mg/l	<0,000005					SMEW.6440C*
Phenanthrene	mg/l	<0,000005					SMEW.6440C*
Anthracene	mg/l	<0,000005					SMEW.6440C*
Fluoranthene	mg/l	<0,000005					SMEW.6440C*
Pyrene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)anthracene	mg/l	<0,000005					SMEW .6440C'*
Chrysene	mg/l	<0,000005					SMEW.6440C*
Benzo(b)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(k)fluoranthene	mg/l	<0,000005					SMEW.6440C*
Benzo(a)pyrene	mg/l	<0,000005					SMEW.6440C*
Indeno(l,2,3-cd)pyrene	mg/l	<0,000005					SMEW.6440C*
Dibenzo(a,h)anthracene	mg/l	<0,000005					SMEW.6440C*
Benzo(g,h,i)perylene	mg/l	<0,000005					SMEW.6440C*
Total mineral oils	mg/l	<0,01	*<G.D*	*0,01*	*0,05*	*0,5*	DIN EN ISO 9377-2:2001*

Note: *- accredited method

GD - limit of detection

LLC Center for Ecotoxicological Research Podgorica

CONCLUSION

According to the results of physical and chemical analyze of sample of the surface water **Vodoljeznica upstreasm** (a branch of the Vodoljeznica river flowing toward Salina - upstream from the road), at the request of E3 CONSULTING (no. of protocol CETI 44/04), **DOES NOT MEETS** conditions of any class of the Regulation on the classification and categorization of surface and ground water (Official Gazette of Montenegro no. 02/07), due to the increased content of total suspended matter and COD values.

Appendix 5 - Biodiversity

5.1 Habitat Mapping and Survey Methodology

The following approach has been adopted for the habitat mapping and surveys:

1. Existing land use maps entered into Google Earth for field work and ground truthing. Maps printed off for field use at 2km per page with field recording sheets.
2. 2 experts (1 habitat expert and 1 mammologist) to walk /drive the route. (3 days)
3. ENUIS classification used to map and identify all important habitat types present within the 150m Project Affected Area.
4. Incidental observations made of notable fauna. Specific watch out for potential bat roosts, tracks etc.
5. Field maps digitized onto GIS and polygons made of each habitat type to enable areas to be calculated.

Note: Freshwater invertebrates: specialist to be invited to visit the route and identify features of concern regarding freshwater invertebrates plus requirements and timings for further studies (delayed due to Covid). **Road Crossings:** Specialist to be invited to walk/ drive along the route to determine additional locations for road crossings (delayed due to covid).

Deliverables

- Maps: Habitat Identification to EUNIS and Associated Species list

5.2 Habitat Map

The following maps show the habitat types recorded in the PAA (150m either side of the road), classified as EUNIS habitat types. The road layout is divided into 8 sections, each showing around 2km of the layout. Unmodified habitat is shown as coloured polygons. Non-coloured sections of the PAA represent anthropogenically modified habitats, which hold little conservation value.

