



MONTHLY REPORT No 74: 1 - 30 June 2017

MONITORING THE ENVIRONMENTAL IMPACT OF THE WORKS REGARDING THE IMPROVING OF THE NAVIGATION CONDITIONS ON THE DANUBE RIVER BETWEEN CALARASI AND BRAILA, KM 375-175

MONTHLY REPORT NO. 74

01 - 30 June 2017



FINAL VERSION





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1. INTRODUCTION

1.1. Brief presentation of monitored objectives

I. This report presents the monitoring objectives for the period 01-30 June 2017.

For post-construction phase the monitoring frequencies for the environmental components are presented in Table 1.1.

II. 3D numerical modeling

During this period have been conducted activities for:

- multi-beam and single-beam bathymetric data aquisition
- data completion for medium scale modeling
- comparative analyzes used as reference data for numerical modeling

In addition to organizing and properly conducting the field campaigns, a permanent cooperation has been ensured between the Coordinator and Partners.





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Table 1.1. Post-construction phase - monitoring objectives - frequencies with differences in the Critical Points

					Critical points							
	MON	ITOR	ING OBJ	IECTIVES	Ma	in Critical P	oints		Second	ary Critica T	al Points	[
	4			01	02	10	03A	03B	04A	04B	07	
Α.	AIR			R	S	S	S	Q	Q	Q	Q	Q
В.			NO	ISE	S	S	S	Q	Q	Q	Q	Q
С.			SO	IL	S	S	S	Q	Q	Q	Q	Q
			Water level		с	с	С	Q	Q	Q	Q	Q
	Y D R O	H Y D Water velocity R Water velocity		м	м	м	Q	Q	Q	Q	Q	
D.	M O R P H		Т	urbidity	С	с	С	Q	Q	Q	Q	Q
	: 0 L O G X	20) bathyn	netric elevation	м	м	м	Q	Q	Q	Q	Q
	Y	30	3D bathymetric elevation		Q	Q	Q		١	lot the ca	se	
E.	WATER QUALITY		Q	Q	Q	S	S	S	S	S		
	SEDIMENTS		ENTS	Q	Q	Q	S	S	S	S	S	
	AQUATIC FLORA			August		Q	Q	Q	Q	Q		
	AQUAT		QUATIO	. FAUNA	0	0	0	Q	Q	Q	Q	Q
F.	с т і	F. is STURGEONS		Two seasons / year (February - May / August - December)			(Fet	Two oruary - M	seasons / ay / Augu:	year st - Decerr	ıber)	
	AND BARBELL		BELL	BARBELL	(April-	One season/y May (breedin	rear g season)	On April- Ma	One season/year April- May (breeding season)			
		F. i (OTHER F	ISH SPECIES	(April- /	Annually (April- May, July - September) (April- May			Annually ay, July - September)			
		TE	RRESTRIAL FLORA Annually in July			Annually in July						
G.	TERRESTRIAL FAUNA/ AVIFAUNĂ		UNA/ AVIFAUNĂ	(April - Ju	Annually ne, Septemb January)	er - October, (Apri		Annually pril - June, September - October, January)				
				ICHTYOFAUNA	(April- /	Annually May, July - Se	eptember)		Annually (April- May, July - September)			
				AQUATIC FLORA		July	. ,	Q	Q	Q	Q	Q
			SCI	AQUATIC FAUNA	Q	Q	Q	Q	Q	Q	Q	Q
н.		UKA DO FS		TERRESTRIAL FLORA		Annually in J	uly		An	nually in .	July	
	5.11	SITES		TERRESTRIAL FAUNA	(April - Ju	Annually ne, Septemb January)	er - October,	(Ar	Annually (April - June, September - October, January)			
			SPA	AVIFAUNĂ	(April - Ju	Annually ne, Septemb January)	er - October,	(Ap	oril - June	Annually , Septemb January)	er - Octob	ber,
J.		3D r	numeric	al modeling				м				
LNO	NOTĂ: QC - guasi continuous M- monthly Q - guarterly S - semester C - continuous											





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1.2. Overview

The elements related to the sampling periods for the objectives monitored in June 2017 for post-construction period are presented in Table 1.2.

		Sampling period			Critical Points							
C	Objectives monitored	/ ongoing activities	Campaign	Main Critical Points			Secondary Critical Points				ts	
				01	02	10	03A	03B	04A	04B	07	
Α.	AIR	12, 15, 21.06.2017	C66	NO	NO	NO	YES	YES	YES	YES	YES	
В.	NOISE	12, 15, 21.06.2017	C69	NO	NO	NO	YES	YES	YES	YES	YES	
С.	SOIL	13.06.2017	C26	YES	YES	YES	YES	YES	YES	YES	YES	
D.	HYDROMORPHOLOGY	06-09, 12-15, 26, 29.06.2017	C71	YES	YES	YES	NO	NO	NO	NO	NO	
E.	WATER QUALITY	13, 26.06.2017	C64	YES	YES	YES	NO	NO	NO	NO	NO	
	SEDIMENTS	13, 26.06.2017	C64	YES	YES	YES	NO	NO	NO	NO	NO	
	AQUATIC FLORA	-	-	NO	NO	NO	NO	NO	NO	NO	NO	
	AQUATIC FAUNA	15.06.2017	C27	YES	YES	YES	YES	YES	YES	YES	YES	
F	F.is. STURGEONS	21, 22.06.2017	C32	YES	YES	YES	YES	YES	YES	YES	YES	
г.	F.is. BARBELL	-	-	NO	NO	NO	NO	NO	NO	NO	NO	
	F.i. OTHER FISH SPECIES	-	-	NO	NO	NO	NO	NO	NO	NO	NO	
	TERRESTRIAL FLORA	-	-	NO	NO	NO	NO	NO	NO	NO	NO	
G.	TERRESTRIAL FAUNA/ AVIFAUNĂ	06-09, 12.06.2017	Avifauna monitoring	YES	YES	NO	YES	YES	YES	YES	YES	
Н.	NATURA 2000 SITES	06-07.06.2017	Avifauna monitoring	YES	YES	NO	YES	YES	YES	YES	YES	
١.	BUILDING SITE	-	-	NO	NO	NO	NO	NO	NO	NO	NO	

Table 1.2. Objectives monitored during the period of 01.06-30.06.2017

NOTE:

YES - samples were taken / activities were conducted in the field

NO - no samples taken / no activities conducted in the field





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Means of transportation used for sampling/conducting activities and samples analysis are presented in Table 1.3.

Field	Transportation means
	trimaran type boat with 25 CP engine
	Laguna type boat with 25 CP engine
WATFR	Lotus type boat with 20 CP engine
	Boat - autolaboratory - with trailer - RANIERI CLF22 model, Suzuki engine,
	175 CP
	Boat ANA 5.0 with trailer, Suzuki engine, 40 CP
	Boat ANA 5.5 with trailer, Suzuki engine, 70 CP
	Autolaboratory - Pickup jeep Toyota Hilux Double Cab 4x4
LAND	Autolaboratory - Jeep Toyota LandCruiser
	Autolaboratory for air monitoring
	Autolaboratory for water and soil monitoring

Table 1.3 Means of transportation





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2. STATE OF THE PROGRESS ACTIVITIES

2.1. State and progress on each activity / critical point on specific monitoring objectives

The equipments used for sampling/ongoing activities and samples analysis are presented in table 2.1.

Ob	jectives monitored	Sampling equipment	Laboratory equipments / ongoing activities
A. B.		 - LECKEL dust sampler - Auto-laboratory - Desaga pump - GPS - Autolaboratory for air monitoring - Sound Level Meter and Microphone, Brüel & Kiær Denmark 	- Analytical balance KERN 770-14 - Atomic absorption spectrometer with graphite furnace AAS - UNICAM 939
5.		- GPS	
C.	SOIL	- Burkle sampler - GPS	 ION-CROMATOGRAPH DIONEX ICS 1500 - anions, cations Multi N/C Analytic Jena (total carbon analyzer and organic carbon) Spectrometer ATI UNICAM UV-VIS Mass Spectrometer with inductively coupled plasma ICPMS NexIon 350x equiped with hydrides generator system and autosampler system with autodiluter
D.	HYDROMORPHOLOGY	 Portable Turbidimeter type VELP SCENTIFICA mini ADP SONTEK Monitoring systems for turbidity and level Monitoring systems for flow - velocities Portable Turbidimeter HANNA Instruments ADCP SONTEK River Surveyor R9 Multiparameter YSI for turbidity and level measurements Bathimetric System 3D - Konsgberg GeoSwath Plus Compact, 250 kHz Acoustic Doppler Current Profiler (ADCP) - Teledyne RD Instruments RiverRay ROV (Remote Operate Vehicle) - ROVBUILDER Mini 600 GPS 	 Turbidimeter HACH RATIO/RX Device for water quality parameters measurements, type 1, Manta 2- Sub3.5+Amphibian 2 Device for water quality parameters measurements, type 2, Manta 2- Sub4.0+Amphibian 2
E.	WATER QUALITY SEDIMENTS	- Ruttner sampler - GPS - Petersen sampler - GPS	 Spectrometer with atomic absorbtion VARIAN Spectrometer CARY BIO 300 U.VVIS Spectrofotometer with atomic absorbtion - with flame, graphyte oven, hydrides system with amalgamation and automatic system for solids CONTRAA Automatic analyzer in continous segmented flux model SAN++ Mineralization system Speedwave Four with microwave Cryo - drying system ALPHA 2-4 LSCplus Gas cromatograph coupled with mass spectrometer for dioxine screening, CPF, CPB and pesticides, with autosampler r-GC MS MS 15-02 Drying stove Sieving system for sediment samples Ethos - digester with microwave for sediments GC-MS-VARIAN Spectrometer with atomic absorbtion SOLAAF
			- Mineralization System Speedwave Four with microwave

