



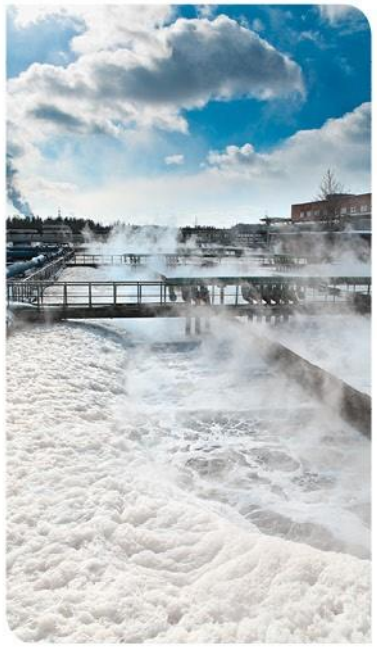






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REPUBLIKA SRBIJA
MINISTARSTVO ZA EVROPSKE INTEGRACIJE

MINISTARSTVO FINANSIJA
Sektor za ugovaranje i finansiranje programa
iz sredstava Evropske unije

Projekat finansira
Evropska unija

EU PROJECT WATER SUPPLY AND DRAINAGE SYSTEM WITH A WASTEWATER TREATMENT PLANT
from the end-user perspective








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- The first major infrastructure IPA project in the water supply sector in RC co-financed from the IPA pre-accession fund.

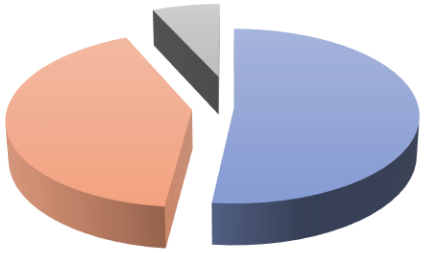
- It's implementation was based on the Operating Programme Environment 2007 – 2013.