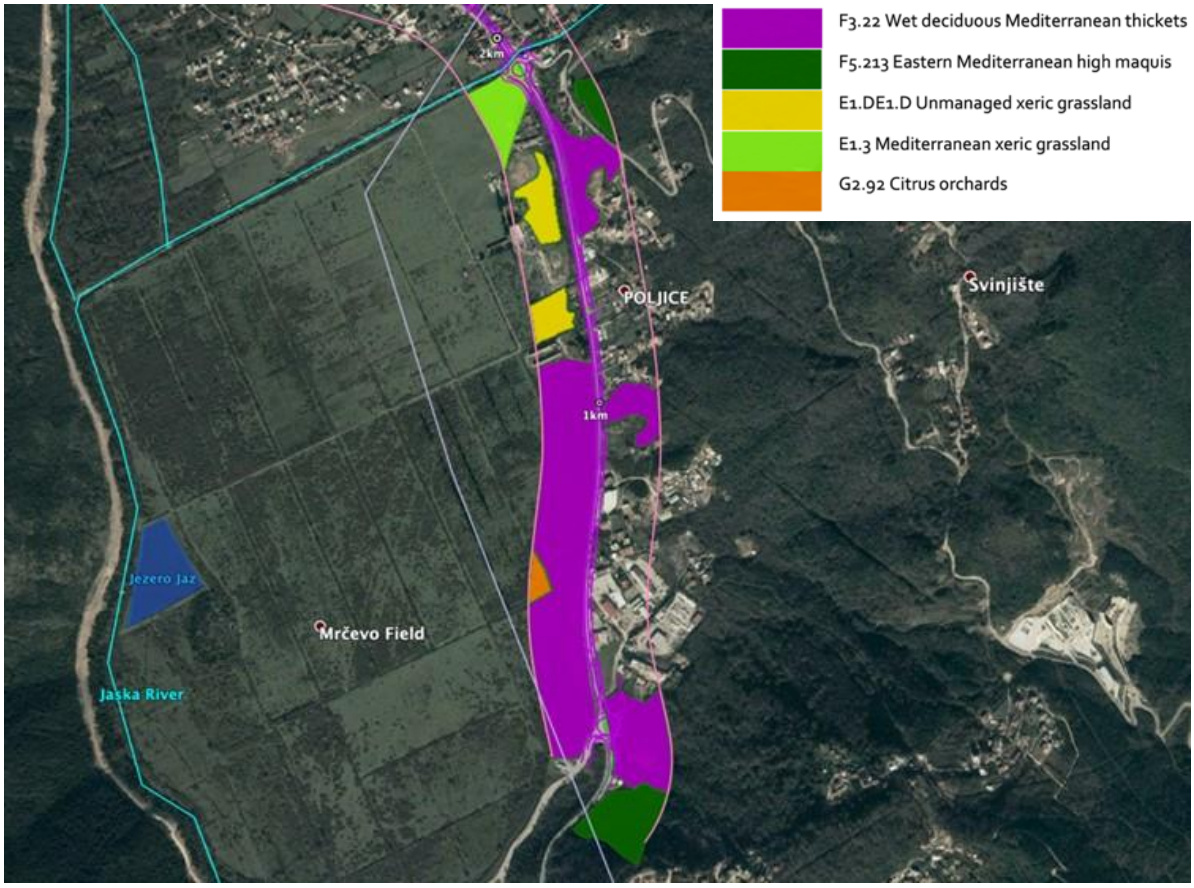


Figure 1- Habitats 0-2km along the proposed alignment

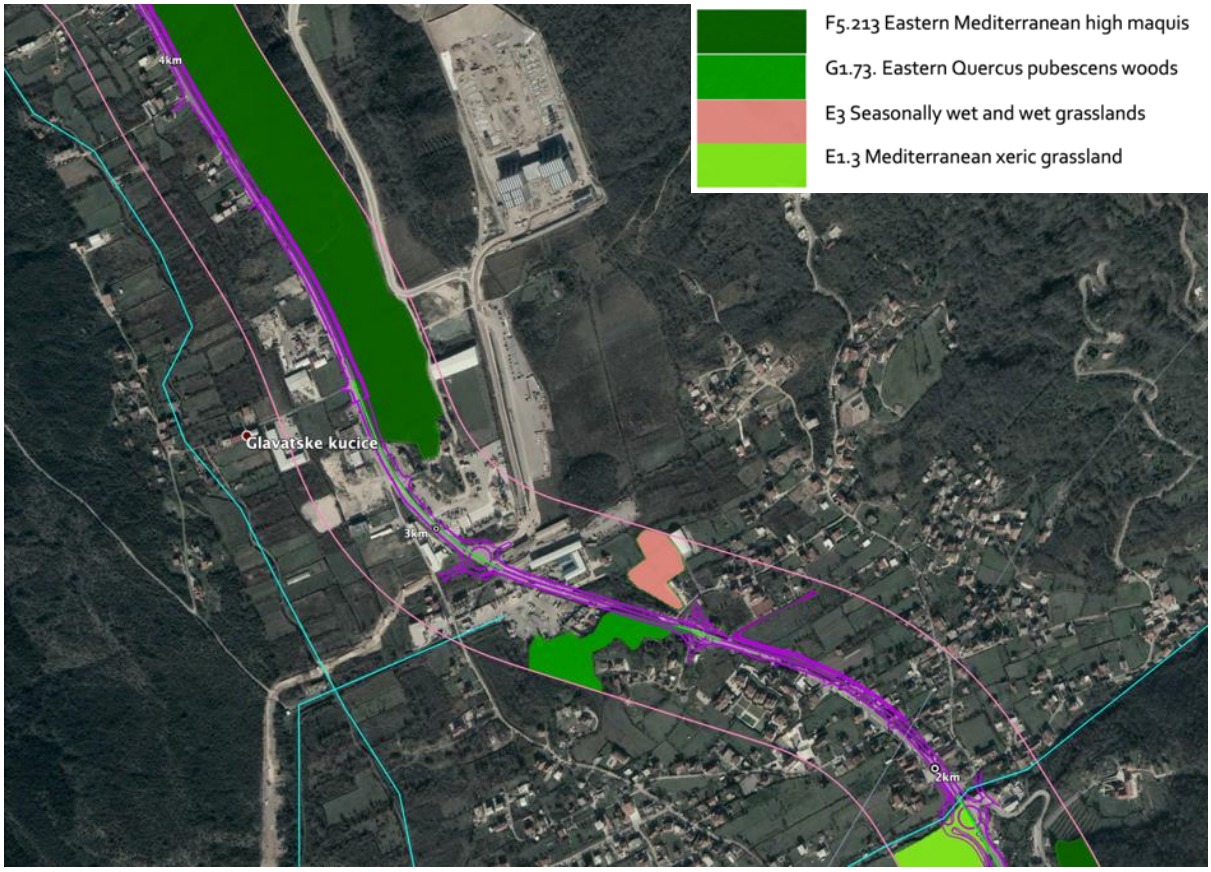


Figure 2 - Habitats 2-4km along the proposed alignment

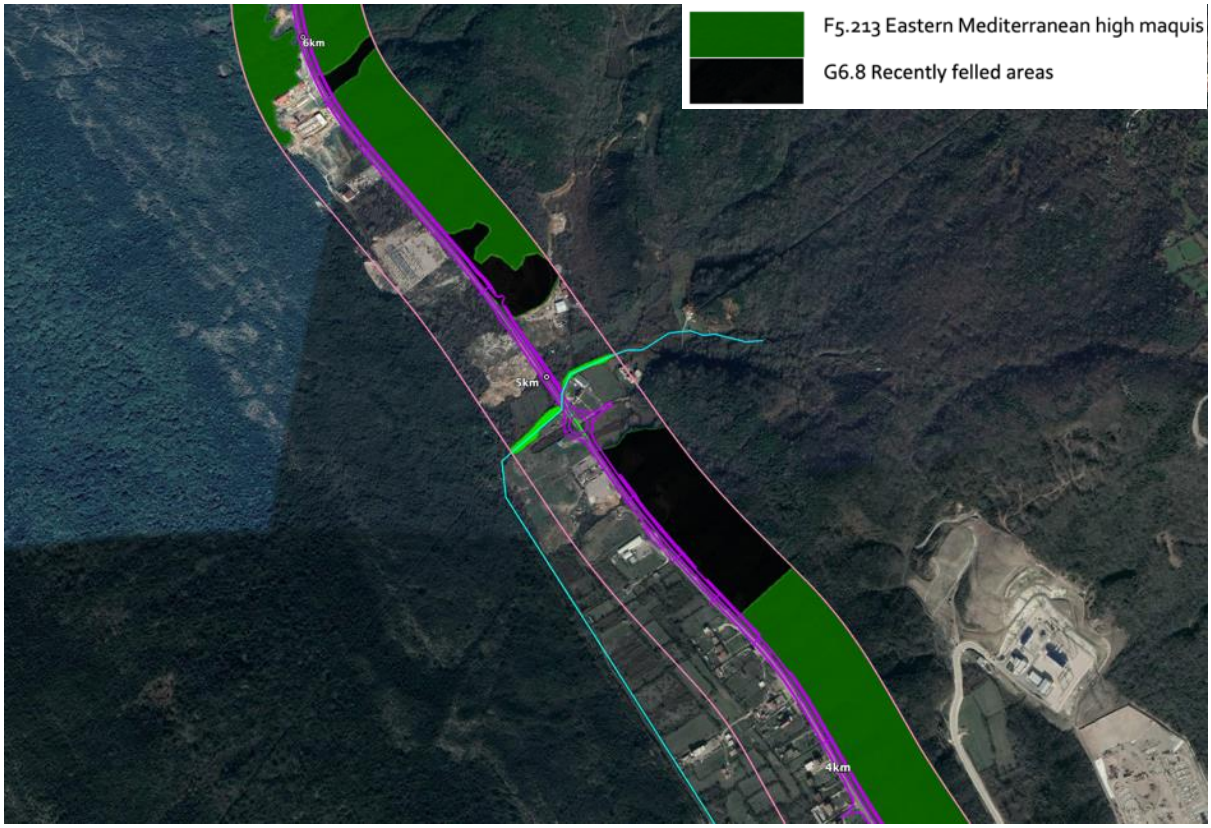


Figure 3 - Habitats 4-6km along the proposed alignment

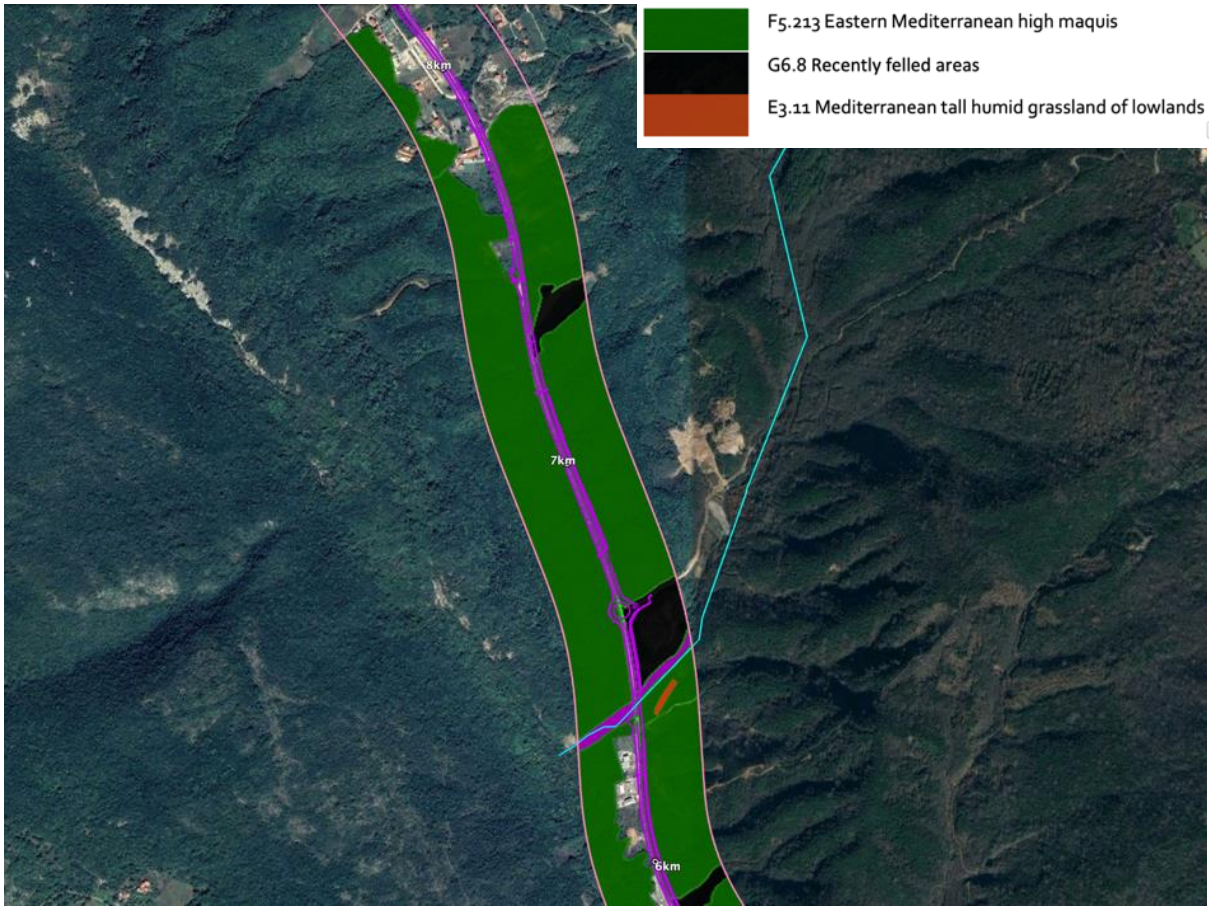


Figure 4 - Habitats 6-8km along the proposed alignment

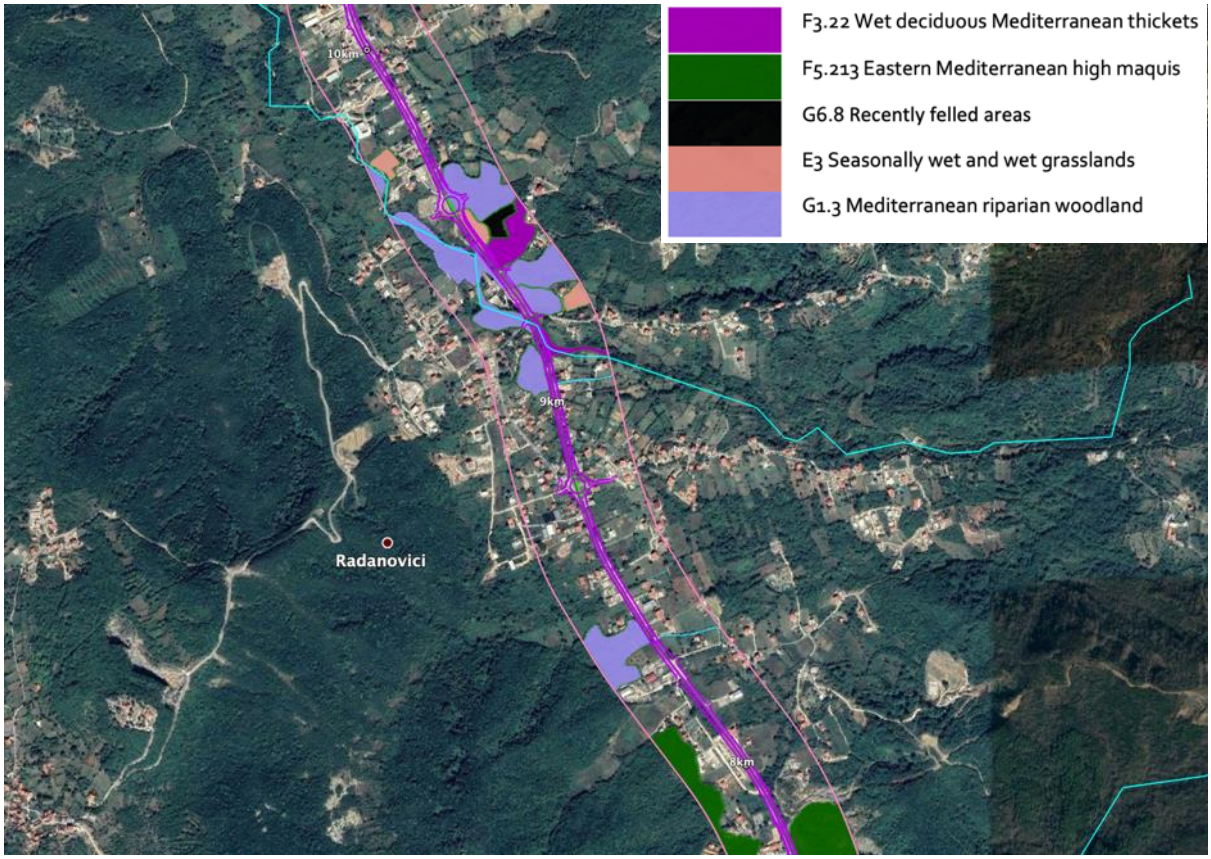


Figure 5- Habitats 8-10km along the proposed alignment

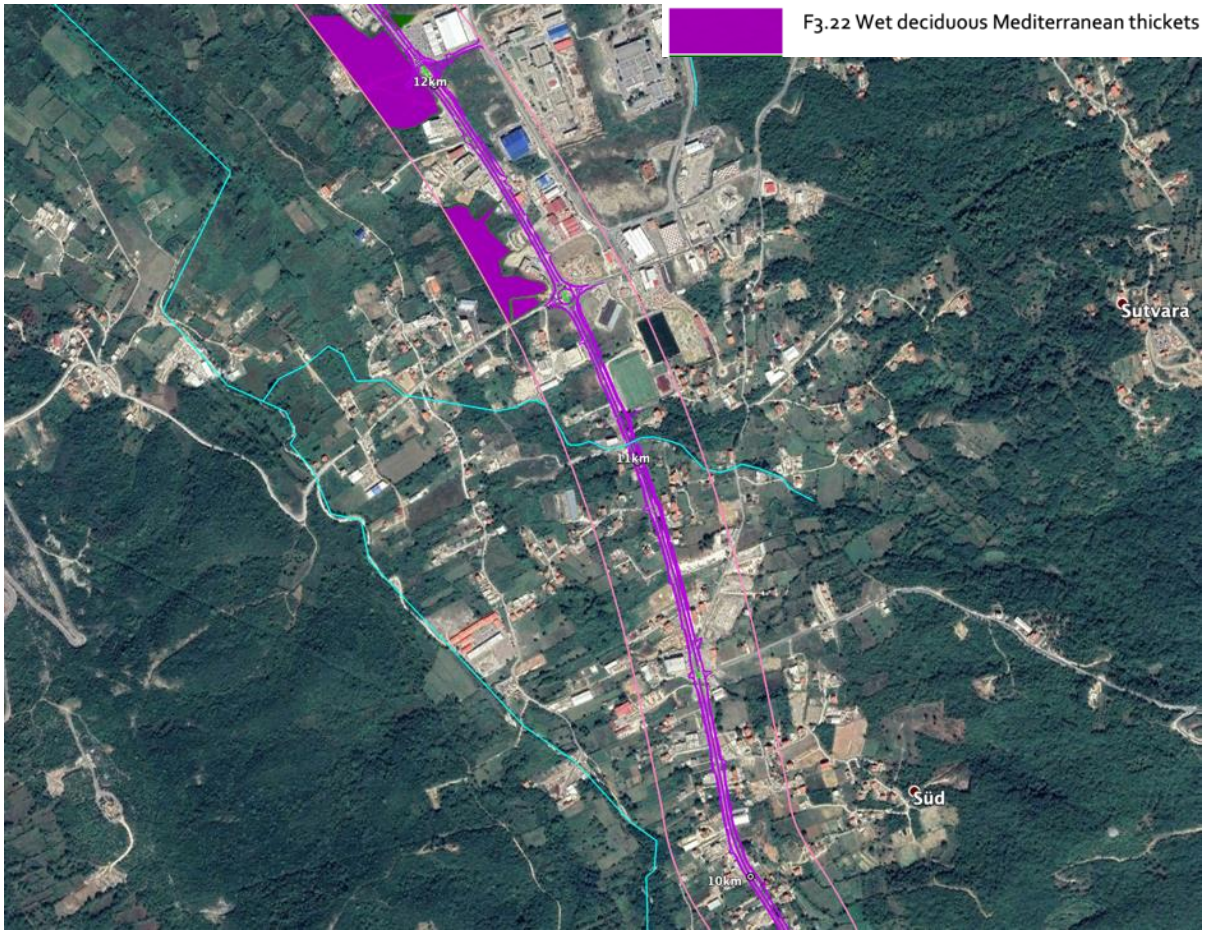


Figure 6 - Habitats 10-12km along the proposed alignment

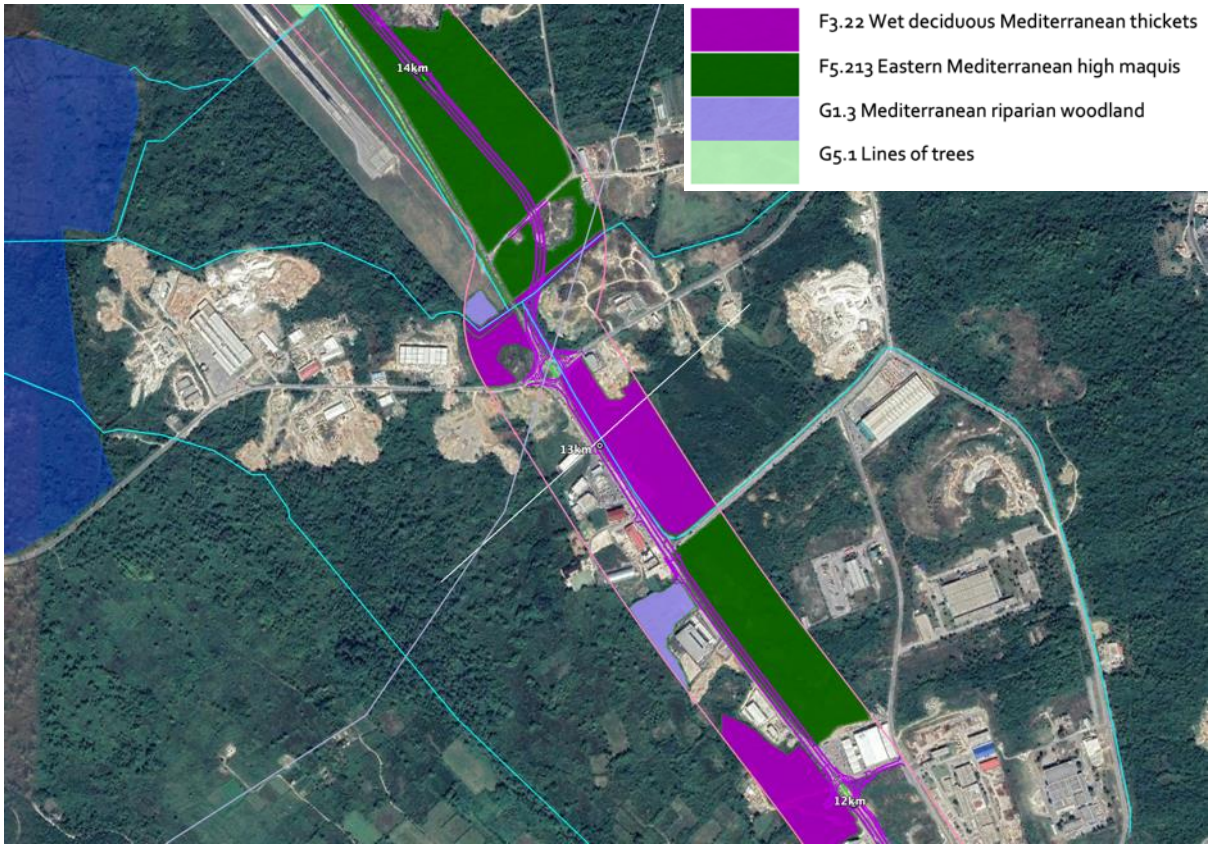


Figure 7 - Habitats 12-14km along the proposed alignment

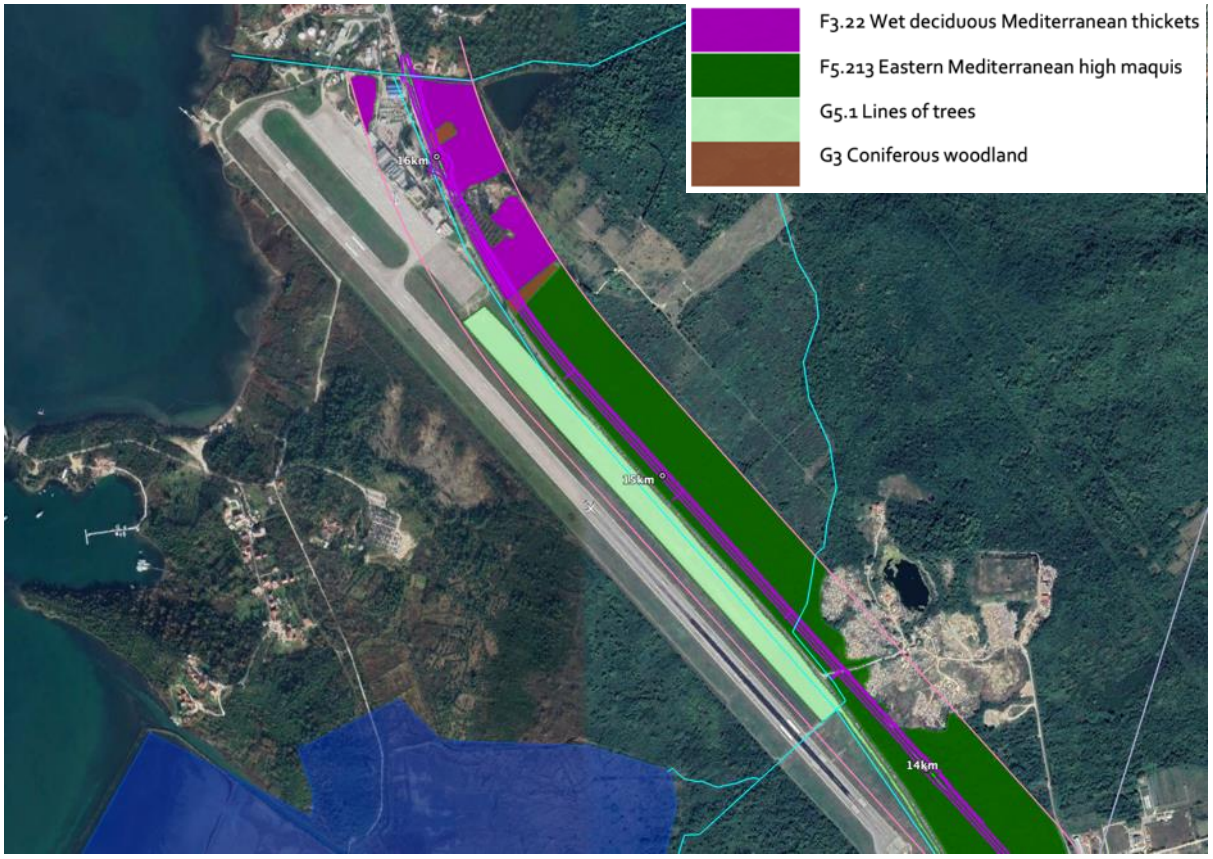


Figure 8 - Habitats 14-16.3km along the proposed alignment

5.3 Critical Habitat Assessment

Critical Habitat

Critical habitat encompasses the highest priority areas of the planet for biodiversity conservation. It takes into account both global and national priority setting systems and builds on the conservation biology principles of 