Table 2.1 Main devices





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Objectives monitored		Sampling equipment	Laboratory equipments / ongoing activities	
F.	AQUATIC FLORA	 planktonic nets Patalas sampler dredges 20cmx50 cm Square wooden frame, with surface of 1m² GPS 	- reverse microscope ZEISS - OPTIKA B-600T microscope - KRUSS microscope - Canon A570 IS camera for microscope	
	AQUATIC FAUNA	 zooplanktonic nets zoobenthic nets Petersen sampler benthos grabbing dredges benthos sampling probe GPS 	- Stereomicroscope Olympus - Binocular Zeiss - Microscope ZEISS - Canon A570 IS camera for microscope - magnifying glass	
	F.is. STURGEONS AND BARBELL	 Fixed monitoring system DKTB Floating monitoring system type DKMR-01T Complex monitoring, alarming and control system type DK-PRB-01U Monitoring system with ultrasonic transmitter type 40 Monitoring system with ultrasonic transmitter type 60 Mobile receiver for sturgeons' telemetry Vemco VR 100 GPS 	 Reception station of WR2W VR100 mobile receptor Multiparameter YSI Endoscope for sturgeon gender determining WELLD WED 3000V Radar Lowrance Elite 9 CHIRP - 4 pieces 	
	F.i. OTHER FISH SPECIES	 High power electrical fishing device Hans Grassl Low power electrical fishing device Hans Grassl Ihtyometer Electronic scale GPS binocular microscope stereo microscope 	EL 65 II GI EL 60 II HI	
~	TERRESTRIAL FLORA	Binoculars, GPS, notebook, standard forms, camera		
6.	TERRESTRIAL FAUNA/ AVIFAUNĂ	Binocular, lunette, camera, GPS		
Н.	NATURA 2000 SITES	Binocular, lunett	e, camera, GPS	
Ι.	BULDING SITE ACTIVITY	- DESAGA pump - Autolaboratory - Sound Level Meter and Microphone, Brüel & Kjær - dust sampler LECKEL		





2.1.1 Critical Point 01 monitoring, Bala branch area and Caragheorghe sand strip

2.1.1.A. Air quality monitoring

The activities carried out during 01/30.06.2017 related to air quality monitoring for each critical point are presented in Table 2.1.1.A.1.

Table 2.1.1.A.1	Specific ob	jective: air	quality	monitoring
	-			

No.	Activities				
1.	Contribution to Monthly Report 74				
2.	Contribution to Interim Report 16				

According to post-construction monitoring objectives, in June 2017 for air quality monitoring in this main critical point CP 01 is not provided a sampling campaign according to Table 1.2. In post-construction period (in this main critical point CP01 have been made the reception of the construction work) frequency is biannual (as Table 1.1).

2.1.1.B. Noise monitoring

The activities carried out during 01/30.06.2017 related to noise level monitoring, for each critical point are summarized in Table 2.1.1.B.1.

No.	Activities			
1.	Contribution to Monthly Report 74			
2.	Contribution to Interim Report 16			

Table 2.1.1.B.1. Specific objective: noise monitoring

According to post-construction monitoring objectives, in June 2017 for noise level monitoring in this main critical point CP 01 is not provided a measurements campaign as presented in Table 1.2. In post-construction period (in this main critical point CP01 have been made the reception of the construction work) frequency is biannual (as Table 1.1).





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2.1.1.C. Soil quality monitoring

Activities performed during 01/30 June 2017, regarding soil quality monitoring, for each critical point, are summarized in Table 2.1.1.C.1.

Table 2.1.1.C.1. Specific objective: soil quality monitoring

No.	Activities					
1.	Organizing the 26 th sampling campaign for soil (table 1.2)					
2.	Campaign 26 for soil sampling (bulletins for soil samples - Annex 6.2.3)					
3.	Observations in the field - lumbricides presence/absence					
4.	Performing laboratory analysis (preliminary determinations) for soil physical-chemical- mechanical characterization					

Number of soil samples collected from CP01 is presented in Table 2.1.1.C.2.

Table 2.1.1.C.2. Soil samples

Type of Critical	Critical	Samples collected	for laboratory analysis
Point	Point	depth 5 cm	depth 30 cm
Main	CP 01	3	3

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annex 6.2.3.

2.1.1.D. Hydromorphological monitoring

The activities from this reporting period are synthetically presented in Table 2.1.1.D.1:

Overall 4 main activities have been carried out:

- Multi-beam bathymetric measurements of high resolution;
- Single-beam bathymetric measurements
- Flow and velocity measurements on the monitoring sections;
- Turbidity and level continuous measurements in the 4 automatic hydrometric stations have continued.





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Table 2.1.1.D.1. Specific objective	: hydromorphological	monitoring
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No.	Activities
1.	Multi-beam bathymetric measurements of high resolution
2.	Single-beam bathymetric measurements
3.	Flow and velocity measurements on the monitoring sections
4.	Turbidity and level continuous measurements in the 4 automatic hydrometric stations

2.1.1.E. Water and sediments monitoring

The activities carried out during 01/30.06.2017, related to water and sediments quality monitoring, in this critical point are summarized in Table 2.1.1.E.1.

Table 2.1.1.E.1. Specific objective: water and sediments quality monitoring

No.	Activities
1.	Organizing campaign 64 for water and sediment samples (Table 1.2)
2.	Performing the sampling campaign for water, on cross-sections at various depths (sampling bulletins for water - Annex 6.2.4)
3.	Performing the sampling campaign for sediments (sampling bulletins for sediments - Annex 6.2.5)
4.	Physical-chemical analysis in field for water samples
5.	Physical-chemical analysis in laboratory for water and sediments samples

In this sampling campaign were collected water and sediment samples as presented in Table 2.1.1.E.2.

Type of Critical Point	Critical Point	Water samples	Sediment samples
Main	01	20	8

Table 2.1.1.E.2. Water and sediment samples

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annexes 6.2.4 and 6.2.5.





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2.1.1.F. Aquatic flora and fauna monitoring

The activities carried out during this reporting period, regarding aquatic fauna and flora (except for ichtyofauna), are summarized in Table 2.1.1.F.1.

Table 2.1.1.F.1 Specific objective: Aquatic flora and fauna monitoring

No.	Activities
1.	Organizing the sampling campaign for aquatic macroinvertebrates (Table 1.2)
2.	Conducting the sampling campaign for aquatic macroinvertebrates (sampling bulletins for aquatic flora and fauna - Annex 6.2.6)
3.	Laboratory preparing and analysis for benthic macroinvertebrates samples

From CP 01 were collected benthic macroinvertebrates samples, as presented in Table 2.1.1.F.2.

Type of	Critical		Samples collected for laboratory analysis		
Point Point		Section	Left bank	Right bank	
Main 01		1	1	1	
	01	2	1	1	
		3	1	1	
		4	1	1	
TOTAL 8		8			

Table 2.1.1.F.2 Benthic macroinvertebrates samples

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annex 6.2.6.

2.1.1.F.is. Sturgeons and barbell migration monitoring

In June there was no scientific fishing for sturgeon species due to the blockage produced by A.N.P.A. in issuing the permit for this activity. The research team carried out the monitoring activity for previously marked sturgeons using DKTB and DKMR-01T stations.

2.1.1.F.i. Other fish species monitoring

Data from the scientific fishing conducted in May on Alosa species were processed.





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2.1.1.G. Terrestrial flora and fauna monitoring

2.1.1.G.1 Terrestrial flora

During this period have not been made monitoring activities for terrestrial flora.

2.1.1.G.2 Terrestrial fauna/ Avifauna

The activities carried out during this reporting period, regarding avifauna monitoring, are summarized in Table 2.1.1.G.2.1.

Table 2.1.1.G.2.1 Specific objective: Avifauna monitoring

No.	Activities
1.	Activities in field: - avifauna observations from the shore and from the boat - census of nesting avifauna
2.	Analysis and processing for the field data

2.1.1.H. Natura 2000 sites monitoring

In this reporting period were monitored Natura 2000 sites in critical point area.

The activities carried out during this reporting period, regarding Natura 2000 sites monitoring, are summarized in Table 2.1.1.H.1.

Table 2.1.1.H.1 Specific objective: Natura 2000 sites monitoring

No.	Activities
1.	 Avifauna assessment in Natura 2000 sites in CP01 area: ROSPA0039 "Dunăre Ostroave"; ROSCI0022 "Canaralele Dunării" Activities in field: avifauna observations from the shore and from the boat census of nesting avifauna
2.	Analysis and processing for the field data

2.1.1.I. Working site activities monitoring and intervention plan compliance in case of accidental pollution

Due to completion of hydrotechnical construction, has not been necessary the construction site activity monitoring. Works reception have been made in April 27th, 2016.