Project value

EUR 29.7 million / **EUR 24 million**

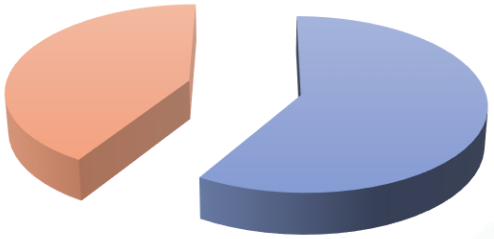
Project co-financing

Planned scope of co-financing



1 European Union IPA 51.75%

The scope of co-financing after implementation



1 European Union IPA 58.65%

2. National budget of RC 41.35%

Main project objectives

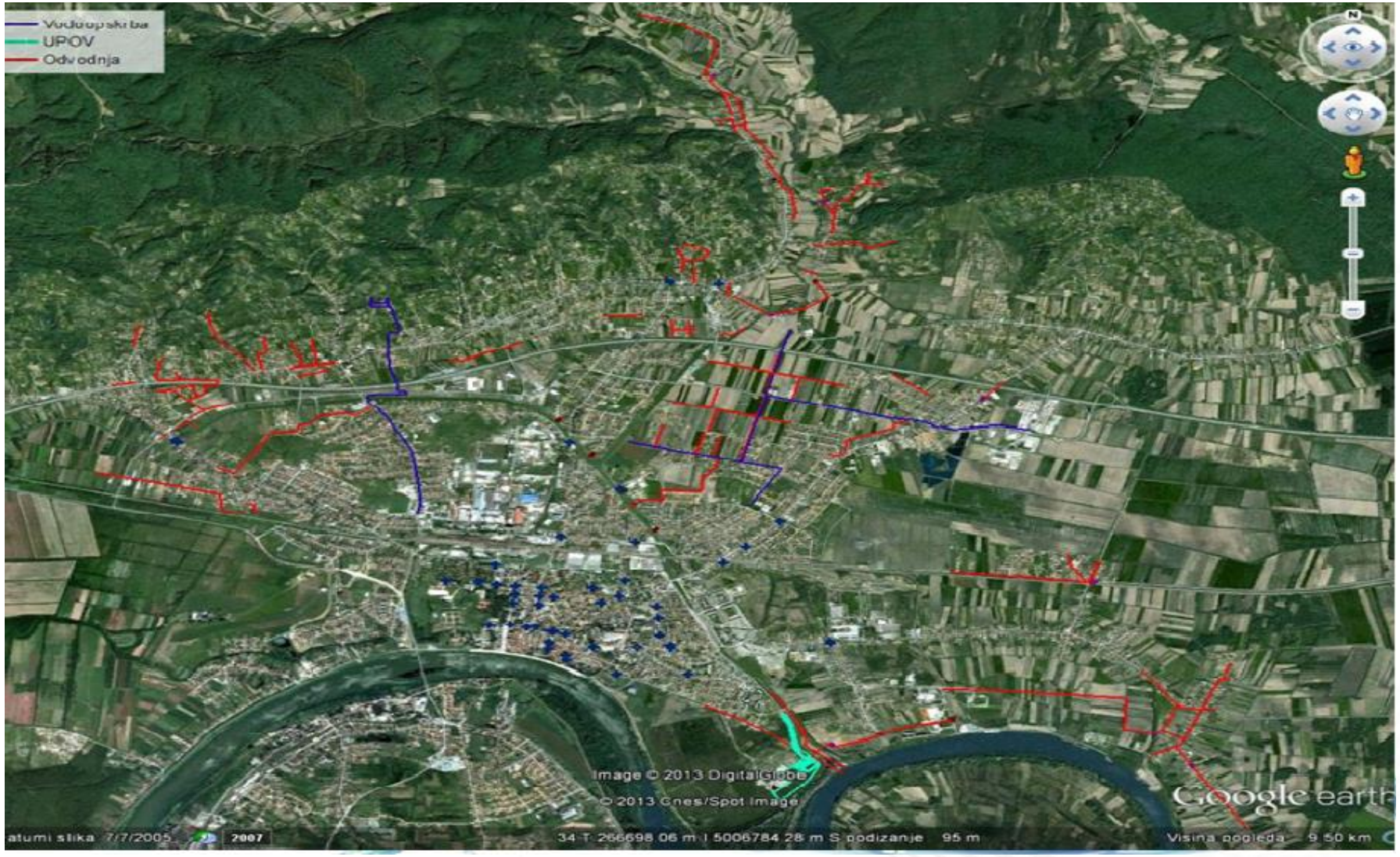
- Improvement of the water supply system in order to provide functionality of the entire system.
- Improvement of the water supply security for existing consumers and connection of approximately **4,300 new** residents in Slavonski Brod due to the strengthening of the water supply system and a larger storage capacity.
- Loss reduction **by 20%**.
- Improvement of the existing sewerage system which will enable a more cost-effective treatment of wastewater and increase the number of residents connected to the sewerage system and help connect **9,950 new** residents to the system.
- Construction of a wastewater treatment plant for **80,000 PE**, which contributes to the implementation of the EU acquis and, especially, the Urban Waste Water Treatment Directive.

- Hrvatske vode, as the executive body, implements the project in its own name and for the account of the Investor.
- Hrvatske vode is the Ordering Party for all contracts with Consultants, Contractors and Suppliers.
- Vodovod is the Investor in the project, according to the Law on Construction.

- contracting according to the PRAG procedure in English with prior approval

- 4 tender procedures – 5 contracts
    1. Contract for the Works on the Wastewater Treatment Plant
    2. Contract for the Works on the Water Supply an Sewerage Network
    3. Contract for the Work Supervision Services
    4. Equipment Purchase Contracts (LOT1 and LOT2)

Project scope map



Project preparation

An EU project is elaborate and complex in all stages

An EU project is strictly defined, with a clearly set framework that needs to be adhered to – adhere to the set deadlines, approved amounts, and given indicators

Preparation of an EU project is very important, and even in this stage it is necessary to see the broader picture, and to immediately start thinking about implementation and potential risks.

