



## INTERMEDIATE ENVIRONMENTAL MONITORING REPORT DURING WORKS

### SUSEK – SUMMARY OF RESULTS

#### Introduction

The main objective of this environmental report during works is to address the base values of the main parameters identified during the elaborations of the EMRbW. These values were established during the Inception Phase and will serve as the base for evaluation of effects of river training and works to the environment.

According to the ToR, one Monitoring report must be prepared every 3 months from the start of the construction works at each critical sector till the end of works (at critical sectors on which dredging activities are performed) and until the start of the Defects Notification Period (for critical sectors on which river training structures have been constructed), identifying all changes in environmental parameters compared to the base values identified in the Environmental Monitoring Report Before Works, also arguing the reasons for these changes, as well as their long-term impact to the integrity of the affected areas.

Works have begun in Susek on August 28<sup>th</sup> 2020 and they have not been finished by the end of November 2020, so this report is necessary in order to identify the current status of environment after three months.

The Environmental Monitoring Report n° 1 covers the following fields:

- Hydromorphology
- Sediment and water quality
- Waste
- Biology
  - Phytoplankton
  - Macrozoobenthos
  - Vegetation (*Limosella aquatica*)
  - Birds (*Charadrius dubius* and *Riparia riparia*)
  - Fish (*Acipenser ruthenus*)
- Development of vegetation and riparian areas
- Protected Areas and Ecological Networks

The table below shows the works to be carried out in the critical sector Susek and their exact location according to the Final Design:

N°	Name of critical sector	Type of works	Chainage from	to
	Susek	Dredging II	1285 + 000	1283+950
		Dredging I	1282+650	1282+050

The report shows the status of environment once completed three months of works, according to ToR statements.

#### Description of work site

Susek is the only critical sector where works execution is in progress in this moment. The Dredging Works of the area II was completed on 26 of October 2020, after which the bathymetric



survey has been done and the vessel composition was shifted to the upstream area I. The dredging works of the area I are under progress from 27 of October 2020.

Floating barge with construction material is used as a temporary storage for solid material like steel armature (reinforcement bar) and new rolls of geotextile are into the foil Floating office.

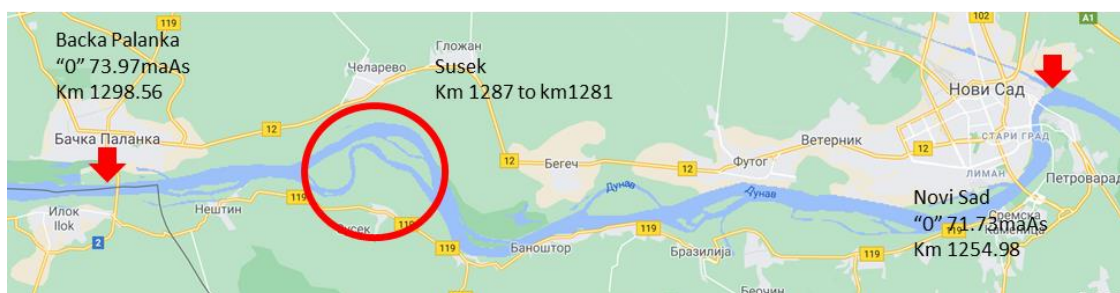
### Status of the works after 3 months

The construction Works in the sector 18 (Susek) are not completed. The table below shows the current status of each planned activity per structure.