2.1.2. Critical Point 02 monitoring, Epuraşu Island area (Lebăda)

2.1.2.A. Air quality monitoring

The activities carried out during 01/30.06.2017 related to air quality monitoring in this critical point are those presented in Table 2.1.1.A.1.

According to post-construction monitoring objectives, in June 2017 for air quality monitoring in this main critical point CP02 is not provided a sampling campaign according to Table 1.2. In post-construction period (in this main critical point CP02 have been made the reception of the construction work) frequency is biannual (as Table 1.1).

2.1.2.B. Noise monitoring

The activities carried out in reporting period, regarding noise level monitoring, in this critical point are those presented in Table 2.1.1.B.1.

According to post-construction monitoring objectives, in June 2017 for noise level monitoring in this main critical point CP 02 is not provided a measurements campaign according to Table 1.2. In post-construction period (in this main critical point CP02 have been made the reception of the construction work) frequency is biannual (as Table 1.1).

2.1.2.C. Soil quality monitoring

The activities carried out during 01/30 June 2017, regarding soil quality monitoring, in this critical point are summarized in Table 2.1.1.C.1.

Number of soil samples collected from CP 02 is presented in Table 2.1.2.C.1.

Type of Critical	Critical Point	Samples collected for laboratory analysis		
Point	Critical Politi	depth 5 cm	depth 30 cm	
Main	CP 02	3	3	

Table	2.1	.2.C.	1.	Soil	samples
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For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annex 6.2.3.



TRANS

Project: MONITORING THE ENVIRONMENTAL IMPACT OF THE WORKS REGARDING THE IMPROVING OF THE NAVIGATION CONDITIONS ON THE DANUBE RIVER BETWEEN CALARASI AND BRAILA, km 375-175

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2.1.2.D. Hydromorphological monitoring

The activities from this reporting period are synthetically presented in Table 2.1.2.D.1:

Overall 4 main activities have been carried out:

- Multi-beam bathymetric measurements of high resolution;
- Single-beam bathymetric measurements;
- Flow and velocity measurements on the monitoring sections;
- Turbidity and level continuous measurements in the 3 automatic hydrometric stations have continued.

Table 2.1.2.D.1. Specific objective: hydromorphological monitoring

No.	Activities
1.	Multi-beam bathymetric measurements of high resolution
2.	Single-beam bathymetric measurements of high resolution
3.	Flow and velocity measurements on the monitoring sections
4.	Turbidity and level continuous measurements in the 3 automatic hydrometric stations

In June 2017 , were mainly made ADCP measurements (flow rates/velocities) as presented in Specifications. Results will be presented in Interim Report for this month.

2.1.2.E. Water and sediments monitoring

Activities performed during the reporting period, regarding water and sediment quality monitoring, reported to this critical point are those presented in Table 2.1.1.E.1.

In this campaign were collected water and sediment samples as presented in Table 2.1.2.E.1.

Type of Critical Point	Critical Point	Water samples	Sediment samples
Main	02	15	6

Table 2.1.2.E.1. Water and sediment samples

For each collected sample, a sampling bulletin was completed according to Annex 6.2.4 and Annex 6.2.5.





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2.1.2.F. Aquatic flora and fauna monitoring

The activities carried out during this reporting period, regarding aquatic fauna and flora (except for ichtyofauna), are summarized in Table 2.1.2.F.1.

Table 2.1.2.F.1. Specific objective: Aquatic flora and fauna monitoring

No.	Activities
1.	Organizing the sampling campaign for aquatic macroinvertebrates (Table 1.2)
2.	Conducting the sampling campaign for aquatic macroinvertebrates (bulletins for aquatic flora and fauna sampling - Annex 6.2.6)
3.	Laboratory preparing and analysis for benthic macroinvertebrates samples

From CP 02 were collected benthic *macroinvertebrates samples*, as presented in Table 2.1.2.F.2.

Type of	Critical	Section	Qualitative and quantitative analysis	
Point	Point		Left bank	Right bank
		3	1	1
Main	02	4	1	1
		5	1	1
TOTAL			6	5

Table 2.1.2.F.2 Benthic macroinvertebrates samples

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annex 6.2.6.

2.1.2.F.is. Sturgeons and barbell migration monitoring

In CP 02 have been monitored sturgeons migration with the monitoring systems placed on the Old Danube.

2.1.2.F.i. Other fish species monitoring

Data were processed from the scientific fishing performed in May for *Alosa* species.





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2.1.2.G. Terrestrial flora and fauna monitoring

2.1.2.G.1 Terrestrial flora

In this period have not been made monitoring activities for terrestrial flora.

2.1.2.G.2 Terrestrial fauna/ Avifauna

Activities conducted during this reporting period, regarding avifauna monitoring, are presented in Table 2.1.2.G.2.1.

Table.	2.1.2.G.2	.1 Spe	cific ob	iective:	Avifauna	monitoring
		ope		,		inerneering

No.	Activities
1.	Activities in field: - avifauna observations from the shore and from the boat - census of nesting avifauna
2.	Analysis and processing of the field data

2.1.2.H. Natura 2000 sites monitoring

In this reporting period were monitored Natura 2000 sites in critical point area.

Activities conducted during this reporting period, regarding Natura 2000 sites monitoring, are summarized in Table 2.1.2.H.1.

Table. 2.1.2.H.1	Specific objective:	Monitoring of Nat	ura 2000 sites
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No.	Activities
1.	 Avifauna assessments in Natura 2000 sites in CP02 area: ROSPA0039 "Dunăre Ostroave"; ROSCI0022 "Canaralele Dunării" Activities in field: avifauna observations from the shore and from the boat census of nesting avifauna
2.	Analysis and processing of the field data

2.1.2.I. Work site activities monitoring and intervention plan compliance in case of accidental pollution

Due to completion of hydrotechnical construction, has not been necessary the construction site activity monitoring. Works reception have been made in November 26th, 2015.



TRANS

Project: MONITORING THE ENVIRONMENTAL IMPACT OF THE WORKS REGARDING THE IMPROVING OF THE NAVIGATION CONDITIONS ON THE DANUBE RIVER BETWEEN CALARASI AND BRAILA, km 375-175

2.1.3. Critical point 10 monitoring, Caleia Branch (Ostrovu Lupu)

2.1.3.A. Air quality monitoring

The activities carried out during 01/30.06.2017, regarding air quality monitoring, in this critical point are those presented in Table 2.1.1.A.1.

For critical point CP 10, in June 2017 have not been conducted any monitoring activities regarding air quality, being a post-construction period (in this main critical point CP10 have been made the reception of the construction work) frequency is biannual (as Table 1.1).

2.1.3.B. Noise monitoring

The activities carried out during reporting period, related to noise level monitoring, reported for this critical point are those presented in Table 2.1.1.B.1.

For critical point CP 10, in June 2017 have not been conducted any activities for noise level monitoring, being a post-construction period (in this main critical point CP10 have been made the reception of the construction work) frequency is biannual (as Table 1.1).

2.1.3.C. Soil quality monitoring

Activities performed during 01/30 June 2017, regarding soil quality monitoring, for this critical point, are summarized in Table 2.1.1.C.1.

Number of soil samples collected from CP10 is presented in Table 2.1.3.C.1.

Type of Critical	Critical Point	Samples collected for laboratory analysis		
Point		depth 5 cm	depth 30 cm	
Main	CP 10	3	3	

Table 2.1.3.C.1. Soil samples

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annex 6.2.3.

2.1.3.D. Hydrophological monitoring

The activities from this reporting period are synthetically presented in Table 2.1.3.D.1:

Overall 3 main activities have been carried out:

- Single-beam bathymetric measurements for sections profiling;
- Flow and velocity measurements on the monitoring sections;
- Turbidity and level continuous measurements in the 3 automatic hydrometric stations have continued.





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	Table 2.1.3.D.1.	Specific	objective:	hydromorp	phological	monitoring
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No.	Activities
1.	Single-beam bathymetric measurements for sections profiling
2.	Flow and velocity measurements on the monitoring sections
3.	Turbidity and level continuous measurements in the 3 automatic hydrometric stations

2.1.3.E. Water and sediments quality monitoring

The activities carried out during reporting period related to water and sediments quality in this critical point are those presented in Table 2.1.1.E.1.

In this campaign were collected water and sediment samples as presented in Table 2.1.3.E.1.

samples
s

Type of Critical Point	Critical Point	Water samples	Sediment samples
Main	10	15	6

For each sample a bulletin has been completed according to Annex 6.2.4 and Annex 6.2.5.

2.1.3.F. Aquatic flora and fauna monitoring

The activities carried out during this reporting period, regarding aquatic fauna and flora (except for ichtyofauna), are summarized in Table 2.1.3.F.1.

Table 2.1.3.F.1 Specific objective: Aquatic flora and fauna monitoring

No.	Activities
1.	Organizing the sampling campaign for aquatic macroinvertebrates (Table 1.2)
2.	Conducting the sampling campaign for aquatic macroinvertebrates (sampling bulletins for aquatic flora and fauna - Annex 6.2.6)
3.	Laboratory preparing and analysis for benthic macroinvertebrates samples

From CP 10 were collected *benthic macroinvertebrates* samples, as presented in Table 2.1.3.F.2.