- It is necessary to properly prepare the entire study, project, and other documentation (a high-quality feasibility study, environmental impact assessment study, implementation package, tender documents), while taking into account the following:
    - Do not approach an EU project in a way you would approach a project funded or co-funded by the state
    - Define your needs and objectives clearly (it is not necessary to build the entire water supply or sewerage network via this project, nor to purchase all equipment)

What does that mean?

Any department has its wants and needs: some would build the entire water supply network and completely reconstruct the existing one, others would build the entire sewerage network and reconstruct the existing one, purchase all missing vehicles and equipment. It is important to “lock” a scope once it has been defined and be consistent about it.

- Do not include elements from short-term construction plans in the Project, as we have seen that the process of granting, contracting, and implementation is prolonged
- Be willing to compromise when defining technical solutions and option analyses
- Via feasibility study prove the need to build household connections to the water supply and sewerage network simultaneously with construction of the water supply and sewerage network (this provides more security in achieving the set indicators – number of residents connected to the newly-constructed and reconstructed network)
- Via feasibility study prove the need for the production of electric energy out of the surplus of biogas produced in the WWTP.

- During the stage of creating project documentation, pay attention to the actual required capacity of the pipeline and the WWTP. It is often the case that larger pipelines are designed for security reasons. Over-dimensioning the WWTP is a problem when proving its functionality and efficiency later on, which is one of the indicators of project success.

- Provide high-quality control of project documentation – visit the field with the designers during the design stage

- Create tender documentation professionally

- Provide a professional and high-quality team that will deal with the property rights as quickly as possible (more than 500 properties in our case, or several times more signed easement contracts – one property does not mean one contract).

- The role of Hrvatske vode as the executive body in all project stages
- High level of engagement of the Project Team of Hrvatske vode as the executive body and utility company in all project stages
- There must be a link between expertise and personal initiative.

2005

DABLAS,EIB – **contracted the creation of Feasibility Study**

2006

Feasibility Study completed and adopted by the City of Slavonski Brod

2007

A working group was set up to prepare and implement projects co-financed by the EU funds

SB project was put on the priority list

Preliminary certification mission of the EU in Slavonski Brod

OPEP adopted by the EC

2007 – 2009

2008

Application sent to the EC in February

Hrvatske vode accredited as the executive body

Amendment of SI

Creation of the Application

EU certification mission in SB in September

Alignment of the documentation with the EC

Modified Application sent to the EU in December

2009

Project awarded in April

RC–EC Bilateral Agreement signed

Preparation of the documentation for tendering

Contracting

Extremely long period, completion time cannot be foreseen

May/2009
tendering documentation awaiting approval
Supervision

October/2009
tendering documentation approved
Supervision

March/2011
WWTP documentation published

July/2011
submission of tenders for WWTP

October/2011
signed contract for WWTP

- **Equipment**, 150 pages of tender documentation
- **Supervision**, 130 pages
- **Network**, 850 pages split into 5 books
- **WWTP**, 500 pages, 5 books of documentation

Project Implementation

- Implementation of the Project starts with the announcement of the first Public Procurement and ends when the last Performance Certificate is issued.
- Different activities overlap during project implementation and the number of activities increases with the activation of each new Contract, which is why it is necessary to:
    - Gather a sufficient number of high-quality people in the project team, who will work both in the field and in the offices, who will supervise field work on a daily basis, because a project cannot be successful without a high-quality team and its engagement in the Project.
    - Increase the level of engagement of all project participants
    - Provide high-quality coordination – a combination of productivity, expertise, political support, and personal initiative
    - Provide good communication with citizens during the implementation stage, as well as transparency and visibility of the project
    - Communicate with citizens through different media on a daily basis, establish transparency and visibility

- project implementation

2010
Beginning of implementation

Tendering period

2011
Implementation

End of the tendering period

2012
Implementation of all activities

2013
Implementation

2014
Implementation

End of test operation

2015
End of implementation

- WWTP project implementation

10/2011

Signed contract with the contractor

2012

Design

Obtaining amendments to location permits (separation into stages of construction)