'vulnerability' (degree of threat) and 'irreplaceability' (rarity or uniqueness). There is no universally accepted or automatic formula for making determinations on critical habitat and the involvement of external experts and project specific assessments is of utmost importance, especially when data are limited. EBRD PR6 (para 14) defines Critical Habitat as "the most sensitive biodiversity features" that typically comprises one or more of the following:

(i) habitats of significant importance to "endangered" or critically endangered species;

(ii) habitats of significant importance to endemic or geographically restricted species;

(iii) habitats supporting globally significant migratory or congregatory species;

(iv) highly threatened or unique ecosystems;

(v) areas associated with key evolutionary processes;

(vi) ecological functions that are vital to maintaining the viability of biodiversity features described in this paragraph.

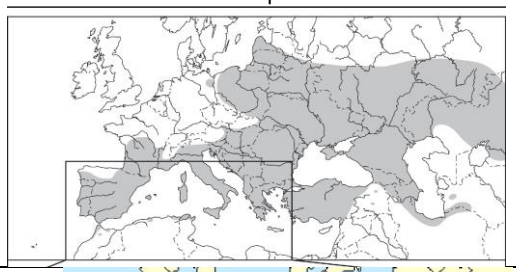
As the EBRD guidelines do not give quantitative thresholds for these criteria, potential CH triggers have been assessed using those proved in the IFC Guidance Note 6.