Type of Critical Point	Critical Point	cal nt Section	Qualitative and quantitative analysis	
			Left bank	Right bank
Main	10	1	1	1
		2	1	1
		3	1	1
TOTAL			6	

Table 2.1.3.F.2 Benthic macroinvertebrates samples





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For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annex 6.2.6.

2.1.3.F.is. Sturgeons and barbell migration monitoring

In June, monitoring for sturgeons' migration have been made with the monitoring systems existent in this area.

2.1.3.F.i. Other fish species monitoring

Data were processed from the scientific fishing performed in May for Alosa species.

2.1.3.G. Terrestrial flora and fauna monitoring

2.1.3.G.1 Terrestrial flora

In this period have not been made monitoring activities for terrestrial flora.

2.1.3.G.2 Terrestrial fauna/ Avifauna

In this reporting period have not been made monitoring activities for avifauna in critical point area.

2.1.3.H. Natura 2000 sites monitoring

In this reporting period have not been made monitoring activities for Natura 2000 sites in critical point area.

2.1.3.I. Work site activities monitoring and intervention plan compliance

in case of accidental pollution

Due to completion of hydrotechical works has not been necessary the building site activity monitoring. Works reception was carried out on August 1st, 2014.

2.1.4. Monitoring in the critical points 03÷07

2.1.4.1. Monitoring in CP 03 (upstream and downstream Seica)

2.1.4.1.A. Air quality monitoring

The activities carried out during 01/30.06.2017, related to air quality monitoring, reported





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for this secondary critical points are those presented in Table 2.1.4.1.A.1.

Table 2.1.4.1.A.1. Specific objective: Air quality monitoring

No.	Activities
1.	Organizing the measurements campaign (Table 1.2)
2.	Conducting the sampling campaign for air (air sampling bulletins - Annex 6.2.1)
3.	Contribution to Monthly Report 74
4.	Contribution to Interim Report 16

In Table 2.1.4.1.A.2. is presented the number of air samples collected/"in situ" measurements made during 01-30 June 2017.

Table	2.1.4.	1.A.2.	Air	samples	repartitio	n
Tuble	4.1.7.	1.4.2.		Jumpies	i epai titio	

Type of Critical Point	Critical Point	Samples collected for laboratory analysis	Number of "in situ" measurements
Secondary	03 A and 03 B	4	4

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample/measurement, a bulletin has been completed, see Annex 6.2.1.

2.1.4.1.B. Noise level monitoring

The activities carried out during 01/30.06.2017, related to noise level monitoring, in this secondary critical points are those presented in Table 2.1.4.1.B.1.

No.	Activities
1.	Measurements campaign for noise level in zero naval traffic/naval traffic (bulletins for noise level measurement - Annex 6.2.2)
2.	Primary processing for the data obtained after measurements
3.	Contribution to Monthly Report 74
4.	Contribution to Interim Report 16

Table 2.1.4.1.B.1	. Specific	objective:	noise	monitoring
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In this monitoring campaign for noise level, during 01/30.06.2017, measurements were made as presented in Table 2.1.4.1.B.2, below.

Table 2.1.4.1.B.2.	Noise level	monitoring
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Type of Critical Point	Critical Point	No. of measurements	
Type of critical Folin		zero naval traffic	Intense naval traffic
Secondary	03 A	2	0
	03 B	2	0





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For each sampling point has been established geographic coordinates, then trans-calculated in STEREO'70 projection system. The measurements have been coded according to the encoding instructions. Also, for each measurement a report for noise level has been completed, see Annex 6.2.2.

2.1.4.1.C. Soil quality monitoring

The activities carried out during 01 /30 June 2017 in the reporting period, related to soil quality monitoring, in this critical point are summarized in Table 2.1.1.C.1.

Number of soil samples collected from CP03 (A and B) is presented in Table 2.1.4.1.C.1.

Type of Critical	Critical Point	Samples collected for laboratory analysis		
Point		depth 5 cm	depth 30 cm	
Secondary	CP 03A	2	2	
Secondary	CP 03B	2	2	

Table 2.1.4.1.C.1. Soil samples

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annex 6.2.3.

2.1.4.1.D. Hydromorphological monitoring

No activities regarding hydromorphological monitoring during this period.

2.1.4.1.E. Water and sediments quality monitoring

In this period have not been made sampling activities for water and sediments.

2.1.4.1.F. Aquatic flora and fauna monitoring

The activities carried out during this reporting period, regarding aquatic fauna and flora (except for ichtyofauna), are summarized in Table 2.1.4.1.F.1.

Table 2.1.4.1.F.1. S	pecific objective:	Aquatic flora and	fauna monitoring
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No.	Activities
1.	Organizing the sampling campaign for aquatic macroinvertebrates (Table 1.2)
2.	Conducting the sampling campaign for aquatic macroinvertebrates (sampling bulletins for aquatic flora and fauna - Annex 6.2.6)
3.	Laboratory preparing and analysis for benthic macroinvertebrates samples

In Table 2.1.4.1.F.2 are presented *benthic macroinvertebrates* samples collected from CP 03.





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Type of Critical	Critical Point		Samples collected for laboratory analysis		
Point			Left bank	Right bank	
	03A	upstream	1	1	
Socondary		downstream	1	1	
Secondary	03B	upstream	1	1	
		downstream	1	1	
TOTAL			8	3	

Table 2.1.4.1.F.2 Benthic macroinvertebrates samples

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annex 6.2.6.

2.1.4.1.F.is. Sturgeons and barbell migration monitoring

In June, the monitoring of sturgeons' migration was carried out with the monitoring systems existent on Danube sector between km 248 and km 348.

2.1.4.1.F.i. Other fish species monitoring

Data were processed from the scientific fishing performed in May for *Alosa* species.

2.1.4.1.G. Terrestrial flora and fauna monitoring

2.1.4.1.G.1 Terrestrial flora

In this period have not been made monitoring activities for terrestrial flora.

2.1.4.1.G.2 Terrestrial fauna / Avifauna

The activities carried out during reporting period, regarding avifauna monitoring, are summarized in Table 2.1.4.1.G.2.1.

No.	Activities					
1.	Activities in field: - avifauna observations from the shore and from the boat - census of nesting avifauna					
2.	Analysis and processing of the field data					

Table. 2.1.4.1.G.2.1 Specific objective: Avifauna monitoring





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2.1.4.1.H. Natura 2000 sites monitoring

In this reporting period were monitored Natura 2000 sites, in critical points areas.

The activities carried out during reporting period, regarding Natura 2000 sites monitoring, monitoring, are summarized in Table 2.1.4.1.H.1.

Table. 2.1.4.1.H.1 Specific objective: Monitoring of Natura 2000 sites

No.	Activities
1.	Avifauna assessments in Natura 2000 sites in CP03 area: - ROSPA0039 "Dunăre Ostroave"; ROSCI0022 "Canaralele Dunării" Activities in field: - avifauna observations from the shore and from the boat - census of nesting avifauna
2.	Analysis and processing of the field data

2.1.4.1.I. Work site activities monitoring and intervention plan compliance in case of accidental pollution

The monitoring of the construction site was not necessary because the hydrotechnical works have not been started.

2.1.4.2. Monitoring in CP 04 /Ceacâru/Fermecatu

2.1.4.2.A. Air quality monitoring

The activities carried out during 01/30.06.2017, regarding air quality monitoring, in this secondary critical points are those presented in Table 2.1.4.1.A.1.

In Table 2.1.4.2.A.1 is presented the number of samples collected/"in situ" measurements made during 01-30 June 2017.

Type of Critical Point	Type of Critical Point Critical Point		Number of "in situ" measurements
Secondary	04 A and 04 B	4	4

Table 2.1.4.2.A.T. All samples repartition
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For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample/measurement, a bulletin has been completed, see Annex 6.2.1.

2.1.4.2.B. Noise level monitoring

The activities carried out during 01/30.06.2017, regarding noise level monitoring, in this secondary critical points are those presented in Table 2.1.4.1.B.1.

In this monitoring campaign for noise level performed during 01/30.06.2017, measurements





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were made as presented in Table 2.1.4.2.B.1, below.

		No. of measurements		
Type of Critical Point	Critical Point	zero naval traffic	Intense naval traffic	
Secondary	04 A	2	0	
	04 B	2	0	

Table 2.1.4.2.B.1. Noise level monitoring

For each sampling point has been established geographic coordinates, then trans-calculated in STEREO'70 projection system. The measurements have been coded according to the encoding instructions. Also, for each measurement a report for noise level has been completed, see Annex 6.2.2.

2.1.4.2.C. Soil quality monitoring

The activities carried out during 01/30 June 2017 regarding soil quality monitoring in this critical point are summarized in Table 2.1.4.1.C.1.

Number of soil samples collected from PC04 (A and B) is presented in Table 2.1.4.2.C.1.

Type of Critical Point	pint Critical Point	Samples collected for laboratory analysis		
Type of Childar Point		depth 5 cm	depth 30 cm	
Secondary	CP 04A	2	2	
Secondary	CP 04B	2	2	

Table 2.1.4.2.C.1. Soil samples

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annex 6.2.3.