Obtaining three construction permits (road, geomechanics, WWTP)

9/2013

Construction of WWTP 440 days

Approved test operation

7/2014

Achieved required parameters after 240 days of test operation

Obtained 3 exploitation permits

8/2014

Certificate of WWTP handover

Start of the DNP period

8/2015

Completion of the contract

Contract dynamics overview

Contract description	Contract signing	Contract value	Completion of the contract
Supervision	10/2010	EUR 1,458 m	10/2015
Purchase of sewerage network maintenance vehicles	11/2011	EUR 0.347 m	6/2013
Purchase of a CCTV inspection vehicle	8/2011	EUR 0.126 m	6/2013
Network construction	9/2010	EUR 10.49 m	12/2013 (including 1-year DNP)
Construction of WWTP	10/2011	EUR 11,605 m	8/2015. (including the time for design, construction, test operation and 1-year DNP)

Equipment purchase contract

LOT 1

Contractor: Gradatin d.o.o.

Contract signing: 1 August 2011

Value: EUR 346,594.00

General contract conditions: PRAG-

General conditions of the equipment purchase contract:

Start of contract period: 19 August 2011

Contract completion: 18 June 2013

Amount paid under contract: EUR 341,395.09

(98.5% of the contract value)

Delivery:

2 vehicles for the sewerage system cleaning, with tank capacities of 8 m^3 and 12 m^3

LOT 2

Contractor: Agra d.o.o.

Contract signing: 25 August 2011

Value: EUR 126,000.00

General contract conditions: PRAG General conditions of the equipment purchase contract

Start of contract period: 20 November 2011

Contract completion: 25 April 2013

Amount paid under contract: EUR 126,000.00

(100% of the contract value)

Delivery:

1 vehicle for CCTV inspection of the network

- Relatively simple implementation of the contract during which no problems are expected, provided that the public procurement documentation is clear and unambiguous
- Clearly defined technical specifications of vehicles
- Make sure the delivered vehicles correspond to the tender
- Training for employees must be professional and of high quality
- Pay attention to the items of visibility

My experience: Contract control in terms of all elements after the expiry of the warranty period, conducted by the agency for control of EU Projects.

The subject of the control included randomly selected documents from both contracting and vehicle delivery stages, as well as vehicles according to technical specifications

Contract for the Work Supervision Services

Contractor: Eptisa Servicios de Ingenieria S.L.

Contract signing: 13 September 2010

Value: EUR 1,458,500.00

General contract conditions: PRAG General conditions of services contracts

Start of contract period: 19 October 2010

Anticipated completion of the contract: 18 December 2014

Contract completion: 18 October 2015

Tracking the actual time spent (main experts spent almost 1,335 days accompanying experts 695 days)

Four main and seven accompanying experts, all professions according to CL and FIDIC, were engaged in the Contract.

Contract for the Construction of Water Supply and Sewerage Network

Contractor: Osijek-Koteks d.d. / Alpine Bau Gmbh / Vodotehnika d.d. / Vodovod-Osijek

Contract signing: 24 September 2010

Value: EUR 10,489,569.00

General contract conditions: FIDIC Red Book

Start of contract period: 29 October 2010

Contract completion: 27 December 2013 (expected completion)

Actual commencement of works: 10 February 2011

Completion of works: 27 December 2012 (Works handed over via the Taking-over Certificate)

Performance Certificate: 19 March 2014

Amount paid under contract: EUR 10,469,740.35

Contract for the Construction of the Wastewater Treatment Plant

Contractor: Tehnika d.d./Ginzler Stahl-u Angenbau GmbH/SFC Umwelttechnik GmbH/Elmap d.o.o.