Item	Activity	Status
1	<b>Dredging area I+II</b> - Placing of benchmarks	Completed
2	<b>Dredging area I+II</b> - Survey	Completed
3	<b>Dredging area I+II</b> - Geodetic data processing	Completed
4	<b>Dredging area I+II</b> - Preparation of drawings	Completed
5	<b>Dredging area II</b> - Dredging with dumping	COMPLETED (Finish Date 26.10.2020)
6	<b>Dredging area I</b> - Dredging with dumping	On Going

### Project context

The stretch Susek has been located in between the gauging stations Backa Palanka and Novi Sad



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The main characteristics of the stretch are the dozen of river islands and long Riverbend with gradually decreased radius towards the exit. Judging by the number of river islands and training works, the stretch Susek appears to be historically very dynamic and critical for navigation. The Nestinska ada is the biggest river island, and the park of nature "Poloj" has encompassed its whole area. The navigational channel has been situated along the left riverbank. Due to specific water currents in the band, the river sediment is being deposited on the inner side of the band and thus contracts the navigation channel. The outer side of the river band has been protected with the embankment while on the inner band there is t shaped groyne and the barrier between Nestin river island and right riverbank.

### Water quality monitoring

Detailed Monitoring plan for both water and sediment quality was created in accordance with monitoring plan from the Inception Report but also in accordance with currently valid dynamic plan and prediction that working period are going to be longer than it was planned.

Regular water quality monitoring is performed every third month (four times per year), while additional monitoring is performed more frequently. During additional monitoring campaigns parameters like temperature, TSS and mineral oil are being determined. Extra monitoring of these parameters is not predicted within the Inception Report for the locations where the construction is performed, only where dredging and sediment disposal is performed. However, the SEM team concluded that additional monitoring could be useful for screening the situation during works execution.

During the works execution phase, one regular monitoring campaign was conducted (November 18/11/2020), at the location Susek 1, with both locations, Susek 1 and Susek 2. In July (30/07/2020) another monitoring campaign was carried out immediately before the start of works, since the previous testing campaign before the start of works was three years ago and this is the first location where excavation (dredging) and sediment disposal works are performed within the Danube River. So, the Supervision wanted to check state of affairs on the ground. In the meantime, one additional water screening analyses was performed, at the same time when regular analyses was carried out. For short analyses, water sample was taken upstream from the construction site.

In the meantime, 8 water samples in 6 campaigns were taken for additional analyzes during the works at Susek 2, where the works were first started and now completed, and 5 water samples in 3 campaigns at Susek 1, where the works are still during. Samples were taken downstream from the sedimentation site, while samples at the Susek 1 site were taken both upstream and downstream from the deposit site on 09/10/2020 to perform a control analysis

### Sediment monitoring

In the phase of works excution, a total of one sampling campaign was conducted at the location Susek 1, at the same time when water samples were taken on 18/11/2020.

At both locations, Susek 1 and Susek 2, an additional sampling campaign was carried out immediately before the start of works in July (30/07/2020), as well as in the case of water.

### Review of water and sediment quality results

The results obtained during the **first regular sampling campaign** conducted on 18.11.2020. at the Susek 1 location show that the quality of water samples, taken and analyzed from three different depths (0.5; 4.0; 6.0 m), was not different from the quality of samples analyzed in previous campaigns, as within this Project (benchmarks) as well as official campaigns.

The results of physico-chemical analyzes show that the water quality of the Danube at the Susek 1 location (depth 0.5 m) predominantly corresponds to the quality of class I waters, except for the



parameters nitrates and BOD5 which correspond to the class II water quality. Total nitrogen and ammonium ion belong to class III.

Regarding the microbiological classification of the quality of this sample, it can be concluded that the waters of the Danube at Susek 1 belong to class I for coliform bacteria of fecal origin and intestinal enterococci, total coliform bacteria belong to class II and for aerobic heterotrophs correspond to class III surface waters.

The results of physico-chemical analyzes show that the quality of the Danube water at the Susek 1 site (depth 4.0 m) predominantly corresponds to the quality of class I waters, except for the parameters nitrates and BOD5 which correspond to the class II water quality. Total nitrogen, ammonium ion and lead belong to class III.

Regarding the microbiological classification of the quality of the mentioned sample, it can be concluded that the waters of the Danube at the Susek 1 location belong to class II for total coliform bacteria and for intestinal enterococci; coliform bacteria of fecal origin belong to class III and for aerobic heterotrophs they correspond to class IV surface waters.