2.1.4.2.D. Hydromorphological monitoring

No activities regarding hydromorphological monitoring during this period.

2.1.4.2.E. Water and sediments quality monitoring

In this period have not been made sampling activities for water and sediments.

2.1.4.2.F. Aquatic flora and fauna monitoring

The activities carried out during this reporting period, regarding aquatic fauna and flora (except for ichtyofauna), are summarized in Table 2.1.4.2.F.1.





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Table 2.1.4.2.F.1. Specific objective: Aquatic flora and fauna monitoring

No.	Activities
1.	Organizing the sampling campaign for aquatic macroinvertebrates (Table 1.2)
2.	Conducting the sampling campaign for aquatic macroinvertebrates (sampling bulletins for aquatic flora and fauna - Annex 6.2.6)
3.	Laboratory preparing and analysis for benthic macroinvertebrates samples

In Table 2.1.4.2.F.2 are presented samples for *benthic macroinvertebrates* collected from CP 04.

Type of Critical	Critical Point		Samples collected for laboratory analysis		
Point			Left bank	Right bank	
	044	upstream	1	1	
Socondary	0 4 A	downstream	1	1	
Secondary	04B	upstream	1	1	
		downstream	1	1	
TOTAL			8	3	

Table	2.1.4	.2.F.2	Benthic	macroin	vertebi	rates	same	oles
Tuble	2.1.1		Dentine	macioni	VCI CCDI	accs	Jump	103

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annex 6.2.6.

2.1.4.2.F.is. Sturgeons and barbell migration monitoring

In June sturgeons' migration monitoring has been done with the monitoring systems existent on Danube sector between km 248 and km 348.

2.1.4.2.F.i. Other fish species monitoring

Have been processed data from scientific fishing performed in May for Alosa species.

2.1.4.2.G. Terrestrial flora and fauna monitoring

2.1.4.2.G.1 Terrestrial flora

During this period have not been made monitoring activities for terrestrial flora.





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2.1.4.2.G.2 Terrestrial fauna/Avifauna

The activities carried out during reporting period, regarding avifauna monitoring, are summarized in Table 2.1.4.2.G.2.1.

Table 2.1.4.2.G.2.1 Specific objective: Avifauna monitoring

No.	Activities					
1.	Activities in field: - avifauna observations from the shore and from the boat - census of nesting avifauna					
2.	Analysis and processing for the field data					

2.1.4.2.H. Natura 2000 monitoring sites

In this reporting period were monitored Natura 2000 sites in critical point and adjacent lakes areas.

Activities conducted during this reporting period, regarding Natura 2000 sites monitoring, monitoring, are summarized in Table 2.1.4.2.H.1.

Table. 2.1.4.2.H.1 Specific objective: Natura 2000 sites monitoring

No.	Activities
	Avifauna assessments in Natura 2000 sites in CP 04 area: - ROSPA0039 "Dunăre Ostroave"; ROSCI0022 "Canaralele Dunării"
1.	Activities in field: - avifauna observations from the shore and from the boat - census for nesting avifauna
2.	Analysis and processing of the field data

2.1.4.2.1. Monitoring the building site activities and the compliance with the intervention plan in case of accidental pollution

The monitoring of the construction site was not necessary because the hydrotechnical works have not been started.

2.1.4.3. Monitoring in CP 07 / Fasolele

2.1.4.3.A. Air quality monitoring

The activities carried out during 01/30.06.2017, regarding air quality monitoring, for this secondary critical point are those presented in Table 2.1.4.1.A.1.

Table 2.1.4.3.A.1 presents the number of air samples collected/"in situ" measurements made during 01-30 June 2017.





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Type of Critical Point Critical Point		Samples collected for laboratory analysis	Number of "in situ" measurements	
Secondary	07	2	2	

Table 2.1.4.3.A.1. Air samples repartition

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample/measurement, a bulletin has been completed, see Annex 6.2.1.

2.1.4.3.B. Noise level monitoring

The activities carried out during 01/30.06.2017, regarding noise level monitoring, in this secondary critical point are those presented in Table 2.1.4.1.B.1.

In this campaign for noise level monitoring, during 01/30.06.2017, were made measurements as presented in Table 2.1.4.3.B.1, below.

Type of Critical Point	Critical Point	No. of measurements		
Type of Critical Point		Zero naval traffic	Intense naval traffic	
Secondary	07	2	0	

Table 2.1.4.3.B.1. Noise level monitoring

For each sampling point has been established geographic coordinates, then trans-calculated in STEREO'70 projection system. The measurements have been coded according to the encoding instructions. Also, for each measurement a report for noise level has been completed, see Annex 6.2.2.

2.1.4.3.C. Soil quality monitoring

Activities performed during 01/30.06.2017, regarding soil quality monitoring, in this critical point, were summarized in Table 2.1.1.C.1.

Number of soil samples collected from CP07 is presented in Table 2.1.4.3.C.1.

Type of Critical	Critical Point	Samples collected for laboratory analysis				
Point	Chicat Foline	depth 5 cm	depth 30 cm			
Secondary	CP 07	2	2			

Table 2.1.4.3.C.1. Soil samples

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annex 6.2.3.





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2.1.4.3.D. Hydromorphological monitoring

No activities regarding hydromorphological monitoring during this period.

2.1.4.3.E. Water and sediments quality monitoring

In this period have not been made sampling activities for water and sediments.

2.1.4.3.F. Aquatic flora and fauna monitoring

Activities performed during this reporting period, regarding aquatic fauna and flora (except for ichtyofauna) are summarized in Table 2.1.4.3.F.1.

Table. 2.1.	4.3.F.1. Spec	fic objective	: Aquatic flora	and fauna monitoring
		,		5

No.	Activities
1.	Organizing the sampling campaign for aquatic macroinvertebrates (Table 1.2)
2.	Conducting the sampling campaign for aquatic macroinvertebrates (sampling bulletins for aquatic flora and fauna - Annex 6.2.6)
3.	Laboratory preparing and analysis for benthic macroinvertebrates samples

In Table 2.1.4.3.F.2 are presented *benthic macroinvertebrates* samples collected from CP07.

Type of	Cr	itical Point	Samples collected for laboratory analysisLeft bankRight bank					Samples collected for laboratory analysis	
Critical Point									
Secondary	07	upstream 1		1					
	07	downstream	1	1					
TOTAL			4	1					

Table 2.1.4.3.F.2 Benthic macroinvertebrates samples

For each sampling point, have been determined geographical coordinates. Samples were labeled according to the encoding and labeling instructions. For each sample, a bulletin has been completed, see Annex 6.2.6.

2.1.4.3.F.is. Sturgeons and barbell migration monitoring

In June sturgeons' migration monitoring has been done with the monitoring systems existent on Danube sector between km 248 and km 348.

2.1.4.3.F.i. Other fish species monitoring

Were processed the data from the scientific fishing performed in May, for Alosa species.





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2.1.4.3.G. Terrestrial flora and fauna monitoring

2.1.4.3.G.1 Terrestrial flora

During this period have not been made activities for terrestrial flora monitoring.

2.1.4.3.G.2 Terrestrial fauna / Avifauna

Activities conducted during this reporting period, regarding avifauna monitoring, are summarized in Table 2.1.4.3.G.2.1.

Table. 2.1.4.3.G.2.1 Specific objective: Avifauna monitoring

No.	Activities
1.	Activities in field: - avifauna observations from the shore and from the boat - census of nesting avifauna
2.	Analysis and processing of the field data

2.1.4.3.H. Natura 2000 sites monitoring

In this reporting period were monitored Natura 2000 sites in critical point area.

Activities conducted during this reporting period, regarding Natura 2000 sites monitoring, are summarized in Table 2.1.4.3.H.1.

Table.	2.	1.4.3	.H.1	Specific	objective:	Monitoring	of	Natura	2000	sites
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No.	Activities
1.	 Avifauna assessment in Natura 2000 sites in CP07 area: ROSPA0039 "Dunăre Ostroave"; ROSCI0022 "Canaralele Dunării" Activities in field: avifauna observations from the shore and from boat census of nesting avifauna
2.	Analysis and processing of the field data

2.1.4.3.I. Work site activities monitoring and intervention compliance plan in case of accidental pollution

The monitoring of the construction site was not necessary because the hydrotechnical works have not been started.

2.2. Stage of 3D numerical modeling

The necessity of updating the numerical model and achieving numerical simulations on a medium scale, derives from the uncertainty about the upstream swim capability of the sturgeons,





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over the bottom sill built on Bala branch. This uncertainty was due to the insufficient number of ultrasonic tagged specimens, caused by the limitation of scientific fishing by the National Agency for Fisheries and Aquaculture (ANPA). Consequently, in June 2017, the following activities were performed for the Critical Point PC 01 area:

- Completing the data for medium scale modeling, based on in situ measurements
- Comparative analyzes used as reference data for numerical modeling

2.2.1. Completion the data for medium-scale modeling, based on in situ measurements

Based on data from the field measurements performed in May-June 2017, was updated the hydrodinamical model for critical point CP 01 area.



Figure 2.2.1.1 - Cells grid for studied sector

In the first phase, the study area was selected, which covers Bala - Old Danube bifurcation area (between km 348 - 344 Old Danube and km 9 Bala branch) (Figure 2.2.1.1).