Contract signing: 28 October 2011

Value: EUR 11,605,000.00

General contract conditions: FIDIC Yellow Book

Start of contract period: 25 November 2011

Contract extension: 14 April 2014 (Contact extended by 43 days due to the increased scope of geomechanical works, poor weather conditions)

Plant constructed and tested on 28 September 2013

Approved test operation: 18 October 2013

Completion of works: 19 August 2014

Contract completion: 15 August 2015

Performance Certificate: 19 August 2015

Amount paid under contract: EUR 10,704,942.29

Construction contracts

WATER SUPPLY
5 construction permits

- Construction of 7.2 km of national road pipelines
- Construction of the new water tank in Brodsko Brdo in the city of Slavonski Brod
- Replacement of 1.8 km of existing main pipelines
- Reconstruction of 50 main hubs in the city of Slavonski Brod

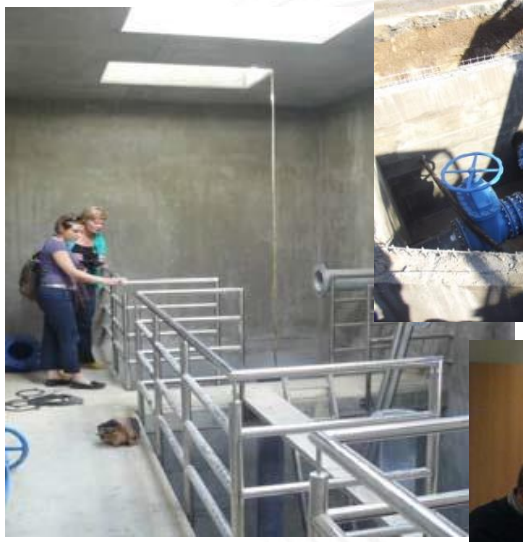
DRAINAGE
16 construction permits

- Construction of 36.1 km of new collectors
- Construction of 8 pumping stations
- Construction of 7 rain overflows
- Reconstruction of 0.7 km of existing main collectors in the city of Slavonski Brod

Construction of WWTP
3 construction permits

- 80.000 PE,
  3rd level of treatment
- mechanical treatment
  biological treatment
  sludge treatment
  biogas processing and use

- Network construction








Our problems during construction

The first problems occurred right after signing the Contract with the Contractor

On the one hand:

- The Contractor has to organize, become familiar with project documentation, get to know the location, create all final designs.
- This requires a certain amount of time that the Contractor was desperately trying to buy, and then started making objections to the project documentation.

On the other hand:

- We have a large number of construction permits.
- Our project documentation is mostly old, created even before the year 2000 and is thus inaccurate, of low quality and no longer matches the location requirements.
- The cadastre of underground installations that was used in existing documentation was either inaccurate or non-existing.

Consent from owners of all installations needs to be obtained before the start of the works

Performance of construction work caused an increased number of test excavations, changes in the pipeline route according to the current state in the field, that is frequent displacement of installations, which in turn had an impact on the work dynamics

The scope of the Project was spread relatively far apart

Around ten construction sites were opened at the same time

Residents complained, justifiably and unjustifiably, about of the disturbance every day

The conservation requirements for archaeological supervision and archaeological research also affected the works

The lack of Contractor’s experience in realisation of big infrastructure works

The Contractor does not have a sufficient number of experts available

The Contractor seeks to reduce costs and perform works contrary to the rules of the profession, interprets the items on the costing sheet arbitrarily

Despite all problems, you constantly need to have in mind that the financial resources are limited, that the time frames are defined and that only minor changes are allowed regarding the approved project documentation, provided that there is very good reasoning for it

- **Constructed facilities**

- **Facilities in the network today**

As there were slight modifications and variations to the project during construction work:

- due to new location requirements which were different from the designed ones,
- mistake made by the contractor when determining the route of the pipeline,
- the state of existing pipelines in the field and hubs that were not in line with the data available to Vodovod

it was necessary to ensure that modifications were made in the main projects, before technical inspections.