The results of physical and chemical analyzes show that the water quality of the Danube at the Susek 1 location (depth 6.0 m) predominantly corresponds to the quality of class I waters, except for the parameters nitrates and BOD5 which correspond to class II water quality. Total nitrogen, ammonium ion and lead belong to class III.

Regarding the microbiological classification of the quality of this sample, it can be concluded that the waters of the Danube at the location of Susek 1, belong to class III for total coliform bacteria and for intestinal enterococci; coliform bacteria of fecal origin and aerobic heterotrophs correspond to class IV surface waters.

The results obtained during the **first regular sampling campaign carried out after the completion of works** at Susek 2, on 18/11/2020, show that the quality of water samples of the Danube at Susek 2, taken and analyzed from three different depths (0.5; 2.5 6.0 m), downstream of the sedimentation site, was not different from the quality of the samples analyzed in previous campaigns, both within this Project (reference values) and official campaigns.

The results of physico-chemical analyzes show that the water quality of the Danube at the location Susek 2 (depth 0.5 m) predominantly corresponds to the quality of water of class I, except for the parameters nitrates and total phosphorus corresponding to the quality of water of class II. Total nitrogen, BOD5 and ammonium ion belong to class III.

Regarding the microbiological classification of the quality of this sample, it can be concluded that the waters of the Danube at the location Susek 2, belong to class II for total coliform bacteria and for coliform bacteria of fecal origin; intestinal enterococci belong to class III; and aerobic heterotrophs correspond to class IV surface waters.

The results of physico-chemical analyzes show that the water quality of the Danube at the Susek 2 location (depth 2.5 m) predominantly corresponds to the quality of class I waters, except for the parameters nitrates and BOD5 which correspond to class II water quality. Total nitrogen and ammonium ion belong to class III.

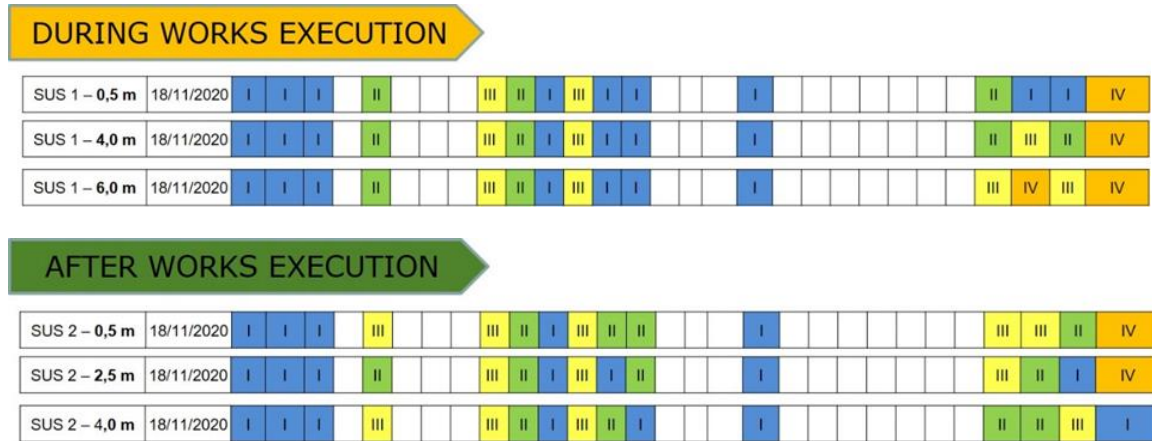
Regarding the microbiological classification of the quality of this sample, it can be concluded that the waters of the Danube at the location Susek 2, belong to class I for intestinal enterococci, for coliform bacteria of fecal origin belong to class II; total coliform bacteria belong to class III and aerobic heterotrophs correspond to class IV surface waters.