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Figure 2.2.1.2 - Properties of the built cells grid

The cells grid was built using the grid module of the Delft3D software package. In order to ensure an optimal ratio between the grid discretization degree, the running time and the provided





results, it was constructed using polyhedral discretization cells with quadrilateral faces, ranging in size from 10 to 35 m, resulting in 8537 cells.

To enable a better results interpretation, the cells grid was refined for the hydrotechnical constructions area.

In order to make correct hydrodynamic calculations, the requirements imposed on the generated networks were analyzed, namely: orthogonality, rate for dimensional and directional changes (flatness, curvature) and the discretization ratio on different directions. Figure 2.2.1.2 shows a number of features of the grid so constructed.

Following the successive operations to improve the grid features, the cells grid has been optimized, in area of hydrotechnical construction on Bala branch, resulting in better property values with approx. 25% relative to the limits recommended by the numerical modeling program.

On this cells grid will be implemented the bathymetry resulting from the processing of data obtained from the multi-beam measurements carried out in June 2017.

2.2.2. Comparative analysis used as reference data for numerical modeling

In order to analyze the sturgeons' swimming capacity, will be made numerical simulations having as input data the updated geometry of 2017 and the hydrological data from the period when the sturgeons crossed towards upstream the bottom sill on Bala branch.

Prior to this activity, based on the data obtained from the field measurements, carried out during the monitoring period, investigations were carried out to highlight hydromorphological and hydrodynamic differences during pre-construction and post-construction of the bottom sill in the CP01 area.

Consequently, in the area of interest, were procedural analyzed the riverbed geometry and the water velocities, in June 2013 (pre-construction) and March 2016 (post-construction), following that this research would be updated with the results from May-June 2017 measurements.

To highlight the morphological changes that took place in critical point CP01 area, following the construction of the new bottom sill, based on multi-beam bathymetric measurements, in Figure 2.2.2.1 is represented the riverbed in June 2013 (pre-construction), respectively in March 2016 (post-construction). The differences recorded during this period can be observed also in the three-dimensional representation in Figure 2.2.2.2.





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Figure 2.2.2.1 - Representation of the riverbed in Bala branch area, during pre-construction period [2013] and post-construction [2016]



Figure 2.2.2.2 - Detail on 3D riverbed representation in Bala branch area, in pre-construction period [2013] and post-construction period [2016]





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In order to obtain a clearer picture about the results of the riverbed geometry comparison, before and after the construction of the bottom sill, these representations were overlapped, highlighting the recorded differences (Figure 2.2.2.3).

As can be observed in the upstream area of the new bottom sill, are evident erosion up to -9.2m, value recorded at the right bank. In Figure 2.2.2.3, the new bottom sill appears as a deposits area of up to 9.5 m. The sector between the two bottom sills is characterized by erosions of up to -10.5 m.

Erosions also resulted in area of the old bottom sill, the values ranging around -5.4 m. Immediately downstream from the old bottom sill can be seen, towards the left bank, an area with erosions up to -17.4 m. Considering the fact that before the works began in June 2013, downstream from the old bottom sill, there was an erosion pit at the right bank, it can be said that in 2016, the pit has deepened and extended toward the right bank.

After database updating with information derived from the measurements carried out in May-June 2017, will be performed detailed comparative analyzes, distributed on the 5 representative areas (1. upstream the new bottom sill, 2. new bottom sill, 3. area between the two sills, 4. old bottom sill, 5. downstream from the old bottom sill) for the presented sector.



Figure 2.2.2.3 - Evolution of the underwater landscape before (2013) and after (2016) the bottom sill construction





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Sections for longitudinal control

In order to perform the comparative analysis on hydromorphological and hydrodynamic conditions in CP01 area, the longitudinal control sections SLCB1, SLCB2 and SLCB3 were investigated.



Figure 2.2.2.4 - Location of the longitudinal control section SLCB1 [right bank]

In Figure 2.2.2.5 are represented the riverbed geometries resulting from the bathymetric measurements of June 2013 and March 2016, in SLCB1 longitudinal control section, located at the right bank (Figure 2.2.2.4). In this section it can be seen that in 2016 (post-construction) were formed erosion areas upstream and downstream from the new bottom sill. Also, the erosion pit formed downstream from the old bottom sill, deepened compared to the period before the hydrotechnical works started.





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Figure 2.2.2.5 - Logitudinal section SLCB1 representing the riverbed in pre-construction and post-construction period

Regarding the velocity of water stream, on the longitudinal control section SLCB1, in preconstruction period are observed maximum values of approx. 2.0 m/s, recorded near the old bottom sill (Figure 2.2.2.6).





Following the analysis of the water flow velocity distribution in SLCB1, during the postconstruction period, maximum values of over 3 m/s were recorded near the new bottom sill (Figure 2.2.2.7).





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Figure 2.2.2.7 - Longitudinal section SLCB1 with water current velocity distribution post-construction period [2016]

In order to perform the comparative analysis, based on the results obtained from the field measurements, velocity histograms were made in which were exposed the values from preconstruction (2013) and post-construction (2016) - periods with comparable flows.

In the case of SLCB 1, according to velocity histogram represented in Figure 2.2.2.8, it can be observed that for both the riverbed layer and the water surface layer, the histogram shape differs between the two periods. Thus, for 2016 the recorded velocity range increased from maximum values of 2.2 m/s for 2013, up to velocities of 2.8 m/s for both the riverbed area and the water upper layer.



Figure 2.2.2.8 - Velocity histogram - comparative analysis on longitudinal control section SLCB1, preconstruction period [2013] and post-construction [2016]





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Figure 2.2.2.9 - Location of longitudinal control section SLCB2 [center]

Longitudinal control section SLCB2 is located on Bala branch center (Figure 2.2.2.9). As presented in Figure 2.2.2.10, it can be observed that an erosion pit was formed immediately downstream of the new bottom sill. At the same time, upstream of the new construction can be observed an area with erosion of up to 5 m. Downstream of the old bottom sill, the erosion pit located during pre-construction period near the right bank it expanded. (Figures 2.2.2.1 and 2.2.2.2)



Figure 2.2.2.10 - Longitudinal section SLCB2 representing the riverbed in pre-construction and postconstruction period

Regarding the distribution of the water flow velocity, as in the case of the longitudinal control section SLCB1, it is noted that during the pre-construction period the maximum values were approx. 2.0 m/s, the maximum being recorded near the old bottom sill (Figure 2.2.2.11).





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Figure 2.2.2.11 - Longitudinal section SLCB2 with the distribution of water stream velocity pre-construction period [2013]

During the post-construction period, as a result of flow section decreasing, maximum values of water velocity were about 3.4 m/s (Figure 2.2.2.12).

Figure 2.2.2.12 - Longitudinal section SLCB2 with the distribution of water stream velocity post-construction period [2016]

Figure 2.2.2.13 - Velocity histogram - comparative analysis on longitudinal control section SLCB2, preconstruction period [2013] and post-construction [2016]

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As can be seen in Figure 2.2.2.13, for longitudinal section SLCB 2, in 2016 the maximum velocity values range from 3-3.2 m/s, compared to maximum in 2013 peak of around 2 m/s. The most common velocity values are about 1.2 m/s (riverbed - 2013), 1.4 m/s (riverbed - 2016 and upper layer - 2013) and respectively 1.8 m/s (upper layer - 2016).

Figure 2.2.2.14 - Location of longitudinal control section SLCB3 [left bank]

In the case of longitudinal control section SLCB3, located near the left bank of Bala branch (Figure 2.2.2.14), from the point of view of riverbed geometry, it can be seen that in 2016, similar to the situation described for SLCB2 longitudinal section, downstream of the new bottom sill an erosion pit was formed, and downstream of the old bottom sill can be observed the erosion pit that extended from the right bank (Figure 2.2.2.15).

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post-construction period

Unlike the other two sections, in the longitudinal section near the left bank, higher water velocities were recorded in the pre-construction period, the maximum being about 2.5 m/s (Figure 2.2.2.16).

Figure 2.2.2.16 - Longitudinal section SLCB3 with the distribution of water stream velocity pre-construction period [2013]

In post-construction period were recorded maximum values for water stream velocity, of about 3.4 m/s, near the new bottom sill (Figure 2.2.2.17).

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Figure 2.2.2.18 - Velocity histogram - comparative analysis on longitudinal control section SLCB3, preconstruction [2013] and post-construction [2016] period

For SLCB 3 - left bank as shown in Figure 2.2.2.18, in 2013 the maximum velocities recorded were around 1.8 m/s (riverbed), respectively 2.2 m/s (water surface layer) and for 2016 these values have increased up to approx. 3 m/s (riverbed), respetively 3.2 m/s (water surface layer). For the riverbed, the most frequent velocity values were around 1 m/s in 2013, and in 2016 around 1.4 m/s. The same increasing trend is also observed for the upper layer, from 1.6 m/s (2013) to 1.8 m/s (2016).

As can be seen from the above-mentioned investigations, the construction of the bottom sill on Bala branch led to a series of morphological and hydrodynamic changes. The riverbed geometry has changed, immediately downstream from the new bottom sill forming an erosion pit. Also, upstream of the new construction a zone with erosions up to 9.2 m was formed towards the right bank. As can be seen in previous representations, compared to the pre-construction period, the erosion pit downstream to the old bottom sill has expanded. By implementing the new construction, the flow section has decreased, so the water velocity values have increased significantly compared to those recorded during the pre-construction period.