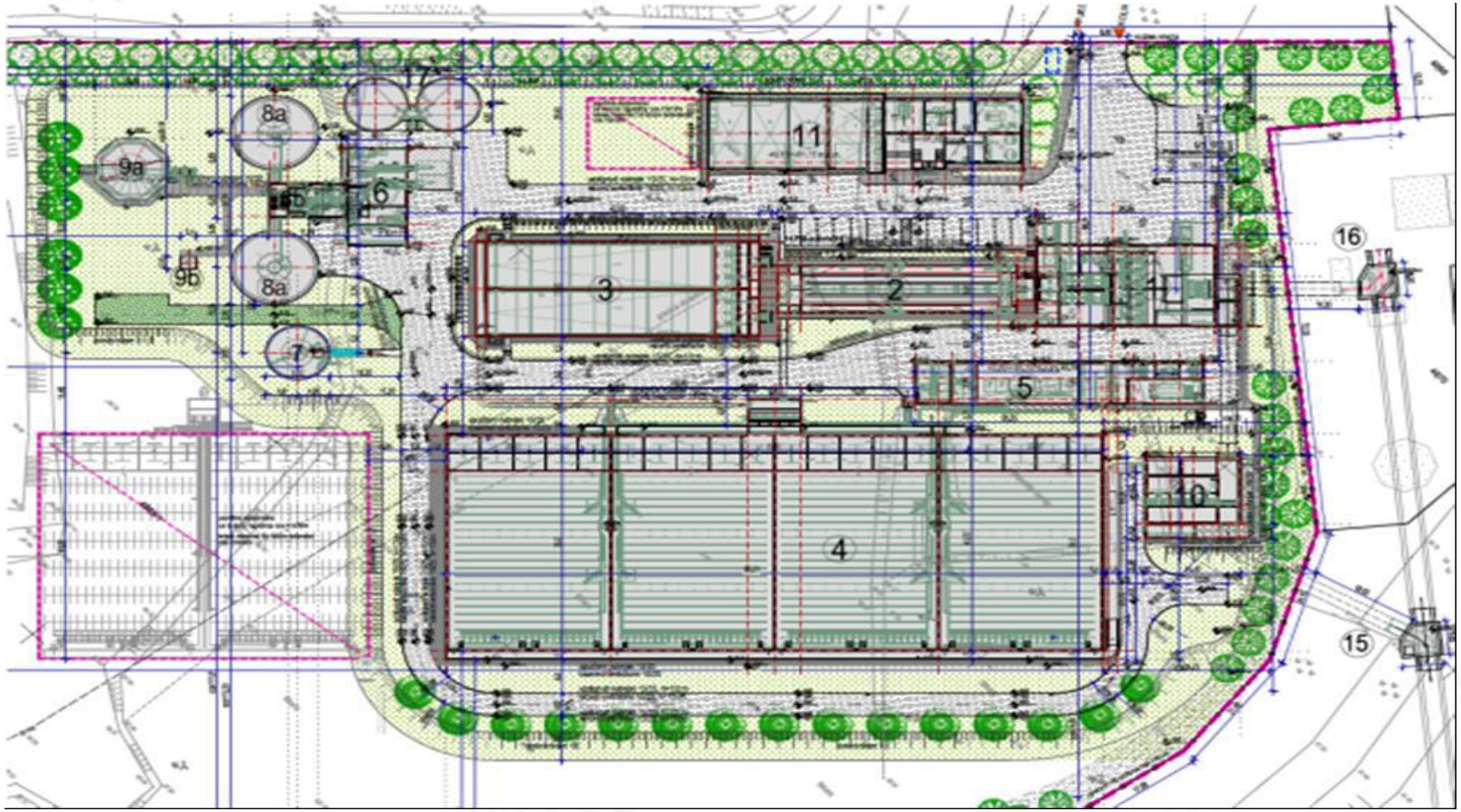
The biggest modification: the water supply pipeline designed in the median strip along the road; during test excavations, a large number of underground installations was noticed; the pipeline needed to be displaced into the road; it was necessary to obtain consent of the road owner in order to dig through the road; this led to cost increase.

Coordination with management authorities of the City and the County in obtaining exploitation permits (21 exploitation permits).

During the time allocated for the correction of deficiencies, keep a list of deficiencies that is as accurate as possible, and together with the supervising body control the contractor on a daily basis.