For the majority of the species identified, there is very little distributional and populational data available, with no estimates of population sizes either in Montenegro or globally that could be found. There is also minimal data on Area of Occupancy (AOO) for many species identified, which is the area within the Extent of Occurrence (EOO) that a species is known to be found. Where neither data type is available, critical habitat determination has been based on calculations from a species Extent of Occurrence. In cases were data is deficient this gives a reasonable approximation of how much of the global distribution of the species is within the designated area of analysis (AoA).

Critical Habitat Assessment

Name	IUCN	Habitats directive	Restricted Range?	Criteria	Evidence	Critical Habitat Determination
Falco cherrug Saker Falcon	EN	-	-	i	Recorded in the wider area in IBAT but no evidence of regular occurrence in PAA (not recorded in the field surveys or literature review. Not considered likely by local specialists).	Not thought to regularly occur in the PAA and PAA therefore not considered to overlap Critical Habitat
Anguilla Anguilla, European Eel	EN	-	No	iii	**Regularly occurs in the PAA** and 8 eels were caught during sampling of the waterways crossed by the road. Little data available on the distribution and population size of this species in Montenegro (or globally). Area of Occurrence (AOO) difficult to estimate for this species, as individuals can be found, at least in passage, in large swathes of the ocean as well as in freshwater habitats across Europe. The species is critically endangered due to the steep population decline, but is still distributed in inland waters across most of Europe over an area of ~ 90,000 km² Given this wide distribution the PAA is not considered to support 0.5% of the global population.  *Figure shows distribution of European Eel from the IUCN red list website. Purple represents areas where eels have been reintroduced.*	Occurs in the PAA. National distribution unknown but unlikely that 0.5% of the global population are found in these waterways given the distribution of the species across Europe. PAA not considered to overlap critical habitat.
Pelophylax shqipericus, Albanian water frog	EN	-	yes	I (ii)	Listed as Endangered by the IUCN, due to it's small EOO, severely fragmented distribution and continued decline in the extent and quality of its habitat. Also qualifies as a restricted range species under criteria ii, with an EOO much lower than 50,000km². Recorded in wider area in IBAT and from Tivat Saline up to 2012 but not recorded in 2019 surveys nr the 2018 Tivat Saline survey (considered by specialists the most likely habitat for it). If it was present would likely trigger CH, but not considered to regularly occur in the PAA.	Not thought to regularly occur in the PAA and PAA therefore not considered to overlap Critical Habitat.
Myotis capaccinii,	VU	Annex IV	no	i	Recorded in IBAT and forages over wetlands and waterways (including artificial waterbodies, such as canals and reservoirs), also scrub. It generally roosts in	Project AoA is less than 0.01% of the estimated EOO. PAA