These investigations were carried out based on the information volume obtained from field campaigns in June 2013 (pre-construction) and March 2016 (post-construction), these data will be updated with the results of May-June 2017 measurements.

Based on these results, comparative analyzes will be performed which will represent input data for the numerical simulations to be performed in order to analyze the correlation between the water flow velocity and the swimming capacity of sturgeons. These will be presented in detail in the related interim report.

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2.2.3. Conclusions

Data completion for medium scale modeling, based on in situ measurements

Based on data obtained from May-June 2017 field measurements, using Delft3D software grid module, the hydrodynamic model in critical point CP01 area was updated.

A cells network was developed, covering the bifurcation area Bala branch - Old Danube (between km 348 - km 344 Old Danube and km 9 Bala branch) and meets the conditions recommended by the program, namely: orthogonality, rate for size and directions changes and (flatness, curvature) and the ratio between discretization on different directions.

On this cells grid will be implemented the bathymetry resulting from the processing of data obtained from multi-beam measurements carried out in June 2017.

Comparative analyzes used as reference data for numerical modeling

Based on the data obtained from the field measurements carried out during the monitoring period, investigations were carried out to highlight hydromorphological and hydrodynamic differences in pre-construction period (June 2013) and post-construction (March 2016) of the bottom sill in CP 01 area.

Consequently, in the area of interest were procedurally analyzed the riverbed geometry and water flow velocities distribution, in June 2013 (pre-construction) and March 2016 (post-construction), this research will be updated with the results from May-June 2017 measurements.

Based on the performed comparative analyzes, resulted that the bottom sill on Bala branch led to a series of morphological and hydrodynamic changes. The riverbed geometry changed immediately downstream of the new bottom sill, forming an erosion pit. Also, upstream of the new construction a zone with erosions up to 9.2 m was formed towards the right bank. Also, compared to the pre-construction period, the erosion pit downstream of the old bottom sill has expanded. By implementing the new construction, the flow section has decreased, so the water velocity values have increased significantly compared to those recorded during the pre-construction period.

After updating the results with the information volume obtained from the measurements in May-June 2017, comparative analyzes will be performed which will represent input data for the numerical simulations to be performed in order to analyze the correlation between the water flow rate and sturgeons' swimming capacity. These will be presented in detail in the related interim report.

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3. MEMBERS OF THE EXPERTS TEAM

3.1. Members of the experts' team

Team's members who carried out activities in the reporting period and the number of days worked by each expert are schematically presented in Table 3.1.

No.	Experts	Names of experts	Number of working days post-construction
1.	Project manager	Deák György	5
2.	Chemist 1	Ghiță Gina	5
3.	Chemist 2	Borş Adriana	5
4.	Ichthyologist 1	Cristea Victor	7
5.	Ichthyologist 2	Falka Istvan	5
6.	Hydrology	Poteraș George	8
7.	Hydraulic sedimentology	Ungureanu Gh Viorel	12
8.	Phytoplankton and aquatic macrophytes	Marinescu Florica	0
9.	Zooplankton	Adina Popescu	0
10.	Terrestrial invertebrates	Şerban Cecilia	3
11.	Aquatic macroinvertebrates	Florea Luiza	5
12.	Terrestrial flora and vegetation	Frink Jozsef Pal	0
13.	Ornithologist 1	Jozsef Szabo	7
14.	Ecologist 1	Ambrus Laszlo	2
15.	Ecologist 2		0
16.	Assessor	Tudor Marian	5
17.	3D Modelling	Helmut Habersack	

Table 3.1. Members of the experts' team

3.2. Experts' tasks during the project

The tasks accomplished by experts on each phase/activity/critical point are presented in Experts' Activity Reports (Annex 6.3).

3.3. Planning the activities for the next month on each phase/activity/critical point

The monitoring activities for the period 01-31 July 2017 are synthetically presented in the table 3.4.

				(Critical	points			
No.	ACTIVITIES	Main critical points Secondary critical points							nts
		01	02	10	03A	03B	04A	04B	07
1.	Further campaign of measurements, field observations (where is necessary)	YES	YES	YES	YES	YES	YES	YES	YES
2.	Processing and interpretation of field and laboratory data (where is necessary)	YES	YES	YES	YES	YES	YES	YES	YES
3.	Monthly report preparation	YES	YES	YES	YES	YES	YES	YES	YES

Table 3.4. Activities for the period of 01 - 31.07.2017

Project: MONITORING THE ENVIRONMENTAL IMPACT OF THE WORKS REGARDING THE IMPROVING OF THE NAVIGATION CONDITIONS

ON THE DANUBE RIVER BETWEEN CALARASI AND BRAILA, km 375-175

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4. TIME SCHEDULE AND BUDGET PROJECT

4.1. Time schedule for project implementation

ID	Task Name	Start	Finish	
				Otr 3, 2017
				28 02 07 12 17 22 27 02 07 12 17 22 27 01
1	Air monitoring: Contribution to Interim Report 16	Fri 02.06.17	Mon 31.07.17	
2	74th Month	Fri 02.06.17	Fri 30.06.17	
3	75th Month	Mon 03.07.17	Mon 31.07.17	
4	Air monitoring: Measurements and sampling campaigns for air quality, in secondary critical points CP 03A, CP 03B, CP 04A, CP 04B, CP 07.	Fri 02.06.17	Fri 30.06,17	
5	74th Month	Fri 02.06.17	Fri 30.06.17	
6	Air monitoring: Processing and assessing of the obtained data and measurements for air quality in secondary critical points CP 03A, CP 03B, CP 04A, CP 04B, CP 07.	Mon 03.07.17	Mon 31.07.17	
7	75th Month	Mon 03.07.17	Mon 31.07.17	
8	Noise monitoring: Contribution to Interim Report RI16	Fri 02.06.17	Mon 31.07.17	
9	74th Month	Fri 02.06.17	Fri 30.06.17	
10	75th Month	Mon 03.07.17	Mon 31.07.17	
11	Noise monitoring: Performing the measuring and sampling campaign for noise monitoring in secondary critical points CP 03A, CP 03B, CP 04A, CP 04B, CP 07.	Fri 02.06.17	Fri 30.06.17	
12	74th Month	Fri 02.06.17	Fri 30.06.17	
13	Water quality monitoring CP01, CP02, CP10 - Water (physical-chemical analysis)	Fri 02.06.17	Fri 30.06.17	
14	74th Month	Fri 02.06.17	Fri 30.06.17	
15	Water quality monitoring - Water (physical-chemical analysis) - physical-chemical analysis C64 (CP 01, CP 02, CP 10)	Mon 03.07.17	Mon 31.07.17	
16	75th Month	Mon 03.07.17	Mon 31.07.17	
17	Water quality monitoring CP01, CP02, CP10 - Sediments (heavy metals, organic micropollutants)	Fri 02.06.17	Fri 30.06.17	
18	74th Month	Fri 02.06,17	Fri 30.06.17	
19	Water quality monitoring - Sediments (heavy metals, organic micropollutants) - physical-chemical analysis C64 (CP 01, CP 02, CP	Mon 03.07.17	Mon 31.07.17	
20	75th Month	Mon 03.07.17	Mon 31.07.17	
21	Soil monitoring CP 01, CP 02, CP 10, CP03(A+B), CP04(A+B), CP07 - Lumbricides presence, abundance	Fri 02.06.17	Fri 30.06.17	
22	74th Month	Fri 02.06.17	Fri 30.06.17	
23	Soil monitoring CP 01, CP 02, CP 10, CP03(A+B), CP04(A+B), CP07 - mineral salts, humic acids, organic matter, physico-chemical	Fri 02.06.17	Fri 30.06.17	
24	74th Month	Fri 02.06.17	Fri 30.06.17	
25	Soil monitoring - physico-chemical analysis C26 (CP 01, CP 02, CP 10, CP 03, CP 04, CP 07)	Mon 03.07.17	Mon 31.07.17	
-			Page 1	

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Project: MONITORING THE ENVIRONMENTAL IMPACT OF THE WORKS REGARDING THE IMPROVING OF THE NAVIGATION CONDITIONS ON THE DANUBE RIVER BETWEEN CALARASI AND BRAILA, km 375-175