WWTP Diagram

1. Inflow structure
2. Aerated sand trap and oil separator
3. Primary sedimentation tank
4. SBR pools
5. Ventilator construction
6. Sludge dewatering
7. Primary sludge thickener
8. Digesters
9. Gas storage and torch
10. Outflow structure
11. Administrative building
12. Outlet
13. Inlet
14. Sludge storage



- Construction of WWTP











The Location Permit for the WWTP includes construction of the access roads.

Right after signing the contract, the Contractor started amending the location permit and dividing the work into stages in order to start with the works as soon as possible (I Construction of the road, II Improvement of the foundation and III Construction of the WWTP).

Given that WWTP is a complex and unfamiliar system, a positive experience and recommendation to managements of all utility companies is:

Appoint the key people who will manage the WWTP at the very beginning of works (WWTP manager, foreman, mechanical engineer, electrical engineer), and form the entire working unit before the test operation starts.

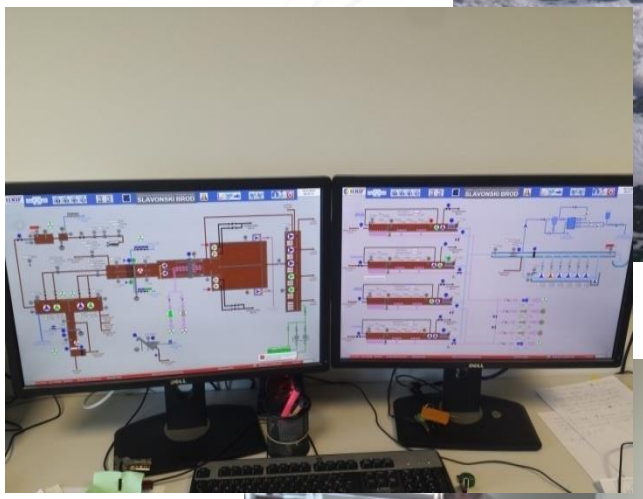
Our employees were located at the construction site, in the container and were present at the construction site throughout the entire working hours.

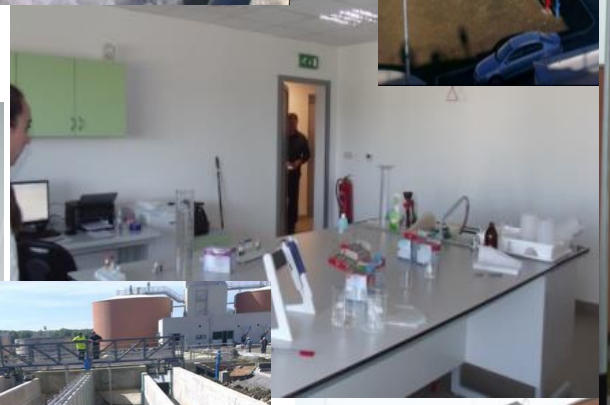
After the construction of the WWTP, the Contractor's contractual obligation also included a test operation, during which they had to prove all designed parameters. As our sewerage system is mixed and the quality of wastewater depends on the amount of precipitation, during test operation it was more difficult to establish the biology (even today the biological load is at the designed 40%, while the hydraulic load is very close to the designed values) – pay attention to the actual needs of the WWTP capacity.

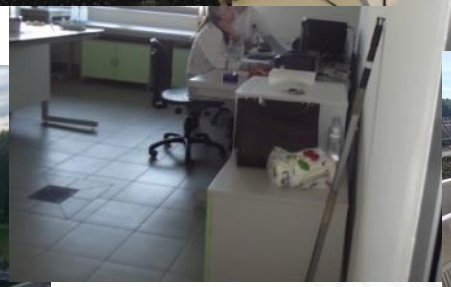
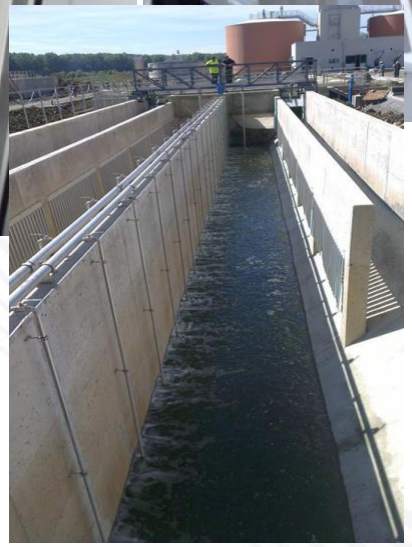
We still haven't solved the sludge disposal problem