The results of physico-chemical analyzes show that the water quality of the Danube at the Susek 2 location (depth 6.0 m) predominantly corresponds to the quality of class I water, except for the



parameters nitrates, BOD5 and total phosphorus corresponding to class II water quality. Total nitrogen and ammonium ion belong to class III.

Regarding the microbiological classification of the quality of this sample, it can be concluded that the waters of the Danube at the location Susek 2, belong to class II for total coliform bacteria and for coliform bacteria of fecal origin; intestinal enterococci belong and aerobic heterotrophs correspond to class IV surface waters.



Quality of parameters temperature, suspended matters and mineral oils of additionally taken sample corresponds to the class I of water quality:

SECTOR	SAMPLING LOCATIONS AND TYPE OF WORKS ON SECTOR	RESULTS OF WATER QUALITY IN DIFFERENT CAMPAIGNS								I CLASS	II CLASS	III CLASS	IV CLASS	V CLASS										
		30.7.2020	07.09.2020.	09.09.2020.	17.9.2020	9.10.2020	17.10.2020	9.11.2020																
temperature (°C) / suspended matters (mg/l) / mineral oils (mg/l)																								
SUSEK 1	Sampling point 1 - upstreams																							
	SILL 22.1																							
	Sampling point 2 - downstreams	21,3	18	<5,0										9	18	<0,1	10							
	depth 2,0 m																							
depth 4,0 m																								
SUSEK 2	Sampling point 3 - upstreams														12,6	20	<0,1							
	SILL 22.2																							
	Sampling point 4 - downstreams	21,4	8	<5,0	20,6	40	<0,1	20,4	16	0,3	19,4	30	<0,1	12,6	26	<0,1	12,4	20	<0,1					
	depth 2,5 m																							
depth 6,0 m																								
LEGEND:																								
LEGEND:																								

The results of testing the values of sediment quality parameters obtained during the additional repeated monitoring campaigns, **in the phase immediately before the works**, performed on 30/07/2020 at the sites Susek 1 and Susek 2, show that the values of all tested parameters are below the prescribed limit values not detected.

The results of testing the values of sediment quality parameters obtained during the regular monitoring campaigns, **in the phase of works execution**, performed on 18/11/2020 at the location Susek 1, show that the values of all tested parameters are below the prescribed limit values, and most of them are not detected.

Also, the results of testing the values of sediment quality parameters obtained during the regular monitoring campaigns, **in the phase after the completion of works**, performed on 18/11/2020 at the site Susek 2, show that the values of all tested parameters are below the prescribed limit values, and most of them are not detected. That is, to be at the level of the natural background.



### Waste

During this period regular inspections have been carried out with the purpose of detecting uncontrolled discharges of waste or pollution incidents. The monitoring has been done by visual inspection of vessels and water analysis.

Conclusions show that all the established preventive measures are been followed by WKSC, so during this period there has been no incident related to discharges or waste

### Phytoplankton

This is typical phytoplankton community structure for this season. Community structure was uniform along depth gradient and among localities.

### Macrozoobenthos

Four species from two genera were found in total.

On the riverbank and in the shallow water, mussels were represented by several dead individuals of *Corbicula* and *Dreissena* genera.

Found mussels in sediment may be presented summarized by sampling locations:

Susek 1, dredging site – *Dreissena polymorpha* (four individuals), *Dreissena rostriformis bugensis* (1) and *Corbicula fluminea* (1)

Susek 1, deposition site – *Dreissena polymorpha* (2)

Susek 2, dredging site – *Dreissena polymorpha* (4) and *Corbicula fluminea* (1)

Susek 2, deposition site – *Dreissena polymorpha* (11) and *Corbicula fluminea* (3)

Sector	<i>Unio</i> sp.	Other species
Sector 18 Susek	No individuals	<i>Corbicula fluminea</i> <i>Corbicula fluminalis</i> <i>Dreissena polymorpha</i> <i>Dreissena rostriformis bugensis</i>

### Birds

Population of birds was scarce in qualitative and quantitative sense. Dominant species is Mallard (*Anas platyrhynchos*), with around 10 individuals. One individual of Great cormorant (*Phalacrocorax carbo*) and Common kingfisher (*Alcedo atthis*) were in flight. Mute swan (*Cygnus olor*) was present, as usual. Also, one species with one individual, but around 150 m from riverbank, was recorded – Common pheasant (*Phasianus colchicus*), as adult male.