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ID	Task Name	Start	Finish							
				Qtr 3, 2017						
				June 2017 July 2017 Au						
				28 02 07 12 17 22 27 02 07 12 17 22 27 02						
26	/Sth Month	Mon 03.07.17	Mon 31.07.17							
27	Aquatic fauna monitoring CP 01/02/10/03A/03B/04A/04B/07 - aquatic macroinvertebrates - sampling, composition, abundance, biomass, saprobic index	Fri 02.06.17	Fri 30.06.17							
28	74th Month	Fri 02.06.17	Fri 30.06.17							
29	Aquatic flora monitoring CP 01/02/10/03A/03B/04A/04B/07 - phytoplankton - sampling, composition, abundance, biomass, saprobic	Mon 03.07.17	Mon 31.07.17							
30	75th Month	Mon 03.07.17	Mon 31.07.17							
31	Aquatic flora monitoring CP 01/02/10/03A/03B/04A/04B/07 - aquatic macrophytes - sampling, composition, abundance, biomass, saprobic	Mon 03.07.17	Mon 31.07.17							
32	75th Month	Mon 03.07.17	Mon 31.07.17							
33	Aquatic fauna monitoring CP 01/02/10/03A/03B/04A/04B/07 - zooplankton - sampling, composition, abundance, biomass, saprobic	Mon 03.07.17	Mon 31.07.17							
34	75th Month	Mon 03.07.	Mon 31.07.1							
35	Hydromorphological monitoring in CP 01/CP 02/CP 10 - Single-beam measurements - sections profiling	Fri 02.06.17	Mon 31.07.17							
36	74th Month	Fri 02.06.17	Fri 30.06.17							
37	75th Month	Mon 03.07.17	Mon 31.07.17							
38	Hydromorphological monitoring in CP 01/CP 02/CP 10 - Flow rate monitoring (volume, velocity, level)	Fri 02.06.17	Mon 31.07.17							
39	74th Month	Fri 02.06.17	Fri 30.06.17							
40	75th Month	Mon 03.07.17	Mon 31.07.17							
41	Hydromorphological monitoring in CP 01/CP 02/CP 10 - level and turbidity measurements in hydrometric automatic station of INCDPM	Fri 02.06.17	Mon 31.07.17							
42	74th Month	Fri 02.06.17	Fri 30.06.17							
43	75th Month	Mon 03.07.17	Mon 31.07.17							
44	Hydromorphological monitoring in CP 01/CP 02 - Bathymetric measurements of high resolution	Fri 02.06.17	Fri 30.06.17							
45	74th Month	Fri 02.06.17	Fri 30.06.17							
46	Ichtyofauna biodiversity monitoring CP 01/02/10/03/04/07 - trails and migration periods monitoring for sturgeon specimens with	Fri 02.06.17	Mon 31.07.17							
47	74th Month	Fri 02.06.17	Fri 30.06.17							
48	75th Month	Mon 03.07.17	Mon 31.07.17							
49	Ichtyofauna biodiversity monitoring CP 01/02 - Data downloading from the monitoring systems for sturgeons migration	Fri 02.06.17	Mon 31.07.17							
50	74th Month	Fri 02.06.17	Fri 30.06.17							
51	75th Month	Mon 03.07.17	Mon 31.07.17							
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Project: MONITORING THE ENVIRONMENTAL IMPACT OF THE WORKS REGARDING THE IMPROVING OF THE NAVIGATION CONDITIONS ON THE DANUBE RIVER BETWEEN CALARASI AND BRAILA, km 375-175

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4.2. Budget and expenses incurred during the reporting period

Justifying calculation for 01 - 30 June 2017

No.	Experts	No. of working days	Fee (Euro on working day)	Maximum total value of the fees	
		Post - Construction (36 monts)			
1	Project leader	5	240	1.200,00 EU	
2	Chemist 1	5	200	1.000,00 EU	
3	Chemist 2	5	200	1.000,00 EU	
4	Ichtyologist 1	7	330	2.310,00 EU	
5	Ichtyologist 2	5	200	1.000,00 EU	
6	Hydrology	8	200	1.600,00 EU	
7	Hydraulic- sedimentlogy	12	200	2.400,00 EU	
8	Aquatic phytoplankton and macropytes	0	130	0,00 EU	
9	Zooplankton	0	130	0,00 EU	
10	Terrestrial invertebrates	3	125	375,00 EU	
11	Aquatic macroinvertebrates	5	125	625,00 EU	
12	Terrestrial flora and fauna	0	125	0,00 EU	
13	Ornithologist 1	7	200	1.400,00 EU	
14	Ecologist 1	2	140	280,00 EU	
15	Ecologist 2	0	140	0,00 EU	
16	Evaluator	5	330	1.650,00 EU	
SUBT	14.840,00 EU				
II EX	PENSES with JUSTIFICATION				
1	Ichtyology- telemetry (sturgeons and barbel transmitters, batteries, expensis on stugeons' capturing)			0,00 EU	
2	Abiotic and biotic data for the establishment of the framework		1		
3	Analysis			0,00 EU	
SUBT	0,00 EU				
III. M	ATHEMTICAL MODELING	50			
1	Softaware acquisiton+hardware+ necessary licenses			0,00 EU	
2	Acquisition of bathymetric data, necessary for the mathematical modeling			68.546,02 EU	
3	Training of 2 specialists in numerical modeling			0,00 EU	
4	Fee for the numerical modeling expert			0,00 EU	
5	3D numerical model and implementation in 3D monitoring			49.995,60 EU	
SUBT	OTAL NUMERICAL MODELING			118.541,62 EU	
TOT	TOTAL without V.A.T.				

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4.3. Budget and expenses for the next period

Estimated calculation for 01 - 31 July 2017

No.	Experts	No. of working days	Fee (Euro on working day)	Maximum total value of the fees
		Post - Construction (36 monts)		
1	Project leader	5	240	1.200,00 EUR
2	Chemist 1	0	200	0,00 EUF
3	Chemist 2	3	200	600,00 EUF
4	Ichtyologist 1	3	330	990,00 EUF
5	Ichtyologist 2	10	200	2.000,00 EUF
6	Hydrology	10	200	2.000,00 EUF
7	Hydraulic- sedimentlogy	12	200	2.400,00 EUF
8	Aquatic phytoplankton and macropytes	10	130	1.300,00 EUR
9	Zooplankton	19	130	2.470,00 EUR
10	Terrestrial invertebrates	0	125	0,00 EUR
11	Aquatic macroinvertebrates	0	125	0.00 EUF
12	Terrestrial flora and fauna	0	125	0.00 EUR
13	Ornithologist 1	0	200	0,00 EUR
14	Ecologist 1	2	140	280.00 EUF
15	Ecologist 2	6	140	840,00 EUF
16	Evaluator	6	330	1.980,00 EUR
SUBT	OTAL EXPERTS' FEES			16.060,00 EUR
II EX	PENSES with JUSTIFICATION			
1	Ichtyology- telemetry (sturgeons and barbel transmitters, batteries, expensis on stugeons' capturing)			0,00 EUF
2	Abiotic and biotic data for the establishment of the framework			
3	Analysis			0,00 EUF
SUBT	OTAL EXPENSES with JUSTIFICATION	0,00 EUR		
III. <i>N</i>	ATHEMTICAL MODELING			
1	Softaware acquisiton+hardware+ necessary licenses			0,00 EUR
2	Acquisition of bathymetric data, necessary for the mathematical modeling			0,00 EUR
3	Training of 2 specialists in numerical modeling			0,00 EUF
4	Fee for the numerical modeling expert			0,00 EUF
5	3D numerical model and implementation in 3D monitoring			40.000,00 EUF
SUBT	OTAL NUMERICAL MODELING			40.000,00 EUR
TOT	AL without V.A.T.	56.060.00 EUR		

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5. CONCLUSIONS, RECOMMENDATIONS, WARNINGS

- 5.1 This Monthly Report reflects monitoring activities from June 2017 related to post-construction period.
- 5.2 For the specific monitoring objectives within this phase, the Provider considered that the field and laboratory activities, logistics and infrastructure be sized so as to be according to the graphs and stipulations mentioned in the Specifications.
- 5.3 Taking into consideration the importance of the construction works that take place on Danube on the section between Calarasi and Braila, the Consortium recommends further actions on biodiversity monitoring, al least with the frequency similar to post-construction phase, up to completion of the project, in order to ensure an informational volume, with a high confidence level, to allow if necessary, the development of preventive solutions.
- 5.4 In June 2017, hydromorphological monitoring activity was mainly based on ADCP measurements (flow rates and velocities) in main critical points area: CP01, CP02 and CP10, single-beam measurements for sections profiling in the 3 main critical points, and multi-beam high resolution measurements in CP01 and CP02, in conditions with low flow rates compared to historical data for this period of the year.
- 5.5 In June 2017 no scientific fishing was carried out on sturgeon species due to the blockage caused by National Agency for Fisheries and Aquaculture in issuing the permit to carry out this activity.
- 5.6 Based on the performed comparative analyzes, it resulted that the bottom sill on Bala branch led to a series of morphological and hydrodynamical changes. The riverbed geometry changed immediately downstream from the new bottom sill, forming an erosion pit. Also, upstream of the new construction, an erosion area of up to 9.2 m was formed towards the right bank. Also, compared to pre-construction period, the erosion pit downstream of the old bottom sill has extended. By implementing the new construction, the flow section has decreased, so the water velocity values have increased significantly compared to those recorded during the pre-construction period.

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6. ANNEXES

6.1 Relevant correspondence

6.2 Recording bulletins for sampling/measurements

- 6.2.1: AIR sampling sheets
- 6.2.2: NOISE sampling sheets
- 6.2.3: SOIL sampling sheets
- 6.2.4: WATER sampling sheets
- 6.2.5: SEDIMENTS sampling sheets
- 6.2.6: AQUATIC FLORA and FAUNA sampling sheets
- 6.3 Experts' activity reports
- 6.4 Images of activities
- 6.5 Hydromorphology monitoring
- 6.6 Avifauna monitoring
- 6.7 Natura 2000 sites monitoring