- **Constructed WWTP**





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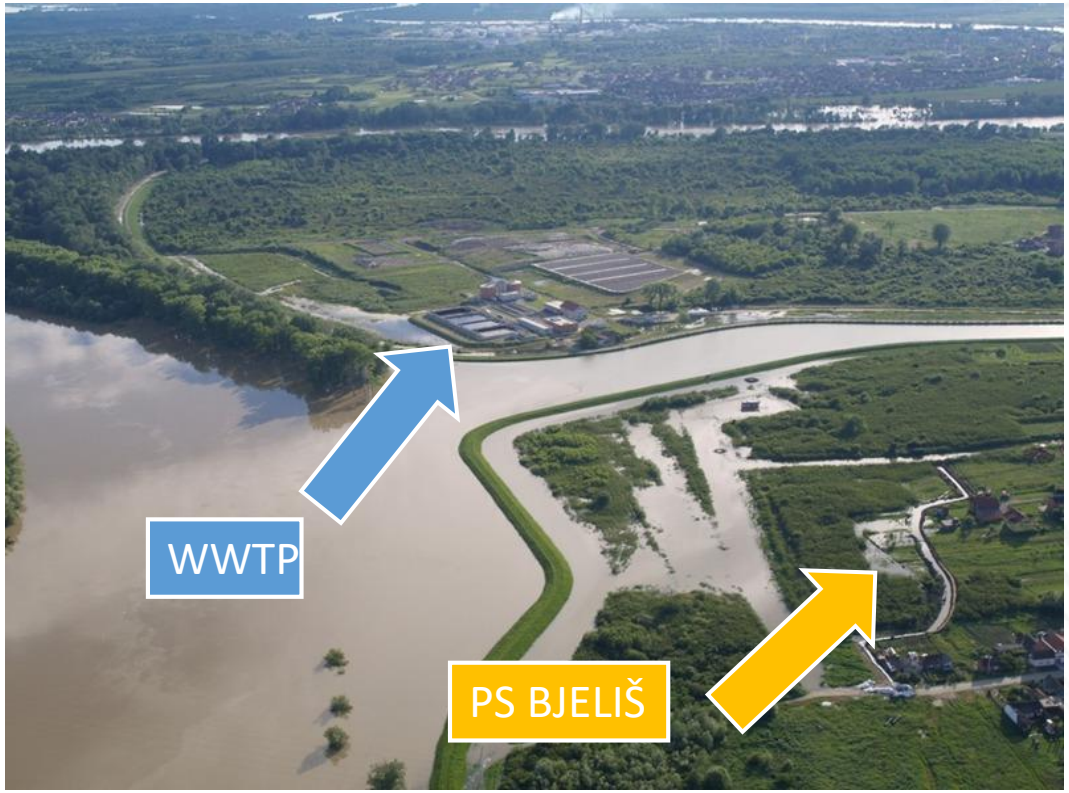
- **WWTP May 2014.**



Designed for HQ100 91.18 – 91.70 m a.s.l.

18 May 2014 939 cm (91.19 m a.s.l.)

And finally, a few more details:

The Project is not completed when the last performance certificate is issued.

During the next five years there is an obligation of annual reporting and issuing a final report at the end.

That time is the monitoring time.

It is recommended to keep a well-organized archive, as well as to store all documents in printed and electronic form.

Keep as much information as possible about all project stages.

During the works on the network and the WWTP, and after their completion, we had:

- several controls conducted by PT1,
- agency for the control of implementation of EU projects,
- near the end of 2018, we had an ex post thorough control by an independent agency appointed by the EU.

Thank you for your attention!

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January 2020,