Sector	<i>Charadrius dubius</i>	<i>Riparia riparia</i>	Other species
Sector 18 Susek	--	--	<i>Anas platyrhynchos</i> <i>Phalacrocorax carbo</i> <i>Phasianus colchicus</i> <i>Alcedo atthis</i>



			<i>Cygnus olor</i>
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### Fishes

In the standing and pulling nets no one individual of fish has been caught. In electrofishing one individual of Common roach (*Rutilus rutilus*) has been caught.

Sectors	<i>Acipenser ruthenus</i>	Other species
Sector 18 Susek	No individuals	<i>Rutilus rutilus</i> (one individual)

### Macrovegetation

Plant belt along left riverbank is in good vegetation status. Root system and habitat are mainly preserved. *Salix alba* dominate in number of individuals along the belt. Some individuals of that species are partially flooded. *Fraxinus* sp. is deeper in the habitat. *Amorpha fruticosa* has many individuals. Herbaceous species has solid diversity between the riverbank and embankment. Pioneer and ephemeral vegetation of periodically flooded shores is present along riverbank. Coverness by shadow at this time is around 70%.

Sector	Species: <i>Limosella aquatica</i>	Other species
Sector 18 Susek	No results	<i>Populus alba</i> <i>Salix alba</i> <i>Fraxinus</i> sp. <i>Robinia pseudoacacia</i> <i>Amorpha fruticosa</i> <i>Rumex obtusifolius</i> <i>Tussilago farfara</i> <i>Ranunculus</i> sp. <i>Urtica dioica</i> <i>Stellaria media</i> <i>Morus</i> sp. <i>Chelidonium majus</i> <i>Asclepias syriaca</i> <i>Symphytum</i> sp. <i>Aristolochia</i> sp. <i>Corylus</i> sp. <i>Pastinaca</i> sp. <i>Erigeron</i> sp.

### Plants

Not any individual of species *Limosella aquatica* and *Lindernia palustris* have been found.

Sector	Species: <i>Limosella aquatica</i> Species: <i>Lindernia palustris</i>
Sector 18 Susek	No results



### Development of vegetation

Primary plant belt is from water line to road below the embankment, which is up to 30 m. Herbaceous and forest species has favourable conditions for development in terms of humidity and shadow. Some species are very close or in the water. Main characteristic of riverbank is that there is no erosion because bank is very low and transition to water is gradual. Submersed macrophytes are present, primarily in the area with deeper sand. Every plants species is represented by different family, except three cases where two species belong in the same family: *Populus* and *Salix* in Salicaceae, *Robinia* and *Amorpha* in Fabaceae and *Tussilago* and *Erigeron* in Asteraceae. All present plant families are Salicaceae, Oleaceae, Fabaceae, Polygonaceae, Asteraceae, Ranunculaceae, Urticaceae, Caryophyllaceae, Moraceae, Papaveraceae, Asclepiadaceae, Boraginaceae, Aristolochiaceae, Betulaceae and Apiaceae.

### Riparian areas

Plant habitat, in some areas, is partially modified due to construction of solid structures. Birds are occurred by several common genera, dominantly by Mallard (*Anas platyrhynchos*) and one individual of Great cormorant (*Phalacrocorax carbo*). One individual of Common pheasant (*Phasianus colchicus*) was recorded, but not so close to investigated area. Vertebrata has been represented by several individuals of Marsh frog (*Pelophylax ridibundus*) and one dead individual of Grass snake (*Natrix natrix*). On several trees, scraping activities are visible in the lower part of trees by Beavers (*Castor fiber*). Some parts of habitat are in great humidity or under the water or periodically flooded. Mushrooms from 3-4 genera grow on trunks in degradation.