Long-fingered bat					underground habitats (principally caves)notably in karst areas. There is very little data on the distribution and population of this species. There is not thought to be an estimate of its population size either in Montenegro or globally, or an estimate of the species AOO. Estimated EOO 5,387,022 km IUCN The project AoA occupies less than 0.01% of the estimated EOO. Although a species will not be present throughout the entirety of its EOO, it is still incredibly unlikely to that the project AOA contains 0.5% of the population of this species.	not thought to represent critical habitat for this species.
Rhinolphus hipposideros, Lesser horseshoe bat	LC	Annex IV		i	A very widespread species, occurring across all of southern Europe, north Africa and Turkey. Recognised as Least Concern by the IUCN and its population size is inferred to be relatively large. Estimated EOO of over 22million km^2 and the project AoA (32.6km^2) occupies less than 0.01% of this. Therefore, it is incredibly unlikely to support 0.5% of this species population. All bats are, however, strictly protected under Annex IV of the habitat directive.	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species.
Pipistrelus kuhlii Kuhl's pipistrelle	LC	Annex IV	-	-	A very widespread species and recognised as Least Concern by the IUCN, with relatively large population size. Estimated EOO of over 51 million km^2. Project AoA occupies less than 0.01% of this and is unlikely to support 0.5% of this species population. . All bats are, however, strictly protected under Annex IV of the habitat directive.	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species
Pipistrellus pygmaeus, Soprano pipistrelle	LC	Annex IV	-	-	A widespread species and recognised as Least Concern by the IUCN, with relatively large population size. It has no estimated Extent of Occurrence, but it is widespread across Europe and into Russia, and thus the AoA is incredibly unlikely to support 0.5% of this species population. All bats are, however, strictly protected under Annex IV of the habitat directive.	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species
Myotis nattereri, Natterer's Bat	LC	Annex IV	-	-	A very widespread species and recognised as Least Concern by the IUCN, with relatively large population size. Estimated EOO of over 4 million km^2. Project AoA occupies less than 0.01% of this and is unlikely to support 0.5% of this species population. . All bats are, however, strictly protected under Annex IV of the habitat directive.	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species
Nictalus noctula/leislerii, Noctule/Lesser Noctule		Annex IV	LC	-	A very widespread species and recognised as Least Concern by the IUCN, with relatively large population size. Estimated EOO of over 5 million km^2. Project AoA occupies less than 0.01% of this and is unlikely to support 0.5% of this species population. . All bats are, however, strictly protected under Annex IV of the habitat directive.	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species
Hypsugo savii Savi's pipistrelle		Annex IV	LC	-	A widespread species with a stable population trend and expanding range. Estimated EOO of over 15 million km^2. Project AoA occupies less than 0.01% of	Project AoA is less than 0.01% of the estimated EOO. PAA

					this and is unlikely to support 0.5% of this species population. . All bats are, however, strictly protected under Annex IV of the habitat directive.	not thought to represent critical habitat for this species
Felis silvestris Wild Cat		Annex IV	LC	i	**Identified from camera trap** within Project AoA. Very broad distribution, with five subspecies. European wildcat *F. s. silvestris* was formerly very widely distributed but severe declines and local extirpations resulted in a fragmented relict distribution. In some areas hybridization with the domestic cat has affected genetic purity wildcats and this is by far the greatest concern to this species. 	Identified in camera trap within AoA for terrestrial mammals. However given broad EOO PAA is not thought to represent CH.
Emys *orbicularis*, European pond turtle	NT	Annex IV	-	i	A very widespread species, occurring across much of Europe and Central Asia, with an estimated EOO of over 5million km². The AoA occupies less than 0.01% of the estimated EOO and is unlikely to support 0.5% of the population. As a freshwater species, no net loss of this species will be achieved via measures already planned to mitigate any impacts on waterways. 	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species
Testudo hermanni, Hermann's tortoise	NT	Annex IV	-	i	Near threatened as a species with western (Italy and southern France) and eastern (Balkan) subspecies. The eastern sub species is distributed throughout the Balkans (estimated EOO of 350,000km²) but the Western subspecies is classified as IUCN endangered The project AoA for terrestrial reptiles (9.78km²) occupies less than 0.01% of the eastern sub species EOO and is unlikely to support 0.5% of 	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species

					the population. It is, however, protected under EU law. In Montenegro the species is specifically threatened by wildfire and road mortality[1]	
Pseudopus apodus, European glass lizard		Annex IV	LC	-	A widespread species ranging eastwards from the Balkans to Central Asia and the Levant. IUCN Least Concern with, tolerance of a broad range of habitats, presumed large population, and no history of rapid decline.	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species
Algyroides nigropunctatus, blue-throated keeled lizard	LC	Annex IV	-	-	IUCN Least Concern species found along the eastern Adriatic coastal region from north eastern Italy to western Greece with a large population and an estimated Extent of Occurrence 120,000 km^2. . The EcAoA for terrestrial reptiles (9.78km2) occupies less than 0.01% of the estimated EOO. Therefore, it is incredibly unlikely to support 0.5% of this population of this species.	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species
Lacerta trilineata, Balkan green lizard	LC	Annex IV	-	-	IUCN Least Concern species found along the eastern Adriatic coastal region from north eastern Italy to western Greece with a large population and an estimated Extent of Occurrence 500,000 km^2. . The EcAoA for terrestrial reptiles (9.78km2) occupies less than 0.01% of the estimated EOO. Therefore, it is incredibly unlikely to support 0.5% of this population of this species.	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species
Podarcis muralis, common wall lizard	LC	Annex IV	-	-	IUCN Least Concern species found across Southern and Eastern Europe with a large population and an estimated Extent of Occurrence of over 2 million km^2. . The EcAoA for terrestrial reptiles (9.78km2) occupies less than 0.01% of the estimated EOO. Therefore, it is incredibly unlikely to support 0.5% of this population of this species.	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species
Natrix tessellata, dice snake	LC	Annex IV	-	-	This species ranges across southern and Eastern Europe, as well as elsewhere across Asia and Russia. Recognised as Least Concern by the IUCN, its population size is inferred to be relatively large and it has an estimated Extent of Occurrence in excess of 5,000,000 km^2. The EcAoA for terrestrial reptiles (9.78km^2) occupies less than 0.01% of the estimated EOO. Therefore, it is incredibly unlikely to support 0.5% of this species population	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species
Podarcis melisellensis, Dalmatian wall lizard	LC	Annex IV	-	-	IUCN Least Concern species found along the eastern Adriatic coastal region from north eastern Italy to western Greece with a large population and an estimated Extent of Occurrence 500,000 km^2. . The EcAoA for terrestrial reptiles (9.78km2) occupies less than 0.01% of the estimated EOO. Therefore, it is incredibly unlikely to support 0.5% of this population of this species.	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species