### Protected areas

Following the EIA document (section 3.8 and from EIA Appendix VII), the protected areas that could be affected by the work at Critical Sector of Susek are summarized in the table below:

Sector 18	Protected Area
Susek	Nature park "Begeč swamp"

Negative effects over the Nature Park "Begeč swamp", due to the activities of this project, are not expected due to long distance between dredging zones and position of "Begeč swamp".

### Ecological network

According to Decree on Ecological Network ("Official Gazette RS" No. 102/2010), in the wider area of work zone is one Ecological corridor of international importance in the Republic of Serbia – Nature park "Begeč swamp".

### Summary of results

After surveys during November 2017, August 2018, July, August and November 2020, the following target species have been found **in sector Susek**.

Period	Macrozoobenthos <i>Unio</i> sp.	Fishes <i>Acipenser ruthenus</i>	Plants <i>Limosella aquatica</i>	Plants <i>Lindernia palustris</i>	Birds <i>Riparia riparia</i>	Birds <i>Charadrius dubius</i>
November 2017	-	-	-	-	-	-
August 2018	-	-	-	-	-	-
July 2020	-	-	-	-	-	-
August 2020	-	-	-	-	-	-





November 2020	-	-				
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### Summary of main impacts in the sector during this period

In this sector is defined dredging activities in two separated subareas.

During these three months, activities have been focused on dredging activities in subsector II, which is completed and subsector I, currently on going. The monitoring activities during this period has been focused on determination of the potential effects on biological parameters and water and sediments parameter, due to the fact that the effects on the hydromorphology would be analysed once the works will have been completed.

According to the data explained in precedent sections, several monitoring has been executed during these months, the last of them after complete three months since the beginning of works in Susek. The obtained results have been compared with data included in Environmental Monitoring Report before Works.

Regarding water and sediments, after these three months it is possible to conclude that there are no significant effects over these parameters. The obtained results during field surveys in November are significantly similar to the previous ones. This can be interpreted as the works are not affecting the quality of water and sediments in the vicinity of critical sector of Susek.

From the point of view of biology, the results show that the nature is not been affected by the works. Results obtained until now are line with normal status during each season, especially birds and fishes.

Bearing in mind that works are being executed from the water, the riparian vegetation existing in the riverbanks are not suffering any impact except a little dust deposited on leaves. This impact cannot be avoided because mainly depends on wind direction. However, it is not significant impact and the general status of riparian habitat remains in good conditions.

None of individuals of protected species of plants have been affected during these months and wildlife seems not to be impressed by the presence of machinery and workers. Protected species of birds have not been detected in Susek during the field surveys.

### Protective and corrective measures

The following mitigation measures have been carried out during these months to reduce or to avoid the described adverse impacts resulting from the proposed project activities:

- Confirm the absence of the river mussel (*Unio* sp.) in the vicinity of the working area.
- Perform monitoring of spills and suspended concentration during the execution of the works. If excedance of the critical concentration is observed the work intensity is to be reduced;
- Monitor the incidence of works over the vegetation surrounding the working area
- Monitor the variations, if any, of wildlife population around the working areas, focused on the main species mentioned in the EIA.

### Conclusions & Recommendations

Works that are being executed currently on critical sector Susek are following the methods and recommendations regarding environment protection included in EIA report and official decision. Additionally, WKSC is accomplishing the environmental measures included in the tender specifications and taking into consideration conclusions of Inception Report. The environmental



monitoring begun at the same moment that the works and has been considered one of the most important elements of the project. Thank to this, the measures implemented by WKSC and the continuous monitoring are avoiding negative effects over the nature.

The main recommendation is to continue with the strong and continuous monitoring until the end of works in this sector. If any negative effect would appear, the environmental team should be immediately advised in order to take the most adequate corrective measures.