[1] Vujović, A., V. Iković, A. Golubović, S. Đorđević, R. Ajtić, V. Pešić, and L. Tomović. 2015. Effects of fires and roadkills on the isolated population of *Testudo hermanni*

Hyla arborea, European tree frog	LC	Annex IV	-	-	A widespread Palearctic species occurring across lowland Europe and western Russia. Estimated EOO of 4 million km² (IUCN).	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species
Rana graeca, Greek stream frog	LC	Annex IV	-	-	Listed as Least Concern in view of its wide distribution, tolerance of a degree of habitat modification, presumed large population, and no evidence of rapid decline. Estimated EOO 200,000 km²	Project AoA is less than 0.01% of the estimated EOO. PAA not thought to represent critical habitat for this species

Priority Biodiversity Features

The EBRD Performance Requirement 6 defines **Priority Biodiversity Features** (PBFs) as those which have a high, but not the highest, degree of irreplaceability and/or vulnerability. A level below critical habitat in sensitivity, they still require careful consideration during project assessment and impact mitigation. Priority Biodiversity Features typically comprise of one or more of the following:

i) Threatened habitats

ii) Vulnerable species

iii) Significant biodiversity features identified by a broad set of stakeholders or governments

iv) Ecological structure and functions needed to maintain the viability of priority biodiversity features

Priority Biodiversity Feature Assessment

Name	IUCN	Habitats directive	Evidence	PBF?
Falco cherrug Saker Falcon	EN	-	No evidence in surveys or the literature reviewed to suggest this species is found regularly in the AoA.	No
Anguilla Anguilla, European Eel	CR	-	A Critically Endangered species recorded in several watercourses crossed by the project (8 individuals caught)	Yes
Pelophylax shqipericus, Albanian water frog	EN	Annex IV	Not identified within the AoA during amphibian surveys or during a 2018 survey of Tivat Saline. Not considered to have regular occurrence in PAA.	No
Myotis capaccinii, Long-fingered bat	VU	Annex IV	Not recorded within the AoA, although genus was (likely to be *Myotis natteri).* If present it will be protected by the mitigation put in place for other bat species..	No
Rhinolphus hipposideros, Lesser horseshoe bat	-	Annex IV	Recorded in attic of house within AoA for bats.	Yes
Pipistrelus kuhlii , Kuhl's pipistrelle	-	Annex IV	Recorded (ultrasound) and caught in mist-netting within the AoA during Summer 19 surveys.	Yes
Pipistrellus pipistrellus, Soprano pipistrelle	-	Annex IV		Yes
Myotis nattereri, Natterer's Bat	-	Annex IV		Yes
Nictalus noctula/leislerii, Noctule/Lesser Noctule	-	Annex IV	Registered by the ultrasound as being present within the AoA for bats.	Yes
Hypsugo savii Savi's pipistrelle	-	Annex IV	Caught in netting within the AoA for bats.	Yes
Felis silvestris Wild Cat	-	Annex IV	Identified in camera trap within AoA for terrestrial mammals	Yes
Emys *orbicularis*, European pond turtle	-	Annex IV	Present in multiple waterways crossed by the project road, as well as drainage channels running alongside the project road.	Yes
Testudo hermanni, Hermann's tortoise	-	Annex IV	Recorded in surveys as present along much of the road layout.	Yes
Pseudopus apodus, European glass lizard	-	Annex IV		Yes

Algyroides nigropunctatus, blue-throated keeled lizard	--	Annex IV		Yes
Lacerta trilineata, Balkan green lizard	-	Annex IV		Yes
Podarcis muralis, common wall lizard	-	Annex IV		Yes
Natrix tessellata, dice snake	-	Annex IV	Identified in surveys as present in the PAA.	Yes
Podarcis melisellensis, Dalmatian wall lizard	-	Annex IV	Identified in surveys as present along much of the road layout.	Yes
Hyla arborea, European tree frog	-	Annex IV	Recorded in multiple water ways and drainage ditches along the road during summer 19 surveys.	Yes
Rana graeca, Greek stream frog	-	Annex IV		Yes
Proteus anguinus, Olm	VU	-	Listed in IBAT but no local records and known to be "exclusively cave-dwelling" (IUCN). Unlikely in the EcAoA.	No
Aythya ferina Common Pochard	VU	-	Recorded during winter migrations in the Tivat Saline wetland area, but not in smaller waterbodies within PAA..	No
Streptopelia turtur European Turtle Dove	VU	-	One individual recorded during 2019 surveys, around 1km from the road. This species is widespread across Europe population exceeds 12 million. Not considered to qualify this species as a PBF.	No
Mosor Rock Lizard	VU		Listed in IBAT, but not identified in summer 2019 reptile surveys and prefers rocky karst areas. Unlikely to be a regularly present within the PAA.	No
Meadow Viper	VU	-	Listed in IBAT, but not identified in summer 2019 reptile surveys and prefers open meadows, rocky hillsides and steppe. Unlikely to be a significant population present within the PAA.	No